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CHINA CLASSIFICATION SOCIETY

法定检验实施指南

GUIDELINES FOR IMPLEMENTATION OF STATUTORY SURVEYS

（国际航行船舶　第 1 部分）

(SHIPS ENGAGED ON INTERNATIONAL VOYAGES PART I)

2022.03

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NOTES TO MODIFICATION

The contents contained in the modified version of the Guidelines in March 2022 are as follows:

CHAPTER 1 INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA (SOLAS CONVENTION)

Index No.	IACS	Title	Applicable paragraphs of Conventions/Codes	Adopted by IACS	Entry into force for IACS	Status of modif.
1.157	SC167	Electrical distribution boards	SOLAS Regulation II-2/9.2.2.3.2.2(7),9.2.2.4.2.2(5),9.2.3.3.2.2(5)&9.3.4.2.2.2(5)	June,2002/ Rev.1,Nov.,2005/ Corr.1,Nov.,2021	Jan.1,2003/	Revised
1.159	SC169	Foam systems positions of aft monitors	Regulation II-2/10.8 of SOLAS, Paragraph 2.3.2.3, Chapter 14 of FSS Code	June 2002/ Corr.1,Feb.,2003/ Rev.1,Nov.,2021	Jan.1,2003/ -/ Rev.1,Jan.1,2023	Revised

CHAPTER 2 INTERNATIONAL CONVENTION ON LOAD LINES(LL CONVENTION)

Index No.	IACS	Title	Applicable paragraphs of Conventions/Codes	Adopted by IACS	Entry into force for IACS	Status of modif.
2.54	LL55	Least moulded depth for a ship with a rake of keel	Regulation 3(1) of Annex I to ICLL Convention 1966	1993/ Rev.1,Jul.,2008/ Corr.1,Dec.,2021	1993	Revised
2.75	LL77	Application of load line requirements to conversions of single-hull oil tankers to double-hull oil tankers or bulk carriers	Regulation 10 of Amendments to Annex I to the Convention revised by the Protocol of 1988	Dec.2011/ Corr.1,Dec.,2021	Jan.1,2013	Revised

CHAPTER 5 INTERNATIONAL CODE OF SAFETY FOR HIGH SPEED CRAFT (HSC CODE)

Index No.	IACS	Title	Applicable paragraphs of Conventions/Codes	Adopted by IACS	Entry into force for IACS	Status of modif.
5.1	HSC1	Cupboard as part of the space	Paragraph 7.3.1 of HSC Code 1994	1996/ Del,Nov.,2021	-/ Jul.1,2022	Deleted
5.2	HSC2	Classification of stairways	Paragraph 7.3.1.3 of HSC Code 1994	1996/ Del,Nov.,2021	-/ Jul.1,2022	Deleted
5.3	HSC3	Public spaces extending over 2 decks	Paragraph 7.4.4.1 of HSC Code 1994	1996/ Del,Nov.,2021	-/ Jul.1,2022	Deleted
5.4	HSC4	Ventilation grille in toilet entrance door	Table 7.4-1 of HSC Code 1994	1997/ Del,Nov.,2021	-/ Jul.1,2022	Deleted
5.6	HSC6	Protection of propeller shafts	Paragraph 9.8 of HSC Code 2000, Chapter 9, part B	1997/ Rev.1,Nov.,2021	-/ Rev.1,Jul.1,2022	Revised

PREAMBLE

1 Conventions and Codes

1.1 The Conventions and Codes covered by the Guidelines are:

(1) International Convention for the Safety of Life at Sea, 1974 (SOLAS Convention);

(2) International Convention on Load Lines (LL Convention) (covering International Convention on Load Lines, 1966, the Protocol of 1988 relating thereto and their amendments);

(3) International Convention for the Prevention of Pollution from Ships, 1973/1978 (MARPOL Convention);

(4) International Convention on Tonnage Measurement of Ships, 1969 (TM Convention);

(5) International Code of Safety for High Speed Craft (HSC Code);

(6) International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH/IBC Code);

(7) International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code);

(8) Guidelines for the Design, Construction and Operation of Passenger Submersible Craft (PASSUB);

(9) International Code for Application of Fire Test Procedures (FTP Code);

(10) International Regulations for Preventing Collisions at Sea, 1972 (COLREG).

(11) Cape Town Agreement Of 2012 On The Implementation Of The Provisions Of The Torremolinos Protocol Of 1993 Relating To The Torremolinos International Convention For The Safety Of Fishing Vessels, 1977 (Cape Town Agreement)

2 Terms

2.1 For the purpose of the Guidelines, the following terms apply:

(1) UI is the abbreviation for the Unified Interpretations;

(2) SC means IACS Unified Interpretations for SOLAS Convention;

(3) LL means IACS Unified Interpretations for LL Convention;

(4) MPC means IACS Unified Interpretations for MARPOL Convention;

(5) TM means IACS Unified Interpretations for TM Convention;

(6) HSC means IACS Unified Interpretations for HSC Code;

(7) CC means IACS Unified Interpretations for BCH/IBC Code;

(8) GC means IACS Unified Interpretations for IGC Code;

(9) PASSUB means IACS Unified Interpretations for PASSUB Guidelines;

(10) FTP means IACS Unified Interpretations for FTP Code;

(11) COLREG means IACS Unified Interpretations for COLREG Regulations;

(12) MSC means Maritime Safety Committee of IMO;

(13) MEPC means Marine Environment Protection Committee of IMO.

PART 1 INTERPRETATIONS OF IMO CONVENTIONS AND CODES

CHAPTER 1 INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA (SOLAS CONVENTION)

1.1 Main source of electrical power

Conventions (Amend.), Reg.		Regulation **41.1.3** of SOLAS **Chapter II-1** as amended by IMO resolutions up to MSC.436(99)					
IACS UI Number	**SC1**	**UI** version	**1985/ Rev.1,June, 2002/ Rev.2,Feb., 2021**	Date of implementation	**-/ Rev.1,Jan.1,2003/ Rev.2,July.1,2022**	Means of implementation	**Contracted for construction** (Rev. 2)

Conventions/Codes Requirements

The arrangements of the ship's main source of electrical power shall be such that the services referred to in Regulation 40.1.1 can be maintained regardless of the speed and direction of rotation of the propulsion machinery or shafting.

Interpretation

Shaft driven generator systems

Generators and generator systems, having the ship's main propulsion machinery as their prime mover may be accepted as part of the ship's main source of electrical power, provided:

1. They are to be capable of operating under all weather conditions during sailing and during manoeuvring, also when the vessel is stopped, within the specified limits for the voltage variation in IEC 60092 - 301:1980 and the frequency variation in UR E5.
2. Their rated capacity is safeguarded during all operations given under 1, and is such that in the event of any other one of the generators failing, the services given under Regulation 41.1.2 of SOLAS Chapter II-1 as amended by IMO resolutions up to MSC.436(99) can be maintained.
3. The short circuit current of the generator/generator system is sufficient to trip the generator/generator system circuit-breaker taking into account the selectivity of the protective devices for the distribution system.

Protection is to be arranged in order to safeguard the generator/generator system in case of a short circuit in the main bus bar. The generator/generator system is to be suitable for further use after fault clearance.

4. Standby sets are started in compliance with the paragraph 2.2 of SC 157.

Remarks

1.2 Emergency source of electrical power

Conventions (Amend.), Reg.		Regulations **II-1/42.1.4** & **43.1.4** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC3**	**UI** version	**1985/Rev. 1, May 1999**	Date of implementation	**01.01.2000**	Means of implementation	

Conventions/Codes Requirements

Provided that suitable measures are taken for safeguarding independent emergency operation under all circumstances, the emergency generator may be used exceptionally, and for short periods, to supply non-emergency circuits.

Interpretation

Exceptionally, whilst the vessel is at sea, is understood to mean conditions such as:

1. blackout situation;
2. dead-ship situation;

3. routine use for testing; 4. short-term parallel operation with the main source of electrical power for the purpose of load transfer. Unless instructed otherwise by the Administration, the emergency generator may be used during lay time in port for the supply of the ship mains, provided the requirements of UI SC 152 are complied with.
Remarks

1.3 Emergency source of electrical power

Conventions (Amend.), Reg.		Regulations **II-1/42.2.3.1** & **43.2.4.1** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC4**	**UI** version	**1985**	Date of implementation		Means of implementation	

Conventions/Codes Requirements
For a period of 36 h: .1 all internal communication equipment required in an emergency; unless such services have an independent supply for the period of 36 h from an accumulator battery suitably located for use in an emergency.
Interpretation
Internal communication equipment required in an emergency is generally: 1. The means of communication which is provided between the navigating bridge and the steering gear compartment; 2. The means of communication which is provided between the navigating bridge and the position in the machinery space or control room from which the engines are normally controlled; 3. The means of communication which is provided between the bridge and the radio telegraph or radio telephone stations.
Remarks

1.4 Emergency source of electrical power in passenger ships

Conventions (Amend.), Reg.		Regulation **II-1/42.2.3.1** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC5**	**UI** version	**1985**	Date of implementation		Means of implementation	

Conventions/Codes Requirements
For a period of 36 h: .1 all internal communication equipment required in an emergency; unless such services have an independent supply for the period of 36 h from an accumulator battery suitably located for use in an emergency.
Interpretation
1. The means of communication which is provided between the officer of the watch and the person responsible for closing any watertight door which is not capable of being closed from a central control station 2. The public address system or other effective means of communication which is provided throughout the accommodation, public and service spaces 3. The means of communication which is provided between the navigating bridge and the main fire control station.
Remarks

1.5 Emergency source of electrical power on Gas Carriers and Chemical Tankers

Conventions (Amend.), Reg.		Regulation **II-1/43.6** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC6**	**UI** version	**1985/ Rev.1,Mar. 2019**	Date of implementation		Means of implemen tation	

Conventions/Codes Requirements

SOLAS Chapter II-1, Regulation 43.6 reads:

"6 The emergency generator and its prime mover and any emergency accumulator battery shall be so designed and arranged as to ensure that they will function at full rated power when the ship is upright and when inclined at any angle of list up to 22.5° or when inclined up to 10° either in the fore or aft direction, or is in any combination of angles within those limits."

Interpretation

The following additional requirements are to be taken into account:

1. IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (Res.MSC.5(48) as amended by resolutions MSC.17(58), MSC.30(61), MSC.32(63), MSC.59(67), MSC.103(73), MSC.177(79) and MSC.220(82), clause 2.9.2.2.

2. IMO International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk, clause 2.9.3.2.

Technical Background

In the light of the revised IGC Code (MSC.370(93)), existing UI SC6 remain applicable for ships constructed before 1 July 2016.

Remarks

Rev.1 of this Unified Interpretation is to be uniformly implemented by IACS Societies on ships constructed on or after 1 July 1986 but before 1 July 2016.

1.6 Precautions against shock, fire and other hazards of electrical origin

Conventions (Amend.), Reg.		Regulation **II-1/45.2** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC7**	**UI** version	**1985**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

"Exposed live parts having voltages to earth exceeding a voltage to be specified by the Administration"

Interpretation

Voltage values as stated in Regulation 45.1.1.1.

Remarks

1.7 Precautions against shock, fire and other hazards of electrical origin

Conventions (Amend.), Reg.		Regulation **II-1/45.3.3** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC8**	**UI** version	**1985**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

"and special precautions shall be taken to the satisfaction of the Administration."

Interpretation

1. All final sub-circuits should consist of two insulated wires, the hull return being achieved by connecting to the

hull one of the bus bars of the distribution board from which they originate. 2. Earth wires should be in accessible locations to permit their ready examination and to enable their disconnection for testing of insulation.
Remarks

1.8 Precautions against shock, fire and other hazards of electrical origin

Conventions (Amend.), Reg.		Regulation **II-1/45.4.2** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC9**	**UI** version	**1985**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
"Insulation level monitoring devices."							
Interpretation							
A device or devices to continuously monitor the values of electrical insulation to earth and to give an audible or visual indication in case of abnormally low insulation values.							
Remarks							

1.9 Precautions against shock, fire and other hazards of electrical origin

Conventions (Amend.), Reg.		Regulation **45. 5. 2** of SOLAS **Chapter II-1** as amended by IMO resolutions up to MSC.436(99)					
IACS UI Number	**SC10**	**UI** version	**1985/ Rev.1,1997/ Rev. 2, May,2001/ Rev.3,Feb.,2021**	Date of implementation	**-/ -/ Rev.2,July.7,2001/ Rev.3,July.1,2022**	Means of implementation	**contracted for construction (Rev. 3)**
Conventions/Codes Requirements							
"(…) shall be at least of a flame-retardant type. (...)"							
Interpretation							
This may be achieved by cables which have been tested in accordance with IEC 60332-1-2:2004+AMD1:2015 or a test procedure equivalent thereto.							
Conventions/Rules Requirements							
"(…) shall be so installed as not to impair their original flame-retarding properties."							
Interpretation							
This may be achieved by: Method 1 Cables which have been tested in accordance with IEC 60332-3-22:2018 Category A or a test procedure for cables installed in bunches equivalent thereto. Method 2 (See Figures 1-4) 2.1 Fire stops having at least B-0 penetrations fitted as follows: 1 cable entries at the main and emergency switchboard, 2 where cables enter engine control rooms, 3 cable entries at centralized control panels for propulsion machinery and essential auxiliaries, 4 at each end of totally enclosed cable trunks; and 2.2 In enclosed and semi-enclosed spaces, cable runs are to comply with the following: 1 to have fire protection coating applied: to at least 1 metre in every 14 metres, to entire length of vertical runs, or 2 fitted with fire stops having at least B-0 penetrations every second deck or approximately 6 metres for vertical runs and at every 14 metres for horizontal runs. The cable penetrations are to be installed in steel plates of at least 3 mm thickness extending all around to twice the largest							

dimension of the cable run for vertical runs and once for horizontal runs, but need not extend through ceilings, decks, bulkheads or solid sides of trunk. In cargo area, fire stops need only be fitted at the boundaries of the spaces.

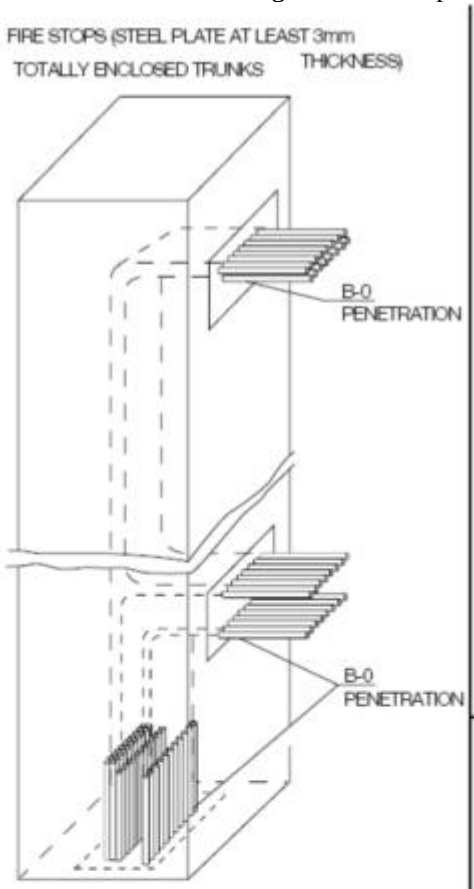


Fig. 1

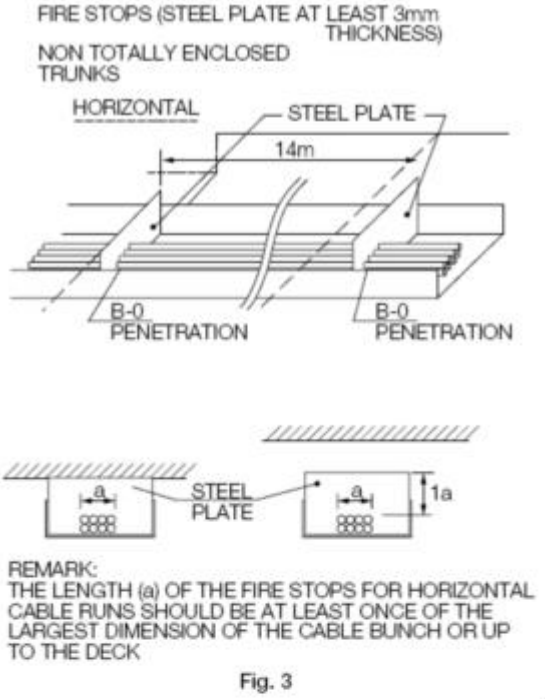


Fig. 3

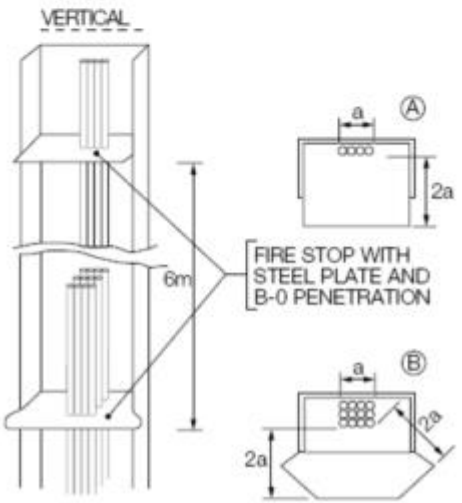


Fig. 2

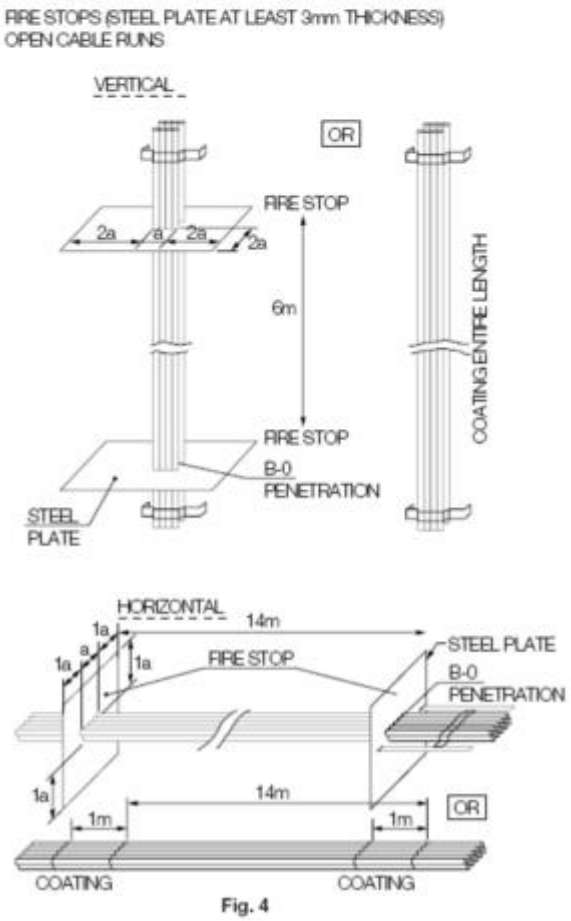


Fig. 4

Remarks

1.10 Precautions against shock, fire and other hazards of electrical origin

Conventions (Amend.), Reg.		Regulation 45.5.3 of SOLAS Chapter II-1 as amended by IMO resolutions up to MSC.436(99)					
IACS UI Number	**SC11**	**UI** version	**1985/ Rev.1,Feb.,2021**	Date of impleme ntation	**Jul.1,2022**	Means of implement ation	**constructed for construction**

Conventions/Codes Requirements

SOLAS regulation 45.5.3 of SOLAS Chapter II-1 reads as follows:

Cables and wiring serving essential or emergency power, lighting, internal communications or signals shall so far as practicable be routed clear of galleys, laundries, machinery spaces of category A and their casings and other high fire risk areas.

Interpretation

High fire risk areas are those considered as such in Regulation 9 of SOLAS Chapter II-2 as amended by IMO resolutions as to MSC.421(98).

Technical Background

IACS safety panel updated this UI to reflect the latest IMO Resolutions related to SOLAS Chapter II-2.

Remarks

1.Rev.1 of this UI is to be uniformly implemented by IACS Societies on ships contracted for construction on and after 1 July 2022.

2.The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.11 Precautions against shock, fire and other hazards of electrical origin

Conventions (Amend.), Reg.		Regulation **II-1/45.5.4** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC12**	**UI** version	**1985**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

Where cables which are installed in hazardous areas introduce the risk of fire or explosion in the event of an electrical fault in such areas, special precautions against such risks shall be taken to the satisfaction of the Administration.

Interpretation

Special precautions should be as follows:

1. Cables to be appropriately sheathed according to intended environment.
2. Cables to be suitably protected against mechanical damage.
3. Electrical and mechanical segregation of intrinsically safe circuits from other circuits.
4. Effective earthing of metal coverings of cables.

Remarks

1.12 Precautions against shock, fire and other hazards of electrical origin

Conventions (Amend.), Reg.		Regulation **II-1/45.6.1** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC13**	**UI** version	**1985**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

"overload.....or where the Administration may exceptionally otherwise permit".

Interpretation

1. When it is impracticable, for example engine starting battery circuit.
2. When by design the circuit is incapable of developing overload, for example control transformers.
3. For essential motors which are duplicated and thruster motors, the overload protection may be replaced by an overload alarm.

Remarks

1.13 Special requirements for machinery, boilers and electrical installations

Conventions (Amend.), Reg.		Regulation **II-1/53.3** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC14**	**UI** version	**1985**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Where stand-by machines are required for other auxiliary machinery essential to propulsion, automatic change-over devices shall be provided.							
Interpretation							
This regulation is applicable to stand-by machines required by the Rules of the individual Societies for: 1. oil engines for propulsion purposes, 2. steam turbines for propulsion purposes, 3. gas turbines for propulsion purposes, 4. controllable pitch propellers.							
Remarks							

1.14 Definitions - Machinery spaces of category A

Conventions (Amend.), Reg.		Regulation **II-2/3.19** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC15**	**UI** version	**1985/ Nov. 2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Machinery spaces of category A are those spaces and trunks to such spaces which contain either: .1 internal combustion machinery used for main propulsion; .2 internal combustion machinery used for purposes other than main propulsion where such machinery has in the aggregate a total power output of not less than 375 kW; or .3 any oil-fired boiler and oil fuel unit							
Interpretation							
Deleted.							
Technical Background							
Deleted in Nov 2005 because of SOLAS 2000 Amendments.							
Remarks							

1.15 Definitions – Oil fuel unit

Conventions (Amend.), Reg.		Regulation **II-2/3. 34** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC16**	**UI** version	**1985/Rev. 1, Jun.2005/ Rev.2,Aug. 2006**	Date of implementation	**01.01.2006**	Means of implementation	Keel laying
Conventions/Codes Requirements							
Oil fuel unit is the equipment used for the preparation of oil fuel for delivery to an oil-fired boiler, or equipment used for the preparation for delivery of heated oil to an internal combustion engine, and includes any oil pressure pumps, filters and heaters dealing with oil at a pressure of more than 0.18 N/mm^2.							
Interpretation							
Oil fuel unit includes any equipment used for the preparation and delivery of oil fuel, heated or not, to boilers (including inert gas generators) and engines (including gas turbines) at a pressure of more than 0.18 N/mm^2. Oil fuel transfer pumps are not considered as oil fuel units. *(MSC.1/Circ.1203)*							
Technical Background							
1.Fuel oil transfer pumps are of intermittent use and are not directly for the preparation of oil fuel for delivery to a boiler or an engine. They may not consequently be considered as oil fuel units. 2. Rev.2 of this UI is editorially amended to refer to MSC.1/Circ.1203.							
Remarks							

Circular No. 037/Total No. 157 (2005) "Notice on the Implementation of IACS UI SC16 (Rev. 1)" issued by CCS' Technical Department

1.16 Definitions - Control stations

Conventions (Amend.), Reg.		Regulation **II-2/3.18** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC17**	**UI** version	**1985/ Rev. 1, 2001/ Rev.2,Nov.,2005/ Rev.3,Nov.,2020**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Control stations are 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.							
Interpretation							
1.Main navigational equipment includes, in particular, the steering stand and the compass, radar and direction-finding equipment. 2.Steering gear rooms containing an emergency steering position are not considered to be control stations. 3.Where in the regulations of chapter II-2 relevant to fixed fire-extinguishing systems there are no specific requirements for the centralization within a control station of major components of a system, such major components may be placed in spaces which are not considered to be a control station. 4.Spaces containing, for instance, the following battery sources shall be regarded as control stations regardless of battery capacity: (1) emergency batteries in separate battery room for power supply from black-out till start of emergency generator, (2) emergency batteries in separate battery room as reserve source of energy to radiotelegraph installation, (3) batteries for start of emergency generator, (4) and, in general, all emergency batteries required in pursuance of Reg. II-1/42 or Reg. II-1/43. *(MSC/Circ. 1120)*							
Technical Background							
Safety Panel decided to update UI SC 17 to use a mandatory expression, use of mandatory text "shall" instead of "should".							
Remarks							

1.17 Fire pumps, fire mains, hydrants and hoses

Conventions (Amend.), Reg.		Regulation **II-2/4.3.1.3** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC18**	**UI** version	**1985/ Nov.2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Ships shall be provided with independently driven fire pumps as follows: in cargo ships of less than 1,000 gross tonnage to the satisfaction of the Administration							
Interpretation							
Deleted.							
Technical Background							
Deleted in Nov 2005 because of SOLAS 2000 Amendments.							
Remarks							

1.18 Fire pumps, fire mains, hydrants and hoses

Conventions (Amend.), Reg.		Regulation **II-2/4.3.3.2** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC19**	**UI** version	**1985/ Rev. 1,1996/ Nov. 2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
In cargo ships of 2,000 gross tonnage and upwards, if a fire in any one compartment could put all the pumps out of action there shall be an alternative means consisting of a fixed independently driven emergency pump which shall be capable of supplying two jets of water to the satisfaction of the Administration. The pump and its location shall comply with the following requirements:							
Interpretation							

Deleted.
Technical Background
Deleted in Nov 2005 because of SOLAS 2000 Amendments.
Remarks

1.19 Fire pumps, fire mains, hydrants and hoses

Conventions (Amend.), Reg.		Regulation **II-2/4.3.3.2.1** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC20**	**UI** version	**1985/ Nov.2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
The capacity of the emergency fire pump							
Interpretation							
Deleted.							
Technical Background							
Deleted in Nov 2005 because of SOLAS 2000 Amendments.							
Remarks							

1.20 Fire pumps, fire mains, hydrants and hoses

Conventions (Amend.), Reg.		Regulation **II-2/4.3.3.2.5** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC21**	**UI** version	**1985/ Rev.1,1996/ Nov. 2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
The total suction head and the net positive suction head of the pump shall be such that the requirements of paragraphs 3.3.2, 3.3.2.1, 3.3.2.2 and 4.2 of this Regulation shall be obtained under all conditions of list, trim, roll and pitch likely to be encountered in service.							
Interpretation							
Deleted.							
Technical Background							
Deleted in Nov 2005 because of SOLAS 2000 Amendments.							
Remarks							

1.21 Fire pumps, fire mains, hydrants and hoses

Conventions (Amend.), Reg.		Regulation **II-2/4.3.3.2.7** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC22**	**UI** version	**1985/ Rev.1,2001/ Nov. 2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Air-locks							
Interpretation							
Deleted.							
Technical Background							
Deleted in Nov 2005 because of SOLAS 2000 Amendments.							
Remarks							

1.22 Fire pumps, fire mains, hydrants and hoses

Conventions (Amend.), Reg.		Regulation **II-2/4.3.4.1** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC23**	**UI** version	**1985/ Rev.1,2001/ Nov. 2005**	Date of implementation		Means of implementation	

Conventions/Codes Requirements
in passenger ships of 1,000 gross tonnage and upwards such that at least one effective jet of water is immediately available from any hydrant in an interior location and so as to ensure the continuation of the output of water by the automatic starting of a required fire pump;
Interpretation
Deleted.
Technical Background
Deleted in Nov 2005 because of SOLAS 2000 Amendments.
Remarks

1.23 Fire pumps, fire mains, hydrants and hoses

Conventions (Amend.), Reg.		Regulation **II-2/4.4.2** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC24**	**UI** version	**1985/ Rev.1,2001/ Nov. 2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
..... the following minimum pressure shall be maintained at all hydrants: for passenger ships: less than 1, 000 tons gross tonnage to the satisfaction of the Administration. For cargo ships: less than 1, 000 tons gross tonnage to the satisfaction of the Administration.							
Interpretation							
Deleted.							
Technical Background							
Deleted in Nov 2005 because of SOLAS 2000 Amendments.							
Remarks							

1.24 Fixed gas fire-extinguishing systems

Conventions (Amend.), Reg.		Paragraph **2.1.3.2**, Chapter **5** of **FSS** Code					
IACS UI Number	**SC25**	**UI** version	**1985/Rev.1, Jun. 2000/ Rev.2,Nov.2005**	Date of implementation	**01.01.2001 (Rev.1)**	Means of implementation	
Conventions/Codes Requirements							
Means shall be provided for automatically giving audible warning of the release of fire-extinguishing medium into any ro-ro spaces and other in which personnel normally work or to which they have access.							
Interpretation							
Ordinary cargo holds need not comply with this requirement. However, ro/ro spaces, cargo holds in container ships equipped for integrated reefer containers and other spaces where personnel can be expected to enter and where the access is therefore facilitated by doors and or manway hatches shall comply with this requirement.*(MSC/Circ. 1120)*							
Technical Background							
Editorially amended in Nov 2005 to refer to FSS Code and MSC/Circ.1120.							
Remarks							

1.25 Fire-extinguishing arrangements in machinery spaces

Conventions (Amend.), Reg.		Regulations **II-2/ 10.5.1& 10.5.2** of Amendments2000 to **SOLAS 1974**					
IACS UI Number	**SC30**	**UI** version	**May 1998/ Rev. 1,June 2000/ Rev.2,Nov.2005**	Date of implementation	**Rev.1,01.01.2001**	Means of implementation	
Conventions/Codes Requirements							

Provision of fire-extinguishing arrangements in spaces containing oil-fired boilers or oil fuel units and spaces containing internal combustion machinery

Interpretation

Number of systems, appliances and extinguishers required by Reg. II-2/10.5.1 & 10.5.2 (MSC/Circ.1120)

Systems, appliances & extinguishers → Category A machinery spaces↓	Fixed fire extinguishing system	Portable foam applicator *1	Portable foam extinguishers	Add'l portable foam extinguishers	135*l* foam extinguisher	45*l* foam extinguishers *2	Sand boxes *3
SOLAS paragraph →	10.5.1.1 10.5.2.1	10.5.1.2.1 10.5.2.2.1	10.5.1.2.2	10.5.2.2.2	10.5.1.2.2	10.5.2.2.2	10.5.1.2.3
Boiler room containing:							
Oil-fired boilers	1	1	2N	NA	1*4	—	N
Oil-fired boilers and oil fuel units	1	1	2N + 2	NA	1*4	—	N
Engine room containing:							
Oil fuel units only	1	—	2	NA	—	—	—
Internal combustion machinery	1	1	X		—	Y	—
Internal combustion machinery and oil fuel units	1	1	X		—	Y	—
Combined engine/boiler room containing:							
Internal combustion machinery, oil fired boilers and oil fuel units	1	1	(2N + 2)or x, whichever is greater		1*4	Y*5	N

N = number of firing spaces.
"2N" means that two extinguishers are to be located in each firing space.
X = sufficient number, minimum two in each space, so located that there are at least one portable fire extinguisher within 10 m walking distance from any point.
Y = sufficient number to enable foam to be directed onto any part of the fuel and lubricating oil pressure systems, gearing and other fire hazards.

Notes:

*1. May be located at outside of the entrance to the room.

*2. May be arranged outside of the space concerned for smaller spaces of cargo ships.

*3. The amount of sand is to be at least 0.1 m^3. A shovel is to be provided. Sand boxes may be substituted by approved portable fire extinguishers.

*4. Not required for such spaces in cargo ships wherein all boilers contained therein are for domestic services and are less than 175 kW.

*5. In case of machinery spaces containing both boilers and internal combustion engines (case not explicitly considered in Reg. 10.5) Reg. 10.5.1 and 10.5.2 apply, with the exception that one of the foam fire-extinguishers of at least 45 l capacity or equivalent (required by Reg. 10.5.2.2.2) may be omitted on the condition that the 135 l extinguisher (required by Reg. 10.5.1.2.2) can protect efficiently and readily the area covered by the 45 l extinguisher

*6. Oil fired machinery other than boilers such as fired inert gas generators, incinerators and waste disposal units are to be considered the same as boilers insofar as the required number and type of fire fighting appliances are concerned.

Technical Background

Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments and MSC/Circ.1120.

Remarks

1.26 Fire-extinguishing arrangements in machinery spaces

Conventions (Amend.), Reg.		Regulation **II-2/7.5** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC31**	**UI** version	**1985/ Nov. 2005**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

Where a fixed fire-extinguishing system not required by this Chapter is installed, such a system shall be to the

satisfaction of the Administration.
Interpretation
Deleted.
Technical Background
Deleted in Nov 2005 because of SOLAS 2000 Amendments.
Remarks

1.27 Fixed high expansion foam fire-extinguishing system

Conventions (Amend.), Reg.		Paragraph 2.2, Chapter **6** of **FSS** Code					
IACS UI Number	**SC32**	**UI** version	**1985/Rev.1, 2001/Rev.2, Nov.2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Fixed high-expansion foam fire-extinguishing systems in machinery spaces							
Interpretation							
When such a system is to be fitted in any other space than a machinery space, this regulation applies. Reference is made to MSC/Circ. 670 - Guidelines for the performance and testing criteria and surveys of high-expansion foam concentrates for fixed fire-extinguishing systems.							
Technical Background							
Editorially amended in Nov 2005 to refer to FSS Code.							
Remarks							

1.28 Special arrangements in machinery spaces

Conventions (Amend.), Reg.		Regulation **II-2/11.2.2** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC33**	**UI** version	**1985/ Nov. 2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Suitable arrangements shall be made to permit the release of smoke, in the event of fire, from the space to be protected.							
Interpretation							
Deleted.							
Technical Background							
Deleted in Nov 2005 because of SOLAS 2000 Amendments.							
Remarks							

1.29 Automatic sprinkler, fire detection and fire alarm system

Conventions (Amend.), Reg.		Paragraph 2.5.2.3, Chapter 8 of FSS Code					
IACS UI Number	**SC34**	**UI** version	**1985/ Rev.1,Nov.,2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Sprinklers shall be placed in an overhead position and spaced in a suitable pattern to maintain an average application rate of not less than 5 l/m^2/min over the nominal area covered by the sprinklers.							
Interpretation							
Deleted							
Technical Background							
Amendment to FSS Code (MSC.339(91)) incorporates UI SC 34’s interpretation of "nominal area".							
Remarks							
IACS deleted the UI in Dec. 2020.							

1.30 Fixed Fire Detection and Fire Alarm System

Conventions (Amend.), Reg.		**FSS Code, Ch. 9, 2.5 System Control Requirements**					
IACS UI Number	**SC35**	**UI version**	**1985/ Rev.1,Nov.2005/ Rev.2,Sept.2009/ Rev.3,Jul.2013**	**Date of implementation**	**Rev.3,Jan.1,2014**	**Means of implementation**	**contracted for construction**

Conventions/Codes Requirements

2.5.1.1 The activation of any detector or manually operated call point shall initiate a visual and audible fire detection alarm signal at the control panel and indicating units. If the signals have not been acknowledged within 2 min, an audible fire alarm shall be automatically sounded throughout the crew accommodation and service spaces, control stations and machinery spaces of category A. This alarm sounder system need not be an integral part of the detection system.

Interpretation

Power supply to the alarm sounder system when not an integral part of the detection system

1 The alarm sounder system utilised by the Fixed Fire Detection and Fire Alarm System shall be powered from no less than two sources of power, one of which shall be an emergency source of power.

2 In vessels required by SOLAS regulation II-1/42 or 43 to be provided with a transitional source of emergency electrical power the alarm sounder system shall also be powered from this power source.

Technical Background

Complaints were received from shipyards that the revision 2 of the UI SC35 2009 was interpreted differently by societies. The difference concerns interpretation of the expression "Fixed Fire Detection and Fire Alarm System". Some societies interpret the expression to include the alarm sounder system, whereas other societies keep this part out of the definition, then confusion on whether the alarm sounder system is equipped with the emergency power results. IACS Statutory Panel have the discussion on it.

In fact, in many cases the general emergency alarm system is used as the alarm sounder system. The general emergency alarm system power supply requirements are found in LSA Code 7.2.1.1 "The general emergency alarm system shall be powered from the ship's main supply and the emergency source of electrical power required by regulation II-1/42 or II-1/43, as appropriate". It is reasonable to apply the power supply requirement same as to the fire detection and fire alarm system to an external alarm sounder system to alert a fire.

The Statutory Panel also consider that 30 min operation as required in FSS 9.2.2.3 shall be within this period (18 h for cargo ships, 36 h for passenger ships) required by regulation II-1/42 or II-1/43 in SOLAS.

Remarks

1、 The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

2、 This UI is not applied to the ships entitled to fly the flag of Republic of the Marshall Islands.

1.31 Arrangements for oil fuel, lubricating oil and other flammable oils

Conventions (Amend.), Reg.		Regulation **II-2/15.2.5** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC36**	**UI** version	**1985/ Nov.2005**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

Every oil fuel pipe, which, if damaged, would allow oil to escape from a storage, settling or daily service tank situated above the double bottom, shall be fitted with a cock or valve directly on the tank capable of being closed from a safe position outside the space concerned in the event of a fire occurring in the space in which such tanks are situated.

Interpretation

Deleted.

Technical Background

Deleted in Nov 2005 because of SOLAS 2000 Amendments.
Remarks

1.32 Arrangements for oil fuel, lubricating oil and other flammable oils

Conventions (Amend.), Reg.		Regulation **II-2/15.2.8** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC37**	**UI** version	**1985/ Corr.1,2001/ Nov. 2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Oil fuel pipes and their valves and fittings shall be of steel or other approved material…….							
Interpretation							
Deleted.							
Technical Background							
Deleted in Nov 2005 because of SOLAS 2000 Amendments.							
Remarks							

1.33 Arrangements for oil fuel, lubricating oil and other flammable oils

Conventions (Amend.), Reg.		Regulation **II-2/15.3** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC38**	**UI** version	**1985/ Rev.1,2001/ Nov. 2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Lubricating oil arrangements							
Interpretation							
Deleted.							
Technical Background							
Deleted in Nov 2005 because of SOLAS 2000 Amendments.							
Remarks							

1.34 Ventilation systems in ships other than passenger ships carrying more than 36 passengers

Conventions (Amend.), Reg.		Regulation **II-2/8.2** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC39**	**UI** version	**1985/ Rev.1,2001/ Rev.2,Nov. 2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
…….At the discretion of the Administration, such requirements need not apply to control stations situated on, and opening on to, an open deck, or where local closing arrangements would be equally effective.							
Interpretation							
Equally effective local closing arrangements mean that in case of ventilators these are to be fitted with fire dampers which shall be easily closed within the control station in order to maintain the absence of smoke in the event of fire.*(MSC/Circ. 1120)*							
Technical Background							
Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments and MSC/Circ.1120.							
Remarks							

1.35 Means of escape

Conventions (Amend.), Reg.		Regulation **II-2/28.3.1.1.1** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC40**	**UI** version	**1985/ Rev.1,2001/ Nov. 2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
One of these ladders shall provide continuous fire shelter from the lower part of the space to a safe position outside the space;							
Interpretation							
Deleted.							
Technical Background							
Deleted in Nov 2005 because of SOLAS 2000 Amendments.							
Remarks							

1.36 Means of escape

Conventions (Amend.), Reg.		Regulation **II-2/13.4.1.3** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC41**	**UI** version	**1985/ Rev.1,2001/ Rev.2,Nov.2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
...In a ship of 1,000 gross tonnage and above, the Administration may dispense with one means of escape from any such space, including a normally unattended auxiliary machinery space, so long as either a door or a steel ladder provides a safe escape route to the embarkation deck, due regard being paid to the nature and location of the space and whether persons are normally employed in that space.							
Interpretation							
The above requirement applies only to auxiliary machinery spaces where persons are not normally employed.							
Technical Background							
Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments.							
Remarks							

1.37 Precaution against ignition of explosive petrol and air mixture in closed vehicle spaces, closed ro-ro spaces and special category spaces

Conventions (Amend.), Reg.		**Regulation 20.3.2.2 of SOLAS Chapter II-2 as amended by IMO resolutions up to MSC.421(98)**					
IACS UI Number	**SC42**	**UI** version	**1985/ Rev.1,Nov.,2005/ Rev.2,Dec.,2007/ Rev.3,Feb.,2021**	Date of implement ation	**-/ Rev.1,Jul.1,2006/ Rev.2,Jul.1,2008/ Rev.3,Jul.1, 2022**	Means of impleme ntation	**Contracted for construction (Rev.3)**
Conventions/Codes Requirements							
SOLAS regulation II-2/**20.3.2.2** reads as follows: "(...) electrical equipment of a type so enclosed and protected as to prevent the escape of sparks (...)"							
Interpretation							
This is realized by requiring an enclosure of at least IP55, or apparatus suitable for use in Zone 2 areas as defined in IEC 60079-10-1:2015. Refer to IEC 60079-14:2013 for types of protection suitable for use in Zone 2 areas.							
Technical Background							
Update to comply with the required format when industry standards are referred to.							
Remarks							
Rev.1 of this UI is to be uniformly implemented by IACS Societies from 1 July 2006. Rev.2 of this UI is to be uniformly implemented by IACS Societies from 1 July 2008. Rev.3 of this UI is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 July 2022.							

The 'contracted for construction' date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of 'contract for construction', refer to Procedural Requirement (PR) No. 29.

1.38 Precaution against ignition of explosive petrol and air mixture in closed vehicle spaces, closed ro-ro spaces and special category spaces

Conventions (Amend.), Reg.		Regulations **II-2/20.3.2.1 & 20.3.3 of SOLAS Chapter II-2** as amended by **IMO resolutions up to MSC.421(98)**					
IACS UI Number	**SC43**	**UI** version	**1985/ Rev.1,Nov.,2005/ Rev.2,Dec.,2007/ Rev.3,Feb.,2021**	Date of implement ation	**-/ Rev.1,Jul.1,2006/ Rev.2,Jul.1,2008/ Rev.3,Jul.1, 2022**	Means of impleme ntation	**Contracted for construction（Rev.3）**

Conventions/Codes Requirements

SOLAS regulations II-2/20.3.2.1read as follows:
"... shall be of a type suitable for use in explosive petrol and air mixtures ..."*
*Refer to the recommendations of the international Electrotechnical Commission, in particular publication 60079.

SOLAS regulations II-2/ 20.3.3 read as follows:
"... shall be of a type approved for use in explosive petrol and air mixtures…"

Interpretation

This is realized by requiring certified safe equipment suitable for use in Zone 1 areas as defined in IEC 60079-10-1:2015 (Gas Group IIA and Temperature Class T3). Refer to IEC 60079-14:2013 for types of protection suitable for use in Zone 1 areas.

Technical Background

Update to comply with the required format when industry standards are referred to.

Remarks

Rev.1 of this UI is to be uniformly implemented by IACS Societies from 1 July 2006.
Rev.2 of this UI is to be uniformly implemented by IACS Societies from 1 July 2008.
Rev.3 of this UI is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 July 2022.
The 'contracted for construction' date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of 'contract for construction', refer to Procedural Requirement (PR) No. 29.

1.39 Bulkheads within accommodation and service spaces

Conventions (Amend.), Reg.		Regulation **II-2/42.4** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC44**	**UI** version	**1974/ Rev.1,2001/ Nov.2005**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

Crowns and casings of machinery spaces of category A shall be of steel construction adequately insulated and openings therein, if any, shall be suitably arranged and protected to prevent the spread of fire.

Interpretation

Deleted.

Technical Background

Deleted in Nov 2005 because of SOLAS 2000 Amendments.

Remarks

1.40 Fire integrity of bulkheads and decks

Conventions (Amend.), Reg.		Regulation **II-2/9.2.3 & 9.2.4** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC45**	**UI** version	**1985/ Rev.1,Nov.2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Fire integrity of bulkheads and decks							
Interpretation							
The following spaces are considered to belong to the categories of spaces dealt with by Reg. II-2/9.2.3 and 9.2.4, for the purpose of this regulation, as follows : - Navigation equipment room (radar transmitter) and battery rooms (1): Control Stations Note 1: Provision chambers are to be treated as store rooms. Note 2: Refrigerated provision chambers are to be Category 9 service spaces if thermally insulated with combustible materials, or Category 5 service spaces if thermally insulated with non-combustible materials.							
Technical Background							
Amended in Nov 2005 to refer to SOLAS 2000 Amendments and MSC/Circ.1120.							
Remarks							

1.41 Protection of stairways and lift trunks in accommodation spaces, service spaces and control stations

Conventions (Amend.), Reg.		Regulation **II-2/9.2.3.4.1** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC46**	**UI** version	**1985/ Rev.1,Dec. 2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
…..Lifts which penetrate only a single deck shall be surrounded by "A-0" class division with steel doors at both levels. Stairways and lift trunks which penetrate more than a single deck shall be surrounded by at least "A-0" class divisions and be protected by self-closing doors at all levels.							
Interpretation							
Dumb-waiters are to be regarded as lifts. *(MSC/Circ. 1120)*							
Technical Background							
Editorially amended in Dec 2005 to refer to SOLAS 2000 Amendments and MSC/Circ.1120.							
Remarks							

1.42 Restricted use of combustible materials

Conventions (Amend.), Reg.		Regulation **II-2/49** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC47**	**UI** version	**1985/ Rev.1,2001/ Nov. 2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Restricted use of combustible materials							
Interpretation							
Deleted.							
Technical Background							
Deleted in Nov 2005 because of SOLAS 2000 Amendments.							
Remarks							

1.43 Fire protection arrangements in cargo spaces

Conventions (Amend.), Reg.		Regulation **II-2/1.6.4 & 10.7.1.3** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC48**	**UI** version	**1985/ Rev.1,Nov. 2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Fire protection arrangements in cargo spaces							
Interpretation							
Ships of less than 2, 000 tons gross tonnage carrying petroleum products having a flash point exceeding 60 ℃ (c.c. test) are not required to be fitted with a fixed fire extinguishing system.							
Technical Background							
Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments.							
Remarks							

1.44 Fire protection arrangements in cargo spaces

Conventions (Amend.), Reg.		Regulation **II-2/10.7.2** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC49**	**UI** version	**1985/ Rev1,Nov.11,2005/ Rev.2,Feb.2,2010/ Corr.1,Mar.,2010/ Rev.3,May,2021**	Date of impleme ntation	**Paragraph 2 of Rev.2,Jul.1, 2010/ Rev.3,Jul.1, 2022**	Means of implementat ion	
Conventions/Codes Requirements							
SOLAS Reg. II-2/10.7.2 reads as follows: *7.2 Fixed gas fire-extinguishing systems for dangerous goods* *A ship engaged in the carriage of dangerous goods in any cargo spaces shall be provided with a fixed carbon dioxide or inert gas fire-extinguishing system complying with the provisions of the Fire Safety Systems Code or with a fire-extinguishing system which, in the opinion of the Administration, gives equivalent protection for the cargoes carried.*							
Interpretation							
1. Fixed fire-extinguishing systems for cargo spaces specified in Regulation II-2/10.7.2 (Regulation II-2/53.1.3 for ships constructed before 1 July 2002) are required for the following ships engaged in the carriage of dangerous goods: 1.1 Passenger ships constructed on or after 1 September 1984; and 1.2 Cargo ships of 500 gross tonnage and upwards constructed on or after 1 September 1984. 2. Cargo ships of less than 500 gross tonnage are not subject to Regulation II-2/10.7.2 (ex. Regulation II-2/53.1.3) even when such ships are engaged in the carriage of dangerous goods and documents of compliance are issued to such ships according to Regulation II-2/19.4 (ex. Regulation II-2/54.3).							
Technical Background							
Safety panel agreed to correct the inaccurate/outdated referenced SOLAS text.							
Remarks							
1. Paragraph 2 of the Rev.2 of this Unified Interpretation is to be uniformly implemented by Members from 1 July 2010. 2. Rev.3 of this UI is to be uniformly implemented by IACS Societies from 1 July 2022.							

1.45 Special requirements for ships carrying dangerous goods

Conventions (Amend.), Reg.		Regulation **II-2/54.2.1.3** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC50**	**UI** version	**1985/ Rev.1,2001/ Nov. 2005**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

Means of effectively cooling the designated under-deck cargo space by copious quantities of water, either by a fixed arrangement of spraying nozzles, or flooding the cargo space with water, shall be provided.

Interpretation

Deleted.

Technical Background

Deleted in Nov 2005 because of SOLAS 2000 Amendments.

Remarks

1.46 Special requirements for ships carrying dangerous goods

Conventions (Amend.), Reg.		Regulation **II-2/54.2.1.4** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC51**	**UI** version	**1985/ Nov. 2005**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

Provision to flood a designated under-deck cargo space with suitable specified media may be substituted for the requirements in paragraph 2.1.3.

Interpretation

Deleted.

Technical Background

Deleted in Nov 2005 because of SOLAS 2000 Amendments.

Remarks

1.47 Special requirements for ships carrying dangerous goods

Conventions (Amend.), Reg.		Regulation **II-2/19.3.4.2** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC52**	**UI** version	**1985/ Rev.1,Nov. 2005**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

The fans shall be such as to avoid the possibility of ignition of flammable gas air mixtures. Suitable wire mesh guards shall be fitted over inlet and outlet ventilation openings.

Interpretation

1 Exhaust fans are to be of non-sparking type in accordance with IACS Requirement F 29, as revised.

2 The purpose of "suitable wire mesh guards" is to prevent foreign objects from entering into the fan casing. The standard wire mesh guards are to have a size of 13 mm x 13 mm. *(MSC/Circ. 1120)*

Technical Background

Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments and MSC/Circ.1120.

Remarks

1.48 Location and separation of spaces

Conventions (Amend.), Reg.		Regulation **II-2/4.5.1** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC54**	**UI** version	**1985/ Rev. 1,1997/ Rev.2,2001/ Rev.3,Nov.2005**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

Location and separation of spaces

Interpretation
The expression “cofferdam” means, for the purpose of this regulation, an isolating space between two adjacent steel bulkhead or decks. The minimum distance between the two bulkheads or decks is to be sufficient for safe access and inspection. In order to meet the single failure principle, in the particular case when a corner-to-corner situation occurs, this principle may be met by welding a diagonal plate across the corner. No cargo, wastes or other goods are to be contained in cofferdams.*(MSC/Circ. 1120)*
Technical Background
Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments and MSC/Circ.1120.
Remarks

1.49 Location and separation of spaces

Conventions (Amend.), Reg.		Regulation **II-2/4.5.2.2** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC55**	**UI** version	**1985/ Rev.1,2001/ Rev.2,Nov.2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Location and separation of spaces							
Interpretation							
1. An access to a deck foam system room (including the foam tank and the control station) can be permitted within the limits mentioned in Reg. II-2/4.5.2.1, provided that the conditions listed in Reg. II-2/4.5.2.2 are satisfied and that the door is located flush with the bulkhead. 2. The navigation bridge external doors and windows which are located within the limits of regulation 4.5.2.1 are to be tested for gastightness. If a water hose test is applied, the following may be taken as a guide: - nozzle diameter: minimum 12 mm; - water pressure just before the nozzle: not less than 0.2 MPa; and - distance between the nozzle and the doors or windows: maximum 1.5 m. *(MSC/Circ. 1120)*							
Technical Background							
Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments and MSC/Circ.1120.							
Remarks							

1.50 Venting, purging, gas freeing and ventilation

Conventions (Amend.), Reg.		Regulations **II-2/59.1.9.3 & 59.1.9.4** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC56**	**UI** version	**1985/ Nov.2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Location of vent outlets							
Interpretation							
Deleted.							
Technical Background							
Deleted in Nov 2005 because of SOLAS 2000 Amendments.							
Remarks							

1.51 Venting, purging, gas freeing and ventilation

Conventions (Amend.), Reg.		Regulations **II-2/ 4.5.3.4.1.3&4.5.3.4.1.4** of **SOLAS as amended by IMO resolutions up to MSC.421.(98)**					
IACS UI Number	**SC57**	**UI** version	**1985/ Rev.1,Nov.,2005/ Rev.2,Feb.,2021**	Date of implementation	-/ -/ **Rev.2,Jul.1,2022**	Means of implementation	**Contracted for construction（Rev.2）**
Conventions/Codes Requirements							
... to enclosed spaces containing a source of ignition and from deck machinery, which may include anchor windlass							

and chain locker openings, and equipment which may constitute an ignition hazard.
Interpretation
Electrical equipment fitted in compliance with IEC 60092-502:1999 is not considered a source of ignition or ignition hazard.(MSC/Circ. 1120 amended by MSC.1/Circ.1436 and MSC.1/Circ.1510)
Technical Background
Rev.1:Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments and MSC/Circ.1120. Rev.2:Update to comply with the required format when industry standards are referred to.
Remarks

1.52 Venting, purging, gas freeing and ventilation

Conventions (Amend.), Reg.		Regulation **II-2/4.5.6.3**of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC58**	**UI** version	**1985/ Rev.1,2001/ Rev.2,Nov.2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Cargo tank purging and/or gas-freeing							
Interpretation							
1. The outlets mentioned in Reg. II-2/4.5.6.3 are to be located in compliance with Reg. II-2/4.5.3.4.1.3 as far as the horizontal distance is concerned. 2. Reference is made to MSC/Circ.677 - Revised standards for the design, testing and locating of devices to prevent the passage of flame into cargo tanks in oil tankers, and MSC/Circ.450/Rev.1 - Revised factors to be taken into consideration when designing cargo tank venting and gas-freeing arrangements. *(MSC/Circ. 1120)*							
Technical Background							
Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments and MSC/Circ.1120.							
Remarks							

1.53 Cargo tank protection

Conventions (Amend.), Reg.		Regulation **II-2/60.6** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC59**	**UI** version	**1985/ Nov.2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
All tankers operating with a cargo tank cleaning procedure using crude oil washing shall be fitted with an inert gas system complying with the requirements of Regulation 62 and with fixed tank washing machines.							
Interpretation							
Deleted.							
Technical Background							
Deleted in Nov 2005 because of SOLAS 2000 Amendments.							
Remarks							

1.54 Fixed deck foam systems

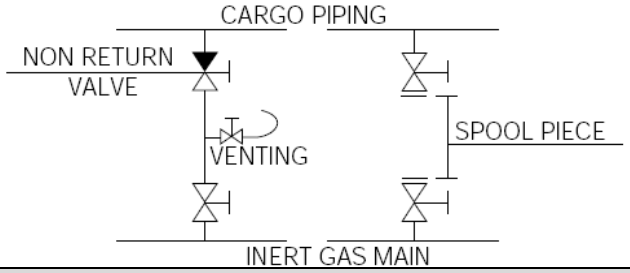
Conventions (Amend.), Reg.		Paragraph **2.2.2.1**, Chapter **14** of **FSS** Code					
IACS UI Number	**SC60**	**UI** version	**1985/Corr.1, 2001/Rev.1, Nov. 2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
On tankers of less than 4,000 tonnes deadweight the Administration may not require installation of monitors but only applicators.							
Interpretation							
2.2.2.3 and 2.3.3 of Ch. 14 of the FSS Code apply to all tankers regardless of size.							
Technical Background							

Editorially amended in Nov 2005 to refer to FSS Code.
Remarks

1.55 Fixed deck foam systems

Conventions (Amend.), Reg.		Paragraph **2.1.3**, Chapter **14** of **FSS** Code					
IACS UI Number	**SC61**	**UI** version	**1985/ Rev.1,1994/ Rev.2,Nov.,2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Operation of a deck foam system at its required output shall permit the simultaneous use of the minimum required number of jets of water at the required pressure from the fire main.							
Interpretation							
Deletd							
Technical Background							
This UI has been consolidated into the FSS Code (Ch.14, 2.1.3) as amended by Res. MSC.339(91).							
Remarks							
This UI was deleted in March 2021 by IACS.							

1.56 Inert gas systems

Conventions (Amend.), Reg.		**Paragraphs 2.2.3.2.7 and 2.2.3.2.8 of Chapter 15 of the IMO International Code for Fire Safety Systems (Fire Safety Systems Code) (Resolution MSC.98(73) as amended by IMO Resolutions up to MSC.410(97))**					
IACS UI Number	**SC62**	**UI** version	**1985/ Rev.1,Nov.,2005/ Rev.2,Dec.,2020**	Date of implementation	**Rev.2,Jan.1, 2022**	Means of implement ation	**Contracted for construction（Rev.2）**
Conventions/Codes Requirements							
The Fire Safety Systems Code Chapter 15, 2.2.3.2.7 and 2.2.3.2.8 read as follows. 2.2.3.2.7 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. 2.2.3.2.8 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.							
Interpretation							
As a guide, the effective isolation required by this regulation may be achieved by the two arrangements shown in the following sketches.  							
Technical Background							
Editorially amended to update this UI to reflect the latest IMO Resolutions related to the FSS Code, and update the format of references IMO instruments in specified format.							
Remarks							
1. Rev.2 of this Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on and after 1 January 2022. 2. The “contracted for construction” date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of “contract for construction”, refer to IACS Procedural Requirement (PR) No. 29.							

1.57 Pre-discharge alarm of fixed gas fire-extinguishing systems

Conventions (Amend.), Reg.		Paragraph **2.1.3.2**, Chapter **5** of **FSS** Code					
IACS UI Number	**SC63**	**UI** version	**1985/ Rev.1,2001/ Rev.2, Nov.,2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
The alarm shall operate for a suitable period before the medium is released.							
Interpretation							
Deleted							
Technical Background							
This UI has been consolidated into FSS Code, Ch. 5.2.1.3.2, amended by Resolution MSC.206(81), adopted on 18 May 2006.							
Remarks							
This UI was deleted in Jan. 2021 by IACS.							

1.58 Fire dampers in ventilation ducts

Conventions (Amend.), Reg.		**SOLAS regulation II-2/9.7.3.1 as amended by resolution MSC.365(93)**					
IACS UI Number	**SC64**	**UI** version	**1985/ Rev.1,Nov.,2005/ Rev.2,June, 2021**	Date of implementation	-/ -/ **Jul.1, 2022**	Means of implementation	Fitted on ship
Conventions/Codes Requirements							
SOLAS regulation II-2/9.7.3.1 reads as follows: *9.7.3.1 Ducts passing through "A" class divisions shall meet the following requirements:* *.1 where a thin plated duct with a free cross sectional area equal to, or less than, 0.02 m^2 passes through "A" class divisions, the opening shall be fitted with a steel sheet sleeve having a thickness of at least 3 mm and a length of at least 200 mm, divided preferably into 100 mm on each side of a bulkhead or, in the case of a deck, wholly laid on the lower side of the decks penetrated;* *.2 where ventilation ducts with a free cross-sectional area exceeding 0.02 m^2, but not more than 0.075 m^2, pass through "A" class divisions, the openings shall be lined with steel sheet sleeves. The ducts and sleeves shall have a thickness of at least 3 mm and a length of at least 900 mm. When passing through bulkheads, this length shall be divided preferably into 450 mm on each side of the bulkhead. These ducts, or sleeves lining such ducts, shall be provided with fire insulation. The insulation shall have at least the same fire integrity as the division through which the duct passes; and* *.3 automatic fire dampers shall be fitted in all ducts with a free cross-sectional area exceeding 0.075 m2 that pass through "A" class divisions. Each damper shall be fitted close to the division penetrated and the duct between the damper and the division penetrated shall be constructed of steel in accordance with paragraphs 7.2.4.1.1 and 7.2.4.1.2. The fire damper shall operate automatically, but shall also be capable of being closed manually from both sides of the division. The damper shall be fitted with a visible indicator which shows the operating position of the damper. Fire dampers are not required, however, where ducts pass through spaces surrounded by "A" class divisions, without serving those spaces, provided those ducts have the same fire integrity as the divisions which they penetrate. A duct of cross-sectional area exceeding 0.075 m2 shall not be divided into smaller ducts at the penetration of an "A" class division and then recombined into the original duct once through the division to avoid installing the damper required by this provision.*							
Interpretation							
Ducts or pipes with free sectional area of 0.075 m^2 or less need to be fitted with fire damper at their passage through Class "A" divisions in those cases indicated in Regulations 9.7.2.2 and 9.7.2.3. The fire damper can be omitted if the duct is arranged in compliance with the requirements of 9.7.2.4.2.1 and 9.7.2.4.2.2.							
Technical Background							

SOLAS II-2/9.7 has been amended through MSC.365(93) which has entered into force on 01/01/2016, and has reorganized the requirements referenced in the UI.
Remarks
1. This UI is to be uniformly implemented by IACS Societies for ventilation ducts fitted on or after 1 July 2022.

1.59 Ventilation ducts for galley

Conventions (Amend.), Reg.		Regulation **II-2/16.3** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC65**	**UI** version	**1985/ Rev.1,2001/ Nov. 2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Ventilation systems in ships other than passenger ships carrying more than 36 passengers.							
Interpretation							
Deleted.							
Technical Background							
Deleted in Nov 2005 because of SOLAS 2000 Amendments.							
Remarks							

1.60 Integrity of emergency generator space

Conventions (Amend.), Reg.		Regulation **II-2/44, Table 44.1** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC66**	**UI** version	**1985/ Nov.2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Fire integrity of decks separating adjacent spaces							
Interpretation							
Deleted.							
Technical Background							
Deleted in Nov 2005 because of SOLAS 2000 Amendments.							
Remarks							

1.61 Doors in fire-resisting corridor bulkheads of cargo ships

Conventions (Amend.), Reg.		Regulation **II-2/47.3** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC67**	**UI** version	**1985/ Rev.1,2001/ Nov. 2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
In corridor bulkheads ventilation openings may be permitted only in and under the doors of cabins and public spaces.							
Interpretation							
Deleted.							
Technical Background							
Deleted in Nov 2005 because of SOLAS 2000 Amendments.							
Remarks							

1.62 Cofferdams adjacent to slop tanks of combination carriers

Conventions (Amend.), Reg.		Regulation **II-2/56.4.1** of Amendments **1983** to **SOLAS 1974**					
IACS UI Number	**SC68**	**UI** version	**1985/ Nov.,2005**	Date of implementation		Means of implementation	

Conventions/Codes Requirements
The slop tanks shall be surrounded by cofferdams except where the boundaries of the slop tanks where slop may be carried on dry cargo voyages are the hull, main cargo deck, cargo pump-room bulkhead or oil fuel bunker tank. These cofferdams shall not be open to a double bottom, pipe tunnel, pump-room or other enclosed space.….
Interpretation
Deleted.
Technical Background
Deleted in Nov 2005 because of SOLAS 2000 Amendments.
Remarks

1.63 Arrangement for pumping of slops in combination carriers in dry cargo mode

Conventions (Amend.), Reg.		Regulation **II-2/56.4.2** of Amendments **1983** to **SOLAS 1974**					
IACS UI Number	**SC69**	**UI** version	**1985/ Nov.2005**	Date of implementation		Means of implementation	

Conventions/Codes Requirements
…… A separate pumping and piping arrangement incorporating a manifold shall be provided for discharging the contents of the slop tanks directly to the open deck for disposal to shore reception facilities when the ship is in the dry cargo mode.
Interpretation
Deleted.
Technical Background
Deleted in Nov 2005 because of SOLAS 2000 Amendments.
Remarks

1.64 Cargo tank vent systems and selection of electrical equipment

Conventions (Amend.), Reg.		**Regulations 11.6.2 and 4.5.4.3.1 of SOLAS Chapter II-2 as amended by IMO resolutions up to MSC.421(98)**					
IACS UI Number	**SC70**	**UI** version	**1985/ Rev.1,May,2001/ Rev.2,Nov.,2005/ Rev.3,Oct.,2010/ Rev.4,Feb.,2021**	Date of impleme ntation	**-/ Rev.1,Jul.1,2001/ -/ Rev.3,Jan.1,2012/ Rev.4,Jul.1,2022**	Means of implement ation	**Contracted for construction（Rev. 4）**

Conventions/Codes Requirements

SOLAS regulation II-2/11.6.2 reads as follows.

6.2 openings for small flow by thermal variations

Openings for pressure release required by paragraph 6.1.1 shall:

.1 have as great a height as is practicable above the cargo tank deck to obtain maximum dispersal of flammable vapours, but in no case less than 2 m above the cargo tank deck; and

.2 Be arranged at the furthest distance practicable but not less than 5m from the nearest air intakes and openings to enclosed spaces containing a source of ignition and from deck machinery and equipment which may constitute an ignition hazard. *Anchor windlass and chain locker openings constitute an ignition hazard.*

For tankers constructed on or after 1 January 2017, the openings shall be arranged in accordance with regulation 4.5.3.4.1.

SOLAS regulation II-2/4.5.3.4.1 reads as follows.

.3 Not less than 10m measured horizontally from the nearest air intakes and openings to enclosed spaces containing a source of ignition and from deck machinery and equipment which may constitute an ignition hazard.

Interpretation

SOLAS regulation II-2/11.6.2:

Area Classification is to be carried out in accordance with the principles laid down in IEC 60092-502:1999.
A1 Areas on open deck, or semi-enclosed spaces on open deck, within 3m of cargo tank ventilation outlets which permit the flow of small volumes of vapour or gas mixtures caused by thermal variation are defined as Zone 1 as specified by IEC 60092-502:1999 para 4.2.2.7.
A2 Areas within 2m beyond the zone specified in A1 above are to be considered Zone 2 (as opposed to 1.5m as specified by IEC 60092-502:1999 para 4.2.3.1).
A3 Electrical equipment or cables shall not normally be installed in hazardous areas. Where essential for operational purposes, electrical equipment may be installed in accordance with IEC 60092-502:1999.

SOLAS regulation II-2/4.5.3.4.1:
Area Classification is to be carried out in accordance with the principles laid down in IEC 60092-502:1999.
B1 Areas on open deck, or semi-enclosed spaces on open deck, within a vertical cylinder of unlimited height and 6m radius centred upon the centre of the outlet, and within a hemisphere of 6m radius below the outlet which permit the flow of large volumes of vapour or gas mixtures during loading/discharging/ballasting are defined as Zone 1 as specified by IEC 60092-502:1999 para 4.2.2.8.
B2 Areas within 4m beyond the zone specified in B1 above are defined as Zone 2 as specified by IEC 60092-502 :1999 para 4.2.3.2.
B3 Electrical equipment or cables shall not normally be installed in hazardous areas. Where essential for operational purposes, electrical equipment may be installed in accordance with IEC 60092-502:1999.

Technical Background

Rev.2: Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments and MSC/Circ.1120.
Rev.3:The original proposal for revision was made by Machinery Panel. This revision is intended to solve the inconsistency between SOLAS and IEC Publication 60092-502 with regard to classification of hazardous areas near cargo tank vent location arrangements. There are only special requirements for cargo tank vent arrangements, i.e. areas within 2 m beyond Zone 1 for the vent system are considered as Zone 2. In other cases, the requirements of IEC publication are to be complied with.
Rev. 4: Update to comply with the required format when industry standards are referred to.

Remarks

The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of 'contract for construction', refer to Procedural Requirement (PR) No. 29.

1.65 Tank level gauging systems

Conventions (Amend.), Reg.		Regulation **II-2/59.1.6** of Amendments **1981** to **SOLAS 1974** Paragraph **2.13.1(a)** of Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (**BCH** Code) Paragraph **8.1.2** of International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (**IBC** Code)					
IACS UI Number	**SC71**	**UI** version	**1985/ Nov.2005**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

Regulation **II-2/59.1.6**:
Provision shall be made to guard against liquid rising in the venting system to a height which would exceed the design head of cargo tanks. This shall be accomplished by high level alarms or overflow control systems or other equivalent means, together with gauging devices and cargo tank filling procedures.
Paragraph **2.13.1(a)** of **BCH** Code, Paragraph **8.1.2** of **IBC** Code:
Provision should be made to ensure that the liquid head in any tank does not exceed the test head of that tank; suitable high level alarms, overflow control systems or spill valves, together with gauging devices and tank filling procedures may be accepted for this purpose.

Interpretation

Deleted.

Technical Background

Deleted in Nov 2005 because of SOLAS 2000 Amendments.
Remarks

1.66 In a ship engaged regularly in voyages of short duration

Conventions (Amend.), Reg.		Regulations **II-1/42.2.7 & 43.2.6.2** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC72**	**UI** version	**1985/ Rev.1,Nov.2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Reg. II-1/42.2.7: In a ship engaged regularly on voyages of short duration, the Administration if satisfied that an adequate standard of safety would be attained may accept a lesser period than the 36 h period specified in paragraphs 2.1 to 2.5 but not less than 12 h. Reg. II-1/43.2.6.2: In a ship engaged regularly on voyages of short duration, the Administration if satisfied that an adequate standard of safety would be attained may accept a lesser period than the 18 h period specified in paragraphs 2.2 to 2.5 but not less than 12 h.							
Interpretation							
Dispensation to the reduced period of availability of the emergency source of power can be given to: 1. Vessels with a class notation "Coastal Service"; 2. Vessels engaged in voyages where the route is no greater than 20 nautical miles offshore.							
Remarks							

1.67 Fire protection of weather decks

Conventions (Amend.), Reg.		Regulations **II-2/20.4& 20.6** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC73**	**UI** version	**1985/ Rev.1,May 2001/ Rev.2 Nov. 2005**	Date of implementation	**01.07.2006**	Means of implementation	
Conventions/Codes Requirements							
Provision of portable fire extinguishers							
Interpretation							
The requirements for a fixed fire extinguishing system, fire detection, foam applicators and portable extinguishers need not apply to weather decks used for the carriage of vehicle with fuel in their tanks.							
Technical Background							
Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments.							
Remarks							

1.68 Fire protection arrangements in cargo spaces including special category spaces

Conventions (Amend.), Reg.		Regulations **II-2/37.2.2, 37.3.2, 38.4.1 & 53.2.4.3** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC74**	**UI** version	**1985/ Nov. 2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Precautions against ignition of flammable vapours							
Interpretation							

Deleted.
Technical Background
Deleted in Nov 2005 because of SOLAS 2000 Amendments.
Remarks

1.69 Fire protection arrangements in cargo spaces

Conventions (Amend.), Reg.		Regulation **II-2/20.3.1.3** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC75**	**UI** version	**1985/ Add.1,2001/ Rev.1,Nov.2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Means shall be provided to indicate any loss of the required ventilation capacity on the navigation bridge.							
Interpretation							
The requirements to indicate any loss of ventilation capacity is considered complied with by an alarm on the bridge, initiated by fall-out of starter relay of fan motor. *(MSC/Circ. 1120)*							
Technical Background							
Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments and MSC/Circ.1120.							
Remarks							

1.70 Engine bearing temperature monitors

Conventions (Amend.), Reg.		Regulation **II-1/47.2** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC76**	**UI** version	**1985**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Internal combustion engines of 2,250 kW and above or having cylinders of more than 300 mm bore shall be provided with crankcase oil mist detectors or engine bearing temperature monitors or equivalent devices.							
Interpretation							
The wording "or engine bearing temperature monitors" is understood to include all bearings i.e. journal and connecting rod bearings.							
Remarks							

1.71 Cargo tanks overflow control system use of spill valves

Conventions (Amend.), Reg.		Regulation **II-2/59.1.6** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC77**	**UI** version	**1985/ Nov.2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Provision shall be made to guard against liquid rising in the venting system to a height which would exceed the							

design head of cargo tanks. This shall be accomplished by high-level alarms or overflow control systems or other equivalent means, together with gauging devices and cargo tank filling procedures.
Interpretation
Deleted.
Technical Background
Deleted in Nov 2005 because of SOLAS 2000 Amendments.
Remarks

1.72 Fire safety measures for tankers

Conventions (Amend.), Reg.		Regulation **II-2/55** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC78**	**UI** version	**1985/ Nov. 2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Application to tankers							
Interpretation							
Deleted.							
Technical Background							
Deleted in Nov 2005 because of SOLAS 2000 Amendments.							
Remarks							

1.73 Certified safe type electrical equipment for ships carrying dangerous goods

Conventions (Amend.), Reg.		Regulation **19.3.2** of SOLAS **Chapter II-2** as amended by IMO resolutions up to MSC.421(98)					
IACS UI Number	**SC79**	**UI** version	**1993/ Rev.1, May,2004/ Rev.2,Sept.,2004/ Rev.3,Aug.,2006/ Rev.4,Oct.,2015/ Rev.5,Feb.,2021**	Date of impleme ntation	**-/ -/ -/ -/ Rev.4,Jan. 1,2017/ Rev.5,Jul.1,2022**	Means of impleme ntation	**contracted for construction (Rev.5)**
Conventions/Codes Requirements							
3.2 Sources of ignition Electrical equipment and wiring shall not be fitted in enclosed cargo spaces or vehicle spaces unless it is essential for operational purposes in the opinion of the Administration. However, if electrical equipment is fitted in such spaces, it shall be of a certified safe type** for use in the dangerous environments to which it may be exposed unless it is possible to completely isolate the electrical system (e.g. by removal of links in the system, other than fuses). Cable penetrations of the decks and bulkheads shall be sealed against the passage of gas or vapour. Through runs of cables and cables within the cargo spaces shall be protected against damage from impact. Any other equipment which may constitute a source of ignition of flammable vapour shall not be permitted. _____ ** Refer to the recommendations of the International Electrotechnical Commission, in particular, publication IEC 60092 on – "Electrical installations in ships".							
Interpretation							

1. Reference is to be made to IEC 60092-506:2003.

2. For pipes having open ends (e.g., ventilation and bilge pipes, etc.) in a hazardous area, the pipe itself is to be classified as hazardous area. See IEC 60092-506:2003 table B1, item B.

3. When carrying flammable liquids having flashpoints less than 23oC as Class 3, 6.1 or 8 in cargo spaces, the bilge pipes with flanges, valves, pumps, etc. constitute a source of release and the enclosing spaces (e.g. pipe tunnels, bilge pump rooms, etc.) are to be classified as an extended hazardous area (comparable with Zone 2) unless these spaces are continuously mechanically ventilated with a capacity for at least six air changes per hour. Except where the space is protected with redundant mechanical ventilation capable of starting automatically, equipment not certified for Zone 2 are to be automatically disconnected following loss of ventilation while essential systems such as bilge and ballast systems are to be certified for Zone 2.

Where redundant mechanical ventilation is employed, equipment and essential systems not certified for Zone 2 shall be interlocked so as to prevent inadvertent operation if the ventilation is not operational. Audible and visible alarms shall be provided at a manned station if failure occurs.

Technical Background

For some solid cargoes that defined as dangerous cargoes since are flammable or may develop flammable gases, the SOLAS Reg.II-2/19.3.5 does not require the installation of a separate bilge pumping system. Therefore, the engine room containing bilge pipes should be regarded as an extended hazardous area, but it is actually impossible to accepte installation of certified safe type equipment only. Thus the UI SC79 was amend that the enclosing spaces constitute bilge pipes was regard as hazardous area only for carrying flammable liquids having flashpoints less than 23℃.

Mechanical ventilation system are alternative method for installation of certified safe type equipment in hazardous area.

Remarks

IMO MSC/Circ.1120 is consistent with the UI SC79 Rev. 3.

1.74 Fire-extinguishing arrangement for paint lockers

Conventions (Amend.), Reg.		Regulation **II-2/18.7** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC80**	**UI** version	**1995/ Rev.1, 2001/ Nov 2005**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

Paint lockers and flammable liquid lockers shall be protected by an appropriate fire-extinguishing arrangement approved by the Administration.

Interpretation

Deleted.

Technical Background

Deleted in Nov 2005 because of SOLAS 2000 Amendments.

Remarks

1.75 Drainage of enclosed spaces situated on the bulkhead deck

Conventions (Amend.), Reg.		Regulation **II-1/35-1.2.6.1** of **SOLAS 1974(Res. MSC.194 (80))**					
IACS UI Number	**SC81**	**UI** version	**Rev.1,Feb.2010**	Date of implementation	**Rev.1, Jul.1, 2010**	Means of implementation	

Conventions/Codes Requirements
Where the freeboard to the bulkhead deck or the freeboard deck, respectively, is such that the deck edge is immersed when the ship heels more than 5°, the drainage shall be by means of a sufficient number of scuppers of suitable size discharging directly overboard, fitted in accordance with the requirements of regulation 15 in the case of a passenger ship and the requirements for scuppers, inlets and discharges of the International Convention on Load Lines in force in the case of a cargo ship.
Interpretation
The drainage of such enclosed spaces to suitable spaces below deck is also permitted provided such drainage is arranged in accordance with the provisions of the Regulation 22(2), ICLL 1966 (1988 Protocol).
Remarks
1、This Unified Interpretation is to be applied on ships contracted for construction on or after 1 July 2010； 2、The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.76 Protection against noise

Conventions (Amend.), Reg.		Regulation **II-1/36** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC82**	**UI** version	**1993**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Measures shall be taken to reduce machinery noise in machinery spaces to acceptable levels as determined by the Administration. If this noise cannot be sufficiently reduced the source of excessive noise shall be suitably insulated or isolated or a refuge from noise shall be provided if the space is required to be manned. Ear protectors shall be provided for personnel required to enter such spaces, if necessary.							
Interpretation							
Deleted							
Remarks							
The IMO resolution MSC.337 (91) " the Code on noise levels on board ships " has come into force in Jul.,1,2014, Accordingly, IACS deleted this UI.							

1.77 Continuity of the supply when transformers constitutes an essential part of the electrical supply system

Conventions (Amend.), Reg.		Regulation **II-1/41.1.5** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC83**	**UI** version	**1993**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							

Where transformers constitute an essential part of the electrical supply system required by this paragraph, the system shall be so arranged as to ensure the same continuity of the supply as is stated in this paragraph.

Interpretation

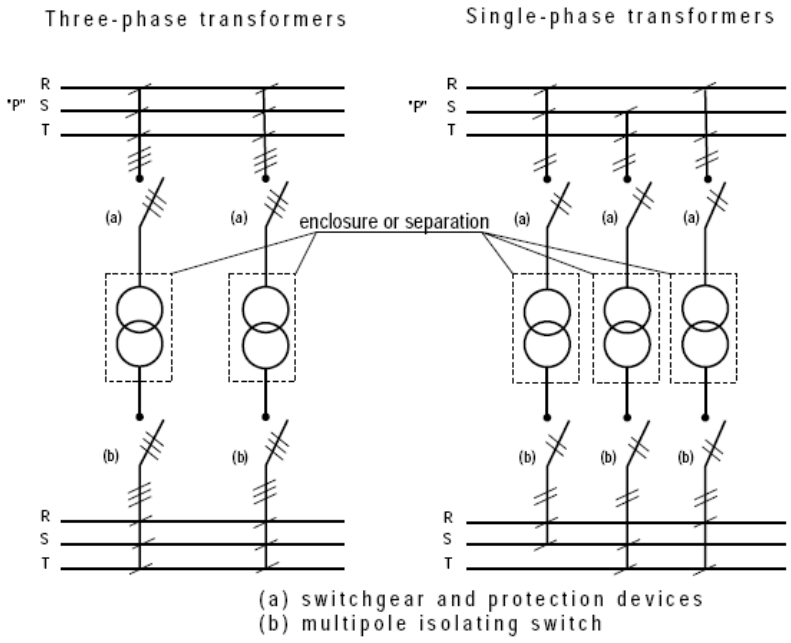
The number, capacity and arrangement of power transformers supplying auxiliary electrical systems are to be such that with any one transformer not in operation, the remaining transformer(s) is (are) sufficient to ensure the safe operation of those services necessary to provide normal operational conditions of propulsion, safety and minimum comfortable conditions of habitability are also to be ensured, which include at least adequate services for cooking, heating domestic refrigeration, mechanical ventilation, sanitary and fresh water.

Each transformer required is to be located as a separate unit with separate enclosure of equivalent, and is to be served by separate circuits on the primary and secondary sides. Each primary circuit is to be provided with switch-gear and protection devices in each phase.

Each of the secondary circuits is to be provided with a multipole isolating switch.

Transformers supplying bow thruster are excluded.

EXAMPLES:



Remarks

1.78 Purpose built container space

Conventions (Amend.), Reg.		Regulation **II-2/19.2.2.2**of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC84**	**UI** version	**1993/ Rev.1,2001/ Rev.2,Nov.2005**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

Purpose-built container ships and cargo spaces intended for the carriage of dangerous goods in freight containers and portable tanks.

Interpretation

A purpose built container space is a cargo fitted with cell guides for stowage securing of containers.*(MSC/Circ.1120)*
Technical Background
Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments and MSC/Circ.1120.
Remarks

1.79 Ro-Ro cargo space

Conventions (Amend.), Reg.		Regulation **II-2/19.2.2**of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC85**	**UI** version	**1993/ Rev.1,Nov., 2005/ Rev.2,May, 2021**	Date of implementation	-/ -/ **Jul.1, 2022**	Means of implementation	
Conventions/Codes Requirements							
SOLAS regulation II-2/19.2.2. reads: *"2.2 The following ship types and cargo spaces shall govern the application of tables 19.1 and 19.2:* *.1 ships and cargo spaces not specifically designed for the carriage of freight containers, but intended for the carriage of dangerous goods in packaged form including goods in freight containers and portable tanks;* *.2 purpose-built container ships and cargo spaces intended for the carriage of dangerous goods in freight containers and portable tanks;* *.3 ro-ro ships and ro-ro spaces intended for the carriage of dangerous goods;* *.4 ships and cargo spaces intended for the carriage of solid dangerous goods in bulk; and* *.5 ships and cargo spaces intended for carriage of dangerous goods other than liquids and gases in bulk in shipborne barges."*							
Interpretation							
Ro-ro spaces include special category spaces (Reg.3.46) and vehicle spaces (3.49)							
Technical Background							
The UI's text has not been updated since last version. During periodic review of IACS instruments, this UI was identified for review and refinement.							
Remarks							
1. Rev.2 of this UI is to be uniformly implemented by IACS Societies from 1 July 2022.							

1.80 Weather decks

Conventions (Amend.), Reg.		Regulation **II-2/19,Table 19.1** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC86**	**UI** version	**1993/ Rev.1,Nov.,2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Table 19.1 – Application of the requirements to different modes of carriage of dangerous goods in ships and cargo spaces.							
Interpretation							
Deleted							
Technical Background							
Definition of "Weather Decks" added to SOLAS Reg.II-2/3 "Definitions" by IMO Resolution MSC.99(73) "ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED".							

Remarks
IACS deleted the UI in Nov. 2020.

1.81 Certification of carriage of solid dangerous bulk cargoes

Conventions (Amend.), Reg.		Regulation **II-2/19.3 & 19.4** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC87**	**UI** version	**1993/ Rev.1,Nov.,2005/ Rev.2,Mar.,2021**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Document of compliance: The Administrations shall provide the ship with an appropriate document as evidence of compliance of construction and requirement with the requirements of this Regulation.							
Interpretation							
Certification for carriage of solid dangerous bulk cargoes covers only those cargoes listed in Group B in the IMSBC-Code except cargoes classified solely as MHB. Other solid dangerous bulk cargoes may be certified subject to acceptance by the Administration involved. *(MSC/Circ. 1120)*							
Technical Background							
Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments and MSC/Circ.1120.							
Remarks							
Rev.2 of the UI is editorially amended to refer to the IMSBC Code.							

1.82 Fire water supply capacity

Conventions (Amend.), Reg.		Regulation **II-2/54.2.1** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC88**	**UI** version	**1993/ Rev.1,2001/ Nov. 2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Water supply							
Interpretation							
Deleted.							
Technical Background							
Deleted in Nov 2005 because of SOLAS 2000 Amendments.							
Remarks							

1.83 Ventilation of Cargo Spaces

Conventions (Amend.), Reg.		**Regulation II-2/19.3.4 of Amendments 2000 to SOLAS Reg.1.7.29.1&3.5.4 to IMSBC Code**					
IACS UI Number	**SC89**	**UI version**	**1993/ Rev.1 ,996/ Rev.2,Nov 2005/ Rev.3,Feb 2011/ Rev.4,June 2018**	**Date of implementation**	**Rev.4,01.01.2019**	**Means of implementation**	**Ships constructed on or after 1 January 2019**
Conventions/Codes Requirements							
SOLAS Reg. II-2/19.3.4 3.4 Ventilation arrangement 3.4.1 Adequate power ventilation shall be provided in enclosed cargo spaces. The arrangement shall be such as to provide for at least six air changes per hour in the cargo space based on an empty cargo space and for removal of vapours from the upper or lower parts of the cargo space, as appropriate. 3.4.2 The fans shall be such as to avoid the possibility of ignition of flammable gas air mixtures. Suitable wire							

mesh guards shall be fitted over inlet and outlet ventilation openings.

3.4.3 Natural ventilation shall be provided in enclosed cargo spaces intended for the carriage of solid dangerous goods in bulk, where there is no provision for mechanical ventilation.

IMSBC Code, Section 1 General provisions

1.7 Definitions

Ventilation means exchange of air from outside to inside a cargo space.

.1 Continuous Ventilation means ventilation that is operating at all times.*

IMSBC Code, Section 3 Safety of personnel and ship

3.5 Ventilation

3.5.4 Ventilation openings shall be provided in holds intended for the carriage of cargoes that require continuous ventilation*. Such openings shall comply with the requirements of the Load Line Convention as amended for openings not fitted with means of closure.

Footnote:

* The IMSBC Code requires continuous ventilation for the following cargoes:

ALUMINIUM FERROSILICON POWDER UN 1395
ALUMINIUM SILICON POWDER, UNCOATED UN 1398
ALUMINIUM SMELTING / REMELTING BY- PRODUCTS, PROCESSED
ALUMINIUM SMELTING BY-PRODUCTS or ALUMINIUM REMELTING BY-PRODUCTS UN 3170
FERROPHOSPHORUS (including BRIQUETTES)
FERROSILICON (25% ≤ Silicon < 30% or ≥ 90% Silicon)
FERROSILICON UN 1408 (30% ≤ Silicon < 90%)
ZINC ASHES UN 1435

Interpretation

If adjacent spaces are not separated from cargo spaces by gastight bulkheads or decks then they are considered as part of the enclosed cargo space and the ventilation requirements shall apply to the adjacent space as for the enclosed cargo space itself.

Where the IMSBC Code requires:

- 2 fans per hold, a common ventilation system with 2 fans connected is acceptable.
- continuous ventilation, this does not prohibit ventilators from being fitted with a means of closure as required for fire protection purposes under SOLAS II-2/5.2.1.1 provided the minimum height to the ventilator opening is to be in accordance with ICLL/19.3 (4.5m for Position 1 and 2.3m for Position 2).

Technical Background

According to the amendments of IMSBC Code in MSC.426(98), the cargo ALUMINIUM SMELTING / REMELTING BY-PRODUCTS, PROCESSED also requires continuous mechanical ventilation as per the other cargoes listed in this UI.

Remarks

1.84 Bilge drainage

Conventions (Amend.), Reg.		Regulation **II-2/19.3.5** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC90**	**UI** version	**1993/ Rev.1,Nov. 2005**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

Bilge pumping

Where it is intended to carry flammable or toxic liquids in enclosed cargo spaces, the bilge pumping system shall be designed to ensure against inadvertent pumping of such liquids through machinery space piping or pumps. Where large quantities of such liquids are carried, consideration shall be given to the provision of additional means of draining those cargo spaces. These means shall be to the satisfaction of the Administration.

Interpretation

a) Cargo spaces intended for carriage of flammable liquids with flash point less than 23 degrees C or toxic liquids shall be fitted with a fixed bilge drainage system independent or separated from the bilge system in machinery space and located outside of the machinery space.

If a single bilge drainage system completely independent of the machinery space is provided, the system is to comply with the Rule requirement to redundancy based on the size of the space or spaces which it services.

b) Electrical equipment in the space containing bilge pumps serving cargo spaces intended for carriage of flammable or toxic liquids is to be according to unified interpretation SC79.

Technical Background

Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments.

Remarks

1.85 Personal protection - protective clothing

Conventions (Amend.), Reg.		Regulation **II-2/19.3.6.1** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC91**	**UI** version	**1993/ Rev.1,Nov.,2005/ Corr.1,Nov.,2020**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

Four sets of full protective clothing resistant to chemical attack shall be provided in addition to the fireman's outfits required by Regulation 17. The protective clothing shall cover all skin, so that no part of the body is unprotected.

Interpretation

a) The required protective clothing is for emergency purposes.

b) For solid bulk cargoes the protective clothing is to satisfy the equipment requirements specified in Appendix 1 of the IMSBC Code for the individual substances. For packaged goods the protective clothing is to satisfy the equipment requirements specified in emergency procedures (EmS) of the Supplement to IMDG Code for the individual substances. *(MSC/Circ. 1120)*

Technical Background

Based on periodic review of IACS Resolution by Safety Panel, noting that the reference of 'Code of Safe Practice for Solid Bulk Cargoes (BC Code)' in SOLAS has been replaced by 'International Maritime Solid Bulk Cargoes (IMSBC) Code', the cross reference of BC code in UI replaced by IMSBC Code, the Safety Panel agreed to update the reference in the UI.

Remarks

1.86 Personal protection - Self-contained breathing apparatus

Conventions (Amend.), Reg.		Regulation **II-2/19.3.6.2** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC92**	**UI** version	**1993/ Rev.1,Nov. 2005**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

At least two self-contained breathing apparatuses additional to those required by Regulation 17 shall be provided.

Interpretation

For each of the breathing apparatuses, two complete sets of air bottles are required. These spare bottles are to be in addition to the spare bottles required for fireman's outfit.

Technical Background

Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments.

Remarks

1.87 Enclosure of stern tubes on cargo ships

Conventions (Amend.), Reg.		Regulation **II-1**/12. 11 of **SOLAS 1974**					
IACS UI Number	**SC93**	**UI** version	**1994/ Rev.1,Feb.,2010/ Rev.2,Feb.,2021**	Date of implementation	**Rev.1,Jul.1,2010/ Rev.2,Jul.1,2021**[①]/ **(Rev.2,Jan.,2024**[②]**)**	Means of implementation	[①]**Contracted for construction** / [②]**Delivery**

Conventions/Codes Requirements

"In all cases, stern tubes shall be enclosed in watertight spaces of moderate volume. In passenger ships the stern gland shall be situated in a watertight shaft tunnel or other watertight space separate from the stern tube compartment and of such volume that, if flooded by leakage through the stern gland, the bulkhead deck will not be immersed. In cargo ships, other measures to minimize the danger of water penetrating into the ship in case of damage to stern tube arrangements may be taken at the discretion of the Administration".

Interpretation

In cargo ships a stern tube enclosed in a watertight space of moderate volume, such as an afterpeak tank, where the inboard end of the stern tube extends through the afterpeak/engine room watertight bulkhead into the engine room is considered to be an acceptable solution satisfying the requirement of Chapter II-1, Regulation12. 11 of SOLAS 1974, as amended, provided the inboard end of the stern tube is effectively sealed at the afterpeak/engine room bulkhead by means of an approved watertight/oiltight gland system.

Technical Background

Rev. 1: Chapter II-1 of SOLAS has been amended by MSC.194(80) and MSC.216(82) and this affects the references for and content of this UI.

Re. v2: Chapter II-1 of SOLAS has been amended by MSC.421 (98), and this affects the references for this UI.

Remarks

Rev.2 is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 July 2021 or the delivery of which is on or after 1 January 2024.

1.88 Mechanical, hydraulic and electrical independency of steering gear control systems

Conventions (Amend.), Reg.		Regulation **II-1/29** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC94**	**UI** version	**1994/ Rev.1, Feb. 2010/ Rev.2, Jun. 2016/ Corr.1, Jan. 2018**	Date of implementation	**Rev.1 01.07.2011/ Rev.2 01.07.2017**	Means of implement ation	

Conventions/Codes Requirements

SOLAS Regulation II-1/29 Steering gear

Interpretation

1. Scope

The interpretation applies to steering gear control systems, as defined in SOLAS regulation II-1, 3/1, for the main and auxiliary steering gear, operable from the navigation bridge, for which SOLAS stipulates two steering gear control systems independent of each other (SOLAS II-1, Reg. 29/6.1, 29/7.2, 29/7.3, Reg. 29/15 and Reg. 29/16).

SOLAS II-1, Reg. 29/6.1 reads:

"Where the main steering gear comprises two or more identical power units, an auxiliary steering gear need not be fitted, provided that:

.1 in a passenger ship, the main steering gear is capable of operating the rudder as required by paragraph 3.2 while any one of the power units is out of operation;

.2 in a cargo ship, the main steering gear is capable of operating the rudder as required by paragraph 3.2 while operating with all power units;

.3 the main steering gear is so arranged that after a single failure in its piping system or in one of the power units the defect can be isolated so that steering capability can be maintained or speedily regained."

SOLAS II-1, Regs. 29/7.2 and 7.3 read:

"7 Steering gear control shall be provided:

.2 where the main steering gear is arranged in accordance with paragraph 6, by two independent control systems, both operable from the navigation bridge. This does not require duplication of the steering wheel or steering lever. Where the control system consists of a hydraulic telemotor, a second independent system need not be fitted, except in a tanker, chemical tanker or gas carrier of 10,000 gross tonnage and upwards;

.3 for the auxiliary steering gear, in the steering gear compartment and, if power-operated, it shall also be operable from the navigation bridge and shall be independent of the control system for the main steering gear."

SOLAS II-1, Regs. 29/15 and 16 read:

"15 In every tanker, chemical tanker or gas carrier of 10,000 gross tonnage and upwards and in every other ship of 70,000 gross tonnage and upwards, the main steering gear shall comprise two or more identical power units complying with the provisions of paragraph 6.

16 Every tanker, chemical tanker or gas carrier of 10,000 gross tonnage and upwards shall, subject to paragraph 17, comply with the following:

.1 the main steering gear shall be so arranged that in the event of loss of steering capability due to a single future in any part of one of the power actuating systems of the main steering gear, excluding the tiller, quadrant or components serving the same purpose, or seizure of the rudder actuators, steering capability shall be regained in not more than 45 s after the loss of one power actuating system;

.2 the main steering gear shall comprise either:

.2.1 two independent and separate power actuating systems, each capable of meeting the requirements of paragraph 3.2; or

.2.2 at least two identical power actuating systems which, acting simultaneously in normal operation, shall be capable of meeting the requirements of paragraph 3.2. Where necessary to comply with this requirement, interconnection of hydraulic power actuating systems shall be provided. Loss of hydraulic fluid from one system shall be capable of being detected and the defective system automatically isolated so that the other actuating system or systems shall remain fully operational;

.3 steering gears other than of the hydraulic type shall achieve equivalent standards."

Following requirements of:

- SOLAS Chap. II-1, Reg. 3/1, 3/3, 3/13 and Reg. 29

have been considered, as far as containing requirements for the independency of the control systems.

2. Basic Requirements

Two independent steering gear control systems shall be provided and shall be so arranged that a mechanical or electrical failure in one of them will not render the other one inoperative.

The term "Steering gear control system" as defined in SOLAS Part A, Regulation 3/1 (UR M42 Appendix item 1) shall be understood to cover "the equipment required to control the steering gear power actuating system".

3. Separation of Control Systems and Components

3.1 General

Wires, terminals and the components for duplicated steering gear control systems installed in units, control boxes, switchboards or bridge consoles shall be separated as far as practicable. Where physical separation is not practicable, separation may be achieved by means of a fire retardant plate.

3.2 Steering wheel or steering lever

All electric components of the steering gear control systems shall be duplicated. This does not require duplication of the steering wheel or steering lever.

3.3 Steering mode selector switch

If a joint steering mode selector switch (uniaxial switch) is employed for both steering gear control systems, the connections for the circuits of the control systems shall be divided accordingly and separated from each other by an isolating plate or by air gap.

3.4 Follow-up amplifier

In the case of double follow-up control (see Annex, example 2), the amplifiers shall be designed and fed so as to be electrically and mechanically separated. In the case of non-follow-up control and follow-up control, it shall be ensured that the follow-up amplifiers are protected selectively (see Annex, example 3).

3.5 Additional control systems

Control circuits for additional control systems, e.g. steering lever or autopilot shall be designed for all - pole disconnection (see Annex, examples 1, 2 and 3).

3.6 Feed-back units and limit switches

The feed-back units and limit switches, if any, for the steering gear control systems shall be separated electrically and mechanically connected to the rudder stock or actuator separately.

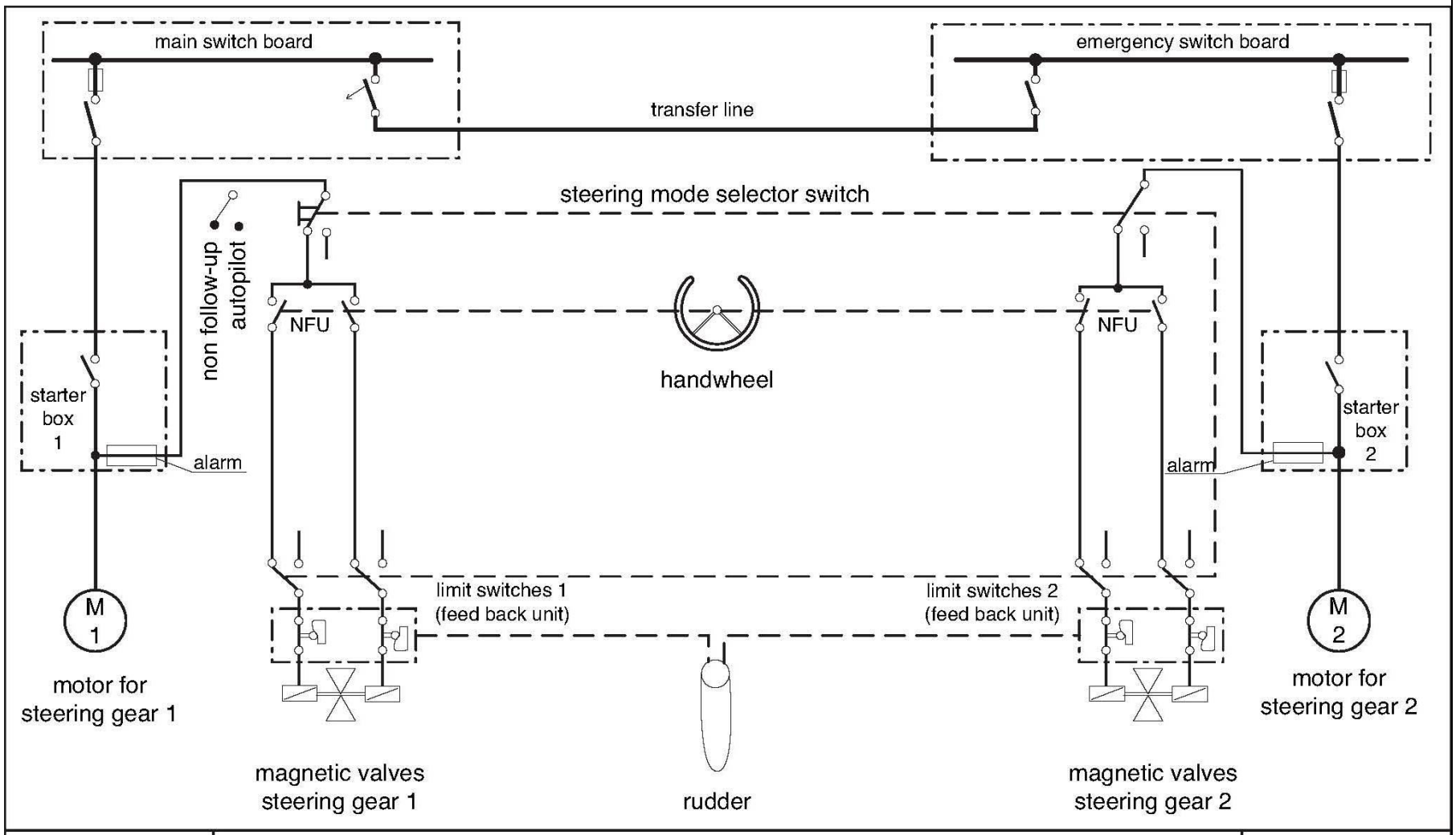
3.7 Hydraulic control components

Hydraulic system components in the power actuating or hydraulic servo systems controlling the power systems of the steering gear (e.g. solenoid valves, magnetic valves) are to be considered as part of the steering gear control system and shall be duplicated and separated.

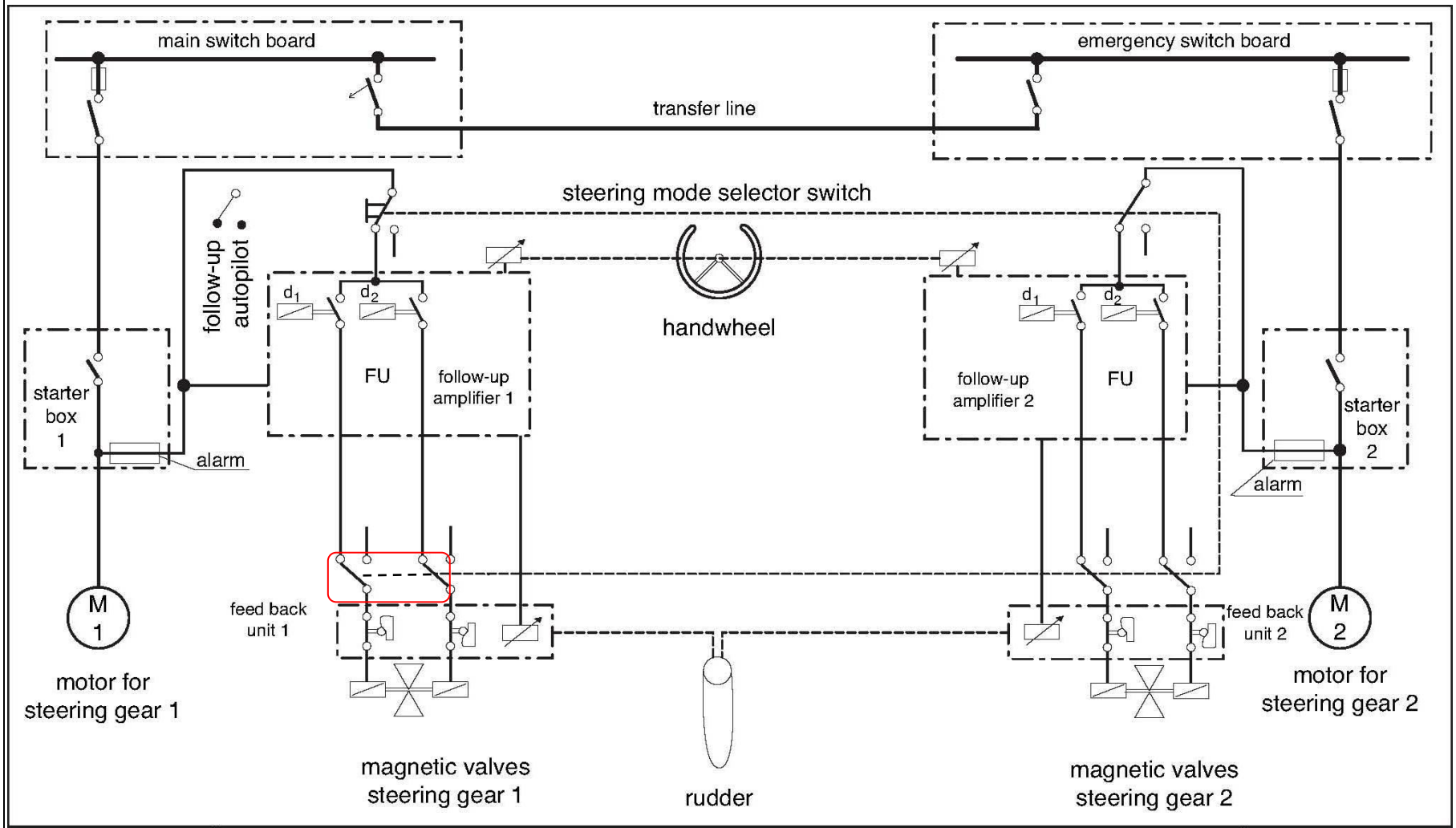
Hydraulic system components in the steering gear control system that are part of a power unit may be regarded as being duplicated and separated when there are two or more separate power units provided and the piping to each power unit can be isolated.

4. Annex

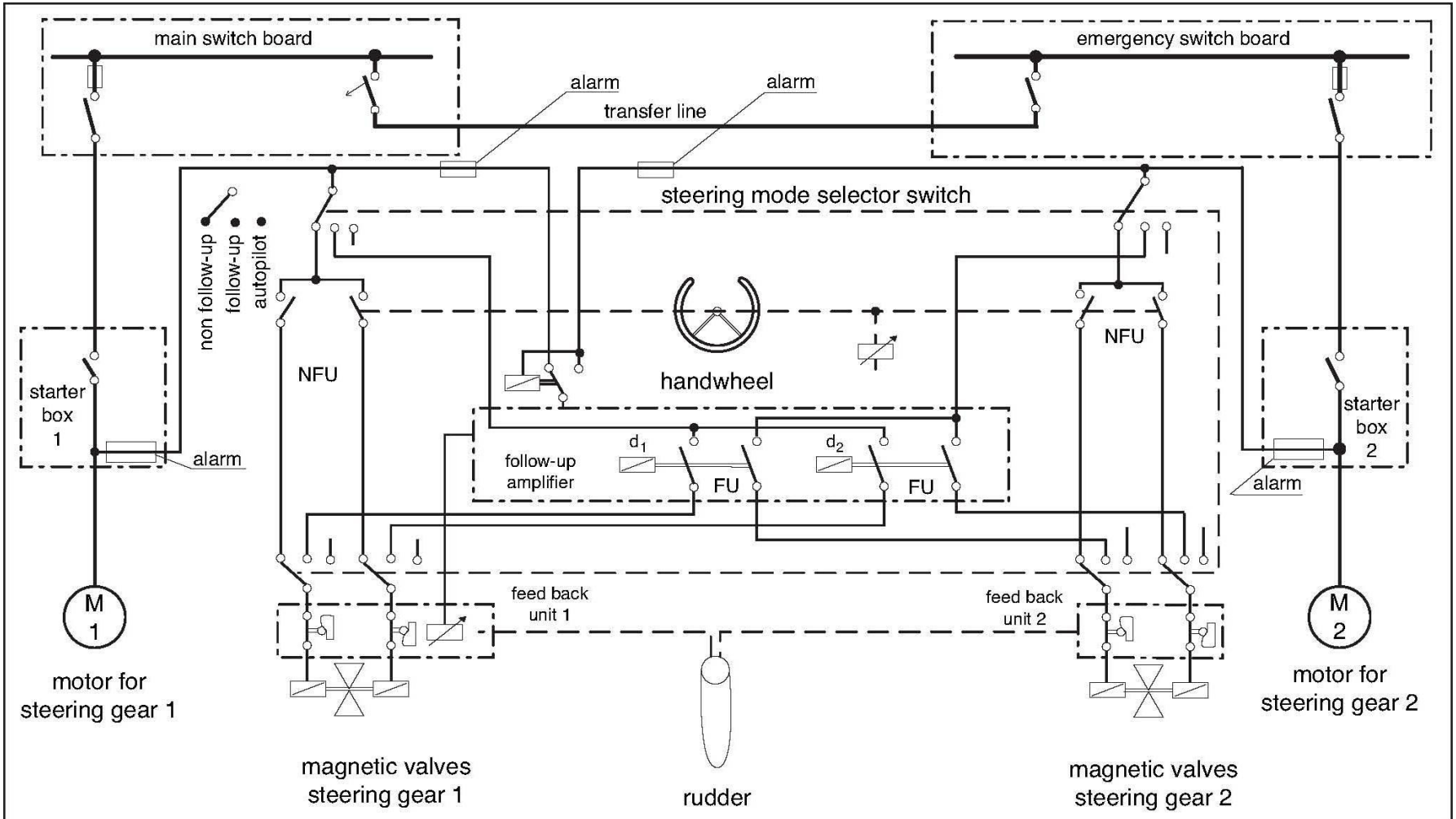
Reference should be made to examples 1, 2 and 3, which can be regarded as basic design.



IACS	Principle scheme for double non follow-up control and autopilot or other additional control	Example 1



IACS	Principle scheme for double non follow-up control and autopilot or other additional control	Example 2



IACS	Principle scheme for double non follow-up control, follow-up control and autopilot or other additional control	Example 3

Technical Background
1. It is important to clarify the difference between steering control and steering gear control, the former controls how you steer the ship i.e. send commands from the navigating bridge, the latter is the actual control system to control the movement of the rudder. 2. Full independency is hard to achieve for podded drives due to the partly common control and governing systems, Therefore it is proposed to exclude "alternative steering gear devices" from unified requirement M42 totally. 3. Change of Rev.2: The need for unified requirements for steering gear control systems is acknowledged by all members, UR E25 “Failure detection and response of all types of steering control systems” has been published. Therefore, section 4 “failure detection and response of control systems” of UISC94 Rev.1 were deleted.
Remarks
1. Amendments introduced in Rev.1 are to be uniformly implemented for ships contracted for construction on or after 1 July 2011. 2. Rev.2 of this UI is to be uniformly implemented by IACS Societies for ships contracted for construction on or after 1 July 2017.

1.89 Communication between navigating bridge and machinery space

Conventions (Amend.), Reg.		Regulation **II-1/37** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC95**	**UI** version	**1994**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
SOLAS Reg. II-1/37 requires that at least two independent means be provided for communicating orders from the navigating bridge to the position in the machinery space or in the control room from which the engines are normally controlled: one of these shall be an engine-room telegraph which provides visual indication of the orders and responses both in the machinery space and on the navigating bridge. Appropriate means of communication shall be provided to any other positions from which the engines may be controlled.							
Interpretation							
The interpretation is that the telegraph is required in any case, even if the remote control of the engine is foreseen, irrespective of the fact that the engine room is attended or not.							
Remarks							

1.90 Capacity of an emergency fire pump

Conventions (Amend.), Reg.		Regulation **II-2/4.3.3.3.1** of **SOLAS 1974**					
IACS UI Number	**SC96**	**UI** version	**1994/ Rev.1, 2001/ Nov.2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
In passenger ships of less than 1,000 gross tonnage and cargo ships of less than 2,000 gross tonnage, if a fire in any one compartment could put all the pumps out of action the alternative means of providing water for fire-fighting purposes are to the satisfaction of the Administration.							
Interpretation							
Deleted.							
Technical Background							
Deleted in Nov 2005 because of SOLAS 2000 Amendments.							
Remarks							

1.91 Connection of a pump to fire main

Conventions (Amend.), Reg.		Regulation **II-2/10.2.2.3.3** of Amendments **2000 to SOLAS 1974**					
IACS UI Number	**SC97**	**UI** version	**1994/ Rev.1, June 2002/ Rev.2,Nov.2005**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

In addition, in cargo ships where other pumps, such as general service, bilge and ballast, etc., are fitted in a machinery space, arrangements shall be made to ensure that at least one of these pumps, having the capacity and pressure required by paragraphs 2.2 and 4.2, is capable of providing water to the fire main.

Interpretation

This paragraph does not force designers to choose pumps with capacity and pressure characteristics other than that being optimal for the service intended, just to make their connection to the fire main possible, provided the required number and capacity of fire pumps are already fitted. *(MSC/Circ. 1120)*

Technical Background

Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments and MSC/Circ.1120.

Remarks

1.92 Fire hose nozzles of a plastic type material

Conventions (Amend.), Reg.		Regulation **II-2/10.2.3.3** of Amendments **2000 to SOLAS 1974**					
IACS UI Number	**SC98**	**UI** version	**1994/ Rev.1,Nov.2005**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

Nozzles

Interpretation

Fire hose nozzles made of plastic type material, e.g. polycarbonate, are considered acceptable provided capacity and serviceability are documented and the nozzles are found suitable for the marine environment.

Technical Background

Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments.

Remarks

1.93 Flexible bellows of combustible materials

Conventions (Amend.), Reg.		SOLAS Reg. **II-2/9.7.1.1**					
IACS UI Number	**SC99**	**UI version**	**1994/ Rev.1,Nov.,2005/ Rev.2,Aug., 2014**	**Date of implementation**	**Rev.2, Jan.1,2015**	**Means of implementation**	**Ships contracted for construction**

Conventions/Codes Requirements

7.1.1 Ventilation ducts shall be of steel or equivalent material. However, short ducts, not generally exceeding 2 m in length and with a free cross-sectional area* not exceeding 0.02 m^2, need not be steel or equivalent, subject to the following conditions:

* The term "free cross-sectional area" means, even in the case of a pre-insulated duct, the area calculated on the basis of the inner diameter of the duct.

.1 subject to paragraph 7.1.1.2 the ducts are made of any material which has low flame-spread characteristics;

.2 on ships constructed on or after 1 July 2010, the ducts shall be made of heat resisting non-combustible material, which may be faced internally and externally with membranes having low flame-spread characteristics and, in each case, a calorific value** not exceeding 45 MJ/m2 of their surface area for the thickness used;

** Refer to the recommendations published by the International Organization for Standardization, in particular publication ISO 1716:2002, Determination of calorific potential.

.3 the ducts are only used at the end of the ventilation device; and

.4 the ducts are not situated less than 600 mm, measured along the duct, from an opening in an "A" or "B" class division including continuous "B" class ceiling.
Interpretation
A short length, not exceeding 600 mm, of flexible bellows constructed of combustible material may be used for connecting fans to the ducting in air conditioning rooms.
Technical Background
IACS Observer to MSC 93 recommended (recommendation 1.2) that UI SC99 should be reviewed in light of the approval of MSC.1/Circ. 1480. The revised version of the UI was unanimously agreed by the Safety Panel. GPG agreed to the revision with an implementation date of 1 January 2015.
Remarks
The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.94 Closing appliances of ventilation inlets and outlets

Conventions (Amend.), Reg.		Regulation **II-2/5.2.1.1** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC100**	**UI** version	**1994/ Rev.1,2001/ Rev.2,Nov.2005/ Corr.1,Aug.,2014**	Date of implement ation		Means of implementation	
Conventions/Codes Requirements							
The main inlets and outlets of all ventilation systems shall be capable of being closed from outside the spaces being ventilated.							
Interpretation							
Ventilation inlets and outlets located at outside boundaries are to be fitted with closing appliances as required by Reg. II-2/5.2.1.1 and need not comply with Reg. II-2/9.7.3.1.							
Technical Background							
Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments.							
Remarks							

1.95 Main vertical zones

Conventions (Amend.), Reg.		Regulation **II-2/9.2.2.1** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC101**	**UI** version	**1994/ Rev.1,Nov. 2005**	Date of implementa tion	**01.07.2006**	Means of implementation	
Conventions/Codes Requirements							
Main vertical zones and horizontal zones							
Interpretation							
If a stairway serves two main vertical zones, the maximum length of one main vertical zone is to be measured from the far side of the main vertical zone stairway enclosure. In this case, all boundaries of the stairway enclosure are to							

be insulated as main vertical zone bulkheads and access doors leading into the stairway are to be provided from the ones(see Figures 1 to 4 for regulation 9.2.2.1). However, the stairway is not to be included in calculating the size of the main vertical zone if it is treated as its own main vertical zone. *(MSC/Circ. 1120)*
The number of MVZ of 48m length is not limited as long as they comply with all the requirements.

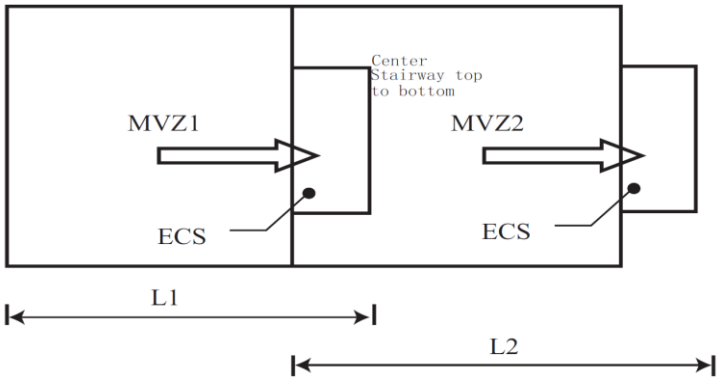
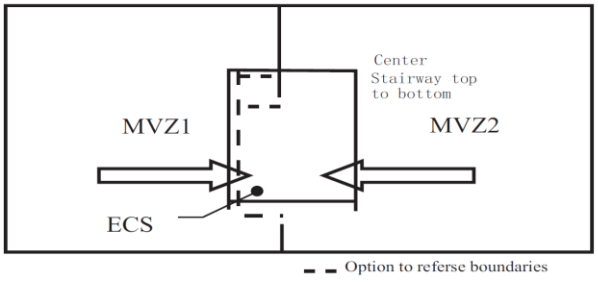
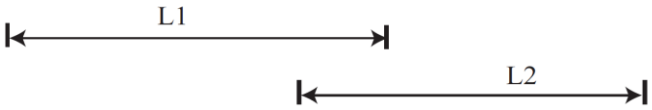


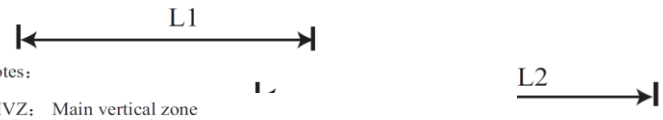
Figure1： ECS serves one MVZ



Option 1： ECS belongs to MVZ1



Option 2： ECS belongs to MVZ2



Notes：

* MVZ： Main vertical zone
ECS： ESCAPE stairway
→： Direction of escape

Figure 2： ECS serves two MVZ

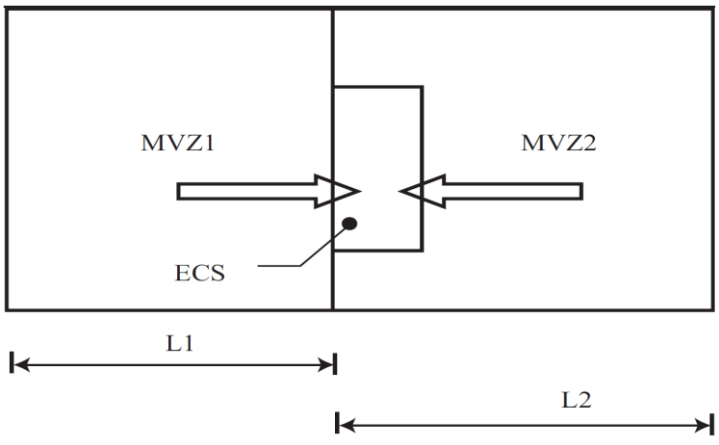
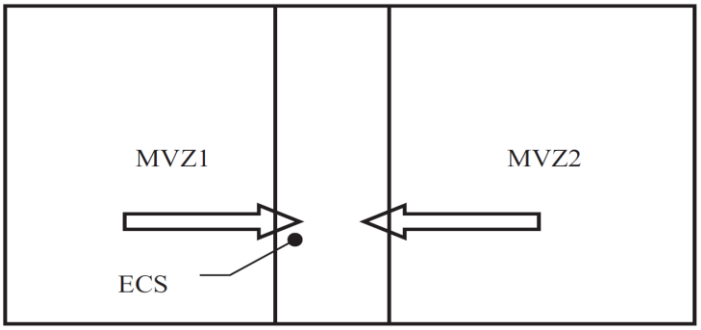
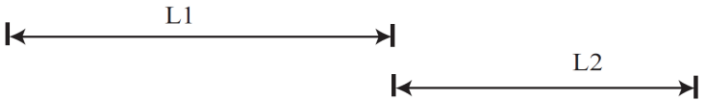


Figure 3： ECS serves two MVZ's(ECS belongs to MVZ2)



Option 1： ECS belongs to MVZ1



Option 2： ECS should be treated as MVZ1

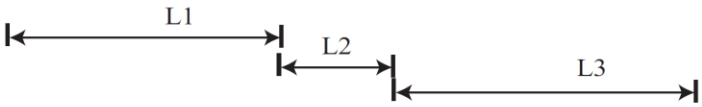


Figure 4： ECS serves two MVZ's

Technical Background
Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments and MSC/Circ.1120.
Remarks

1.96 Cold service

Conventions (Amend.), Reg.		Regulations **II-2/5.3.1.1** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC102**	**UI** version	**1994/ Rev.1,Nov.2005**	Date of implementation		Means of implementation	

Conventions/Codes Requirements
Insulating materials shall be non-combustible, except in cargo spaces, mail rooms, baggage rooms and refrigerated compartment of service spaces. Vapour barriers and adhesive used in conjunction with insulation, as well as the insulation of pipe fittings for cold service systems, need not be of non-combustible materials, but they shall be kept to the minimum quantity practicable and their exposed surfaces shall have low flame-spread characteristics.
Interpretation
Cold service is understood to mean refrigeration systems and chilled water piping for air-conditioning systems.*(MSC/Circ. 1120)*
Technical Background
Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments and MSC/Circ.1120.
Remarks

1.97 Insulation of machinery space boundaries

Conventions (Amend.), Reg.		Regulation **II-2/19.3.8** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC103**	**UI** version	**1994/Rev.1, Nov. 2005**	Date of implementation		Means of implementation	

Conventions/Codes Requirements
Bulkheads forming boundaries between cargo spaces and machinery spaces of category A shall be insulated to "A-60" standard, unless the dangerous goods are stowed at least 3 m horizontally away from such bulkheads. Other boundaries between such spaces shall be insulated to "A-60" standard.

Interpretation
In the case that a closed or semi-closed cargo space is located partly above a machinery space and the deck above the machinery space is not insulated, dangerous goods are prohibited in the whole of that cargo space. If the uninsulated deck above the machinery space is a weather deck, dangerous goods are prohibited only for the portion of the deck located above the machinery space.
Technical Background
Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments.
Remarks

1.98 Quick closing valve for emergency generator fuel tank

Conventions (Amend.), Reg.		Regulation **II-2/15.2.5** of **SOLAS 1974**					
IACS UI Number	**SC104**	**UI** version	**1995/ Nov.2005**	Date of implementation	**01.01.1996**	Means of implementation	
Conventions/Codes Requirements							
Closing valves for fuel tanks							
Interpretation							
Deleted.							
Technical Background							
Deleted in Nov 2005 because of SOLAS 2000 Amendments.							
Remarks							

1.99 Relief valve in oil filling lines

Conventions (Amend.), Reg.		Regulation **II-2/15.2.7** of **SOLAS 1974**					
IACS UI Number	**SC105**	**UI** version	**1995/ Rev.1, 2001/ Nov. 2005**	Date of implementation	**01.01.1996**	Means of implementation	
Conventions/Codes Requirements							
Provision shall be made to prevent overpressure in any oil tank or in any part of the oil fuel system, including the filling pipes. Any relief valves and air or overflow pipes shall discharge to a position which, in the opinion of the Administration, is safe.							
Interpretation							
Deleted.							
Technical Background							
Deleted in Nov 2005 because of SOLAS 2000 Amendments.							
Remarks							

1.100 Galley exhaust duct

Conventions (Amend.), Reg.		Regulations **II-2/9.7.5.2.1** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC106**	**UI** version	**1995/Rev. 1, Nov. 2005**	Date of implementation	**01.01.1996**	Means of implementation	
Conventions/Codes Requirements							
Where they pass through accommodation spaces or spaces containing combustible materials, the exhaust ducts from galley ranges shall be constructed of "A" class division…							
Interpretation							
Grease trap, fire damper, fan shut-off and fixed fire extinguishing are only required when a galley exhaust duct							

passes through accommodation spaces or spaces containing combustible materials. The term "spaces containing combustible materials" will normally apply to all spaces in accommodation.
Remarks

Conventions (Amend.), Reg.		Regulation **II-2/9.7.5.1.1 &9.7.5.2.1** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC118**	**UI** version	**1996/ Rev.1, Nov., 2005/ Rev.2, Jul., 2015**	Date of implementation		Means of implementation	**Ships constructed before Jan.1, 2016**

Conventions/Codes Requirements
Where they pass through accommodation spaces or spaces containing combustible materials, the exhaust ducts from galley ranges shall be constructed of "A" class division…
Interpretation
Fire dampers required by Reg. II-2/9.7.5.1.1 and 9.7.5.2.1 do not need to pass the fire test in either Res. A 754(18) or Appendix 2 of Part 3, of Annex 1 of the 2010 FTP Code, but should be of steel and capable of stopping the draught. The requirements to "A" class applies only to the part of the duct outside of the galley.
Technical Background
The issue was raised within the Safety Panel. Members agreed to retain and amend UI SC118 taking into account the SOLAS amendments by MSC.365(93). it was agreed by the panel that the existing IACS UI should be retained for existing ships.
Remarks
This UI is to be uniformly implemented by IACS Members on ships constructed before 1 January 2016.

1.101 Continuous ceiling

Conventions (Amend.), Reg.		Regulation **II-2/9.2.2.2.3** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC107**	**UI** version	**1995/Rev. 1, Nov. 2005**	Date of implementation	**01.01.1996**	Means of implementation	

Conventions/Codes Requirements
All bulkheads required to be "B" class division, except corridor bulkheads prescribed in paragraph 2, shall extend from deck to deck and to the shell or other boundaries unless continuous "B" class ceilings or linings fitted on both sides of the bulkhead are at least of the same fire resistance as the bulkhead, in which case the bulkhead may terminate at the continuous ceiling or lining.
Interpretation
If an air gap between cabins results in an opening in the continuous class B-15 ceiling, the bulkheads on both sides of the air gap are to be of class B-15.
Technical Background
Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments.
Remarks

1.102 Galley exhaust duct

Conventions (Amend.), Reg.		Regulation **II-2/9.7.5.1** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC108**	**UI** version	**1995/Rev.1, Nov. 2005**	Date of implementation	**01.01.1996**	Means of implementation	

Conventions/Codes Requirements
Exhaust ducts from galley ranges in which grease or fat is likely to accumulate shall meet the requirements of Regulations 16.3.2.1 and 16.3.2.2 and shall be fitted with: …
Interpretation
The requirements to exhaust ducts from galley ranges in which grease or fat is likely to accumulate will apply to all exhaust ducts from galley ranges.
Technical Background
Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments.
Remarks

1.103 Open top container holds - water supplies

Conventions (Amend.), Reg.		Regulation **II-2/19.3.1** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC109**	**UI** version	**1995/Rev.1, Nov. 2005**	Date of implementation	**01.01.1996**	Means of implementation	

Conventions/Codes Requirements

Water supplies

Interpretation

1.The water spray system required by item 9.2, 9.3 and 9.4 of MSC/Circ.608/ Rev.1 "Interim Guidelines for Open-Top Container Ships" will also satisfy the requirement for dangerous goods.

2.The amount of water required for fire fighting purposes in the largest hold is to satisfy simultaneous use from the water spray system plus 4 jets of water from hose nozzles. *(MSC/Circ. 1120)*

Technical Background

Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments and MSC/Circ.1120.

Remarks

1.104 Open top container holds – ventilation

Conventions (Amend.), Reg.		Regulation **II-2/19.3.4** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC110**	**UI** version	**1995/Rev.1, Nov. 2005**	Date of implementation	**01.01.1996**	Means of implementation	

Conventions/Codes Requirements

Ventilation

Interpretation

Power ventilation is interpreted to be required only for the lower part of the cargo hold for which purpose ducting is required. The ventilation capacity is to be at least 2 air changes per hour based on the empty hold volume below weather deck. *(MSC/Circ. 1120)*

Technical Background

Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments and MSC/Circ.1120.

Remarks

1.105 Open top container holds - bilge pumping

Conventions (Amend.), Reg.		Regulation **II-2/19.3.5** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC111**	**UI** version	**1995/Rev.1, Nov. 2005**	Date of implementation	**01.01.1996**	Means of implementation	

Conventions/Codes Requirements

Bilge pumping

Interpretation

Bilge systems for cargo holds should be independent of the machinery space bilge system and be located outside of the machinery space.

Technical Background

Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments.

Remarks

1.106 Emergency towing arrangements on tankers - prototype test

Conventions (Amend.), Reg.		Resolution **MSC.35(63)**, **2.10**					
IACS UI Number	**SC113**	**UI** version	**1996**	Date of implementation	**01.01.1996**	Means of implementation	

Conventions/Codes Requirements

Designs of emergency towing arrangements in accordance with these Guidelines should be prototype tested to the satisfaction of the Administration.

Interpretation

Towing arrangements may be (1) a packaged self contained unit, or (2) a unit comprised of individually tested components assembled onboard the vessel.

Both arrangements should meet the specified strength requirements and undergo a deployment test onboard the vessel as required by MSC.35 (63).

Fixed gear such as strong points, fairleads, foundations and associated vessel supporting structure are to be demonstrated as adequate for the loads imposed by means of a submitted engineering analysis or calculations. If the structural configuration is of a particularly complex or novel nature, such that its load bearing adequacy cannot be satisfactorily determined by engineering analysis, suitable proof test will be required.

Articles of loose gear such as chains, towing pennants and associated end fittings, and shackles or other connecting links should be tested to the requirements of the Classification Society concerned.

Where a manufacturer requests a certificate of type approval for a complete self contained arrangement, one assembled unit is additionally to undergo a test to 2 × SWL.

Remarks

1.107 Emergency fire pump access

Conventions (Amend.), Reg.		Regulation **II-2/10.2.2.3.2.1** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC114**	**UI** version	**1996/Rev.1, Nov. 2005**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

The space containing the fire pump shall not be contiguous to the boundaries of machinery spaces of category A or those spaces containing main fire pumps. Where this is not practicable, the common bulkhead between the two spaces shall be insulated to a standard of structural fire protection equivalent to that required for a control station in regulation 44.

Interpretation

When a single access to the emergency fire pump room is through another space adjoining a machinery space of category A or the spaces containing the main fire pumps, class A-60 boundary is required between that other space and the machinery space of category A or the spaces containing the main fire pumps.

Technical Background

Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments.

Remarks

1. 108 Fire detection system with remotely and individually identifiable detectors

Conventions (Amend.), Reg.		**FSS Code, Ch. 9, 2.4.1.1 and 2.5.1.1**					
IACS UI Number	**SC115**	**UI version**	**1996/ Rev.1, Nov 2005**	**Date of implementation**		**Means of implementation**	

Conventions/Codes Requirements

FSS Code Ch. 9, 2.4.1.1:

2.4.1.1 Detectors and manually operated call points shall be grouped into sections.

FSS Code Ch. 9, 2.5.1.1:

2.5.1.1 The activation of any detector or manually operated call point shall initiate a visual and audible fire signal at the control panel and indicating units…….
Interpretation
Deleted in Oct. 2015
Technical Background
Relevant contents are included in the chapter 9 of the FSS Code, as amended by resolution MSC.311(88)。
Remarks

1.109 Fire detection system with remotely and individually identifiable detectors

Conventions (Amend.), Reg.		Regulation **II-2/13.1.10** of **SOLAS 1974**					
IACS UI Number	**SC116**	**UI** version	**1996/Nov. 2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
A section of fire detectors which covers a control station, a service space or an accommodation space shall not include a machinery space of Category A.							
Interpretation							
Deleted.							
Technical Background							
Deleted in Nov 2005 because of SOLAS 2000 Amendments.							
Remarks							

1.110 Fire detection system with remotely and individually identifiable detectors

Conventions (Amend.), Reg.		Paragraph **2.1.4&2.4.3.2**, Chapter **9** of **FSS** Code					
IACS UI Number	**SC117**	**UI** version	**1996/ Rev.1,2001/ Rev.2.Nov. 2005**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
2.1.4 Fixed fire detection and fire alarm systems with a zone address identification capability shall be so arranged that: .1 means are provided to ensure that any fault (e.g. power break, short circuit, earth, etc.) occurring in the loop will not render the whole loop ineffective; …… 2.4.3.2 A loop of fire detection systems with a zone address identification capability shall not be damaged at more than one point by a fire.							
Interpretation							
Delted							
Technical Background							
SSE 3 did not agree with IACS' arguments about the clarification of ' individually identifiable detectors ' presented in SSE 3/12/14.							
Remarks							
IACS deleted the UI in Sept. 2020.							

1.111 Balancing ducts

Conventions (Amend.), Reg.		Regulations **II-2/9.4.1.2& 9.4.2** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC119**	**UI** version	**1996/ Rev.1, Nov.2005**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

Regulation 31: Openings in "B" class divisions
Regulation 47: Doors in fire-resisting divisions

Interpretation

Balancing openings or ducts between two enclosed spaces are prohibited except for openings as permitted by Reg. II-2/9.4.1.2 and Reg. II-2/9.4.2.

Technical Background

Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments.

Remarks

1.112 Access to forecastle spaces on tankers

Conventions (Amend.), Reg.		Regulation **II-2/4.5.2.1&4.5.2.2** of Amendments **2000** to **SOLAS 1974** Paragraph **3.2.3** of IBC Code Paragraph **3.2.4** of IGC Code					
IACS UI Number	**SC120**	**UI** version	**1996/Rev.1, Nov.2005/ Rev.2,Aug. 2006**	Date of implementation	**01.01.2007**	Means of implementation	

Conventions/Codes Requirements

SOLAS regulations II-2/4.5.2.1 and 4.5.2.2 read:

5.2.1 Except as permitted in paragraph 5.2.2, access doors, air inlets and openings to accommodation spaces, service spaces, control stations and machinery spaces shall not face the cargo area. They shall be located on the transverse bulkhead not facing the cargo area or on the outboard side of the superstructure or deckhouse at a distance of at least 4% of the length of the ship, but not less than 3 m from the end of the superstructure or deckhouse facing the cargo area. This distance need not exceed 5 m.

5.2.2 The Administration may permit access doors in boundary bulkheads facing the cargo area or within the 5 m limits specified in paragraph 5.2.1, to main cargo control stations and to such service spaces used as provision rooms, store-rooms and lockers, provided they do not give access directly or indirectly to any other space containing or providing for accommodation, control stations or service spaces such as galleys, pantries or workshops, or similar spaces containing sources of vapour ignition. The boundary of such a space shall be insulated to "A-60" class standard, with the exception of the boundary facing the cargo area. Bolted plates for the removal of machinery may be fitted within the limits specified in paragraph 5.2.1. Wheelhouse doors and windows may be located within the limits specified in paragraph 5.2.1 so long as they are designed to ensure that the wheelhouse can be made rapidly and efficiently gastight and vapourtight.

Paragraph 3.2.3 of the IBC Code reads:

3.2.3 Entrances, air inlets and openings to accommodation, service and machinery spaces and control stations should not face the cargo area. They should be located on the end bulkhead not facing the cargo area and/or on the outboard side of the superstructure or deckhouse at a distance of at least 4% of the length (L) of the ship but not less than 3 m from the end of the superstructure or deck-house facing the cargo area. This distance, however, need not exceed 5 m. No doors should be permitted within the limits mentioned above, except that doors to those spaces not having access to accommodation and service spaces and control stations, such as cargo control stations and store-rooms, may be

fitted. Where such doors are fitted, the boundaries of the space should be insulated to "A-60" standard. Bolted plates for removal of machinery may be fitted within the limits specified above. Wheelhouse doors and wheelhouse windows may be located within the limits specified above so long as they are so designed that a rapid and efficient gas- and vapour-tightening of the wheelhouse can be ensured. Windows and sidescuttles facing the cargo area and on the sides of the superstructures and deck-houses within the limits specified above should be of the fixed (non-opening) type. Such sidescuttles in the first tier on the main deck should be fitted with inside covers of steel or equivalent material.

Paragraph 3.2.4 of the IGC Code reads:

3.2.4 Entrances, air inlets and openings to accommodation spaces, service spaces, machinery spaces and control stations should not face the cargo area. They should be located on the end bulkhead not facing the cargo area or on the outboard side of the superstructure or deck-house or on both at a distance of at least 4% of the length (L) of the ship but not less than 3 m from the end of the superstructure or deck-house facing the cargo area. This distance, however, need not exceed 5 m. Windows and sidescuttles facing the cargo area and on the sides of the superstructures or deck-houses within the distance mentioned above should be of the fixed (non-opening) type. Wheelhouse windows may be non-fixed and wheelhouse doors may be located within the above limits so long as they are so designed that a rapid and efficient gas and vapour tightening of the wheelhouse can be ensured. For ships dedicated to the carriage of cargoes which have neither flammable nor toxic hazards, the Administration may approve relaxations from the above requirements.

Interpretation

Access to forecastle spaces containing sources of ignition may be permitted through doors facing cargo area provided the doors are located outside hazardous areas as defined in IEC Publication 60092-502.

Technical Background

The IEC Publication is referred to in the IBC Code and IGC Code amended by MSC.176(79) and MSC.177(79), and UI is newly revised to refer to SOLAS, IBC Code, IGC Code.

Remarks

1.113 Fire pump isolation requirements

Conventions (Amend.), Reg.		Regulation **II-2/10.2.1.4.1**of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC121**	**UI** version	**1997/Rev.1, Nov. 2005**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

Isolating valves to separate the section of the fire main within the machinery space containing the main fire pump or pumps from the rest of the fire main shall be fitted in an easily accessible and tenable position outside the machinery space.

Interpretation

Any part of the fire main routed through a category A machinery space must be fitted with isolating valves outside of the space. The arrangements of the fire mains must allow for fire water from the fire pumps or emergency fire pump to reach all hydrants outside of the isolated space. Isolation requirements of SOLAS Reg. II-2/10.2.1.4.1 are not applicable to the piping from fire pumps located in other spaces other than category A machinery spaces.

Technical Background

Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments.

Remarks

1.114 Corrosion Prevention in Seawater Ballast Tanks

Conventions (Amend.), Reg.		Regulation **II-1/3-2** of **SOLAS 1974**					
IACS UI Number	**SC122**	**UI** version	**1998/ V0.1,Apr.,1998/ Rev.1,Aug.,2008/ Corr.1,Oct.,2008**	Date of implementation	**Jul.1,1998/ Oct.,2009**	Means of implementation	

Conventions/Codes Requirements

All dedicated seawater ballast tanks shall have an efficient corrosion prevention system, such as hard protective coatings or equivalent. The coatings should preferably be of a light colour. The scheme for the selection, application and maintenance of the system shall be approved by the Administration, based on the guidelines adopted by the Organization (i.e. Guidelines for the selection, application and maintenance of corrosion prevention systems of dedicated seawater ballast tanks adopted by the Organization by resolution A.798(19)). Where appropriate, sacrificial anodes shall also be used.

Interpretation

The scheme for the selection, application and maintenance of the coating system should follow the requirements of IMO Resolution A.798(19) and contain, as a minimum, the following documentation:

Owner's, coating manufacturer's and shipyard's explicit agreement to the scheme for coating selection, application and maintenance.

List of seawater ballast tanks identifying the coating system for each tank, including coating colour and whether coating system is a hard coating.

Details of anodes, if used.

Manufacturer's technical product data sheet for each product.

Manufacturer's evidence of product quality and ability to meet owners requirements.

Evidence of shipyard's and/or its subcontractor's experience in coating application.

Surface preparation procedures and standards, including inspection points and methods.

Application procedures and standards, including inspection points and methods.

Format for inspection reports on surface preparation and coating application.

Manufacturer's product safety data sheets for each product and owner's, coating manufacturer's and shipyard's explicit agreement to take all precautions to reduce health and other safety risks which are required by the authorities.

Maintenance requirements for the coating system.

Coating of any colour may be accepted, unless otherwise instructed by the Flag Administration. "Light colour" coating is preferable, and includes colours which facilitate inspection or are easily distinguishable from rust.

Remarks

This UI applies to ships constructed on or after 1 July 1998 but for which: either the building contract is placed before 1 July 2008; or, in the absence of a building contract, the keels of which are laid or which are at a similar stage of construction before 1 January 2009; or, the delivery of which is before 1 July 2012; and interprets SOLAS II-1/3-2.2 adopted by Resolution MSC.47(66), which is referred to in the amended SOLAS II-1/3-2.3 as adopted by Resolution MSC.216(82).

1.115 Machinery installations - service tank arrangements

Conventions (Amend.), Reg.		Regulation **II-1/26.11** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC123**	**UI** version	**1998/Rev. 2, June 2002/Rev. 3, Dec. 2005**	Date of implementation	**01.01.2003 (Rev.2) 01.07.2006 (Rev.3)**	Means of implementation	

Conventions/Codes Requirements

Location and arrangement of vent pipes for fuel oil service, settling and lubrication oil tanks shall be such that in the event of a broken vent pipe this shall not directly lead to the risk of ingress of seawater splashes or rainwater. Two fuel oil service tanks for each type of fuel used on board necessary for propulsion and vital systems or equivalent arrangements shall be provided on each new ship, with a capacity of at least 8 h at maximum continuous rating of the propulsion plant and normal operating load at sea of the generator plant. This paragraph applies only to ships constructed on or after 1 July 1998.

Interpretation

SOLAS Regulation II-1/26.11 states: Two fuel oil service tanks for each type of fuel used on board necessary for propulsion and vital systems or equivalent arrangements shall be provided on each new ship, with a capacity of at least 8 h at maximum continuous rating of the propulsion plant and normal operating load at sea of the generator plant.

Arrangements complying with this regulation and acceptable "equivalent arrangements", for the most commonly utilised fuel systems, are shown below.

A service tank is a fuel oil tank which contains only fuel of a quality ready for use i.e. fuel of a grade and quality that meet the specification required by the equipment manufacturer. A service tank is to be declared as such and not to be used for any other purpose.

Use of a setting tank with or without purifiers, or purifiers alone, and one service tank is not acceptable as an "equivalent arrangement" to two service tanks.

Examples of application for the most common systems

1. Example 1

1.1 Requirement according to SOLAS - Main and Auxiliary Engines and Boiler(s) operating with Heavy Fuel Oil (HFO) (one fuel ship)

HFO Serv. TK Capacity for at least 8 h Main Eng. + Aux. Eng. + Aux. Boiler	HFO Serv. TK Capacity for at least 8 h Main Eng. + Aux. Eng. + Aux. Boiler	MDO TK For initial cold starting or repair work of Engines/Boiler

1.2 Equivalent arrangement

HFO Serv. TK Capacity for at least 8 h Main Eng. + Aux. Eng. + Aux. Boiler	MDO Serv. TK Capacity for at least 8 h Main Eng. + Aux. Eng. + Aux. Boiler

This arrangement only applies where main and auxiliary engines can operate with heavy fuel oil under all load conditions and, in the case of main engines, during manoeuvring.

For pilot burners of Auxiliary Boilers if provided, an additional MDO tank for 8 hours may be necessary.

2. Example 2

2.1 Requirement according to SOLAS - Main Engine(s) and Auxiliary Boiler(s) operating with HFO and Auxiliary Engine operating with Marine Diesel Oil (MDO)

HFO Serv. TK Capacity for at least 8 h Main Eng. + Aux.Boiler	HFO Serv. TK Capacity for atleast 8 h Main Eng. + Aux. Boiler	MDO Serv. TK Capacity for at least 8 h Aux. Eng.	MDO Serv. TK Capacity for at least 8 h Aux. Eng.

2.2 Equivalent arrangement

HFO Serv. TK Capacity for atleast 8 h Main Eng. + Aux. Boiler	MDO Serv. TK Capacity for at least the highest of: • 4 h Main Eng. + Aux. Eng +Aux. Boiler, or • 8 h Aux. Eng. + Aux Boiler	MDO Serv. TK Capacity for at least the highest of: • 4 h Main Eng. + Aux. Eng +Aux. Boiler, or • 8 h Aux. Eng. + Aux Boiler

3. The arrangements in 1.2 and 2.2 apply, provided the propulsion and vital systems which use two types of fuel support rapid fuel change over and are capable of operating in all normal operating conditions at sea with both types of fuel (MDO and HFO).

Remarks

Rev.4 of this UI is withdrawn prior to coming into force on 1 January 2020 and Rev.3 of this UI is reinstated on Nov 2019.

1.116 Emergency source of power in passenger and cargo ships

Conventions (Amend.), Reg.		Regulations **II-1/42.3.4 & 43.3.4** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC124**	**UI** version	**May 1999/ Rev. 1, June 2002/ Corr.1, Oct.2007**	Date of implementation	**01.01.2003(Rev.1)**	Means of implementation	

Conventions/Codes Requirements

For ships constructed on or after 1 July 1998, where electrical power is necessary to restore propulsion, the capacity shall be sufficient to restore propulsion to the ship in conjunction with other machinery, as appropriate, from a dead

ship condition within 30 mins after blackout.
Interpretation
"Blackout" as used in Regulation II-1/42.3.4 and II-1/43.3.4 is to be understood to mean a "dead ship" condition". "Dead ship" condition, for the purpose of Regulation II-1/42.3.4 and II-1/43.3.4, is to be understood to mean a condition under which the main propulsion plant, boilers and auxiliaries are not in operation and in restoring the propulsion, no stored energy for starting the propulsion plant, the main source of electrical power and other essential auxiliaries is to be assumed available. It is assumed that means are available to start the emergency generator at all times. The emergency generator and other means needed to restore the propulsion are to have a capacity such that the necessary propulsion starting energy is available within 30 minutes of blackout/dead ship condition as defined above. Emergency generator stored starting energy is not to be directly used for starting the propulsion plant, the main source of electrical power and/or other essential auxiliaries (emergency generator excluded). For steam ships, the 30 minute time limit given in SOLAS can be interpreted as time from blackout/dead ship condition defined above to light-off of the first boiler.
Remarks
Corr.1 of this UI contains the interpretation of the "contracted for construction" date. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.117 B and C Class Divisions

Conventions (Amend.), Reg.		Regulations **II-2/3.4 & 3.10** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC125**	**UI** version	**May,1998/ Rev.1,Jul.,2004/ Rev.2,Nov.,2005/ Corr.1,Jan.,2010/ Rev.3,Dec.,2020**	Date of implementation	**Jan.1,1999**	Means of implementation	**Contracted for construction**
Conventions/Codes Requirements							
B and C Class Divisions							
Interpretation							
A division consisting of a non-combustible core and combustible veneers may be accepted as a B or C class division, provided: (1) that the non-combustible core is tested in accordance with the FTP Code, Annex 1, part 1, (2) that the B class division is tested in accordance with the FTP Code, Annex 1, part 3, and (3) that the veneers are tested in accordance with the FTP Code, Annex 1, part 5 and part 2, if applicable.							
Technical Background							
Noting that part 1, part 2, part 3 and part 5 referenced by the UI is second class directory under the Annex 1 of FTP Code, the Safety Panel agreed to update the references in the UI.							
Remarks							

The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.118 Fire protection materials for cargo ships

Conventions (Amend.), Reg.		Regulations **II-2/4.4.4,5.3, 6.2.1 and 6.3.1** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC126**	**UI** version	**May 1998/ Rev. 1,June 2000/ Rev. 2,Nov.,2005/ Corr.1,Aug.,2021**	Date of impleme ntation	-/ -/ **Rev.2,Jan.1,2006**	Means of implement ation	**Contracted for construction**
Conventions/Codes Requirements							
Regulations II-2/4.4.4,5.3, 6.2.1 and 6.3.1 of SOLAS: Regulation 4.4.4 Primary deck coverings Regulation 5.3 Fire protection materials Regulation 6.2.1 Paints, varnishes and other finishes Regulation 6.3.1 Primary deck coverings							
Interpretation							
For the application of SOLAS regulations II-2/4.4.4, 5.3, 6.2.1 and 6.3.1, reference is to be made to the attached Figure 1 and associated Tables 1 and 2.							

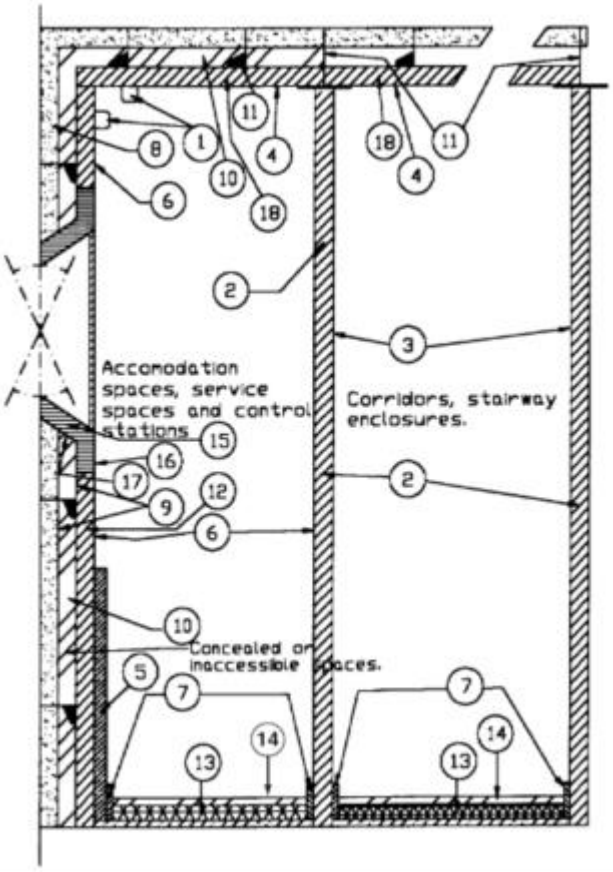


Figure 1: Constructural elements in accommodation spaces

(Table 1&Table 2 are shown in the next page)

Remarks

1. This Unified Interpretation is to be applied by all Members and Associates on ships contracted for construction on or after 1 January 2006.
2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29."
3. Circular No. 012/Total No. 126 (2006) "On the Implementation of IACS UI SC126 & 127 (Rev.2)" issued by CCS' Technical Department.

Table 1: Method IC

		Requirements for components						
		A Non Combustible Material Reg.II-2/5.3.1.2.2.1	**B Non Combustible Material Reg. II-2/5.3.1.1**	**C Low Flame Spread Reg.II-2/5.3.2.4.2**	**D Equivalent Volume Reg.II-2/5.3.2.3.1**	**E Calorific Value Reg.II-2/5.3.2.2**	**F Smoke Production Reg. II-2/6**	**G Not readily ignite Reg.II-2/4.4.4**
1	Moulding				×			
2	Panel	×						
3	Painted surfaces or Veneer or Fabric or Foils			×	×	×	×(2)	
4	Painted surfaces or Veneer or Fabric or Foils			×	×	×	×(2)	
5	Decoration				×		×	
6	Painted surfaces or Veneer or Fabric or Foils				×	×	×(2)	
7	Skirting board				×			
8	Insulation		×(1)					
9	Surfaces and paints in concealed or inaccessible spaces			×				
10	Draught stops	×						
11	Grounds and supports	×		×				
12	Lining	×						
13	Primary deck covering 1st layer						×(4)	×
14	Floor finishing			×(3)			×	
15	Window box	×						
16	Window box surface			×	×	×	×	
17	Window box surface in concealed or inaccessible spaces			×				
18	Ceiling panel	×						

(1) Vapour barriers used on pipes for cold systems (see UI SC 102) may be of combustible materials providing that their surface has low flame spread characteristics (Reg. II-2/5.3.1.1).

(2) Applicable to paints, varnishes and other finishes (Reg. II-2/6.2.1).

(3) Only in corridors and stairway enclosures.

(4) Only in accommodation and service spaces and control stations (Reg. II-2/6.3.1).

– Regulation II-/6.2 only applies to accommodation spaces, service spaces and control stations as well as stairway enclosures (UI SC 127).

– As far as window boxes construction is concerned, reference is also to be made to MSC/Circ.917 and MSC/Circ. 917 Add. 1.

Table 2: Methods IIC and IIIC

		Requirements for components						
		A Non Combustible Material Reg. II-2/5.3.1.2.2.2	**B Non Combustible Material Reg. II-2/5.3.1.1**	**C Low Flame Spread Reg.II-2/5.3.2.4.2**	**D Equivalent Volume Reg.II-2/5.3.2.3.1**	**E Calorific Value Reg.II-2/5.3.2.2**	**F Smoke Production Reg. II-2/6**	**G Not readily ignite Reg. II-2/4.4.4**
1	Moulding				×(3)			
2	Panel	×(4)						
3	Painted surfaces or Veneer or Fabric or Foils			×	×	×	×(5)	
4	Painted surfaces or Veneer or Fabric or Foils			×	×(3)	×(2)	×(5)	
5	Decoration				×(3)		×	
6	Painted surfaces or Veneer or Fabric or Foils				×(3)	×(2)	×(5)	
7	Skirting board				×(3)			
8	Insulation		×(1)					
9	Surfaces and paints in concealed or inaccessible spaces			×				
10	Draught stops	×(4)						
11	Grounds and supports	×(4)		×				
12	Lining	×(4)						
13	Primary deck covering 1st layer						×(7)	×
14	Floor finishing			×(6)			×	
15	Window box	×(4)						
16	Window box surface			×(3)	×(3)	×(2)	×	
17	Window box surface in concealed or inaccessible spaces			×				
18	Ceiling panel	×(4)						

(1) Vapour barriers used on pipes for cold systems (see UI SC 102) may be of combustible materials providing that their surface has low flame spread characteristics (Reg. II-2/5.3.1.1).
(2) Where fire material is fitted on non combustible bulkheads, ceiling and lining in accommodation and service spaces (Reg. II-2/5.3.2.2).
(3) To be applied to those accommodation and service spaces bounded by non combustible bulkheads, ceiling and lining (Reg. II-2/ 5.3.2.3.1).
(4) Only in corridor and stairway enclosures serving accommodation and service spaces and control stations (Reg. II-2/5.3.1.2.2.2).
(5) Applicable to paints, varnishes and other finishes (Reg. II-2/6.2.1).
(6) Only in corridors and stairway enclosures.
(7)Only in accommodation and service spaces and control stations (Reg. II-2/6.3.1).
– Regulation II-/6.2 only applies to accommodation spaces, service spaces and control stations as well as stairway enclosures (UI SC 127).
– As far as window boxes construction is concerned, reference is also to be made to MSC/Circ.917 and MSC/Circ. 917 Add. 1.

1.119 Paints, varnishes and other finishes

Conventions (Amend.), Reg.		Regulation **II-2/6.2** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC127**	**UI** version	**May 1998/ Rev. 1, July 2004 Rev. 2, Nov. 2005**	Date of implementation	**01.01.2006 (Rev.2)**	Means of implementation	Contracted for construction

Conventions/Codes Requirements

Paints, varnishes and other finishes used on exposed interior surface shall not be capable of producing excessive quantities of smoke and toxic products, this being determined in accordance with the Fire Test Procedure Code.

Interpretation

This regulation only applies to accommodation spaces, service spaces and control stations as well as stairway enclosures.

Remarks

1. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.
2. Circular No. 012/Total No. 126 (2006) "On the Implementation of IACS UI SC126 & 127 (Rev.2)" issued by CCS' Technical Department.

1.120 CO2 discharge time

Conventions (Amend.), Reg.		**FSS Code, Ch. 5, 2.2.1.2, 2.2.1.6, 2.2.1.7**					
IACS UI Number	**SC128**	**UI** version	**May ,1998/ Rev.1,July,2004/ Rev.2,Nov.,2005**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

FSS Code, Ch. 5, 2.2.1.2:

For vehicle spaces and ro-ro spaces which are not special category spaces, the quantity of carbon dioxide available shall be at least sufficient to give a minimum volume of free gas equal to 45% of the gross volume of the largest such cargo space which is capable of being sealed, and the arrangements shall be such as to ensure that at least two thirds of the gas required for the relevant space shall be introduced within 10 min. Carbon dioxide systems shall not be used for the protection of special category spaces。

FSS Code, Ch. 5, 2.2.1.6:

For machinery spaces the fixed piping system shall be such that 85% of the gas can be discharged into the space within 2 min.

FSS Code, Ch. 5, 2.2.1.7:

For container and general cargo spaces (primarily intended to carry a variety of cargoes separately secured or packed) the fixed piping system shall be such that at least two thirds of the gas can be discharged into the space within 10 min. For solid bulk cargo spaces the fixed piping system shall be such that at least two thirds of the gas can be discharged into the space within 20 min. The system controls shall be arranged to allow one third, two thirds or the entire quantity of gas to be discharged based on the loading condition of the hold.

Interpretation

Deleted

Technical Background

Requirements for the quantity of carbon dioxide available and the maximum time for the gas introduction to the relevant spaces were deleted from SOLAS II-2/20.6.1.1.1 by Resolution MSC.338(91) and re-introduced in FSS Code Chapter 5 by Resolution MSC.339(91) together with a requirement to perform system flow calculations.

Remark

This UI was deleted in April 2021.

1.121 Fire detection in unmanned machinery spaces

Conventions (Amend.), Reg.		Regulation **II-2/7.4** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC129**	**UI** version	**May 1998/ Rev.1,July 2004/Rev.2, Nov.2005**	Date of implementation	**01.01.1999**	Means of implementation	**Contracted for construction**
Conventions/Codes Requirements							
Fixed fire detection and fire alarm systems for periodically unattended machinery spaces.							
Interpretation							
This requirement applies to machinery spaces of category A.							
Technical Background							
Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments.							
Remarks							
The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.							

1.122 Fire detection and sprinkler systems in refrigerated chambers and similar spaces

Conventions (Amend.), Reg.		Regulations **II-2/7.5.2&10.6.1.1** of **SOLAS 1974, Reg.II-2/41-2.5 of** 81 Amendment included in MSC.24(60)**,** Paragraph **2.1.1**, Chapter **8** of **FSS** Code					
IACS UI Number	**SC130**	**UI** version	**May 1998/ Rev.1,July 2004/Rev.2, Nov.2005**	Date of implementation	**01.01.1999**	Means of implementation	**Contracted for construction**
Conventions/Codes Requirements							
Fixed fire detection and fire alarm systems in accommodation spaces, control stations, service spaces, and stairway enclosures and corridors of passenger ships.							
Interpretation							
Heat detectors are acceptable in refrigerated chambers and in other spaces where steam and fumes are produced such as saunas and laundries. Refrigerated chambers may be fitted with dry pipe sprinkler systems.							
Technical Background							
Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments and FSS Code.							
Remarks							
The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.							

1.123 Liquid cargoes for which regular foam is not effective for fire fighting

Conventions (Amend.), Reg.		Regulation **II-2/55.2** of **SOLAS 1974**					
IACS UI Number	**SC131**	**UI** version	**May 1998/ Corr. 1, Jun. 1999/Rev. 1, July 2004/Nov. 2005**	Date of implementation	**01.01.1999**	Means of implementation	**Contracted for construction**
Conventions/Codes Requirements							
Where liquid cargoes other than those referred to in paragraph 1 or liquefied gases which introduce additional fire hazards are intended to be carried, additional safety measures shall be required to the satisfaction of the Administration, having due regard to the provisions of the International Bulk Chemical Code, the Bulk Chemical Code, the International Gas Carrier Code and the Gas Carrier Code, as appropriate.							

Interpretation
Deleted.
Technical Background
Deleted in Nov 2005 because of SOLAS 2000 Amendments.
Remarks
The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.124 Release Operation of the CO2 System

Conventions (Amend.), Reg.		**International Code for Fire Safety Systems (FSS Code) Ch 5,2.1.3.2 and 2.2.2(as amended by MSC.339(91))**					
IACS UI Number	**SC132**	**UI** version	**May,1998/ Rev.1,Jul.2004/ Rev.2,Nov.,2005/ Rev.3,May,2010/ Corr.1,Sept.,2010/ Corr.2,Dec.,2011/ Rev.4,Nov.,2013**	Date of implementation	**Rev.4, Jul.1,2014**	Means of implementation	**Contracted for construction**

Conventions/Codes Requirements
FSS Code, Ch 5,2.1.3.2 (as amended by MSC.339(91)) 2.1.3.2 Means shall be provided for automatically giving audible and visual warning of the release of fire-extinguishing medium into any ro-ro spaces, container holds equipped with integral reefer containers, spaces accessible by doors or hatches, and other spaces in which personnel normally work or to which they have access. The audible alarms shall be located so as to be audible throughout the protected space with all machinery operating, and the alarms should be distinguished from other audible alarms by adjustment of sound pressure or sound patterns. The pre-discharge alarm shall be automatically activated (e.g. by opening of the release cabinet door). The alarm shall operate for the length of time needed to evacuate the space, but in no case less than 20 s before the medium is released. Conventional cargo spaces and small spaces (such as compressor rooms, paint lockers, etc.) with only a local release need not be provided with such an alarm. **FSS Code, Ch 5,2.2.2 (as amended by MSC.339(91))** Carbon dioxide systems for the protection of ro-ro spaces, container holds equipped with integral reefer containers, spaces accessible by doors or hatches, and other spaces in which personnel normally work or to which they have access shall comply with the following requirements: .1 two separate controls shall be provided for releasing carbon dioxide into a protected space and to ensure the activation of the alarm. One control shall be used for opening the valve of the piping which conveys the gas into the protected space and a second control shall be used to discharge the gas from its storage containers. Positive means shall be provided so they can only be operated in that order; and .2 the two controls shall be located inside a release box clearly identified for the particular space. If the box containing the controls is to be locked, a key to the box shall be in a break-glass-type enclosure conspicuously located adjacent to the box.
Interpretation
Conventional cargo spaces means cargo spaces other than ro-ro spaces or container holds equipped with integral reefer containers, and they need not be provided with means for automatically giving audible and visual warning of the release. The requirements of FSS Code, Ch. 5, 2.2.2 apply to the spaces identified in Ch. 5, 2.1.3.2 of FSS Code.
Technical Background
Provisions 2.1.3.2 and 2.2.2 of the FSS Code Ch.5 were amended by MSC.339(91), in which relevant interpretation of MSC/Circ.1120 was incorporated. Rev.4 of UI SC 132 is intended to clarify the application to "conventional cargo spaces", which are not required to be provided with means for automatically giving audible and visual warning of the release.
Remarks

1. This Unified Interpretation is to be applied by all Members and Associates on ships contracted for construction on or after 1 January 1999.
2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.
3. Rev.3 of this UI shall be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 July 2010.
4. Rev.4 of this UI shall be uniformly implemented by IACS Societies on ships constructed on or after 1 July 2014.

1.125 Oil mist detector on high speed engines – "equivalent device"

Conventions (Amend.), Reg.		Regulation **II-1/47.2** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC133**	**UI** version	**May 1998**	Date of implementation	**01.01.1999**	Means of implementation	

Conventions/Codes Requirements

Internal combustion engines of 2,250 kW and above or having cylinders of more than 300 mm bore shall be provided with crankcase oil mist detectors or engine bearing temperature monitors or equivalent devices.

Interpretation

"An equivalent device could be interpreted as measures applied to high speed engines where specific design features to preclude the risk of crankcase explosions are incorporated".

Remarks

1.126 Essential services and arrangements of sources of power, supply, control and monitoring to the different categories of essential services

Conventions (Amend.), Reg.		Regulations **II-1/40 & 41** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC134**	**UI** version	**June 2002**	Date of implementation	**01.01.2003**	Means of implementation	

Conventions/Codes Requirements

SOLAS Reg. II-1/40 General
Reg. II-1/41 Main source of electrical power and lighting systems

Interpretation

1. Classification of electrical services

1.1 Essential Services are those services essential for propulsion and steering, and safety of the ship, which are made up of "Primary Essential Services" and "Secondary Essential Services".
Definitions and examples of such services are given in 2 and 3 below.

1.2 Services to ensure minimum comfortable conditions of habitability are those services such as defined in 4 below.

2. Primary Essential Services

Primary Essential Services are those services which need to be in continuous operation to maintain propulsion and steering. Examples of equipment for primary essential services are as follows:

- Steering gears;
- Pumps for controllable pitch propellers;
- Scavenging air blower, fuel oil supply pumps, fuel valve cooling pumps, lubricating oil pumps and cooling water pumps for main and auxiliary engines and turbines necessary for propulsion;
- Forced draught fans, feed water pumps, water circulating pumps, vacuum pumps and condensate pumps for steam plants on steam turbine ships, and also for auxiliary boilers on ships where steam is used for equipment supplying primary essential services;
- Oil burning installations for steam plants on steam turbine ships and for auxiliary boilers where steam is used for equipment supplying primary essential services;
- Azimuth thrusters which are the sole means for propulsion/steering with lubricating oil pumps, cooling water pumps;
- Electrical equipment for electric propulsion plant with lubricating oil pumps and cooling water pumps;
- Electric generators and associated power sources supplying the above equipment;
- Hydraulic pumps supplying the above equipment;
- Viscosity control equipment for heavy fuel oil;

– Control, monitoring and safety devices/systems for equipment to primary essential services.

3. Secondary Essential Services

Secondary Essential Services are those services which need not necessarily be in continuous operation to maintain propulsion and steering but which are necessary for maintaining the vessel's safety. Examples of equipment for secondary essential services are as follows:

– Windlass;
– Fuel oil transfer pumps and fuel oil treatment equipment;
– Lubrication oil transfer pumps and lubrication oil treatment equipment;
– Pre-heaters for heavy fuel oil;
– Starting air and control air compressors;
– Bilge, ballast and heeling pumps;
– Fire pumps and other fire extinguishing medium pumps;
– Ventilating fans for engine and boiler rooms;
– Services considered necessary to maintain dangerous spaces in a safe condition;
– Navigation lights, aids and signals;
– Internal safety communication equipment;
– Fire detection and alarm system;
– Lighting system;
– Electrical equipment for watertight closing appliances;
– Electric generators and associated power sources supplying the above equipment;
– Hydraulic pumps supplying the above equipment;
– Control, monitoring and safety systems for cargo containment systems;
– Control, monitoring and safety devices/systems for equipment to secondary essential services.

4. Services for habitability

Services for habitability are those services which need to be in operation for maintaining the vessel's minimum comfort conditions for the crew and passengers. Examples of equipment for maintaining conditions of habitability are as follows:

– Cooking
– Heating
– Domestic refrigeration
– Mechanical ventilation
– Sanitary and fresh water
– Electric generators and associated power sources supplying the above equipment

5. Regulation II-1/40.1.1 and Regulation II-1/41.1.1 – For the purposes of these regulations, the services as included in paragraphs 2 to 4 are to be considered.

6. Regulation II-1/40.1.2 – For the purposes of this regulation, the services as included in paragraphs 2 and 3 and the services in the Regulation II-1/42 or II-1/43, as applicable, are to be considered.

7. Regulation II-1/41.1.2 – For the purposes of this regulation, the services as included in paragraphs 2 to 4, except for those also listed in UI SC2, are to be considered.

8. Regulation II-1/41.1.5 – For the purposes of this regulation, the services as included in paragraphs 2, 3 and 4 are to be considered. See also UI SC83.

9. (void)

10. Regulation II-1/41.5.1.2 - For the purposes of this regulation, the following interpretations are applicable.

10.1 Services in paragraph 2 are not to be included in any load shedding or other equivalent arrangements.

10.2 Services in paragraph 3 may be included in the automatic load shedding or other equivalent arrangement provided disconnection will not:

(a) cause immediate disruption of systems required for safety, e.g.:
  – Lighting systems,
  – Navigation lights, aids and signals,
  – Internal safety communication equipment.

(b) Prevent services required for safety being immediately available when the power supply is restored to normal operating conditions, e.g.:
  – Fire pumps, and other extinguishing medium pumps,
  – Bilge pumps,
  – Ventilating fans for engine and boiler rooms.

Examples of equipment in the paragraph 3, for which the automatic load shedding or other equivalent arrangement is normally allowed, includes:

– Fuel oil transfer pumps and fuel oil treatment equipment, – Lubrication oil transfer pumps and lubrication oil treatment equipment, – Pre-heaters for heavy fuel oil, – Starting air and control air compressors (except for control air compressors for propulsion control and its safety systems), – Services listed in UI SC2. 10.3 Services for habitability in the paragraph 4 may be included in the automatic load shedding or other equivalent arrangement.
Remarks

1.127 Connecting means by which the main bus bars of the main source of electrical power are normally connected

Conventions (Amend.), Reg.		Regulation **II-1/41.5.1.3** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC136**	**UI** version	**1999/Rev.1, Jul.2001/Rev.2, Jul.2004/Rev. 3, Nov. 2005**	Date of implementation	**01.01.1999/ 01.01.2004 (Rev.1)**	Means of implementation	
Conventions/Codes Requirements							
where the main source of electrical power is necessary for propulsion of the ship, the main bus bar shall be subdivided into at least two parts which shall normally be connected by circuit breakers or other approved means; so far as is practicable, the connection of generating sets and other duplicated equipment shall be equally divided between the parts; and							
Interpretation							
Other approved means can be achieved by: – circuit breaker without tripping mechanism; or – disconnecting link or – switch by which bus bars can be split easily and safely. Bolted links, for example bolted bus bar sections, are not to be accepted.							
Remarks							

1.128 Definition of High-speed craft

Conventions (Amend.), Reg.		Regulation **IX/1.8** of o **SOLAS 1974**					
IACS UI Number	**SC137**	**UI** version	**April, 1998/ Rev.1,Nov.,2020**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
High-speed craft means a craft as defined in regulation X/1.2.							
Interpretation							
For the purpose of application of the ISM (International Safety Management) Code not later than 1 July 1998, a High-Speed Craft is a craft as defined in SOLAS regulation X/1.3 which complies with the requirements of the High-Speed Craft Code in its entirety and has been surveyed as given in regulation X/3.1. High speed craft meeting the requirements given in the regulation X/1.3 but complying with requirements of chapters I to IV and regulation V/12 in lieu of the High-Speed Craft Code are not required to comply with the ISM Code by 1 July 1998, but must comply by 1 July 2002.							
Remarks							

1.129 Safe access to tanker bows

Conventions (Amend.), Reg.		Regulation **II-1/3-3.2** of Amendments **1996** to **SOLAS 1974**					
IACS UI Number	**SC138**	**UI** version	**May 1998**	Date of implementation	**May 1998**	Means of implementation	
Conventions/Codes Requirements							

Every tanker constructed on or after 1 July 1998 shall be provided with the means to enable the crew to gain safe access to the bow even in severe weather conditions. For tankers constructed before 1 July 1998, such means of access shall be provided at the first scheduled dry-docking after 1 July 1998, but not later than 1 July 2001. Such means of access shall be approved by the Administration based on the guidelines developed by the Organization.
Interpretation
Interpretation of SOLAS II-1/3-3.2, Safe Access to Tanker Bows, for all vessels subject to that regulation, is provided in IACS UI LL50.
Remarks
IACS Members and Associates are to apply UI LL50 (Rev. 2 1997), in so far as SOLAS II-1/3-3.2 is concerned, to all ships subject to that regulation.

1.130 Navigation bridge visibility

Conventions (Amend.), Reg.		**Regulation V/22 of Amendments 2000 to SOLAS 1974**					
IACS UI Number	**SC139**	**UI** version	**May 1998/ Rev.1, Dec.2003/ Dec.2011**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
SOLAS regulation V/22.1.6 reads: *The ship's side shall be visible from the bridge wing.* **SOLAS regulation V/22.3 reads:** *On ships of unconventional design which, in the opinion of the Administration, cannot comply with this regulation, arrangements shall be provided to achieve a level of visibility that is as near as practical to that prescribed in this regulation.*							
Interpretation							
Deleted.							
Technical Background							
It was combined with SC235 as SC235 Corr.1 in December 2011.							
Remarks							

1.131 Secondary Means of Venting Cargo Tanks

Conventions (Amend.), Reg.		Regulation **II-2/4.5.3.2.2&11.6.3.2** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC140**	**UI** version	**Oct.1998/ Rev.1,Jun.1999/ Rev.2,Nov.2005/ Rev.3,Jan.2011**	Date of implementation	**Jul.1,2013 (Rev.3)**	Means of implementation	**Contracted for construction**
Conventions/Codes Requirements							
Reg. II-2/4.5.3.2.2 Where the arrangements are combined with other cargo tanks, either stop valves or other acceptable means shall be provided to isolate each cargo tank. Where stop valves are fitted, they shall be provided with locking arrangements which shall be under the control of the responsible ship's officer. There shall be a clear visual indication of the operational status of the valves or other acceptable means. Where tanks have been isolated, it shall be ensured that relevant isolating valves are opened before cargo loading or ballasting or discharging of those tanks is commenced. Any isolation must continue to permit the flow caused by thermal variations in a cargo tank in accordance with regulation 11.6.1.1. **Reg. II-2/11.6.3.2** Secondary means for pressure/vacuum relief A secondary means of allowing full flow relief of vapour, air or inert gas mixtures to prevent over-pressure or							

under-pressure in the event of failure of the arrangements in paragraph 6.1.2. Alternatively, pressure sensors may be fitted in each tank protected by the arrangement required in paragraph 6.1.2, with a monitoring system in the ship's cargo control room or the position from which cargo operations are normally carried out. Such monitoring equipment shall also provide an alarm facility which is activated by detection of over-pressure or under-pressure conditions within a tank.

Interpretation

1. A P/V breaker fitted on the IG main may be utilised as the required secondary means of venting where the cargo is homogenous or for multiple cargoes where the vapours are compatible and do not require isolation.

2. The height requirements of Reg. II-2/4.5.3.4.1 and 11.6.2 and the requirements for devices to prevent the passage of flame of Reg. II-2/4.5.3.3 are not applicable to the P/V breaker provided the settings are above those of the venting arrangements required by Reg. II-2/11.6.1.

3. Where the venting arrangements are of the free flow type and the masthead isolation valve is closed for the unloading condition, the IG systems will serve as the primary under-pressure protection with the P/V breaker serving as the secondary means.

4. Inadvertent closure or mechanical failure of the isolation valves required by SOLAS Reg. II-2/4.5.3.2.2 and the FSS Code, Ch. 15, 2.3.2.2 need not be considered in establishing the secondary means where the cargo is homogenous or for multiple cargoes where the vapours are compatible and do not require isolation since:

a) The valves are operated under the control of the responsible ship's officer and a clear visual indication of the operational status of the valves is required by SOLAS Reg. II-2/4.5.3.2.2, as amended, and

b) The possibility of mechanical failure of the valves is remote due to their simplicity.

5. For ships that apply pressure sensors in each tank as an alternative secondary means of venting as per SOLAS Reg. II-2/11.6.3.2, the setting of the over-pressure alarm shall be above the pressure setting of the P/V-valve and the setting of the under-pressure alarm shall be below the vacuum setting of the P/V-valve. The alarm settings are to be within the design pressures of the cargo tanks. The settings are to be fixed and not arranged for blocking or adjustment in operation*.

* An exception is permitted for ships that carry different types of cargo and use P/V-valves with different settings, one setting for each type of cargo. The settings may be adjusted to account for the different types of cargo.

Technical Background

1. (Rev.2) Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments.

2.(Rev.3) Revisions are made by IACS based on the feedback from OCIMF regarding differences between this UI and OCIMF SIRE VIQ Inspector Guidance notes on the interpretation of SOLAS Reg. II-2/11.6.3.2.for its application.

Remarks

The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.132 Information on compliance with requirements for bulk carriers – "triangle" to be marked on a bulk carrier

Conventions (Amend.), Reg.		Regulation **XII/8.3** of **SOLAS 1974**					
IACS UI Number	**SC141**	**UI** version	**1999**	Date of implementation		Means of implementation	
Conventions/Codes Requirements							
Interpretation							
Deleted							
Remarks							
UI SC 141 (1999), with some changes, was adopted by IMO/MSC 71 in 1999 as MSC Res.89 (71).							

1.133 Stowage of Marine Evacuation Systems

Conventions (Amend.), Reg.		Regulation **III/15** of **SOLAS 1974**					
IACS UI Number	**SC143**	**UI version**	**Jan.29,1999/ Rev1,Feb.19, 2010**	**Date of implementation**	**Jul.1,1999/ Rev1,Jul.1, 2010**	**Means of implementation**	

Conventions/Codes Requirements

The ship's side shall not have any openings between the embarkation station of the marine evacuation system and the waterline in the lightest seagoing condition and means shall be provided to protect the system from any projections.

Interpretation

III/15.1 requires that the ship's side shall not have any openings between the embarkation station of the marine evacuation station and the sea level in the lightest seagoing condition. This means no openings, be they permanent openings, recessed promenades or temporary openings such as shell doors, windows or ports, are allowed in this particular area.

On passenger ships, windows and side scuttles of the non-opening type are allowed in this area if complying with Reg.II-2/9.4.1.3.3. On cargo ships, the windows and side scuttles in the area in way of a marine evacuation system, if installed, shall only be of the non-opening type.

Technical Background

The original UI makes reference to the fact that windows and side scuttles of the non-opening type are allowed if complying with Reg.II-2/33.3 which refers to SOLAS Passenger Ship requirements. But the reference to Reg.II-2/33.3 is changed to Reg.II-2/9.4.1.3.3 to reflect SOLAS 2000 Amendments, also covering cargo ships. It was considered necessary for the UI to be updated to also cover SOLAS Cargo Ships requirements.

Remarks

1. This Unified Interpretation is to be uniformly implemented by all Members and Associates from 1 July 1999, unless otherwise instructed by a flag state.
2. Changes introduced in Rev.1 are to be uniformly applied by IACS Societies for ships contracted for construction on or after 1 July 2010.
3. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.134 Maintenance, Thorough Examination,Operational Testing, Overhaul and Repair of Lifeboats, Rescue Boats and Fast Rescue Boats, Launching Appliances and Release Gear

Conventions(Amend),Reg.		**SOLASRegulaition III/20.11**					
IACS UI number	**SC144**	**UI version**	**02.1999/ Rev.1,11.1999/ Rev.2,09.2012/ Rev.3,10.2017**	**Date of implemen tation**	**01.07.1999/ Rev.1,01.07.1999/ Rev.2,01.01.2013/ Rev.3,01.01.2020**	**Means of implementation**	

Conventions/Code Requirments

SOLAS Regulation **III/20.11** reads:

11.1. Launching appliances shall be:

.2 upon completion of the examination referred to in paragraph 11.1.1, subjected to a dynamic test of the winch brake at maximum lowering speed. The load to be applied shall be the mass of the survival craft or rescue boat without persons on board, except that, at intervals of at least once every five years, the test shall be carried out with a proof load equal to 1.1 times the weight of the survival craft or rescue boat and its full complement of persons and equipment.

11.2. Lifeboat and rescue boat release gear, including fast rescue boat release gear and freefall lifeboat release systems, shall be:

.2 in case of on-load release gear, operationally tested under a load of 1.1 times the total mass of the boat when loaded with its full complement of persons and equipment whenever the release gear is overhauled. Such overhauling and operational test shall be carried out at least once every five years.

.3 Notwithstanding paragraph 11.2.2, the operational testing of free-fall lifeboat release systems shall be performed either by free fall launch with only the operating crew on board or by a test without launching the lifeboat carried out based on requirements for maintenance, thorough examination, operational testing, overhaul and repair.

11.3. Davit-launched liferaft automatic release hooks shall be:

.2 operationally tested under a load of 1.1 times the total mass of the liferaft when loaded with its full complement of persons and equipment whenever the automatic release hook is overhauled. Such overhauling and operational test shall be carried out at least once every five years.

Interpretation

The thorough examinations/overhauls and operational tests, carried out at intervals of at least once every five years, shall be done in the presence of a surveyor.

Technical Background

This UI is updated to take account of amendments to SOLAS Reg.III-20.11 adopted through resolution MSC.404 (96).

Remarks

Effective date is the date of survey.

1.135 Public address system

Conventions (Amend.), Reg.		Paragraph **7.2.2** of International Life-Saving Appliance (**LSA**) Code					
IACS UI Number	**SC145**	**UI** version	**1998**	Date of implementation	**01.04.1999**	Means of implementation	

Conventions/Codes Requirements

7.2.2.1 The public address system shall be a loudspeaker installation enabling the broadcast of messages into all spaces where crew members or passengers, or both, are normally present, and to muster stations. It shall allow for the broadcast of messages from the navigation bridge and such other places on board the ship as the Administration deems necessary.

In 7.2.2.2, the minimum sound pressure levels are specified for broadcasting emergency announcements with the ship underway in normal conditions.

Interpretation

1. With respect to spaces where a public address system is/may not be required in 7.2.2.1, these may be spaces such as under deck passage way, bosun's locker, hospital, pump room.
2. With respect to cabin/state rooms, the sound pressure levels as stated in 7.2.2.2.1 shall be attained as required inside the cabin/state room, during sea trials.
3. Where an individual loudspeaker has a device for local silencing, an over-ride arrangement from the control station(s), including the navigating bridge, shall be in place.

Remarks

1.136 Fire hose couplings and nozzles

Conventions (Amend.), Reg.		Regulations **II-2/10.2.3** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC146**	**UI** version	**May 1999/ Rev.1,Nov.,2005/ Rev.2,June,2021**	Date of implementation	**Jan.1,2000 -/ Rev.2,Jul.1,2022**	Means of implementation	

Conventions/Codes Requirements

SOLAS regulation II-2/10.2.3 reads as follows:

2.3 Fire hoses and nozzles

2.3.1 General specifications

2.3.1.1 Fire hoses shall be of non-perishable material approved by the Administration and shall be sufficient in length to project a jet of water to any of the spaces in which they may be required to be used. Each hose shall be provided with a nozzle and the necessary couplings. Hoses specified in this chapter as "fire hoses" shall, together with any necessary fittings and tools, be kept ready for use in conspicuous positions near the water service hydrants or connections. Additionally, in interior locations in passenger ships carrying more than 36 passengers fire hoses shall be connected to the hydrants at all times. Fire hoses shall have a length of at least 10 m, but not more than:

.1 15 m in machinery spaces;

.2 20 m in other spaces and open decks; and

.3 25 m for open decks on ships with a maximum breadth in excess of 30 m.

2.3.1.2 Unless one hose and nozzle is provided for each hydrant in the ship, there shall be complete interchangeability of hose couplings and nozzles.

2.3.2 Number and diameter of fire hoses

2.3.2.1 Ships shall be provided with fire hoses the number and diameter of which shall be to

the satisfaction of the Administration.

2.3.2.2 In passenger ships, there shall be at least one fire hose for each of the hydrants required by paragraph 2.1.5 and these hoses shall be used only for the purposes of extinguishing fires or testing the fire-extinguishing apparatus at fire drills and surveys.

2.3.2.3 In cargo ships:

.1 of 1,000 gross tonnage and upwards, the number of fire hoses to be provided shall be one for each 30 m length of the ship and one spare but in no case less than five in all. This number does not include any hoses required in any engine or boiler room. The Administration may increase the number of hoses required so as to ensure that hoses in sufficient number are available and accessible at all times, having regard to the type of ship and the nature of trade in which the ship is employed. Ships carrying dangerous goods in accordance with regulation 19 shall be provided with 3 hoses and nozzles, in addition to those required above; and

.2 of less than 1,000 gross tonnage, the number of fire hoses to be provided shall be calculated in accordance with the provisions of paragraph 2.3.2.3.1. However, the number of hoses shall in no case be less than three.

2.3.3 Size and types of nozzles

2.3.3.1 For the purposes of this chapter, standard nozzle sizes shall be 12 mm, 16 mm and 19 mm or as near thereto as possible. Larger diameter nozzles may be permitted at the discretion of the Administration.

2.3.3.2 For accommodation and service spaces, a nozzle size greater than 12 mm need not be used.

2.3.3.3 For machinery spaces and exterior locations, the nozzle size shall be such as to obtain the maximum discharge possible from two jets at the pressure mentioned in paragraph 2.1.6 from the smallest pump, provided that a nozzle size greater than 19 mm need not be used.

2.3.3.4 Nozzles shall be of an approved dual-purpose type (i.e., spray/jet type) incorporating a shutoff.

Interpretation
Aluminium alloys may be used for fire hose couplings and nozzles, except in open deck areas of oil tankers and chemical tankers.
Technical Background
Reveised and clarified the provisions of SOLAS being interpreted in June 2021.
Remarks

1.137 Watertight door closure

Conventions (Amend.), Reg.		Paragraph **2.1.2. 4**, Chapter **9** of **FSS** Code					
IACS UI Number	**SC147**	**UI** version	**May 1999/ Rev.1,Nov.,200/ Rev.2 Feb.,2021**	Date of implementation	**Jan.1,2000**	Means of implementation	**contract for construction**

Conventions/Codes Requirements

FSS Code, Ch. 9, 2.1.2.4
the system may be arranged with output signals to other fire safety systems including:
[…]
.3 Fire doors
[…]

Interpretation

Watertight doors complying with Reg.II-1/16 which also serve as fire doors are not to close automatically in case of fire detection.

Technical Background

IMO FSS Code has been amended through MSC.311(88) which has entered into force on 01/07/2012, thus changing the wording of the reference regulation.

Remarks

1.This UI SC 147 is to be uniformly implemented by IACS Members and Associates from 1 January 2000.
2. The "contract for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No.29.

1.138 Ventilation by fan coil units and internal circulation fans

Conventions (Amend.), Reg.		**SOLAS Chapter II-2, Regulation 5.2.1.2, 5.2.1.3 & 7.9.3**					
IACS UI Number	**SC148**	**UI** version	**May 1999/ Rev.1, Nov 2005/ Rev.2, Sept 2015**	Date of implementation	**1 July 2016**	Means of implementation	

Conventions/Codes Requirements

SOLAS Regulations Chapter II-2/5.2.1.2 reads:

Power ventilation of accommodation spaces, service spaces, cargo spaces, control stations and machinery spaces shall be capable of being stopped from an easily accessible position outside the space being served. This position shall not be readily cut off in the event of a fire in the spaces served.

SOLAS Regulations Chapter II-2/5.2.1.3 reads:

In passenger ships carrying more than 36 passengers, power ventilation, except machinery space and cargo space ventilation and any alternative system which may be required under regulation 8.2, shall be fitted with controls so grouped that all fans may be stopped from either of two separate positions which shall be situated as far apart as practicable. Fans serving power ventilation systems to cargo spaces shall be capable of being stopped from a safe position outside such spaces.

SOLAS Regulations Chapter II-2/7.9.3 reads:

Passenger ships carrying more than 36 passengers shall have the fire detection alarms for the systems required by paragraph 5.2 centralized in a continuously manned central control station. In addition, controls for remote closing of the fire doors and shutting down the ventilation fans shall be centralized in the same location. The ventilation fans shall be capable of reactivation by the crew at the continuously manned control station. The control panels in the central control station shall be capable of indicating open or closed positions of fire doors and closed or off status of the detectors, alarms and fans. The control panel shall be continuously powered and shall have an automatic change-over to standby power supply in case of loss of normal power supply. The control panel shall be powered from the main source of electrical power and the emergency source of electrical power defined by regulation II-1/42 unless other arrangements are permitted by the regulations, as applicable.

Interpretation

The fan in a HVAC temperature control unit, or a circulation fan inside a cabinet/switchboard, is not considered to be a ventilation fan as addressed in Reg.II-2/5.2.1.2, Reg.II-2/5.2.1.3 and Reg.II-2/7.9.3, if it is not capable of supplying outside air to the space when the power ventilation is shut down (e.g., small units intended for re-circulation of air within a cabin).

Therefore, such fans need not be capable of being stopped from an easily accessible position (or a safe position) outside the space being served when applying SOLAS Reg.II-2/5.2.1.2 or Reg.II-2/5.2.1.3, and need not be capable of being controlled from a continuously manned central control station for passenger ships carrying more than 36 passengers when applying SOLAS Reg.II-2/7.9.3.

Technical Background

To provide interpretation of a vague expression within an IMO instrument, IACS safety panel clarifies the requirements to remote control of ventilation fans(such as a small unit intended for re-circulation of air of split type air-conditioning) that do not supply outside air to a cabin, cabinet or switchboard for all ship types.

Remarks

1. This UI SC 148 is to be uniformly implemented by IACS Members and Associates from 1 January 2000.
2. Revision 2 of UI SC148 is to be uniformly implemented by IACS Societies from 1 July 2016.

1.139 Gas Measurement and Detection - Portable instruments

Conventions (Amend.), Reg.		**Regulation II-2/4.5.7.1 of SOLAS 1974**					
IACS UI Number	**SC149**	**UI version**	**May,1999/ Rev.1,Nov.,2005/ Rev.2,Jan.,2012**	**Date of implementation**	**01.01.2000/ 01.01.2013**	**Means of implementation**	

Conventions/Codes Requirements

Tankers shall be equipped with at least one portable instrument for measuring oxygen and one for measuring flammable vapour concentrations, together with a sufficient set of spares. Suitable means shall be provided for the calibration of such instruments.

Interpretation

The requirement of Reg. II-2/4.5.7.1 for one portable instrument for measuring oxygen and one for measuring flammable vapour concentrations, and spares for both, is considered as being satisfied when a minimum of two instruments, each capable of measuring both oxygen and flammable vapour concentrations are provided onboard.

Alternatively two portable instruments for measuring oxygen and two portable instruments for measuring flammable vapour concentrations could be provided onboard.
Technical Background
1.（Rev.1）Editorial modification on Nov.2005 according to the SOLAS 2000 amendments. 2.（Rev.2）This UI revises the interpretation to incorporate amendments to SOLAS Reg. II-2/4.5.7.1 introduced through MSC.291(87), which enters into force on 1 January 2012. This UI interprets the provision of two instruments for measuring flammable vapour concentrations as satisfying the requirement for at least one portable instrument together with a sufficient set of spares. This UI has to be read as stating that compliance with UR F7 satisfies the SOLAS vague requirement for spares.
Remarks

1.140 Location of the foam system equipment

Conventions (Amend.), Reg.		Paragraph 2.1.2&2.3.1, Chapter **14** of **FSS** Code					
IACS UI Number	**SC150**	**UI** version	**May 1999/Rev.1, Nov. 2005**	Date of implementation	**01.01.2000**	Means of implementation	
Conventions/Codes Requirements							
The deck foam system shall be capable of simple and rapid operation. The main control station for the system shall be suitably located outside the cargo area, adjacent to the accommodation spaces and readily accessible and operable in the event of fire in the areas protected.							
Interpretation							
The major equipment such as the foam concentrate tank and the pumps may be located in the engine room. The controls of the system are to be located in accordance with FSS Code, Ch. 14, 2.3.1.							
Technical Background							
Editorially amended in Nov 2005 to refer to FSS Code.							
Remarks							

1.141 Location of the main generating station with respect to the main switchboard and associated section boards

Conventions (Amend.), Reg.		Regulation **II-1/41.3** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC151**	**UI** version	**May 1999**	Date of implementation	**01.01.2000**	Means of implementation	
Conventions/Codes Requirements							
The main switchboard shall be so placed relative to one main generating station that, as far as is practicable, the integrity of the normal electrical supply may be affected only by a fire or other casualty in one space. An environmental enclosure for the main switchboard, such as may be provided by a machinery control room situated within the main boundaries of the space, is not to be considered as separating the switchboards from the generators.							
Interpretation							
Definitions Main generating station is the space where the main source of electrical power is situated. Main source of electrical power is a source intended to supply electrical power to the main switchboard for distribution to all services necessary for maintaining the ship in normal operational and habitable condition.							

Main switchboard is a switchboard which is directly supplied by the main source of electrical power and is intended to distribute electrical energy to the ship's services.

Machinery space, for the purpose of this UI, is to be taken as extending from the moulded base line to the margin line and between the extreme main transverse watertight bulkheads, bounding the spaces containing the main and auxiliary propulsion machinery, boilers serving the needs of propulsion, and all permanent coal bunkers. In the case of unusual arrangements, the Administration may define the limits of the machinery space.

Interpretations

The main generating station is to be situated within the machinery space, i.e. within the extreme main transverse watertight bulkheads.

Any bulkhead between the extreme main transverse watertight bulkheads is not regarded as separating the equipment in the main generating station provided that there is access between the spaces.

The main switchboard is to be located as close as practicable to the main generating station, within the same machinery space and the same vertical and horizontal A60 fire boundaries.

Where essential services for steering and propulsion are supplied from section boards these and any transformers, converters and similar appliances constituting an essential part of electrical supply system are also to satisfy the foregoing.

Remarks

1.142 Use of emergency generator in port

Conventions (Amend.), Reg.		Regulations **II-1/42.1.4 & 43.1.4** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC152**	**UI** version	**May 1999**	Date of implementation	**01.01.2000**	Means of implementation	

Conventions/Codes Requirements

Provided that suitable measures are taken for safeguarding independent emergency operation under all circumstances, the emergency generator may be used exceptionally, and for short periods, to supply non-emergency circuits.

Interpretation

1. General

Unless instructed otherwise by the Administration the emergency generator may be used during lay time in port for the supply of the ship mains, provided the requirements as per items 2 and 3 below are complied with.

2. Requirements

2.1 To prevent the generator or its prime mover from becoming overloaded when used in port, arrangements are to be provided to shed sufficient non-emergency loads to ensure its continued safe operation.

2.2 The prime mover is to be arranged with fuel oil filters and lubrication oil filters, monitoring equipment and protection devices as required for the prime mover for main power generation and for unattended operation.

2.3 The fuel oil supply tank to the prime mover is to be provided with a low level alarm, arranged at a level ensuring sufficient fuel oil capacity for the emergency services for the period of time as required by SOLAS.

2.4 The prime mover is to be designed and built for continuous operation and should be subjected to a planned maintenance scheme ensuring that it is always available and capable of fulfilling its role in the event of an emergency at sea.

2.5 Fire detectors are to be installed in the location where the emergency generator set and emergency switchboard are installed.

2.6 Means are to be provided to readily change over to emergency operation.

2.7 Control, monitoring and supply circuits, for the purpose of the use of the emergency generator in port are to be so arranged and protected that any electrical fault will not influence the operation of the main and emergency services.

When necessary for safe operation, the emergency switchboard is to be fitted with switches to isolate the circuits.

3. Operation

Instructions① are to be provided on board to ensure that when the vessel is under way all control devices (e.g. valves, switches) are in a correct position for the independent emergency operation of the emergency generator set and emergency switchboard.

———

① These instructions are also to contain information on required fuel oil tank level, position of harbour/sea mode switch if fitted, ventilation openings etc.

Remarks

1.143 Rudder stock diameter

Conventions (Amend.), Reg.		Regulations **II-1/29.3.3, 29.4.3 & 29.14** of **SOLAS 1974**					
IACS UI Number	**SC153**	**UI** version	**Feb. 2000**	Date of implementation	**01.01.2001**	Means of implementation	

Conventions/Codes Requirements

Regulation 29.3.3 Operated by power where necessary to meet the requirements of paragraph 3.2 and in any case when the Administration requires a rudder stock of over 120 mm diameter in way of the tiller, excluding strengthening for navigation in ice; and…

Regulation 29.4.3 Operated by power where necessary to meet the requirements of paragraph 4.2 and in any case when the Administration requires a rudder stock of over 230 mm diameter in way of the tiller, excluding strengthening for navigation in ice.

Regulation 29.14 Where the rudder stock is required to be over 230 mm diameter in way of the tiller, excluding strengthening for navigation in ice, an alternative power supply, sufficient at least to supply the steering gear power unit which complies with the requirements of paragraph 4.2 and also its associated control system and the rudder angle indicator, shall be provided automatically, within 45 s, either from the emergency source of electrical power or from an independent source of power located in the steering gear compartment. This independent source of power shall be used only for this purpose. In every ship of 10,000 gross tonnage and upwards, the alternative power supply shall have a capacity for at least 30 min of continuous operation and in any other ship for at least 10 min.

Interpretation

1. When calculating the diameter of the rudder stock, cognizance must be taken of SOLAS II-1/29.3.3 and 29.4.3.
2. In this regard, the diameter mentioned in SOLAS II-1/29.3.3, 29.4.3 and 29.14 should be taken as having been calculated for rudder stock of mild steel with a yield strength of 235 N/mm^2. (i.e. with a material factor k = 1).

Remarks

1.144 Provision of detailed information on specific cargo hold flooding scenarios

Conventions (Amend.), Reg.		Regulation **XII/9.3** of **SOLAS**					
IACS UI Number	**SC154**	**UI** version	**Mar. 2000/ Corr.1,Sep.,2021**	Date of implementation	**Jan.1,2001**	Means of implementation	

Conventions/Codes Requirements

SOLAS XII/9 reads as follows:

…

.3are provided with detailed information on specific cargo hold flooding scenarios. This information shall be accompanied by detailed instruction on evacuation preparedness under the provisions of section 8 of the International Safety Management (ISM) Code and be used as the basis for crew training and drills.

Interpretation

This Unified Interpretation is applicable only to bulk carriers which are constructed before 1 July 1999 but not capable of complying with SOLAS XII/4.3.

Where bulk carriers are shown to be not capable of complying with SOLAS XII/4.3 due to the design configuration of

their cargo holds, SOLAS XII/9 permits relaxation from the application of regulations 4.3 and 6 on the basis of compliance with certain other requirements, including provision of detailed information on specific cargo hold flooding scenarios.

1. General - The information should comprise at least the following:

1.1 Specific cargo hold flooding scenarios.

1.2 Instructions for evacuation preparedness.

1.3 Details of the ship means for leakage detection.

2. Specific cargo hold flooding scenarios

2.1 Flooding assumptions:

2.1.1 The flooding of the foremost cargo hold is to be used as the starting point for any respective flooding scenario. Subsequent flooding of other spaces can only occur due to progressive flooding.

2.1.2 The permeability of a loaded hold shall be assumed as 0.9 and the permeability of an empty hold shall be assumed as 0.95, unless a permeability relevant to a particular cargo is assumed for the volume of a flooded hold occupied by cargo and a permeability of 0.95 is assumed for the remaining empty volume of the hold. The permeability of a hold loaded with packaged cargo shall be assumed as 0.7.

2.2 Loading conditions to be considered:

2.2.1 Flooding scenarios should be developed for loading conditions loaded down to the summer load line even if not in compliance with the requirements of Regulation 4.3.

The scope to be covered should include at least the following:

- A homogenous and, if applicable, an alternate hold loading condition are to be considered;
- In case one or more loading conditions meet the requirements of Regulation 4.3, this should be noted;
- A packaged cargo condition, if applicable.

2.2.2 In case the vessel is able to withstand flooding of the foremost hold at a lower draught, guidance in the form of limiting KG/GM curves, based on the flooding assumptions in 2.1, should be provided. Curves should indicate the assumed trim and whether the foremost hold is homogeneously loaded, loaded with high density cargo (alternate hold loading), loaded with packaged cargo or empty.

2.3 Presentation of results

The results should clearly indicate the reasons for non-compliance with the survival criteria given in Reg. XII/4.4 and explain the implications regarding the need to abandon ship, e.g. immersion of a weathertight closing appliance if the stability characteristics are otherwise satisfactory may indicate that there is no immediate danger of foundering, provided the bulkhead strength is adequate, particularly if the weather conditions are favourable and bilge pumping can cope with any progressive flooding.

3. Guidance for evacuation

The following guidance in this IACS Interpretation with regard to preparation for evacuation is in the most general terms. Responsibility for the preparation of detailed information rests with the operator of the ship.

3.1 In any case of detection of severe flooding (made in accordance with UI SC180), preparations for abandoning the vessel shall be envisaged in accordance with the applicable rules and procedures, such as SOLAS III, STCW and the ISM Code.

3.2 In the context of severe weather conditions the weather itself may have substantial influence on the development of the flooding and consequently the time remaining to execute the abandoning of the ship could be much shorter than estimated in any pre-assessed flooding scenario.

Remarks

1.145 Lightweight check in lieu of inclining test

Conventions (Amend.), Reg.		Regulation **II-1 / 22** of **SOLAS 1974**					
IACS UI	**SC 155**	**UI**	**Jun.,2000/ Rev.1,Feb.,2008/**	Date of	**Jan.1,2001/ Apr.1,2008**	Means of	

Number		version	Rev.2,Feb.,2010	implementation		implementation	

Conventions/Codes Requirements

Regulation II-1/22

Stability information for passenger ships and cargo ships

1. Every passenger ship regardless of size and every cargo ship having a length, as defined in the International Convention on Load Lines in force, of 24 m and upwards, shall be inclined upon its completion and the elements of its stability determined. The master shall be supplied with such information satisfactory to the Administration as is necessary to enable him by rapid and simple processes to obtain accurate guidance as to the stability of the ship under varying conditions of service. A copy of the stability information shall be furnished to the Administration.

2. Where any alterations are made to a ship so as to materially affect the stability information supplied to the master, amended stability information shall be provided. If necessary the ship shall be re-inclined.

3. At periodical intervals not exceeding five years, a lightweight survey shall be carried out on all passenger ships to verify any changes in lightship displacement and longitudinal centre of gravity. The ship shall be re-inclined whenever, in comparison with the approved stability information, a deviation from the lightship displacement exceeding 2% or a deviation of the longitudinal centre of gravity exceeding 1% of L is found or anticipated.

4. The Administration may allow the inclining test of an individual ship to be dispensed with provided basic stability data are available from the inclining test of a sister ship and it is shown to the satisfaction of the Administration that reliable stability information for the exempted ship can be obtained from such basic data, as required by paragraph 1.

5. The Administration may also allow the inclining test of an individual ship or class of ships especially designed for the carriage of liquids or ore in bulk to be dispensed with when reference to existing data for similar ships clearly indicates that due to the ship's proportions and arrangements more than sufficient metacentric height will be available in all probable loading conditions.

Interpretation

Unless advised otherwise by the Flag Administration, MSC/Circ.1158 shall be applied to determine the lightship characteristics of a ship under SOLAS 74/78, as amended. Where it is determined that the tolerances in MSC/Circ.1158 are exceeded, the Administration shall be contacted to determine the acceptability of such a deviation.

Note:

1. This UI SC155 is to be uniformly implemented by IACS Members and Associates from 1 January 2001.

2. Revision 1 is to be uniformly implemented by IACS Members and Associates to ships that are contracted for construction, or to ships which commence conversions, on or after 1 April 2008.

3. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer

to IACS Procedural Requirement (PR) No. 29.

4. Revision 2 is to be uniformly implemented by IACS Members and Associate to ships that are contracted for construction, or to ships which commence conversions, before 1 July 2010.

Technical Background

UI SC 155 (June 2000) and MSC/Circ.1158(24 May 2005) both contains interpretations of SOLAS Reg.II-1/22 and the requirements are different. As a result, revision was made to align UI SC155 with MSC/Circ.1158.

Remarks

1.146 Doors in watertight bulkheads of cargo ships and passenger ships

Conventions (Amend.), Reg.		Regulations **II-1/10、13、13-1、15、15-1、16、17、17-1、22、23** and **24** of **SOLAS 1974，MARPOL I/28, ICLL66+A.320 1988 Protocol to ICLL66, IBC,** and **IGC**					
IACS UI Number	**SC156**	UI version	**Jun.,2002/ Rev.1,Oct.,2018/ Rev.2,Jan.,2021**	Date of implementation	**Jan.1,2003/ Rev.1,Jan.1,2020/ Rev.2,Jul.1,2021**	Means of implementation	

Conventions/Codes Requirements

SLOAS II-1/10	Construction of watertight bulkheads
SLOAS II-1/13	Openings in watertight bulkheads below the bulkhead deck in passenger ships
SLOAS II-1/13-1	Openings in watertight bulkheads and internal decks in cargo ships
SLOAS II-1/15	Openings in the shell plating below the bulkhead deck of passenger ships and the freeboard deck of cargo ships
SLOAS II-1/15-1	External openings in cargo ships
SLOAS II-1/16	Construction and initial tests of watertight doors, sidescuttles, etc.
SLOAS II-1/17	Internal watertight integrity of passenger ships above the bulkhead deck
SLOAS II-1/17-1	Integrity of the hull and superstructure, damage prevention and control on ro-ro passenger ships
SLOAS II-1/22	Prevention and control of water ingress, etc.
SLOAS II-1/23	Special requirements for ro-ro passenger ships
SLOAS II-1/24	Prevention and control of water ingress, etc., in cargo ships
MARPOL I/28.3	Subdivision and damage stability
ICLL+A.320 1988	Protocol to ICLL66, IBC and IGC

Interpretation

Application

This unified interpretation pertains to doors located in way of the internal watertight subdivision boundaries and the external watertight boundaries necessary to ensure compliance with the relevant subdivision and damage stability regulations.

This unified interpretation does not apply to doors located in external boundaries above equilibrium or intermediate waterplanes.

The design and testing requirements for watertight doors vary according to their location relative to the 1) equilibrium waterplane or intermediate waterplane at any stage of assumed flooding and or 2) bulkhead deck or freeboard deck.

This UI applies to ships subject to certification under SOLAS, MARPOL, ICLL, the IBC Code and the IGC Code in accordance with SOLAS II-1/Reg. 4.1 and Reg.4.2 as amended by resolution MSC.421(98).

Small cargo vessels not subject to damage stability requirements are not required to comply with the full scheme[①].

1. Definitions

For the purpose of this UI the following definitions apply:

Watertight: Capable of preventing the passage of water in any direction under a design head. The design head for any part of a structure shall be determined by reference to its location relative to the bulkhead deck or freeboard deck, as applicable, or to the most unfavourable equilibrium/intermediate waterplane, in accordance with the applicable subdivision and damage stability regulations, whichever is the greater. A watertight door is thus one that will maintain the watertight integrity of the subdivision bulkhead in which it is located.

Equilibrium Waterplane: The waterplane in still water when, taking account of flooding due to an assumed damage, the weight and buoyancy forces acting on a vessel are in balance. This relates to the final condition when no further flooding takes place or after cross flooding is completed.

Intermediate Waterplane: The waterplane in still water, which represents the instantaneous floating position of a vessel at some intermediate stage between commencement and completion of flooding when, taking account of the assumed instantaneous state of flooding, the weight and buoyancy forces acting on a vessel are in balance.

Sliding Door or Rolling Door: A door having a horizontal or vertical motion generally parallel to the plane of the door.

Hinged Door: A door having a pivoting motion about one vertical or horizontal edge.

2. Structural Design

Doors shall be of approved design and substantial construction in accordance with the requirements of the classing society and shall be of a strength equivalent to that of the subdivision bulkheads in which they are fitted.

3. Operation Mode, Location and Outfitting

Doors shall be fitted in accordance with all requirements regarding their operation mode, location and outfitting, i.e. provision of controls, means of indication, etc., as shown in Table 1 below. This table is to be read in conjunction with the following general notes: For passenger ships the watertight doors and their controls are to be located in compliance with SOLAS II-1/13.5.3 and II-1/13.7.1.2.2.

3.1 Frequency of Use whilst at sea

Normally Closed

Kept closed at sea but may be used if authorised. To be closed again after use.

Permanently Closed

The time of opening such doors in port and of closing them before the ship leaves port shall be entered in the log-book. Should such doors be accessible during the voyage, they shall be fitted with a device to prevent unauthorised opening.

Used

Kept closed, but may be opened during navigation when authorized by the Administration to permit the passage of passengers or crew, or when work in the immediate vicinity of the door necessitates it being opened. The door shall be immediately closed after use.

3.2 Type

Power operated, sliding or rolling②	POS
Power operated, hinged	POH
Sliding or Rolling	S
Hinged	H

3.3 Control

3.3.1 Local

All doors, except those which are to be permanently closed at sea, are to be capable of being opened and closed by hand (and by power, where applicable③) locally from both sides of the doors, with the ship listed to either side.

For passenger ships, the angle of list at which operation by hand is to be possible is 15.

For cargo ships, the angle of list at which operation by hand is to be possible is 30 degrees.

3.3.2 Remote

Where indicated in Table 1, doors are to be capable of being remotely closed by power from the bridge④ for all

ships, and by hand also from a position above the bulkhead deck for passenger ships as required by SOLAS II-1/13 7.1.4. Where it is necessary to start the power unit for operation of the watertight door, means to start the power unit is also to be provided at remote control stations. The operation of such remote control is to be in accordance with SOLAS II-1/13.8.1 to 13.8.3. For tankers, where there is a permanent access from a pipe tunnel to the main pump room, in accordance with regulation II-2/4.5.2.4 the watertight door shall be capable of being manually closed from outside the main pump room entrance in addition to the requirements above.

3.4 Indication⑤

3.4.1 Where shown in Table 1, position indicators are to be provided at all remote operating positions for all ships and provided locally on both sides of the internal doors for cargo ships, to show whether the doors are open or closed and, if applicable, with all dogs/cleats fully and properly engaged.

3.4.2 The door position indicating system is to be of self-monitoring type and the means for testing of the indicating system are to be provided at the position where the indicators are fitted.

3.4.3 A diagram showing the location of the door and an indication to show its position shall be provided at the central operating console located at the navigating bridge. A red light shall indicate the door is in the open position and a green light shall indicate the door is in the closed position. When the door is closed from this remote position, the red light shall flash when the door is in an intermediate position. This applies to passenger ships and cargo ships.

3.4.4Signboard/instructions should be placed in way of the door advising how to act when the door is in "doors closed" mode.

3.5 Alarms⑤

3.5.1 For passenger ships, failure of the normal power supply of the required alarms shall be indicated by an audible and visual alarm at the central operating console at thenavigation bridge. For cargo ships, failure of the normal power supply of the requiredalarms shall be indicated by an audible and visual alarm at the navigation bridge.

3.5.2 All door types, including power-operated sliding watertight doors which are to be capable of being remotely closed are to be provided with an audible alarm, distinct from any other alarm in the area, which will sound whenever such a door is remotely closed.

For passenger ships the alarm shall sound for at least 5 s but not more than 10 s before the door begins to move and shall continue sounding until the door is completely closed. In the case of remote closure by hand operation, an alarm is required to sound only while the door is actually moving. In passenger areas and areas of high ambient noise, the audible alarms are to be supplemented by visual signals at both sides of the doors.

3.5.3 All watertight doors, including sliding doors, operated by hydraulic door actuators, either a central hydraulic unit or an independent hydraulic unit for each door is to be provided with a low fluid level alarm or low gas pressure alarm, as applicable or some other means of monitoring loss of stored energy in the hydraulic accumulators. For passenger ships this alarm is to be both audible and visible and shall be located on the central operating console at the navigation bridge.For cargo ships, this alarm shall be both audible and visible and should be located at the navigation bridge.

3.6 Notices

As shown in Table 1, doors which are normally closed at sea but not provided with means of remote closure, are to have notices fixed to both sides of the doors stating, “To be kept closed at sea”. Doors which are to be permanently closed at sea are to have notices fixed to both sides stating, “Not to be opened at sea”.

3.7 Location

For passenger ships the watertight doors and their controls shall be located in compliance with regulations II-1/13.5.3 and II-1/13.7.1.2.2.

4. Fire Doors

Watertight doors may also serve as fire doors but need not be fire-tested if fitted on cargo ships or if fitted below the bulkhead deck on passenger ships. However, such doors fitted above the bulkhead deck on passenger ships shall be tested to the FTP Code in accordance with the fire rating of the division they are fitted in. If it is not practicable to ensure self-closing, means of indication on the bridge showing whether these doors are open or closed and a notice stating ‘To be kept closed at sea’ can be alternative of the self-closing.

Where a watertight door is located adjacent to a fire door, both doors shall be capable of independant operation, remotely if required by SOLAS ll-1/13.8.1 to 13.8.3 and from both sides of each door.

5. Testing

5.1 Doors which become immersed by an equilibrium or intermediate waterplane, are to be subjected to a hydrostatic pressure test.

5.1.1 For large doors intended for use in the watertight subdivision boundaries of cargo spaces, structural analysis may be accepted in lieu of pressure testing. Where such doors utilise gasket seals, a prototype pressure test to confirm that the compression of the gasket material is capable of accommodating any deflection, revealed by the structural analysis, is to be carried out.

5.2 Doors above freeboard or bulkhead deck which are not immersed by an equilibrium or intermediate waterplane but become intermittently immersed at angles of heel in the required range of positive stability beyond the equilibrium position are to be hose tested.

5.3 Pressure Testing

5.3.1 The head of water used for the pressure test shall correspond at least to the head measured from the lower edge of the door opening, at the location in which the door is to be fitted in the vessel, to the bulkhead deck or freeboard deck, as applicable, or to the most unfavourable damage waterplane, if that be greater. Testing may be carried out at the factory or other shore based testing facility prior to installation in the ship.

5.3.2 Leakage Criteria

5.3.2.1 The following acceptable leakage criteria should apply to

Doors with gaskets No leakage

Doors with metallic sealing Max leakage 1 litre/min.

5.3.2.2 Limited leakage may be accepted for pressure tests on large doors located in cargo spaces employing gasket seals or guillotine doors located in conveyor tunnels, in accordance with the following⑥

$$\text{Leakage rate (liter/min)} = \frac{(P+4.572)\cdot h^3}{6568}$$

where: P = perimeter of door opening (metres)

h = test head of water (metres)

5.3.2.3 However, in the case of doors where the water head taken for the determination of the scantling does not exceed 6.10 m, the leakage rate may be taken equal to 0.375 litre/min if this value is greater than that calculated by the above-mentioned formula.

5.3.3 For doors on passenger ships which are used at sea or which become submerged by the equilibrium or intermediate waterplane, a prototype test shall be conducted, on each side of the door, to check the satisfactory closing of the door against a force equivalent to a water height of at least 1 m above the sill on the centre line of the door ⑦.

5.4 Hose Testing

5.4.1 All watertight doors shall be subject to a hose test in accordance with UR S14.2.3 after installation in a ship. Hose testing is to be carried out from each side of a door unless, for a specific application, exposure to floodwater is anticipated only from one side. Where a hose test is not practicable because of possible damage to machinery, electrical equipment insulation or outfitting items, it may be replaced by means such as an ultrasonic leak test or an equivalent test.

Footnote:

① Doors in watertight bulkheads of small cargo ships, not subject to any statutory subdivision and damage stability requirements, may be hinged single action doors arranged to open out of the major space protected. They shall be constructed in accordance with the requirements of the classing society and have notices affixed to each side stating, "To be kept closed at sea".

② Rolling doors are technically identical to sliding doors.

③ Arrangements for passenger ships shall be in accordance with SOLAS II-I/13.7.1.4 and 13.7.1.5 and regulation II-1/13-1.2 for cargo ships.

④ Arrangements shall be in accordance with SOLAS II-1/13.7.1.5 for passenger ships and 13-1.2 for cargo ships.

⑤ Refer to SOLAS II-I/Reg.13, 13-1, 15-1 and 17-1, IEC 60092-504, IMO International Code on Alarms and Indicators (2009).

⑥ Published in the ATM F 1196, Standard Specification for Sliding Watertight Door Assemblies and referenced in the Title 46 US Code of Federal Regulations 170.270 Door design, operation installation and testing.

⑦ Arrangements for passenger ships shall be in accordance with SOLAS Reg. II-1/13.5.2.

Technical Background

Remarks

1.This UI is to be uniformly implemented by IACS Members and Associates from 1 January 2003.

2.Rev.1:to be applied by Members on ships contracted for construction on or after 1 January 2020 (in the absence of a building contract, the keel of which is laid or which are at a similar stage of construction on or after 1 July 2020) or delivered on or after 1 January 2024.

3.The "contracted for construction" means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

4.Rev.2 : to be applied by Members on ships contracted for construction on or after 1 July 2021 (in the absence of a building contract, the keel of which is laid or which are at a similar stage of construction on or after 1 January2022) or delivered on or after 1 July 2024.

Table 1: Doors in Internal Watertight Bulkheads and External Watertight Boundaries in Cargo Ships and Passenger Ships

A. Door in Internal Watertight Bulkheads

Position relative to bulkhead or freeboard deck	1. Regulation	2. Frequency of Use whilst at sea	3. type	4. Remote Closure	5. Remote Indication	6. Audible or Visual Alarm	7. Notice	8. Comments
I. Passenger Ships								
(1) Below	SOLAS II-1/10,13.4, 13.5.1, 13.5.2,13.6, 13.7.1,13.8.1, 13.8.2, 16.2,22.1, 22.3 and 22.4	Used	POS	Yes	Yes	Yes (local)	No	For doors that are used, see SOLAS II-1/22.3 and IMO MSC.1/Circ.1564
	SOLAS II-1/10,13.9.1, 13.9.2, 14.2, 16.2,22.2 and 22.5	Perm. Closed	S, H	No	No	No	Yes	See Notes 3 + 4 + 6
(2) At or above	SOLAS II-1/10,16.2,17.1 and 22.3	Used	POS, POH	Yes	Yes	Yes (local)	No	See Note 7
			S, H	No	Yes	No	Yes	See Note 1
	SOLAS II-1/17-1.1.1, 17-1.1.2, 17-1.1.3, 23.6 and 23.8		S, H	No	Yes	Yes (remote)	Yes	Doors giving access to below Ro-Ro Deck
	SOLAS II-1/17-1.1.1, 17-1.1.2, 17-1.1.3, 22.7 and 23.3 to 23.5	Perm. Closed	S, H	No	Yes	Yes (remote)	Yes	See Notes 1 + 3 + 4
II. Cargo Ships								
(1) Below	SOLAS II-1/10,13-1.2,16.2 and 22.3 MARPOL I/28.3 ICLL66+A.320 1988 Protocol to ICLL66 IBC and IGC	Used	POS	Yes	Yes	Yes (local)	No	

	SOLAS II-1/10,13-1.3, 16.2,22.3 and 24.4	Norm. Closed	S, H	No	Yes	No	Yes	See Note 1
	SOLAS II-1/10,13-1.4,16.2, 24.3, and 24.4	Perm. Closed	S, H	No	No	No	Yes	See Notes 3 + 4
	SOLAS II-1/ 10,13-1.4, 13-1.5, 16.2,22.2, 24.3 and 24.4							
(2) At or above	SOLAS II-1/10,13-1.2,16.2 and 22.3 MARPOL I/28.3 ICLL66+A.320 1988 Protocol to ICLL66 IBC, and IGC	Used	POS	Yes	Yes	Yes (local)	No	See Notes 2 + 5
	SOLAS II-1/10,13-1.3, 16.2,22.3 and 24.4	Norm. Closed	S, H	No	Yes	No	Yes	See Note 1
	SOLAS II-1/10,13-1.4, 13-1.5, 16.2,24.3 and 24.4	Perm. Closed	S, H	No	No	No	Yes	See Notes 3 + 4

Notes:

1. If hinged, this door shall be of single action type.
2. Under ICLL66, doors separating a main machinery space from a steering gear compartment may be hinged single action type provided the lower sill of such doors is above the Summer Load Line and the doors remain closed at sea whilst not in use.
3. The time of opening such doors in port and closing them before the ship leaves port shall be entered in the logbook, in case of doors in watertight bulkheads subdividing cargo spaces.
4. Doors shall be fitted with a device which prevents unauthorized opening.
5. Under MARPOL, hinged watertight doors may be acceptable in watertight bulkhead in the superstructure.
6. Passenger ships which have to comply with SOLAS II-1/14.2 require an indicator on the navigation bridge to show automatically when each door is closed and all door fastenings are secured.
7. Refer to the Explanatory Note to Regulation 17.1 of Res.MSC.429(98) regarding sliding watertight doors with a reduced pressure head and sliding semi-watertight doors.

B. Door in External Watertight Boundaries below equilibrium or intermediate waterplane

Position relative	1.	2.	3.	4.	5.	6.	7.	8.

to bulkhead deck or freeboard deck	Regulation	Frequency of Use while at sea	Type	Remote Closure	Remote Indication	Audible or Visual Alarm	Notice	Comments
I. Passenger Ships								
(1) Below	SOLAS II-1/15.9, 22.6 and 22.12	Perm. Closed	S, H	No	No	No	Yes	See Notes 2 + 3
(2) At or above	SOLAS II-1/17.1 and 22.3 MSC.Circ.541	Norm. Closed	S, H	No	Yes	No	Yes	See Note 1
	SOLAS II-1/17-1.1.1, 17-1.1.2, 17-1.3, 23.6 and 23.8		S, H	No	Yes	Yes (Remote)	Yes	Doors giving access to below Ro-Ro Deck
	SOLAS II-1/17-1.1.1, 17-1.2, 17-1.3, 23.3 and 23.5	Perm. Closed	S, H	No	Yes	Yes (Remote)	Yes	See Notes 2 + 3
II. Cargo Ships								
(1) Below	SOLAS II-1/15.9, 15-1.2, 15-1.3, 15-1.4, 22.6, 22.12 and 24.1	Perm. Closed	S, H	No	Yes	No	Yes	See Notes 2 + 3
(2) At or above	SOLAS II-1/15-1.2	Norm. Closed	S, H	No	Yes	No	Yes	See Note 1
	SOLAS II-1/15-1.2 and 15-1.4	Perm. Closed	S, H	No	Yes	No	Yes	See Notes 2 +3

Notes:

1. If hinged, this door shall be of single action type.

2. The time of opening such doors in port and closing them before the ship leaves port shall be entered in the logbook.

3. Doors shall be fitted with a device which prevents unauthorized opening.

Remarks

1.147 Main source of electrical power

Conventions (Amend.), Reg.		Regulation **II-1/41.5** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC157**	**UI** version	**Jun.2000/Rev. 1, Feb. 2005**	Date of implementation	**01.01.2006 (Rev.1)**	Means of implementation	

Conventions/Codes Requirements

…where the main source of electrical power is necessary for propulsion and steering of the ship, the system shall be so arranged that the electrical supply to equipment necessary for propulsion and steering and to ensure safety of the ship will be maintained or immediately restored in the case of loss of any one of the generators in service;

Interpretation

1. Reg. II-1/41.5.1.1 – Where the main source of electrical power is necessary for propulsion and steering of the ship, the system shall be so arranged that the electrical supply to equipment necessary for propulsion and steering and to ensure safety of the ship will be maintained or immediately restored in case of loss of any one of the generators in service.

2. To fulfil the above the following measures are required:

2.1 Where the electrical power is normally supplied by more than one generator set simultaneously in parallel operation, provision of protection, including automatic disconnection of sufficient non-essential services and if necessary secondary essential services and those provided for habitability, should be made to ensure that, in case of loss of any of these generating sets, the remaining ones are kept in operation to permit propulsion and steering and to ensure safety.

2.2 Where the electrical power is normally supplied by one generator provision shall be made, upon loss of power, for automatic starting and connecting to the main switchboard of stand-by generator(s) of sufficient capacity with automatic restarting of the essential auxiliaries, in sequential operation if required. Starting and connection to the main switchboard of the stand-by generator is to be preferably within 30 seconds, but in any case not more than 45 seconds, after loss of power.

Where prime movers with longer starting time are used, this starting and connection time may be exceeded upon approval from the society.

2.3 Load shedding or other equivalent arrangements should be provided to protect the generators required by this regulation against sustained overload.

2.3.1 The load shedding should be automatic.

2.3.2 The non-essential services, service for habitable conditions may be shed and where necessary, additionally the secondary essential services, sufficient to ensure the connected generator set(s) is/are not overloaded.

Remarks

Circular No.11/Total No. 019 (2000) "On the Circulation of IACS UI SC157 Main Source of Electrical Power" issued by CCS' Rules and Technology Management Department

1.148 Horizontal fire zone concept

Conventions (Amend.), Reg.		Regulation **II-2/20.2.2.1** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC158**	**UI** version	**June 2006/Rev.1, Nov. 2005**	Date of implementation	**01.01.2001**	Means of implementation	

Conventions/Codes Requirements

… Under this concept a horizontal zone for the purpose of this Regulation may include special category spaces on more than one deck provided that the total overall clear height for vehicles does not exceed 10 m.

Interpretation

The "Total overall clear height" is the sum of distances between deck and web frames of the decks forming one horizontal zone. *(MSC/Circ. 1120)*

Technical Background

Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments and MSC/Circ.1120.

Remarks

1.149 Equivalent protection SOLAS II-2/10.7.2

Conventions (Amend.), Reg.		Regulation **II-2/10.7.2** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC159**	**UI** version	**June,2000/ Corr. 1, May,2001/ Rev.1,Nov.,2005/ Corr.1,Sep.,2021**	Date of implementation	**Jan.1,2001**	Means of implementation	

Conventions/Codes Requirements

SOLAS Chapter II-2, Regulation 10.7.2 reads as follows:

10.7.2 A ship engaged in the carriage of dangerous goods in any cargo spaces shall be provided with a fixed carbon dioxide or inert gas fire-extinguishing system complying with the provisions of the Fire Safety Systems Code or with a fire-extinguishing system which, in the opinion of the Administration, gives equivalent protection for the cargoes carried.

Interpretation

Water supplies as defined in Reg. II-2/19.3.1.2 are considered as an acceptable protection for cargoes listed in Table 2 of the latest revision of MSC.1/Circ.1395.

Technical Background

In Sept. 2021，this UI has been updated to account for changes to the referenced IMO circulars and to align with the current IACS standard format.

Remarks

1.150 Method IIIC construction

Conventions (Amend.), Reg.		Regulation **II-2/7.5.5.3** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC160**	**UI** version	**June 2000/Rev.1, Nov. 2005**	Date of implementation	**01.01.2001**	Means of implementation	

Conventions/Codes Requirements

In ships in which method IIIC is adopted, a fixed fire detection and fire alarm system of an approved type complying with the requirements of Regulation 13 shall be so installed and arranged as to …

Interpretation

In the case of ships built in accordance with Method IIIC, the detection system is only relevant to the accommodation block. Service spaces built away from the accommodation block need not be fitted with a fixed fire detection system.

Technical Background

Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments.

Remarks

1.151 Timber deck cargo in the context of damage stability requirements

Conventions (Amend.), Reg.		Regulation **II-1 / 5-1** of **SOLAS** as amended by **IMO** resolutions **MSC.421(98)**					
IACS UI Number	**SC161**	**UI** version	**May,2000/ Rev.1,Feb.,2008/ Rev.2,Apr.,2021**	Date of implementation	**Jan.1,2001/ Rev.1,Jan.1,2009 / Rev.2,Jul.1,2022**	Means of implementation	**Contracted for construction**

Conventions/Codes Requirements

SOLAS Regulation II-1/5-1 reads:

1 The master shall be supplied with such information- to the satisfaction of the Administration as is necessary to enable him by rapid and simple processes to obtain accurate guidance as to the stability of the ship under varying conditions of service. A copy of the stability information shall be furnished to the Administration.

2 The information should include:

.1 curves or tables of minimum operational metacentric height (*GM*) and maximum permissible trim versus draught which assures compliance with the intact and damage stability requirements where applicable, alternatively corresponding curves or tables of the maximum allowable vertical centre of gravity (*KG*) and maximum permissible trim versus draught, or with the equivalents of either of these curves or tables;
.2 instructions concerning the operation of cross-flooding arrangements; and
.3 all other data and aids which might be necessary to maintain the required intact stability and stability after damage.

3 The intact and damage stability information required by regulation 5-1.2 shall be presented as consolidated data and encompass the full operating range of draught and trim. Applied trim values shall coincide in all stability information intended for use on board. Information not required for determination of stability and trim limits should be excluded from this information.

4 If the damage stability is calculated in accordance with regulation 6 to regulation 7-3 and, if applicable, with regulations 8 and 9.8, a stability limit curve is to be determined using linear interpolation between the minimum required *GM* assumed for each of the three draughts d_s, d_p and d_l. When additional subdivision indices are calculated for different trims, a single envelope curve based on the minimum values from these calculations shall be presented. When it is intended to develop curves of maximum permissible *KG* it shall be ensured that the resulting maximum *KG* curves correspond with a linear variation of *GM*.

5 As an alternative to a single envelope curve, the calculations for additional trims may be carried out with one common *GM* for all of the trims assumed at each subdivision draught. The lowest values of each partial index A_s, A_p and A_l across these trims shall then be used in the summation of the attained subdivision index *A* according to regulation 7.1. This will result in one *GM* limit curve based on the *GM* used at each draught. A trim limit diagram showing the assumed trim range shall be developed.

6 When curves or tables of minimum operational metacentric height (*GM*) or maximum allowable *KG* versus draught are not- provided, the master shall ensure that the operating condition does not deviate from approved loading conditions, or verify by calculation that the stability requirements are satisfied for this loading condition.

Interpretation

Scope

The provisions given hereunder apply to ships that are subject to SOLAS, Chapter II-1, subdivision and damage stability calculations and engaged in carrying timber deck cargoes where the buoyancy of the timber deck cargo is taken into account in the damage stability calculations.

Definitions

The following definitions apply for the purposes of this interpretation:

Timber is used as a collective expression used for all types of wooden material covered by CODE OF SAFE PRACTICE FOR SHIPS CARRYING TIMBER DECK CARGOES, 2011 (Resolution A.1048(27)), including both round and sawn wood but excluding wood pulp and similar cargo;

timber deck cargo means a cargo of timber carried on an uncovered part of a freeboard or superstructure deck.
timber load line means a special load line assigned to ships complying with certain conditions set out in the International Convention on Load Lines.

deepest timber subdivision draught is the waterline which corresponds to the timber summer draught to be assigned to the ship;

partial timber subdivision draught is the light service draught as defined in SOLAS Reg.II-1/2.11 plus 60% of the

difference between the light service draught and the deepest timber subdivision draught

Interpretation

1. The ship shall be supplied with comprehensive stability information which takes into account timber deck cargo. Such information shall enable the master to rapidly and simply obtain accurate guidance as to the stability of the ship under varying conditions of service, and as required in SOLAS Regulation II-1/5-1 it shall include, among other damage stability related issues, a curve of minimum operating metacentric height (GM) versus draught or maximum allowable vertical centre of gravity (KG) versus draught which covers the requirements of SOLAS Regulation II-1/5-1.2.1.

2. To ensure the buoyancy of timber deck cargo can be justifiably credited in damage stability calculations, the integrity of the lashed timber deck cargo shall comply with the following:

.1 The timber deck cargo is to be stowed in accordance with the requirements of 2.9 of the CODE OF SAFE PRACTICE FOR SHIPS CARRYING TIMBER DECK CARGOES, 2011 (Resolution A.1048(27)).

.2 The timber deck cargo is to be secured by lashings and/or uprights.

.3 Lashings are to comply with the requirements of 2.10 of the CODE OF SAFE PRACTICE FOR SHIPS CARRYING TIMBER DECK CARGOES, 2011 (Resolution A.1048(27)).

.4 Uprights are to

.1. be made of steel or other suitable material of adequate strength, taking into account the breadth of the deck cargo;

.2. be spaced at intervals not exceeding 3 m;

.3. be fixed to the deck by angles, metal sockets or equally efficient means; and

.4. if deemed necessary, be further secured by a metal bracket to a strengthened point, i.e. bulwark, hatch coaming.

3. The height and extent of the timber deck cargo shall be in accordance with 3.3.2 of Chapter 3, Part A of the International Code on Intact Stability, 2008 and shall be at least stowed to the standard height of one superstructure.

4. The permeability of the timber deck cargo is not to be less than 25% of the volume occupied by the cargo up to one standard superstructure.

5. Unless instructed otherwise by the Administration, the stability information for ships with timber deck cargoes shall be supplemented by additional curve(s) of limiting GM (or KG) covering the timber draught range.

6. The above described curve(s) applicable for conditions with timber deck cargo is/are to be developed as described in SOLAS Regulation II-1/5-1.4, and considering timber deck cargo at the deepest timber subdivision draught and at the partial timber subdivision draught only.

7. The limiting GM shall be varied linearly between the deepest timber subdivision draught, and between the partial timber subdivision draught and the light service draught respectively. Where timber freeboards are not assigned the deepest and partial draughts shall relate to the summer load line.

8. When considering the vertical extent of damage, the upper deck may be regarded as a horizontal subdivision (in accordance with SOLAS Regulation II-1/7-2.6.1). Thus when calculating damage cases are limited vertically to the upper deck with the corresponding v-factor, the timber deck cargo may be considered to remain buoyant with an assumed permeability of 0.25 at the deepest and partial draught. For damage extending above the upper deck the timber deck cargo buoyancy in way of the damage zone is to be ignored.

Note:

1. Implementation date 1 January 2001.

2. This Unified Interpretation Rev.1 is to be applied by all Members and Associate on ships contracted for construction on or after 1 January 2009. However, Members and Associate are not precluded from applying this UI before this date.

3. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

4. This Unified Interpretation Rev.2 is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 July 2022.

Technical Background
Rev.1：UI SC161 has been updated to confirm its applicability after the entering into force of the revised SOLAS Ch.II-1 as contained in resolution MSC.216(82). Rev.2：It is updated to consider the new TDC code (Resolution A.1048(27)) and SOLAS amendments (Resolution MSC.421(98)).
Remarks

1.152 Emergency fire pumps in cargo ships- General

Conventions (Amend.), Reg.		Regulations **II-2/10.2.2.3.1.2** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC162**	**UI** version	**Feb. 2002/Rev.1, Nov. 2005**	Date of implementation	**01.01.2001**	Means of implementation	
Conventions/Codes Requirements							
Arrangements of emergency fire pump							
Interpretation							
Unless the two main fire pumps, their sea suctions and the fuel supply or source of power for each pump are situated within compartments separated at least by A-0 divisions, so that a fire in any one compartment will not render both fire pumps inoperable, an emergency fire pump should be fitted. An arrangement in which one main fire pump is located in a compartment having more than one bulkhead or deck adjacent to the compartment containing the other main fire pump should also require an emergency fire pump.							
Technical Background							
Editorially amended in Nov 2005 to refer to SOLAS 2000 Amendments.							
Remarks							

1.153 Emergency fire pumps in cargo ships – sea suction and sea valve

Conventions (Amend.), Reg.		Paragraph **2.2.1.1**, Chapter **12** of **FSS** Code Regulations **II-2/10.2.2.3.1 & 10.2.2.4.2** of **SOLAS 1974**					
IACS UI Number	**SC163**	**UI** version	**Feb.,2002/ Rev.1,Nov.,2005 Rev.2,Sep.,2009**	Date of implementation	**Jan.1,2001/ Jan.1,2010**	Means of implementation	Contracted for construction（Rev.2）
Conventions/Codes Requirements							
Capacity of emergency fire pumps...							
Interpretation							

The emergency fire pump shall as a minimum comply with paragraph 2.2.1.1 of FSS Code, Ch.12.
Where a fixed water-based fire extinguishing system installed for the protection of the machinery space in accordance with SOLAS regulation II-2/Reg.10.4.1.1, is supplied by the emergency fire pump, the emergency fire pump capacity shall be adequate to supply the fixed fire extinguishing system at the required pressure plus two jets of water.
The capacity of the two jets shall in any case be calculated by that emanating from the biggest nozzle size available onboard from the following table (*note), but shall not be less than 25 m^3/h.

Capacity of single jet

Nozzle size / Pressure at Hydrant	16mm	19mm
$0.27N/mm^2$	$16m^3/h$	$23.5m^3/h$

note: When selecting the biggest nozzle size available onboard, the nozzles located in the space where the main

fire pumps are located can be excluded.
Technical Background
1. Rev.1: Editorially amended in Nov 2005 to refer to FSS Code. 2. Rev.2: from submission FP 53/3/2 of IACS Statutory Panel to IMO FP 53rd meeting. This document seeks clarification concerning the minimum required capacity of the emergency fire pump when it is arranged to provide additional services (i.e. a fixed high-expansion foam system, a fixed pressure water-spraying fire-extinguishing system) beyond the basic service as required by the FSS Code. In connection with UI SC163 (Rev.1), it raises questions on removal of the requirement to supply two (2) jets of water from SOLAS 2000 Amendments and FSS Code, and the determination of 40% capacity of emergency fire pump specified in the FSS Code. At last, after discussion at FP 53rd meeting, it was decided that for the emergency fire pump used for other services, the capacity shall be adequate to supply the fixed fire extinguishing system at the required pressure plus two jets of water. Relevant circular was drafted for approval of MSC 86 (MSC.1/Circ.1314). This revision was based on the circular and further clarification is made to tow jets of water mentioned in the circular.
Remarks
The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.154 Emergency fire pumps in cargo ships – priming

Conventions (Amend.), Reg.		Paragraph **2.2.1.3**, Chapter **12** of **FSS** Code					
IACS UI Number	**SC164**	**UI** version	**Feb. 2002/Rev.1, Nov. 2005**	Date of implementation	**01.01.2001**	Means of implementation	
Conventions/Codes Requirements							
The total suction head and the net positive suction head of the pump shall ….							
Interpretation							
Where necessary to ensure priming, the emergency fire pump should be of the selfpriming type.							
Technical Background							
Editorially amended in Nov 2005 to refer to FSS Code.							
Remarks							

1.155 Electrical cables for the emergency fire pump

Conventions (Amend.), Reg.		Regulation **II-2/10.2.2.3.1.2** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC165**	**UI** version	**June 2002/ Rev. 1, May 2004/ Del., Dec.2014**	Date of implementation	**01.01.2005**	Means of implementation	
Conventions/Codes Requirements							
2.2.3.1 Fire pumps The arrangement of sea connections, fire pumps and their sources of power shall be as to ensure that: .1 in passenger ships of l,000 gross tonnage and upwards, in the event of a fire in any one compartment all the fire pumps will not be put out of action; and .2 in passenger ships of less than 1,000 gross tonnage and in cargo ships, if a fire in any one compartment could put all the pumps out of action, there shall be an alternative means consisting of an emergency fire pump complying with the provisions of the Fire Safety Systems Code with its source of power and sea connection located outside the space where the main fire pumps or their sources of power are located.							
Interpretation							
Deleted							
Technical Background							
As the original UI SC165 is inconsistent with MSC/Circ.1120, IACS Machinery Panel has analyzed and included the content of UI SC165 in URE 15 according to MSC/Circ.1120 when revising UR E15. This UI is to be deleted accordingly.							

Remarks

1.156 Waste receptacles

Conventions (Amend.), Reg.		Regulation **II-2/4.4.2** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC166**	**UI** version	**June 2002/Rev.1, Nov. 2005**	Date of implementation	**01.01.2003**	Means of implementation	

Conventions/Codes Requirements
Waste receptacles shall be constructed of non-combustible materials with no openings in the sides or bottom.
Interpretation
This regulation is not intended to preclude the use of containers constructed of combustible materials in galleys, pantries, bars, garbage handling or storage spaces and incinerator rooms provided they are intended purely for the carriage of wet waste, glass bottles and metal cans and are suitably marked. *(MSC/Circ. 1120)*
Technical Background
Editorially amended in Nov 2005 to refer to MSC/Circ.1120.
Remarks

1.157 Electrical distribution boards

Conventions (Amend.), Reg.		SOLAS Regulation **II-2/9.2.2.3.2.2(7),9.2.2.4.2.2(5),9.2.3.3.2.2(5)&9.3.4.2.2.2(5)**					
IACS UI Number	**SC167**	**UI** version	**June,2002/ Rev.1,Nov.,2005/ Corr.1,Nov.,2021**	Date of implementation	**Jan.1,2003/**	Means of implementation	

Conventions/Codes Requirements

SOLAS II-2/9.2.2.3.2.2(7) reads as follows:

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 regulation, 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.

(7) Accommodation spaces of moderate fire risk

- *Spaces as in category (6) above but containing furniture and furnishings of other than restricted fire risk.*
- *Public spaces containing furniture and furnishings of restricted fire risk and having a deck area of 50 m^2 or more.*
- *Isolated lockers and small store-rooms in accommodation spaces having areas less than 4 m^2 (in which flammable liquids are not stowed).*
- *Motion picture projection and film stowage rooms. Diet kitchens (containing no open flame).*
- *Cleaning gear lockers (in which flammable liquids are not stowed).*
- *Laboratories (in which flammable liquids are not stowed).*
- *Pharmacies.*
- *Small drying rooms (having a deck area of 4 m^2 or less).*
- *Specie rooms.*
- *Operating rooms.*

SOLAS II-2/9.2.2.4.2.2(5) reads as follows:

For determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (11) 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 regulation, 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 9.3 and 9.4. 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.

(5) Service spaces (low risk)
Lockers and store-rooms not having provisions for the storage of flammable liquids and having areas less than 4 m^2 and drying rooms and laundries.

SOLAS II-2/9.2.3.3.2.2(5) reads as follows:
For determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (11) 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 regulation, 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 9.5 and 9.6. 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.

(5) Service spaces (low risk)
Lockers and store-rooms not having provisions for the storage of flammable liquids and having areas less than 4 m^2 and drying rooms and laundries.

SOLAS II-2/9.2.4.2.2.2(5) reads as follows:
For determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (10) 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 regulation, 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 areas within a space that have less than 30% communicating openings to that space are considered separate areas. The fire integrity of the boundary bulkheads and decks of such smaller spaces shall be as prescribed in tables 9.7 and 9.8. 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.

(5) Service spaces (low risk)
Lockers and store-rooms not having provisions for the storage of flammable liquids and having areas less than 4 m^2 and drying rooms and laundries.

Interpretation

Distribution boards may be located behind panels/linings within accommodation spaces including stairway enclosures, without the need to categorize the space, provided no provision is made for storage.
If distribution boards are located in an identifiable space having a deck area of less than $4m^2$, this space may be categorised in (7), according to regulation 9.2.2.3.2.2, or (5), according to regulations 9.2.2.4.2.2, 9.2.3.3.2.2 and 9.2.4.2.2.2.

Technical Background

The reference to the SOLAS II-2/9.2.4.2.2.2(5) was stated to be to SOLAS II-2/9.3.4.2.2.2(5). This needed to be corrected.

Remarks

1.158 Hydrants for dangerous goods

Conventions (Amend.), Reg.		Regulation **II-2/19.3.1.2** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC168**	**UI** version	**June 2002/Rev.1, Nov. 2005**	Date of implementation	**01.01.2003**	Means of implementation	

Conventions/Codes Requirements

The quantity of water delivered shall be capable of supplying four nozzles of a size and at pressures as specified in Regulation 10.2, capable of being trained on any part of the cargo space when empty. This amount of water may be applied by equivalent means to the satisfaction of the Administration.

Interpretation

The number and position of hydrants should be such that at least two of the required four jets of water, when supplied by single lengths of hose, may reach any part of the cargo space when empty; and all four jets of water, each supplied by single lengths of hose may reach any part of ro-ro cargo spaces. *(MSC/Circ. 1120)*

Technical Background

Editorially amended in Nov 2005 to refer to MSC/Circ.1120.

Remarks

1.159 Foam systems positions of aft monitors

Conventions (Amend.), Reg.		Regulation **II-2/10.8** of **SOLAS,** Paragraph **2.3.2.3, Chapter 14** of **FSS** Code					
IACS UI Number	**SC169**	**UI** version	**June 2002/ Corr.1,Feb.,2003/ Rev.1,Nov.,2021**	Date of implementation	**Jan.1,2003/ -/ Rev.1,Jan.1,2023**	Means of implementation	

Conventions/Codes Requirements

SOLAS II-2/10.8 reads as follows:

8.1 Fixed deck foam fire-extinguishing systems

8.1.1 For tankers of 20,000 tonnes deadweight and upwards, a fixed deck foam fire-extinguishing system shall be provided in accordance with the requirements of the Fire Safety Systems Code, except that, in lieu of the above, the Administration, after having given consideration to the ship's arrangement and equipment, may accept other fixed installations if they afford protection equivalent to the above, in accordance with regulation I/5. The requirements for alternative fixed installations shall comply with the requirements in paragraph 8.1.2.

8.1.2 In accordance with paragraph 8.1.1, where the Administration accepts an equivalent fixed installation in lieu of the fixed deck foam fire-extinguishing system, the installation shall:
.1 be capable of extinguishing spill fires and also preclude ignition of spilled oil not yet ignited; and
.2 be capable of combating fires in ruptured tanks.

8.1.3 Tankers of less than 20,000 tonnes deadweight shall be provided with a deck foam fire-extinguishing system complying with the requirements of the Fire Safety Systems Code.

Paragraph 2.3.2.3 of the FSS Code, chapter 14 reads as follows:

A monitor and hose connection for a foam applicator shall be situated both port and starboard at the front of the poop or accommodation spaces facing the cargo tanks deck. The monitors and hose connections shall be aft of any cargo tanks, but may be located in the cargo area above pump-rooms, cofferdams, ballast tanks and void spaces adjacent to cargo tanks if capable of protecting the deck below and aft of each other. On tankers of less than 4,000 tonnes deadweight a hose connection for a foam applicator shall be situated both port and starboard at the front of the poop or accommodation spaces facing the cargo tanks deck.

Interpretations

The port and starboard monitors required by this paragraph may be located in the cargo area above oil bunker tanks adjacent to cargo tanks if capable of protecting the deck below and aft of each other. （MSC.1/Circ.1491）
Remarks

1.160 Low pressure CO2 systems

Conventions (Amend.), Reg.		Paragraph **2.2,Chapter 5** of **FSS** Code					
IACS UI Number	**SC170**	**UI** version	**June,2002/ Rev.1,Nov.,2005/ Del, Aug.,2021**	Date of implement ation	**Jan.1,2003/ -/ Jul.,2022**	Means of implementation	
Conventions/Codes Requirements							
CO_2 systems							
Interpretation							
Deleted							
Technical Background							
The main content of this UI has been consolidated into FSS Code, Ch. 5.2.2.4, amended by Resolution MSC.206(81), adopted on 18 May 2006. Para. 11 of the UI has been included in UR F46.							
Remarks							
Deleted in July 2022 because of FSS Code amendments introduced by resolution MSC.206(81) and UR F46.							

1.161 Interpretation of the term "First Survey"

Conventions (Amend.), Reg.		**The term "first survey" which is referenced by a regulation in SOLAS 74, as amended**					
IACS UI Number	**SC171**	**UI** version	**Jul.,2002/ Mar.,2008/ Mar.,2008/ Aug.,2008**	Date of implementation	**Jul.1,2002/ Rev.1,Dec.31,2008/ Corr.1, Dec.31,2008/ Rev.2, Dec.31,2008**	Means of implementation	Keel laying
Conventions/Codes Requirements							
The term "first survey" which is referenced by a regulation in SOLAS 74, as amended.							
Interpretation							
Unless indicated otherwise, when the term "first survey" is referenced by a regulation in SOLAS 74, as amended, it means the first annual survey, the first periodical survey or the first renewal survey as applicable to the relevant certificates, whichever is due first after the date specified in the relevant regulation or any other survey if the administration deems it to be reasonable and practicable, taking into account the extent of repairs and alterations being undertaken. For a ship under construction, where the keel is laid before, but the ship is delivered after, the date specified in the relevant regulation, the initial survey is the "first survey", and this ship needs to comply with the relevant regulation when it is delivered.							
Remarks							

1.162 Monitoring the concentration of hydrocarbon gases in cargo pump rooms on oil tankers

Conventions (Amend.), Reg.		Regulation **II-2/4.5.10.1.3** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC172**	**UI** version	**Aug. 2002/Rev.1, Nov. 2005**	Date of implementation	**01.07.2002/ 01.07.2006 (Rev.1)**	Means of implementation	
Conventions/Codes Requirements							
In tankers: .3 a system for continuous monitoring of the concentration of hydrocarbon gases shall be fitted. Sampling points or detector heads shall be located in suitable positions in order that potentially dangerous leakages are readily detected. When the hydrocarbon gas concentration reaches a pre-set level which shall not be higher than 10% of the lower							

flammable limit, a continuous audible and visual alarm signal shall be automatically effected in the pump-room, engine control room, cargo control room and navigation bridge to alert personnel to the potential hazard; and
Interpretation
1. Sequential sampling is acceptable as long as it is dedicated for the pump room only, including exhaust ducts, and the sampling time is reasonably short. 2. Detection positions are the zones where air circulation is reduced (e.g. recessed corners). *(MSC/Circ. 1120)*
Technical Background
Amended in Nov 2005 to refer to MSC/Circ.1120.
Remarks
Circular No. 026/Total No.076 (2002) "Notice on IACS Deleting UR F39 and Newly Adding SC 172" issued by CCS' Technical Department

1.163 Safety devices in venting systems

Conventions (Amend.), Reg.		Regulation **II-2/4.5.3.3** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC173**	**UI** version	**July 2003**	Date of implementation	**01.01.2004**	Means of implementation	
Conventions/Codes Requirements							
… Ullage openings shall not be used for pressure equalization. They shall be provided with self-dosing and tightly sealing covers. Flame arresters and screens are not permitted in these openings.							
Interpretation							
Ullage openings do not include cargo tank openings that are fitted with standpipe arrangements with their own manually operated shutoff valves. Examples include the common 1" to 2" diameter standpipe arrangements that are used for sampling, monitoring or measuring of ullage/temperature/interface, oxygen, liquid and hand dipping in the cargo tank.							
Remarks							

1.164 A 60 front insulation of tankers

Conventions (Amend.), Reg.		Regulation **II-2/9.2.4.2.5** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC174**	**UI** version	**July 2003/Rev.1, Aug. 2006**	Date of implementation	**01.01.2004**	Means of implementation	
Conventions/Codes Requirements							
Exterior boundaries of superstructures and deckhouses enclosing accommodation and including any overhanging decks which support such accommodation shall be constituted of steel and insulated to "A-60" standard for the whole of the portions which face the cargo area and on the outward sides for a distance of 3 m from the end boundary facing the cargo area. The distance of 3 m shall be measured horizontally and parallel to the middle line of the ship from the boundary which faces the cargo area at each deck level. In the case of the sides of those superstructures and deckhouses, such insulation shall be carried up to the underside of the deck of the navigation bridge.							
Interpretation							
For the portions which face the cargo area, the A 60 standard insulation should be provided up to the underside of the deck of the navigation bridge. (*MSC/Circ.1203*)							
Technical Background							
Editorially amended in Aug. 2006 to refer to MSC/Circ.1203.							
Remarks							

1.165 Combustible gaskets in ventilation duct connections

Conventions (Amend.), Reg.		Regulation **II-2/9.7.1.1** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC175**	**UI** version	**July 2003**	Date of implementation	**01.01.2004**	Means of implementation	
Conventions/Codes Requirements							
Ventilation ducts shall be of non-combustible material….							
Interpretation							
Combustible gaskets in flanged ventilation duct connections are not permitted within 600 mm of an opening in an A class or B class division and in ducts required to be of A class construction.							
Remarks							

1.166 Fixed local application fire-extinguishing system

Conventions (Amend.), Reg.		Regulation **II-2/10.5.6** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC176**	**UI** version	**July 2003/ Rev. 1, May 2004**	Date of implementation	**01.01.2004/ 01.07.2004 (Rev.1)**	Means of implementation	
Conventions/Codes Requirements							
Fixed local application fire-extinguishing system							
Interpretation							
Any installation of nozzles on board should reflect the arrangement successfully tested in accordance with MSC/Circ.913. If a specific arrangement of the nozzles is foreseen on board, deviating from the one tested as per MSC/circ. 913, it can be accepted provided such arrangement additionally passes fire tests based on the scenarios of this circular. The automatic release should be activated by a detection system capable of reliably identifying the local zones. Consideration should be given to prevent accidental release. Oil fired equipment, such as inert gas generators and thermal oil heaters should also be protected by this system, if located in machinery spaces above 500 m^3. Boiler fronts should be interpreted as the boiler burner location irrespective of the boiler design. Grouped visual and audible alarms, as well as indication of the activated zone, should be provided in each protected space, in the engine control room and in the wheelhouse. Audible alarms may use a single tone.							
Remarks							

1.167 Lubricating oil and other flammable oil system arrangements — Retroactive application of Regulations II- 2/15.3 and 15.4 of SOLAS (2001 Edition)

Conventions (Amend.), Reg.		Regulations **II-2/15.3 & 15.4** of **SOLAS 1974**					
IACS UI Number	**SC177**	**UI** version	**July 2003**	Date of implementation	**01.01.2004**	Means of implementation	
Conventions/Codes Requirements							
Lubricating oil arrangements; arrangements for other flammable oils							
Interpretation							
SOLAS regulations II-2/15.2.10 and 15.2.11 are not intended to apply to lubricating oil and other flammable oil system arrangements on ships constructed before 1 July 1998.							
Remarks							

1.168 Suction piping of emergency fire pumps, which are run through the machinery space

Conventions (Amend.), Reg.		FSS Code, Ch. 12, 2.2.1.3					
IACS UI Number	**SC178**	**UI version**	**Jul.2003/ Withdrawn, Apr.,2005/ Rev.1 Apr., 2011**	**Date of implementation**	**Jan.1,2012 (Rev.1)**	**Means of implementation**	**Contracted for construction**①

Conventions/Codes Requirements

FSS Code, Chapter 12, paragraph 2.2.1.3 Suction heads

The total suction head and the net positive suction head of the pump shall be determined having due regard to the requirements of the Convention and this chapter on the pump capacity and on the hydrant pressure under all conditions of list, trim, roll and pitch likely to be encountered in service. The ballast condition of a ship on entering or leaving a dry dock need not be considered a service condition.

Interpretation

1. It shall be documented that the suction inlet is fully submerged under "all conditions of list, trim, roll and pitch likely to be encountered in service" as given below.

1.1 Operational seagoing condition for which roll, pitch and heave shall be applied is as follows:

The lightest seagoing condition shall be considered, which is defined as the ballast condition which gives the shallowest draught at the position of the sea chest and emergency fire pump as given in the approved stability booklet (or preliminary stability calculation for new building). The following table shall be applied for the calculation of roll, pitch and heave. The heave combined pitch and heave combined roll are taken into account separately.

1.1.1 Heave combined pitch[1] in head sea

L(m)	*75 and below*	*100*	*125*	*150*	*175*	*200*	*225*	*250*	*300*	*350 and above*
Φ(deg)	*4.5*	*4*	*3.2*	*2.7*	*2.3*	*2.1*	*1.8*	*1.7*	*1.6*	*1.5*
H(m)	*0.73*	*0.8*	*0.87*	*0.93*	*0.98*	*1.03*	*1.07*	*1.11*	*1.19*	*1.25*

Note: Values at the intermediate length of ships are to be obtained by linear interpolation.

Where:

L: length of the ship, in meters, as defined in the International Convention on Load Lines in force, or length between perpendiculars at the ballast draught, whichever is greater

φ: pitch angle[2] as defined in figure 1

H: heave amplitude as defined in figure 1

1.1.2 Heave combined roll in beam sea

Heave combined roll angle[2] shall be taken as:

.1 ships with bilge keels: 11 °; and

.2 ships without bilge keels: 13 °

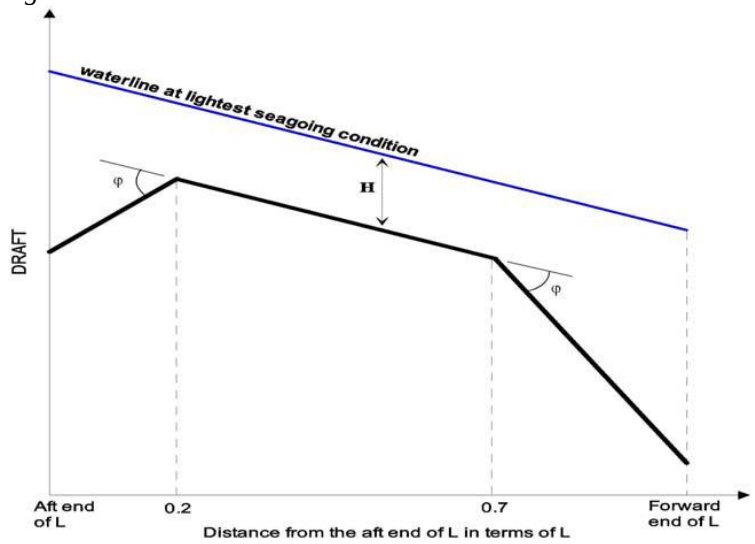


Figure 1 – Waterline for which heave combined pitch is taken into account

1) The heave combined pitch is taken into account as in figure 1.

2) Angle is to be measured from still waterline and downwards.

1.2 The emergency fire pump suction shall be submerged at the waterlines corresponding to the two following conditions:
.1 a static waterline drawn through the level of 2/3 immersion of the propeller at even keel (for pod or thruster driven ship, special consideration should be given); and
.2 the ship in the arrival ballast condition, as per the approved trim and stability booklet,without cargo and with 10% stores and fuel remaining.
For either condition, roll, pitch and heave need not be applied.
1.3 A ship operating solely in sheltered water issued with SOLAS Certificates shall be subject to compliance with the still water submergence requirements set out in paragraph 1.2.1 above.
2. In all cases the net positive suction head (NPSH) available for the pump shall be greater than the NPSH required.
3. Upon completion of the emergency fire pump installation, a performance test confirming the pump's capacity required in the FSS Code, chapter 12, paragraph 2.2.1.1, shall be carried out and, if the emergency fire pump is the main supply of water for any fixed fire-extinguishing system provided to protect the spaces where the main fire pumps are located, the pump shall have the capacity for this system. As far as practicable, the test shall be carried out at the draught corresponding to the lightest seagoing condition.

Technical Background

1.（Rev.1）The implementation requirements in 2.2.1.3 of Chapter 12 in FSS Code is to be harmonized with the united interpretation of the relevant requirements for emergency fire pumps in MSC.1/Circ.1388 by IMO.

Remarks

①*The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No.29.*
Among the Administrations which have granted CCS with authorizations (including the authorizations for each individual ship) to implement statutory surveys and certifications, the flag States with specific requirements for the implementation of IACS UI SC 178(rev.1) are as follows:
- Marshall Islands
The unified interpretation of MSC.1/Circ.1388, when applying relevant provisions of chapter 12 of the FSS Code, to be applied for ships constructed on or after 1 January 2012 and were contracted after 10 December 2010 (the issued date of MSC/Circ.1388). However, exemptions may be considered by the Marshall Islands Administrator provided that the RO considers the design/equipment changes are such that a contract would need to be renegotiated. For each such instance, the RO should provide a recommendation to the Administrator as to how the relevant requirements of the SOLAS Convention and the FSS Code are adequately met.
- Panama
(i) It is acceptable to apply Unified Interpretation IACS UI SC 178(rev.1) to the ships of which application of construction is already submitted to Class before 8 August 2011 and of which keel lay will be on or after 1 January 2012.
(ii) It is further acceptable to apply Unified Interpretation IACS UI SC 178(rev.1) to ships other than above (i), as long as the contract for construction is before 1 January 2012 with the condition that the vessel is to be launched to construction before 1 January 2013.
(iii) For any other case which does not meet condition (i) and (ii), contact to this Administration should be made in order to seek for approval of applying IACS UI SC 178(rev.1) on a case by case basis as through Class .
- Cyprus/Hong Kong, China/Malta/Singapore
The unified interpretation of MSC.1/Circ.1388, when applying relevant provisions of chapter 12 of the FSS Code, to be applied for ships constructed on or after 1 January 2012.

1.169 Dewatering of forward spaces of bulk carriers

Conventions (Amend.), Reg.		**Regulation 13.1 of SOLAS Chapter XII as amended by IMO resolutions up to MSC.170(79) and IMO interpretation of SOLAS Rregulation XII/13 (MSC/Circ.1069)**					
IACS UI Number	**SC179**	**UI** version	**Sep.,2003/ Rev.1,Nov.,2005/ Rev.2,Mar.,2011/ Rev.3,Feb.,2021**	Date of implementation	**Oct.1,2003/ -/ Rev.2,Jan.1,2012/ Rev.3,Jul.1,2022**	Means of implementation	**Contracted for construction (Rev.3)**
Conventions/Codes Requirements							

SOLAS regulation XII/13.1 reads as follows:

1. On bulk carriers, the means for draining and pumping ballast tanks forward of the collision bulkhead, and bilges of dry spaces any part of which extends forward of the foremost cargo hold, shall be capable of being brought into operation from a readily accessible enclosed space, the location of which is accessible from the navigation bridge or propulsion machinery control position without traversing exposed freeboard or superstructure decks. Where pipes serving such tanks or bilges pierce the collision bulkhead, valve operation by means of remotely operated actuators may be accepted, as an alternative to the valve control specified in regulation II-1/12, provided that the location of such valve controls complies with this Regulation.

MSC/Circ.1069 reads as follows:

1. The spaces where availability of pumping systems is required in accordance with paragraph 1 of SOLAS regulation XII/13 should be the same watertight spaces where water level detectors are required in accordance with paragraph 1.3 of SOLAS Regulation XII/12.

2. This means that paragraph 1 of Regulation XII/13 does not apply to the enclosed spaces the volume of which does not exceed 0.1% of the ship's maximum displacement volume and to the chain locker.

Interpretation

1. Where the piping arrangements for dewatering closed dry spaces are connected to the piping arrangements for the drainage of water ballast tanks, two non-return valves are to be provided to prevent the ingress of water into dry spaces from those intended for the carriage of water ballast. One of these non-return valves is to be fitted with shut-off isolation arrangement. The non-return valves are to be located in readily accessible positions. The shut-off isolation arrangement is to be capable of being controlled from the navigation bridge, the propulsion machinery control position or enclosed space which is readily accessible from the navigation bridge or the propulsion machinery control position without travelling exposed freeboard or superstructure decks. In this context, a position which is accessible via an under deck passage, a pipe trunk or other similar means of access is not to be taken as being in the "readily accessible enclosed space".

2. Under this Regulation 13.1 of SOLAS Chapter XII as amended by IMO resolutions up to MSC.170(79) (hereinafter the same):

2.1 The valve specified under Regulation 12.5.1 of SOLAS Chapter II-1 as amended by IMO resolutions up to MSC.436(99) (hereinafter the same) is to be capable of being controlled from the navigation bridge, the propulsion machinery control position or enclosed space which is readily accessible from the navigation bridge or the propulsion machinery control position without travelling exposed freeboard or superstructure decks. In this context, a position which is accessible via an under deck passage, a pipe trunk or other similar means of access is not to be taken as being in the "readily accessible enclosed space";

2.2 The valve is not to move from the demanded position in the case of failure of the control system power or actuator power;

2.3 Positive indication is to be provided at the remote control station to show that the valve is fully open or closed;

2.4 local hand powered valve operation from above the freeboard deck as specified in Regulation 12.5.1 of SOLAS Chapter II-1 is required. An acceptable alternative to such arrangement may be remotely operated actuators as specified in Regulation 13.1 of SOLAS Chapter XII on the condition that all provisions in 13.1 are met.

3. The dewatering arrangements are to be such that any accumulated water can be drained directly by a pump or eductor.

4. The dewatering arrangements are to be such that when they are in operation, other systems essential for the safety of the ship including fire-fighting and bilge systems remain available and ready for immediate use. The systems for normal operation of electric power supplies, propulsion and steering are not to be affected by the operation of the dewatering systems. It must also be possible to immediately start fire pumps and have a ready available supply of fire-fighting water and to be able to configure and use bilge system for any compartment when the dewatering system is in operation.

5. Bilge wells are to be provided with gratings or strainers that will prevent blockage of the dewatering system with debris.

6. The enclosures of electrical equipment for the dewatering system installed in any of the forward dry spaces are to provide protection to IPX8 standard as defined in IEC 60529 :1989/AMD2:2013/COR1:2019 for a water head equal to the height of the space in which the electrical equipment is installed for a time duration of at least 24 hours.

Technical Background

Rev. 3: Update to comply with the required format when industry standards are referred to.

Remarks
1. Equipment and arrangements which do not fully comply with this UI may be installed until 31 December 2003 for compliance with SOLAS regulation XII/13. 2. Refer to IMO MSC/Circ. 1176 (Rev.1 is to introduce a reference to IMO MSC/Circ. 1176 with no change of technical substance). 3. Arrangements complying with the changes introduced in Rev.2 of this UI are to be uniformly applied by IACS Members on ships contracted for construction on or after 1 January 2012 and are acceptable on any ship subject to this SOLAS Regulation. 4. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29. 5. Rev.3 is to be uniformly implemented by IACS Members on ships contracted for construction on or after 1 July 2022.

1.170 Hold, ballast and dry space water level detectors (Chapter II-1/25 and Chapter XII/12) and Performance Standards for Water Level Detectors on Bulk Carriers and Single Hold Cargo Ships other than Bulk Carriers (Resolution MSC.188(79))

Conventions (Amend.), Reg.		Regulation **II-~~1~~/25** of SOLAS **Chapter II-1** as amended by IMO resolutions up to MSC.436(99) and Regulation- **12** of SOLAS **Chapter XII** as amended by IMO resolutions up to MSC.170(79)					
IACS UI Number	**SC180**	**UI** version	**Sept., 2003/ May, 2004/ Rev.2, Nov.,2005/ Rev.3, Mar.,2012/ Rev.4,Feb.,2021**	Date of implementation	**-/ -/ -/ Rev.3,July 1,2012/ Rev.4,July 1,2022**	Means of implementation	**Contracted for construction**

Conventions/Codes Requirements
SOLAS Regulation II-1/25 and SOLAS Regulation XII/12 When water level detectors are installed on single hold cargo ships other than bulk carriers subject to Regulation 25 of SOLAS Chapter II-1 as amended by IMO resolutions up to MSC.436(99) or bulk carriers subject to Regulation 12 of SOLAS Chapter XII as amended by IMO resolutions up to MSC.170(79), the Performance Standards for water level detectors on bulk carriers, and single hold cargo ships other than bulk carriers, annexed to IMO Resolution MSC.188(79) adopted on 3 December 2004 are to be applied, taking into account the following interpretations to the paragraphs of the Performance Standards, as applicable: **Performance Standards, paragraph 3.2.1** 3.2.1 Detector system should provide a reliable indication of water reaching a preset level.
Interpretation
One sensor capable of detecting both preset levels (pre-alarm level and main alarm level) is allowed.
Conventions/Codes Requirements
Performance Standards, paragraph 3.2.3 3.2.3 Detection equipment should be suitably corrosion resistant for all intended cargoes.
Interpretation
Detection equipment includes the sensor and any filter and protection arrangements for the detector installed in cargo holds and other spaces as required by SOLAS regulation II-1/25 or XII/12.1.
Conventions/Codes Requirements
Performance Standards, paragraph 3.2.5 3.2.5 The part of the system which has circuitry in the cargo area, should be intrinsically safe.
Interpretation
• In general, the construction and type testing is to be in accordance with IEC Publication 60079:2011 to a minimum requirement of EX(ib). Where a ship is designed only for the carriage of cargoes that cannot create an a combustible or explosive atmosphere then the requirement for intrinsically safe circuitry is not to be insisted upon, provided the operational instructions included in the Manual required by 4.1 of the Appendix to the Annex specifically exclude the carriage of cargoes that could produce a potential explosive atmosphere. Any exclusion of cargoes identified in the Annex is to be consistent with the ship's Cargo Book and any Certification relating to the carriage of specifically identified cargoes. • The maximum surface temperature of equipment installed within cargo spaces is to be appropriate for the

combustible dusts and/or explosive gasses likely to be encountered. Where the characteristics of the dust and gases are unknown, the maximum surface temperature of equipment is not to exceed 85 deg. C.

• Where intrinsically safe equipment is installed, it is to be of a certified safe type.

• Where detector systems include intrinsically safe circuits, plans of the arrangements are to be appraised/approved by individual classification societies.

Conventions/Codes Requirements

Performance Standards, paragraph 3.3.2

3.3.2 Visual and audible alarms should conform to Code on Alerts and Indicators 2009（IMO A.1021(26)）,as applicable to a primary alarm for the preservation or safety of the ship.

Interpretation

The pre-alarm, as a primary alarm, is to indicate a condition that requires prompt attention to prevent an emergency condition and the main-alarm, as an emergency alarm is to indicate that immediate actions are to be taken to prevent danger to human life or to the ship.

Conventions/Codes Requirements

Performance Standards, paragraph 3.3.5

3.3.5 The system may be provided with a capability of overriding indication and alarms for the detection systems installed only in tanks and holds that have been designed for carriage of water ballast (SOLAS Regulation XII/12.1).

Interpretation

The water ingress alarm system is not to be capable of overriding the alarm of the spaces (e.g., dry spaces, cargo holds, etc.), that are neither designed nor intended to carry water ballast.

• Enabling the facility to override alarms is to be customized for each specific ship prior to the commissioning tests witnessed by a classification society surveyor pursuant to certification. Any subsequent modifications are subject to re-certification.

• A “Caution Plate”, which prohibits personnel from overriding an alarm to any hold, is not an acceptable alternative to the above provisions.

Conventions/Codes Requirements

Performance Standards, paragraph 3.3.7

3.3.7 Requirements for malfunctions, alarms and indications should include a facility for continuous monitoring of the system which, on detecting a fault activates a visual and audible alarm. The audible alarm should be capable of being muted but the visual indication should remain active until the malfunction is cleared.

Interpretation

Fault monitoring is to address faults associated with the system, e.g. open circuit, short circuit, loss of power supplies, CPU failure.

Conventions/Codes Requirements

Performance Standards, paragraph 3.3.8

3.3.8 The water level indicator should be capable of being supplied with electrical power from two independent electrical supplies. Failure of the primary electrical power supply should be indicated by an alarm.

Interpretation

• The electrical power supply is to be from two separate sources, one is to be the main source of electrical power and the other is to be the emergency source, unless a continuously charged dedicated accumulator battery is fitted, having arrangement, location and endurance equivalent to that of the emergency source (18 h). The battery supply may be an internal battery in the water level detector system.

• The changeover arrangement of supply from one electrical source to another need not be integrated into the water level detector system.

• Where batteries are used for the secondary power supply, failure alarms for both power supplies are to be provided.

Conventions/Codes Requirements

Performance Standards, paragraph 3.4.1

3.4.1 – Footnote

With regard to testing, reference is made to IEC 60092-504 and IEC 60529. Electrical components installed in the cargo holds, ballast tanks and dry spaces should satisfy the requirements of IP 68 in accordance with IEC 60529.

Interpretations

• IACS UR E10 may be used as an equivalent test standard to IEC 60092-504:2016.

• The range of tests is to include the following:

For alarm/monitoring panel:

– functional tests in accordance with MSC. 188(79);

– electrical power supply failure test;

– power supply variation test;
– dry heat test;
– damp heat test
– vibration test.
– EMC tests;
– insulation resistance test;
– high voltage test; and
– static and dynamic inclinations tests, if moving parts are contained.
For IS barrier unit if located in the wheelhouse:
– In addition to the certificate issued by a competent independent testing laboratory, EMC tests are also to be carried out.
For water ingress detectors:
– functional tests in accordance with MSC.188(79);
– electrical power supply failure test;
– power supply variation test;
– dry heat test;
– damp heat test;
– cold test;
– vibration test;
– enclosure class in accordance with MSC.188(79);
– insulation resistance test;
– high voltage test;
– EMC tests, (if the detector is capable of producing electromagnetic noise), and
– static and dynamic inclinations tests, (if the detectors contain moving parts).

Conventions/Codes Requirements

Performance Standards,
APPENDIX, paragraph 2.1.1
2.1.1 Detector equipment should provide a reliable indication of water reaching a preset level and should be type tested to demonstrate their robustness and suitability under the appropriate conditions of IEC 60092-504 and the following:

Interpretation

The test procedure is to satisfy the following criteria:
• The type tests are to be witnessed by a classification society surveyor if the tests are not carried out by a competent independent test facility.
• Type tests are to be carried out on a prototype or randomly selected item(s) which are representative of the manufactured item that is being type tested.
• Type tests are to be documented (type test reports) by the manufacture and submitted for review by classification societies.

Conventions/Codes Requirements

Performance Standards,
APPENDIX, paragraph 2.1.1.1
2.1.1.1 Protection of the enclosures of electrical components installed in the cargo holds, ballast tanks and dry spaces should satisfy the requirements of IP68 in accordance with IEC 60529. The water pressure testing of the enclosure should be based on a pressure head held for a period depending on the application. For detectors to be fitted in holds intended for the carriage of water ballast or ballast tanks the application head should be the hold or tank depth and the hold period should be 20 days. For detectors to be fitted in spaces intended to be dry the application should be the depth of the space and the hold period should be 24 h.

Interpretation

• The submerged test period for electrical components intended to be installed in ballast tanks and cargo tanks used as ballast tanks is to be not less than 20 days.
• The submerged test period for electrical components intended to installed dry spaces and cargo holds not intended to be used as ballast tanks is to be not less than 24 hours.
• Where a detector and/or cable connecting device (e.g. junction box, etc) is installed in a space adjacent to a cargo hold (e.g. lower stool, etc.) and the space is considered to be flooded under damage stability calculations, the detectors and equipment are to satisfy the requirements of IP68 for a water head equal to the hold depth for a period of 20 days or 24 hours on the basis of whether or not the cargo hold is intended to be used as a ballast tank as described in the previous bullet points.

Conventions/Codes Requirements

Performance Standards,
APPENDIX, paragraph 2.1.1.2

2.1.1.2 Operation in cargo/water mixture for a selected range of cargoes such as iron ore dust, coal dust, grains and oils using seawater in suspension of representative fine material for each cargo group. For type test purposes an agitated suspension of representative fine materials in seawater, with a concentration of 50% by weight, should be used with the complete detector assembly including any filtration fitted. The functioning of the detection assembly with any filtration arrangements should be verified in the cargo/water mixture with immersion repeated ten times without cleaning any filtration arrangements.

Interpretation

1 The type test required for the sensor is to be in accordance with the following:

.1 the test container for the cargo/water mixture is to be dimensioned so that its height and volume are such that the sensor and any filtration fitted can be totally submerged for the repeated functionality tests required by 2.1.1.2 and the static and dynamic inclination tests identified in the previous interpretation.

.2 the sensor and any filtration fitted that are to be submerged and are to be arranged in the container as they would be installed in accordance with the installation instructions required by 4.4.

.3 the pressure in the container for testing the complete detector is to be not more than 0.2 bar at the sensor and any filter arrangement. The pressure may be realised by pressurisation or by using a container of sufficient height.

.4 the cargo/water mixture is to be pumped into the test container and suitable agitation of the mixture provided to keep the solids in suspension. The effect of pumping the cargo/water mixture into the container is not to affect the operation of the sensor and filter arrangements.

.5 the cargo/water mixture is to be pumped into the test container to a predetermined level that submerges the detector and the operation of the alarm observed.

.6 the test container is then to be drained and the de-activation of the alarm condition observed.

.7 the test container and sensor with any filter arrangement are to be allowed to dry without physical intervention.

.8 the test procedure is to be repeated consecutively ten times without cleaning any filter arrangement that may be fitted in accordance with the manufacturer's installation instructions (see also 2.1.1.2).

.9 satisfactory alarm activation and de-activation at each of the ten consecutive tests will demonstrate satisfactory type testing.

2 The cargo/water mixture used for type testing are to be representative of the range of cargoes within the following groups and is to include the cargo with the smallest particles expected to be found from a typical representative sample:

.1 iron ore particles and seawater;

.2 coal particles and seawater;

.3 grain particles and seawater; and

.4 aggregate (sand) particles and seawater.

The smallest and largest particle size together with the density of the dry mixture is to be ascertained and recorded. The particles are to be evenly distributed throughout the mixture. Type testing with representative particles will in general qualify all types of cargoes within the four groupings shown above.

The following provides guidance on the selection of particles for testing purposes:

.1 Iron ore particles are to mainly consist of small loose screenings of iron ore and not lumps of ore (dust with particle size < 0.1 mm).

.2 Coal particles are to mainly consist of small loose screenings of coal and not lumps of coal (dust with particle size < 0.1 mm).

.3 Grain particles are to mainly consist of small loose grains of free flowing grain (grain having a size > 3mm, such as wheat).

.4 Aggregate particles are to mainly consist of small loose grains of free flowing sand and without lumps (dust with particle size < 0.1 mm).

Conventions/Codes Requirements

Performance Standards,
APPENDIX, paragraph 2.2.1

2.2.1 The sensors should be located in a protected position that is in communication with the specified part of the cargo hold(usually the aft part) such that the position of the sensor detects the level that is representative of the levels in the actual hold space. These sensors should be located:

.1 either as close to the centreline as practicable, or

.2 at both the port and starboard sides of the cargo hold.

Interpretation

For ships having keel laid on or after 1 July 2004, if sensors are not placed within a distance less than or equal to 1 corrugation space or 1 bulkhead vertical stiffener space from the centreline, sensors are to be located at both the port and starboard sides of the cargo hold.
For ships having keel laid before 1 July 2004, if sensors are not placed within a distance less than or equal to B/6 from the centreline, sensors are to be located at both the port and starboard sides of the cargo hold.

Conventions/Codes Requirements

Performance Standards,
APPENDIX, paragraph 3.1.1
3.1.1 Alarm systems should be type tested in accordance with IEC 60092-504, as appropriate.

Interpretation

The test procedure is to satisfy the following criteria:
- The type tests are to be witnessed by a classification society surveyor if the tests are not carried out by a competent independent test facility.
- Type tests are to be carried out on a prototype or randomly selected item(s) which are representative of the manufactured item that is being type tested.
- Type tests are to be documented (type test reports) by the manufacture and submitted for review by classification societies.

Conventions/Codes Requirements

Performance Standards,
APPENDIX, Section 4
4 MANUALS
Manuals should be provided on board and should contain the following information and operational instructions:

Interpretation

For each ship, a copy of the manual is to be made available to the surveyor at least 24 hours prior to survey of the water level detection installation. Each classification society is to ensure that any plans required for classification purposes have been appraised/approved as appropriate.

Remarks

Rev.3 reflects that MSC.188(79) superseded and revoked MSC.145(77) and extended the application of the Performance Standards to include single hold cargo ships other than bulk carriers subject to compliance with SOLAS II-1/25, with no substantive change to the technical requirements of the Performance Standards. Thus, there are no substantive changes in the technical content of the interpretations in Rev.3 in relation to Rev.2 of this UI. Rev.3 is to be uniformly implemented by IACS Members on ships contracted for construction on or after 1 July 2012.

1.171 Bulk carriers not complying with SOLAS XII/9 as of 1 January 2004

Conventions (Amend.), Reg.		Regulation **XII/9** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC182**	**UI** version	**Nov. 2003/ Rev.1,Nov. 2005**	Date of implementation	**01.01.2004**	Means of implementation	

Conventions/Codes Requirements

For bulk carriers being within the application limits of Regulation 4.2, which have been constructed with an insufficient number of transverse watertight bulkheads to satisfy that regulation, the Administration may allow relaxation from the application of Regulations 4.2 and 6 and condition that they shall comply with the following requirements:

.1 for the foremost cargo hold, the inspections prescribed for the annual survey in the enhanced programme of inspections required by Regulation XI/2 shall be replaced by the inspections prescribed therein for the intermediate survey of cargo holds;

.2 are provided with bilge well high water level alarms in all cargo holds, or in cargo conveyor tunnels, as appropriate, giving an audible and visual alarm on the navigation bridge, as approved by the Administration or an organization recognized by it in accordance with the provisions of regulation XI/1;and

.3 are provided with detailed information on specific cargo hold flooding scenarios. This information shall be accompanied by detailed instructions on evacuation preparedness under the provisions of Section 8 of the International Safety Management (ISM) Code and be used as the basis for crew training and drills.

Interpretation

Delected

Remarks
IACS deleted the UI in April 2020.

1.172 Endorsement of certificates with the date of completion of the survey on which they are based

Conventions (Amend.), Reg.		**MSC**/Circ. **1012** and **MEPC**/Circ. **384**					
IACS UI Number	**SC183 LL67 MPC10**	**UI** version	**Nov. 2003/ Rev.1, Nov. 2005**	Date of implementation	**01.03.2004/ 01.07.2006 (Rev.1)**	Means of implementation	

Conventions/Codes Requirements

1. The Maritime Safety Committee, at its seventy-fourth session (30 May to 8 June 2001) and the Marine Environment Protection Committee, at its forty-sixth session (23 to 27 April 2001), acknowledging that, in the process of transition to the Harmonized System of Survey and Certification (HSSC) under the SOLAS, MARPOL and Load Line Conventions, it has become evident that it is sometimes difficult on the pre-HSSC certificates, and in certain cases not possible on certificates issued under the HSSC, to find information on the date of completion of the survey on which the certificate in question and its validity is based, agreed that when the date of issue of a certificate does not correspond with the associated survey, all certificates should clearly indicate when the associated survey was completed. The primary purpose of this indication is to provide port State control officers and other parties with clear and unambiguous information.
2. Conscious of the time needed to effect the appropriate amendments to the form of the certificates issued under the HSSC; realizing that any amendments to the form of pre-HSSC certificates are no longer possible; and recognizing that it would be advantageous for all the parties involved to provide in the certificates as soon as possible all the information that port State control officers may need, the Committees invited flag Administrations, in the interim and when appropriate, to endorse, or authorize their recognized organizations to endorse the relevant certificates with the following words:

"Completion date of the survey on which this certificate is based: dd/mm/yy".

Interpretation

For application of this Circular the following IACS Unified Interpretation applies:
The Completion date of the survey on which this certificate is based, is the date of the last survey visit on which all statutory and class items, required to be surveyed, have been surveyed (regardless if they were found satisfactory or with minor deficiency).

Remarks

1.173 Machinery installations–Dead ship condition

Conventions (Amend.), Reg.		Regulation **II-1/26.4** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC184**	**UI** version	**Dec. 2003/ Rev. 1, Nov. 2005**	Date of implementation	**01.03.2004**	Means of implementation	

Conventions/Codes Requirements

Means shall be provided to ensure that machinery can be brought into operation from the dead ship condition without external aid.

Interpretation

1. Dead ship condition for the purpose of Regulation II-1/26.4, is to be understood to mean a condition under which the main propulsion plant, boilers and auxiliaries are not in operation and in restoring the propulsion, no stored energy for starting and operating the propulsion plant, the main source of electrical power and other essential auxiliaries is assumed to be available.
2. Where the emergency source of power is an emergency generator which complies with Regulation II-1/44, UI SC185 and UI SC124, this generator may be used for restoring operation of the main propulsion plant, boilers and auxiliaries where any power supplies necessary for engine operation are also protected to a similar level as the starting arrangements.
3. Where there is no emergency generator installed or an emergency generator does not comply with Regulation II-1/44, the arrangements for bringing main and auxiliary machinery into operation are to be such that the initial charge of starting air or initial electrical power and any power supplies for engine operation can be developed on board ship without external aid. If for this purpose an emergency air compressor or an electric generator is required, these units are to be powered by a hand-starting oil engine or a hand-operated compressor. The arrangements for

bringing main and auxiliary machinery into operation are to have capacity such that the starting energy and any power supplies for engine operation are available within 30 minutes of a dead ship condition.
Remarks
Refer to IMO MSC/Circ. 1176 (Rev. 1 is to introduce a reference to IMO MSC/Circ. 1176 with no change of technical substance).

1.174 Starting arrangements for emergency generating sets

Conventions (Amend.), Reg.		Regulation **II-1/44** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC185**	**UI** version	**Dec.2003/ Rev.1, Nov. 2005**	Date of implementation	**01.03.2004**	Means of implementation	
Conventions/Codes Requirements							
SOLAS Regulation II-1/44, paragraph 1 Emergency generating sets shall be capable of being readily started in their cold condition at a temperature of 0 deg C. If this is impracticable, or if lower temperatures are likely to be encountered, provision acceptable to the Administration shall be made for the maintenance of heating arrangements, to ensure ready starting of the generating sets.							
Interpretation (from MSC/Circ.736)							
Emergency generating sets are to be capable of being readily started in their cold condition at a temperature of 0 deg C. If this is impracticable, or if lower temperatures are likely to be encountered, heating is to be provided to ensure ready starting of the generating sets.							
Conventions/Codes Requirements							
SOLAS Regulation II-1/44, paragraph 2 Each emergency generating set arranged to be automatically started shall be equipped with starting devices approved by the Administration with a stored energy capability of at least three consecutive starts. A second source of energy shall be provided for an additional three starts within 30 minutes unless manual starting can be demonstrated to be effective.							
Interpretation (from MSC/Circ.736)							
Each emergency generating set arranged to be automatically started is to be equipped with starting devices with a stored energy capability of at least three consecutive starts. A second source of energy is to be provided for an additional three starts within 30 minutes unless manual starting can be demonstrated to be effective.							
Remarks							
Refer to IMO MSC/Circ. 1176 (Rev.1 is to introduce a reference to IMO MSC/Circ. 1176 with no change of technical substance).							

1.175 Acceptable voltage variations in voltage when the emergency loads are supplied from a battery via an electronic converter/inverter

Conventions (Amend.), Reg.		Regulations **II-1/42.3.2.1, 42.4, 43.3.2.1 & 43.4** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC186**	**UI** version	**May 2004/Corr.1, Jan., 2010**	Date of implementation	**01.01.2005**	Means of implementation	
Conventions/Codes Requirements							
Reg.II-1/42.3.2.1 3.2 Where the emergency source of electrical power is an accumulator battery, it shall be capable of: .1 carrying the emergency electrical load without recharging while maintaining the voltage of the battery throughout the discharge period within 12% above or below its nominal voltage; **Reg.II-1/42.4** 4. The transitional source of emergency electrical power required by paragraph 3.1.3 shall consist of an accumulator battery suitably located for use in an emergency which shall operate without recharging while maintaining the voltage of the battery throughout the discharge period within 12% above or below its nominal voltage and be of sufficient capacity and so arranged as							

to supply automatically in the event of failure of either the main or emergency source of electrical power at least the following services, if they depend upon an electrical source for their operation:

4.1 For half an hour:

.1 the lighting required by paragraphs 2.1 and 2.2.

.2 all services required by paragraphs 2.3.1, 2.3.3 and 2.3.4 unless such services have an independent supply for the period specified from the accumulator battery suitably located for use in an emergency.

4.2 Power to operate the watertight doors, as required by regulation 15.7.3.3, but not necessarily all of them simultaneously, unless an independent temporary source of stored energy is provided. Power to the control, indication an alarm circuits are required by regulation 15.7.2 for half an hour.

Reg.II-1/43.3.2.1

3.2 Where the emergency source of electrical power is an accumulator battery, it shall be capable of:

.1 carrying the emergency electrical load without recharging while maintaining the voltage of the battery throughout the discharge period within 12% above or below its nominal voltage;

Reg.II-1/43.4

4 The transitional source of emergency electrical power where required by paragraph 3.1.3 shall consist of an accumulator battery suitably located for use in an emergency which shall operate without recharging while maintaining the voltage of the battery throughout the discharge period within 12% above or below its nominal voltage and be of sufficient capacity and shall be so arranged as to supply in the event of failure of either the main or the emergency source of electrical power for half an hour at least the following services if they depend upon an electrical source for their operation:

.1 the lighting required by paragraphs 2.1, 2.2 and 2.3.1. For this transitional phase, the required emergency electrical lighting, in respect of the machinery space and accommodation and service spaces may be provided by permanently fixed, individual, automatically charged, relay operated accumulator lamps; and

.2 all services required by paragraphs 2.4.1, 2.4.3 and 2.4.4 unless such services have an independent supply for the period specified from an accumulator battery suitably located for use in an emergency.

Interpretation

Where the emergency and/or transitional emergency loads are supplied from a battery via an electronic converter or inverter the maximum permitted d.c. voltage variations are to be taken as those on the load side of the converter or inverter.

Where the d.c. is converted into a.c. the maximum variations are not exceed those given in UR E5.

Remarks

1.176 Electric steering gear overload alarm

Conventions (Amend.), Reg.		Regulation **II-1/30.3** of Amendments **1981** to **SOLAS 1974**					
IACS UI Number	**SC187**	**UI** version	**May 2004**	Date of implementation	**01.01.2005**	Means of implementation	

Conventions/Codes Requirements

Short circuit protection and an overload alarm shall be provided for such circuits and motors. Protection against excess current, including starting current, if provided, shall be for not less than twice the full load current of the motor or circuit so protected, and shall be arranged to permit the passage of the appropriate starting currents. Where

a three-phase supply is used an alarm shall be provided that will indicate failure of any one of the supply phases. The alarms required in this paragraph shall be both audible and visual and shall be situated in a conspicuous position in the main machinery space or control room from which the main machinery is normally controlled and as may be required by regulation 51.

Interpretation

Steering gear motor circuits obtaining their power supply via an electronic converter, e.g. for speed control, and which are limited to full load current are exempt from the requirement to provide protection against excess current, including starting current, of not less than twice the full load current of the motor. The required overload alarm is to be set to a value not greater than the normal load① of the electronic converter.

Note ①: Normal load is the load in normal mode of operation that approximates as close as possible to the most severe conditions of normal use in accordance with the manufacturers' operating instructions.

Remarks

1.177 Segregation of cargo oil tanks

Conventions (Amend.), Reg.		**SOLAS Chapter II-2, Regulation 4.5.1.1**					
IACS UI Number	**SC188**	**UI** version	**May, 2004/ Rev.1, Nov., 2005/ Rev.2, Feb., 2015/ Rev.3, Jul., 2015**	Date of impleme ntation	**Rev.3, Jan., 2016**	Means of impleme ntation	**Contracted for construction**

Conventions/Codes Requirements

SOLAS Reg. II-2/4.5.1.1

Pump-rooms, containing pumps and their accessories for ballasting those spaces situated adjacent to cargo tanks and slop tanks and pumps for oil fuel transfer shall be considered as equivalent to a cargo pump-room within the context of this regulation provided that such pump-rooms have the same safety standard as that required for cargo pump-rooms.

Interpretation

Pump-rooms intended solely for ballast transfer need not comply with the requirements of regulation II-2/4.5.10. The requirements of regulation II-2/4.5.10 are only applicable to the pump-rooms，regardless of their location, where pumps for cargo, such as cargo pumps, stripping pumps, pumps for slop tanks, pumps for COW or similar pumps are provided. (MSC/Circ.1037 and MSC/Circ. 1120).

"Similar pumps" includes pumps intended for transfer of fuel oil having a flashpoint of less than 60ºC. Pump-rooms intended for transfer of fuel oil having a flashpoint of not less than 60ºC need not comply with the requirements of regulation II-2/4.5.10.

Technical Background

In response to the query from shipyards, Safety Panel agreed to clarify that SOLAS regulation II-2/4.5.10 should apply to the pump rooms containing pumps for transfer of fuel oil having a flashpoint not exceeding 60°C "regardless of their location". Further, to eliminate an inconsistency of threshold of "flashpoint" between UI

SC188 (rev.2) and SOLAS regulation II-2/4.2.1, it was agreed that the threshold of "flashpoint" of the UI should be harmonised with the regulation II-2/4.2.1.

Remarks

1. This UI is to be uniformly implemented from 1 July 2004.
2. Rev.2 of the UI is to be uniformly implemented on ships constructed on or after 1 January 2016.
3. Rev.3 of the UI is to be uniformly implemented on ships constructed on or after 1 January 2016.

1.178 High pressure oil fuel delivery lines on small engines

Conventions (Amend.), Reg.		Regulations **II-2/15.2.9 & 15.2.12** of **SOLAS 1974**					
IACS UI Number	**SC189**	**UI** version	**May 2004**	Date of implementation	**01.07.2004**	Means of implementation	

Conventions/Codes Requirements

15.2.9 All 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 for an alarm to be given of a fuel line failure.

15.2.12 Ships constructed before 1 July 1998 shall comply with the requirements of paragraphs 2.9 to 2.11 not later than 1 July 2003, except that a suitable enclosure on engines having an output of 375 kW or less having fuel injection pumps serving more than one injector may be used as an alternative to the jacketed piping system in paragraph 2.9.

Interpretation

1. Application

1.1 This interpretation applies to ships constructed before 1 July 1998.

1.2 The requirements of SOLAS Regulation II-2/15.2.9 and 15.2.12 are applicable to internal combustion engines installed in any area on board ships irrespective of service and location. These requirements do not apply to gas turbines.

1.3 Engines having a single cylinder, multi-cylinder engines having separate fuel pumps and those having multiple fuel injection pump units are included.

1.4 For the purpose of these regulations lifeboat engines are excluded.

2. Suitable enclosure

2.1 For engines of less than 375 kW where an enclosure is fitted, the enclosure is to have a similar function to jacketed pipes i.e., prevent spray from a damaged injector pipe impinging on a hot surface.

2.2 The enclosure is to completely surround the injection pipes except that existing "cold" engine surfaces may be considered as part of the enclosure.

2.3 All engine parts within the enclosure are to have a surface temperature not exceeding 220 ℃ when the engine is running at its maximum rating.

2.4 The enclosure is to have sufficient strength and cover area to resist the effects of high pressure spray from a failed fuel pipe in service, prevent hot parts from being sprayed and restrict the area that can be reached by leaked fuel. Where the enclosure is not of metallic construction, it is to be made of non-combustible, non oil-absorbing material.

2.5 Screening by the use of reinforced tapes is not acceptable as a suitable enclosure.

2.6 Where leaked oil can reach hot surfaces, suitable drainage arrangements are to be fitted to enable rapid passage of leaked oil to a safe location which may be a drain tank. Leaked fuel flow onto "cold" engine surfaces can be accepted, provided that it is prevented from leaking onto hot surfaces by means of screens or other arrangements.

2.7 Where the enclosure has penetrations to accommodate high pressure fittings, the penetrations are to be a close fit to prevent leakage.
Remarks

1.179 Application of SOLAS Regulation II-1/3-6 (Res MSC.134(76)) and Technical Provisions on Permanent Means of Access (Res MSC.133(76))

Conventions (Amend.), Reg.		SOLAS Regulation II-1/3-6 and Res MSC.133(76)					
IACS UI Number	**SC190**	**UI** version	**04.2004/ Rev.1,04.2019**	Date of implement ation	**01.01.2005/ Rev.1,01.07.2019**	Means of implement ation	**Contracted for construction**

Conventions/Codes Requirements

SOLAS regulation II-1/3-6, section 1
1 Application
1.1 Except as provided for in paragraph 1.2, this regulation applies to oil tankers of 500 gross tonnage and over and bulk carriers, as defined in regulation IX/1, of 20,000 gross tonnage and over, constructed on or after 1 January 2005.
1.2 Oil tankers of 500 gross tonnage and over constructed on or after 1 October 1994 but before 1 January 2005 shall comply with the provisions of Regulation II-1/12-2 adopted by resolution MSC.27(61).

Interpretation

Oil tankers:
Notwithstanding the definition of "oil tanker" in Reg.II-1/2.12, this regulation is only applicable to oil tankers having integral tanks for carriage of oil, which is contained in the definition of oil in Annex 1 of MARPOL 73/78. Independent oil tanks can be excluded.
Reg. II-1/3-6 is not normally applied to FPSO or FSO unless the Administration decides otherwise.

Technical Background

Permanent Means of Access (PMA) specified in the Technical Provision contained in Resolution MSC.133(76) is not specific whether it assumes application to integral cargo oil tanks or also to independent cargo oil tanks. ESP requirements of oil tankers have been established assuming the target cargo oil tanks are integral tanks. The PMA regulated under SOLAS Reg.II-1/3-6 is for overall and close-up inspections as defined in regulation IX/1. Therefore it is assumed that the target cargo oil tanks are those of ESP, i.e. integral cargo tanks.
Reg. II-1/3-6 is applicable to FPSO or FSO if they are subject to the ESP Code as amended.

Remarks

SOLAS Regulation IX/1 and the ESP Code, as amended.

Conventions/Codes Requirements

SOLAS regulation II-1/3-6, section 2.1
2 Means of access to cargo and other spaces
2.1 Each space within **the cargo area** shall be provided with a permanent means of access to enable, throughout the life of a ship, overall and close-up inspections and thickness measurements of the ship's structures to be carried out by the Administration, the company, as defined in regulation IX/1, and the ship's personnel and others as necessary. Such means of access shall comply with the requirements of paragraph 5 and with the Technical provisions for means of access for inspections, adopted by the Maritime Safety Committee by resolution MSC.133(76), as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the Annex other than chapter I.

Interpretation

Forepeak tanks on oil tankers and bulk carriers are to be addressed in the Technical Provisions as follows:
For fore peak tank with a depth of 6 m or more at the center line of the collision bulkhead a suitable means of access

is to be provided for access to critical areas such as the underdeck structure, stringers, collision bulkhead and side shell structure.
Stringers of less than 6 m in vertical distance from the deck head or a stringer immediately above are considered to provide suitable access in combination with portable means of access.
In case the vertical distance between the deck head and stringers, stringers or the lowest stringer and the tank bottom is 6 m or more alternative means of access as defined in paragraph 9 of the Technical Provisions is to be provided.

Technical Background

1) The third paragraph of Preamble of the Technical Provision contained in Annex of Resolution MSC.133(76) defines the ship structure referred to in SOLAS regulation II-1/3-6 on access to and within spaces in the cargo area of oil tankers and bulk carriers. Further it is defined that terms used in the Technical provisions have the same meaning as those defined in the 1974 SOLAS Conventions as amended, and in the ESP Code, as amended.
2) Definition of cargo area in SOLAS Reg. II-2/3.32 is cross-referenced in the ESP Code for oil tankers. However "cargo length area" is used for bulk carriers in the ESP Code for the relevant definition. This difference of terminology caused confusion for defining tanks or spaces, which are to be subject to the Technical provision.
3) Fore peak tanks have unique structural configurations and their means of access is addressed separately form other ballast tanks.

Remarks

SOLAS Reg. II-2/3.32 and the ESP Code.

Conventions/Codes Requirements

SOLAS regulation II-1/3-6, section 2.2
2.2 Where a permanent means of access may be susceptible to damage during normal cargo loading and unloading operations or where it is impracticable to fit permanent means of access, the Administration may allow, in lieu thereof, the provision of movable or portable means of access, as specified in the Technical provisions, provided that the means of attaching, rigging, suspending or supporting the portable means of access forms a permanent part of the ship's structure. All portable equipment shall be capable of being readily erected or deployed by ship's personnel.

Interpretation

1) Movable means of access was envisioned in place of the elevated passageways for the permanent means of access to deck transverse. No specific design has been proposed that is considered appropriate. However a door should be kept open for an innovative approach in the future for developing alternative means of access suitable for the purposes:
Alternate means of access should include but not be limited to such devices as:
.1 hydraulic arm fitted with a stable base
.2 wire lift platform.
.3 staging
.4 Rafting
.5 Robot arm or ROV
.6 Rope access
.7 Portable ladders more than 5 m long shall only be utilized if fitted with a mechanical device to secure the upper end of the ladder
.8 other means of access, approved by and acceptable to the administration.
Means for safe operation and rigging such equipment to and from, and within these spaces, must be clearly demonstrated in the PMA Manual.

2) Subject to acceptance as equivalent by the Administration, an unmanned robot arm, ROV's and dirigibles with necessary equipment of the permanent means of access for overall and close-up inspections and thickness measurements of the deck head structure such as deck transverses and deck longitudinals of cargo oil tanks and ballast tanks. Such robot arm and equipment are to be capable of:
.1 safe operation in ullage space in gas-free environment;
.2 introduction into the place from an access hole of the deck plating.

Technical Background

Elevated passageways in particular for access to deck transverses and upper part of transverse bulkheads and longitudinal bulkheads are subject to structural damages due to sloshing of liquid in the tank, corrosion and fatigue. Such damages would render the effective use of the permanent means of access when needed for survey and inspection of under deck structure.
Innovative approaches in particular a development of robot in place of elevated passageways are encouraged and it is considered worthwhile to provide the functional requirement for the innovative approach.

Remarks

Conventions/Codes Requirements

SOLAS regulation II-1/3-6, section 2.3

2.3 The construction and materials of all means of access and their attachment to the ship's structure shall be to the satisfaction of the Administration. The means of access shall be subject to survey prior to, or in conjunction with, its use in carrying out surveys in accordance with regulation I/10.

Interpretation

Inspection

The PMA arrangements, including portable equipment and attachments, are to be periodically inspected by the crew or competent inspectors as and when it is going to be used to confirm that the PMAs remain in serviceable condition.

Procedures

1. Any authorised person using the PMA shall assume the role of inspector and check for obvious damage prior to using the access arrangements. Whilst using the PMA the inspector is to verify the condition of the sections used by close up examination of those sections and note any deterioration in the provisions. Should any damage or deterioration be found, the effect of such deterioration is to be assessed as to whether the damage or deterioration affects the safety for continued use of the access. Deterioration found that is considered to affect safe use is to be determined as "substantial damage" and measures are to be put in place to ensure that the affected section(s) are not to be further used prior effective repair.

2. Statutory survey of any space that contains PMA shall include verification of the continued effectiveness of the PMA in that space. Survey requirements of the PMA shall not be expected to exceed the scope and extent of the survey being undertaken. If the PMA is found deficient the scope of survey should be extended as found appropriate.

3. Records of all inspections are to be established with specific requirements detailed in the ships Safety Management System. The record is to be readily available to persons using the PMAs and it is recommended that a copy be attached to the PMA Manual. The original records should include as a minimum the date of the inspection, the name and title of the inspector, a confirmation signature, the sections of PMA inspected, verification of continued serviceable condition or details of any deterioration or substantial damage found. A file of permits issued should be maintained for verification.

Technical Background

It is recognised that PMA is subject to deterioration in a long term due to corrosive environment and external forces from ship motions and sloshing of liquid contained in the tank. PMA therefore should be inspected at every opportunity of tank/space entry. The above interpretation is to be contained in a section of the PMA Manual.

Remarks

Conventions/Codes Requirements

SOLAS regulation II-1/3-6, section 3.1

3 Safe access to cargo holds, cargo tanks, ballast tanks and other spaces

3.1 Safe access* to cargo holds, cofferdams, ballast tanks, cargo tanks and other spaces in the cargo area shall be direct from the open deck and such as to ensure their complete inspection. Safe access to double bottom spaces

may be from a pump-room, deep cofferdam, pipe tunnel, cargo hold, double hull space or similar compartment not intended for the carriage of oil or hazardous cargoes.
* Refer to the Recommendations for entering enclosed spaces aboard ships, adopted by the Organization by resolution A.864(20).

Interpretation

Access to a double side skin space of bulk carriers may be either from a topside tank or double bottom tank or from both.

Technical Background

Unless used other purposes, the double side skin space is to be designed as a part of a large U-shaped ballast tank and such space is to be accessed through the adjacent part of the tank, i.e. topside tank or double bottom/bilge hopper tank. Access to the double side skin space from the adjacent part rather than direct from the open deck is justified.

Remarks

Conventions/Codes Requirements

SOLAS regulation II-1/3-6, section 3.2

3.2 Tanks, and subdivisions of tanks, having a length of 35 m or more shall be fitted with at least two access hatchways and ladders, as far apart as practicable. Tanks less than 35 m in length shall be served by at least one access hatchway and ladder. When a tank is subdivided by one or more swash bulkheads or similar obstructions which do not allow ready means of access to the other parts of the tank, at least two hatchways and ladders shall be fitted.

Interpretation

A cargo oil tank of less than 35 m length without a swash bulkhead requires only one access hatch.

Remarks

Conventions/Codes Requirements

SOLAS regulation II-1/3-6, section 3.3

3.3 Each cargo hold shall be provided with at least two means of access as far apart as practicable. In general, these accesses should be arranged diagonally, for example one access near the forward bulkhead on the port side, the other one near the aft bulkhead on the starboard side.

Interpretation

N/A

Remarks

Paragraph 19 of Annex to MSC/Circ.686.

Conventions/Codes Requirements

SOLAS regulation II-1/3-6, section 4.1

4 Ship structure access manual

4.1 A ship's means of access to carry out overall and close-up inspections and thickness measurements shall be described in a Ship structure access manual approved by the Administration, an updated copy of which shall be kept on board. The Ship structure access manual shall include the following for each space in the cargo area:

.1 plans showing the means of access to the space, with appropriate technical specifications and dimensions;

.2 plans showing the means of access within each space to enable an overall inspection to be carried out, with appropriate technical specifications and dimensions. The plans shall indicate from where each area in the space can be inspected;

.3 plans showing the means of access within the space to enable close-up inspections to be carried out, with appropriate technical specifications and dimensions. The plans shall indicate the positions of critical structural areas, whether the means of access is permanent or portable and from where each area can be

inspected;

.4 instructions for inspecting and maintaining the structural strength of all means of access and means of attachment, taking into account any corrosive atmosphere that may be within the space;

.5 instructions for safety guidance when rafting is used for close-up inspections and thickness measurements;

.6 instructions for the rigging and use of any portable means of access in a safe manner;

.7 an inventory of all portable means of access; and

.8 records of periodical inspections and maintenance of the ship's means of access.

Interpretation

As a minimum the English version should be provided

- The ship structure access manual is to contain at least the following two parts:

Part 1: Plans, instructions and inventory required by paragraphs 4.1.1 to 4.1.7 of Reg. II-1/3-6;

Part 2: Form of record of inspections and maintenance, and change of inventory of portable equipment due to additions or replacement after construction

- The part 1 of plans, instruction and inventory is to be approved by the Administration or the Classification Societies recognised by the Administration.

- The part 2 of record of inspections and maintenance, etc. is be approved for its form only at new building.

- The following matters are to be addressed in the ship structure access manual:

1) The access manual should clearly cover scope as specified in the regulations for use by crews, surveyors and port state control officers.
2) Approval / re-approval procedure for Manual, i.e. any changes of the PMA, portable, movable or alternative means of access within the scope of the Regulation and the Technical Provisions are subject to review and approval by the Administration or by the classification societies recognised by the Administration.
3) Verification of PMA be part of safety construction survey for continued effectiveness of the PMA in that space which is subject to the statutory survey.
4) Inspection of PMA by the crew and/or a competent inspector of the company as a part of regular inspection and maintenance.
   (See Interpretation for paragraph 2.3 of SOLAS Reg.II-1/3-6)
5) Actions to be taken if PMA is found unsafe to use.
6) In case of use of portable equipment plans showing the means of access within each space indicating from where and how each area in the space can be inspected;

Model Section 5 "Inspection" of the access manual is to be developed addressing authorised use, permit to use system, inspection, and maintenance and repairs

Remarks

Conventions/Codes Requirements

SOLAS regulation II-1/3-6, section 4.2

4.2 For the purpose of this regulation "critical structural areas" are locations which have been identified from calculations to require monitoring or from the service history of similar or sister ships to be sensitive to cracking, buckling, deformation or corrosion which would impair the structural integrity of the ship.

Interpretation

1) Critical structural areas are to be identified by advanced calculation techniques for structural strength and fatigue performance, if available and feed back from the service history and design development of similar or sister ships.
2) Reference is to be made to the following publications for critical structural areas, where applicable:
   - Oil tankers: Guidance Manual for Tanker Structures by TSCF;
   - Bulk carriers: Bulk Carriers Guidelines for Surveys, Assessment and Repair of Hull Structure by IACS;
   - Oil tankers and bulk carriers: The ESP Code as amended.

Technical Background

These documents contain the relevant information for the present ship types. However identification of critical areas for new double hull tankers and double side skin bulk carriers of improved structural design would have to be made by structural analysis at design stage if available.

Remarks

Conventions/Codes Requirements

SOLAS regulation II-1/3-6, section 5.1

5 General technical specifications

5.1 For access through horizontal openings, hatches or manholes, the dimensions shall be sufficient to allow a person wearing a self-contained air-breathing apparatus and protective equipment to ascend or descend any ladder without obstruction and also provide a clear opening to facilitate the hoisting of an injured person from the bottom of the space. The minimum clear opening shall not be less than 600 mm x 600 mm. When access to a cargo hold is arranged through the cargo hatch, the top of the ladder shall be placed as close as possible to the hatch coaming. Access hatch coamings having a height greater than 900 mm shall also have steps on the outside in conjunction with the ladder.

Interpretation

The minimum clear opening of 600 mm x 600 mm may have corner radii up to 100 mm maximum. The clear opening is specified in MSC/Circ.686 to keep the opening fit for passage of personnel wearing a breathing apparatus. In such a case where as a consequence of structural analysis of a given design the stress is to be reduced around the opening, it is considered appropriate to take measures to reduce the stress such as making the opening larger with increased radii, e.g. 600 x 800 with 300 mm radii, in which a clear opening of 600 x 600 mm with corner radii up to 100mm maximum fits.

Technical Background

The interpretation is based upon the established Guidelines in MSC/Circ.686.

Remarks

Paragraph 9 of Annex of MSC/Circ.686.

Conventions/Codes Requirements

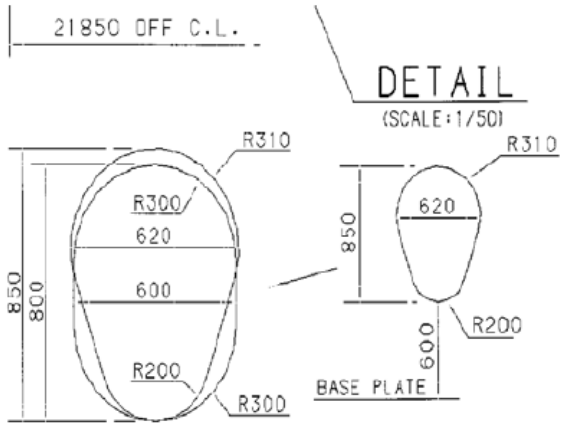
SOLAS regulation II-1/3-6, section 5.2

5.2 For access through vertical openings, or manholes, in swash bulkheads, floors, girders and web frames providing passage through the length and breadth of the space, the minimum opening shall be not less than 600 mm × 800 mm at a height of not more than 600 mm from the bottom shell plating unless gratings or other foot holds are provided.

Interpretation

1) The minimum clear opening of not less than 600 mm x 800 mm may also includes an opening with corner radii of 300 mm.

2) Subject to verification of easy evacuation of injured person on a stretcher the vertical opening 850 mm x 620 mm with wider upper half than 600 mm , while the lower half may be less than 600 mm with the overall height not less than 850 mm is considered acceptable alternative to the traditional opening of 600 mm x 800 mm with corner radii of 300 mm.



3. If a vertical opening is at a height of more than 600 mm steps and handgrips are to be provided. In such arrangement it should be demonstrated that an injured person can be easily evacuated.

Technical Background

The interpretation is based upon the established Guidelines in MSC/Circ.686 and an innovative design in consideration of human body to easily access through the opening.

Remarks

Ref,
Paragraph 11 of Annex to MSC/Circ.686.

Conventions/Codes Requirements

SOLAS regulation II-1/3-6, section 5.3

5.3 For oil tankers of less than 5,000 tonnes deadweight, the Administration may approve, in special circumstances, smaller dimensions for the openings referred to in paragraphs 5.1 and 5.2, if the ability to traverse such openings or to remove an injured person can be proved to the satisfaction of the Administration."

Interpretation

N/A

Remarks

Conventions/Codes Requirements

Technical Provision, resolution MSC.133(76)

Preamble

It has long been recognised that the only way of ensuring that the condition of a ship's structure is maintained to conform with the applicable requirements is for all its components to be surveyed on a regular basis throughout their operational life so as to ensure that they are free from damage such as cracks, buckling or deformation due to corrosion, overloading or contact damage and that thickness diminution is within established limits. The provision of suitable means of access to the hull structure for the purpose of carrying out overall and close-up surveys and inspections is essential and such means should be considered and provided for at the ship design stage.

Ships should be designed and built with due consideration as to how they will be surveyed by flag State inspectors and classification society surveyors during their in-service life and how the crew will be able to monitor the condition of the ship. Without adequate access, the structural condition of the ship can deteriorate undetected and major structural failure can arise. A comprehensive approach to design and maintenance is required to cover the whole projected life of the ship.

Interpretation

N/A

Remarks

Conventions/Codes Requirements

Technical Provision, Resolution MSC.133(76)

Preamble

3rd Paragraph

In order to address this issue, the Organization has developed these Technical provisions for means of access for inspections, intended to facilitate close-up inspections and thickness measurements of the ship's structure referred to in SOLAS regulation II-1/3-6 on Access to and within spaces in the cargo area of oil tankers and bulk carriers.

Interpretation

To refer to the observation of "cargo area" in Reg. II-1/3-6.2.1

Remarks

Conventions/Codes Requirements

Technical Provision, Resolution MSC.133(76)

Definitions

Terms used in the Technical provisions have the same meaning as those defined in the 1974 SOLAS Convention, as amended, and in the ESP Code, as amended.

Interpretation

The following definitions other than those contained in the ESP Code have been used for the interpretations:

1. Rung means the step of vertical ladder or step on the vertical surface.
2. Tread means the step of inclined ladder, or for vertical access opening.
3. Flight of an inclined ladder means the actual stringer length of an inclined ladder. For vertical ladders, it is the distance between the platforms.
4. Stringer means

a. the frame of a ladder; or

b. the stiffened horizontal plating structure fitted on side shell, transverse bulkheads and/or longitudinal bulkheads in the space. For the purpose of ballast tanks of less than 5 m width forming double side spaces, the horizontal plating structure is credited as a stringer that is installed to secure continuous 600 mm or more in width past side longitudinals or stiffeners on side shell or longitudinal bulkhead. Openings in the stringer plating, if any, are to be arranged with safe guard rails or grid cover for not to impair safe passage on the stringer or safe access to each transverse web.

5. vertical ladder means the ladder of which inclined angle is 70 degrees and over up to 90 degrees. Vertical ladder shall not be skewed by more than 2 degrees.
6. Overhead obstructions mean the deck or stringer structure including stiffeners above the means of access.
7. Distance below the deck head means the distance below the plating

Technical Background

The definition of stringer as the horizontal structural member is defined in the context of Section 2 (Wing water ballast tanks of less than 5 m width forming double side space and their bilge hopper sections) of Table 1 – Means of access for oil tankers. This section is also referred to by paragraph 2.8 (Double skin side tanks) of Table 2 – Means of access for bulk carriers.

Remarks

Conventions/Codes Requirements

Technical Provision, Resolution MSC.133(76)

1 Structural members subject to the close-up inspections and thickness measurements of the ship's structure referred to in SOLAS regulation II-1/ 3-6, except those in double bottom spaces, shall be provided with a permanent means of access to the extent as specified in table 1 and table 2, as applicable. For oil tankers and wing ballast tanks of ore carriers, rafting may be used in addition to the specified permanent means of access, provided that the structure allows for its safe and effective use.

Interpretation

The permanent means of access to a space can be credited for the permanent means of access for inspection.

For oil tankers and wing ballast tanks of ore carriers, approved alternative methods may be used in combination with the fitted permanent means of access, provided that the structure allows for its safe and effective use.

Technical Background

The Technical Provisions specify means of access to a space and to hull structure for carrying out overall and close up surveys and inspections. Requirements of PMA to hull structure may not always be suitable for access to a space. However if the PMA for access to a space can also be used for the intended surveys and inspections such PMA can be credited for the PMA for use for surveys and inspections.

Remarks

Conventions/Codes Requirements

Technical Provision, Resolution MSC.133(76)

2 Elevated passageways, where fitted, shall have a minimum width of 600 mm and be provided with toe boards not less than 150 mm high and guard rails over both sides of their entire length. Sloping structure providing part of the access shall be of a non-skid construction. Guard rails shall be 1,000 mm in height and consist of a rail and intermediate bar 500 mm in height and of substantial construction. Stanchions shall be not more than 3 m apart.

Interpretation

1) Guardrail arrangement specified by the provisions of paragraphs (2) and (3) of Reg.25 in ICLL, i.e. guardrails of 1.0 m in height having intermediate rails such that lowest course is not more than 230mm with a 50 mm toe board and other courses are not more than 380mm is to be considered as an alternative to the toe boards and the guard rails specified in TP.2.

2) Permanent means of access of the following configuration is to be considered as an alternative to the elevated passageways: The permanent means of access is integrated in the structure by means of wide longitudinals, on stiffened structural surfaces is to have a minimum clear width of 600 mm. The clear width may be minimum 450 mm for going around vertical webs. Guardrails is to be fitted over the open side of their entire length and is to be of substantial construction, 1,000 mm in height and consist of a rail and an intermediate bar at 500 mm in height. Stanchions is to be not more than 3 m apart

3) Height of toe board is to be measured from the surface of the passage way.

4) Slopping structures are structures that are sloped by 5 or more degrees from horizontal plane when a ship is in upright position at even-keel.

5) Guard rails are to be fitted on the open side. For stand alone passageways guard rails are to be fitted on both sides of these structures.

6) Discontinuous handrails and toe boards in way thereof are allowed provided the gap for both does not exceed 50 mm. The maximum distance between the adjacent stanchions across the handrail gaps is to be 350 mm.

7) Non-skid construction is such that the surface on which personnel walks provides sufficient friction to the sole of boots even the surface is wet and covered with thin sediment.

8) "Substantial construction" is taken to refer to the as designed strength as well as the residual strength during the service life of the vessel. Durability of passageways together with guard rails should be ensured by the initial corrosion protection and inspection and maintenance during services.

9) For guard rails, use of alternative materials such as GRP should be subject to compatibility with the liquid carried in the tank. Non-fire resistant materials should not be used for means of access to a space with a view to securing an escape route at a high temperature.

10) Requirements for resting platforms placed between ladders are equivalent to those applicable to elevated passageways.

Technical Background

1) The toe board fitted to the wide face plate of a deck transverse for an elevated passageway would easily trap sludge and sediment, which would likely cause difficulty for a safe use of the passageway. The interpretation in items 1) and 2) above provides practical solution for a safe use of the permanent means of access.

Remarks

Paragraph 10 of Annex to MSC/Circ.686.

Conventions/Codes Requirements

Technical Provision, Resolution MSC.133(76)

3 Access to elevated passageways and vertical openings from the ship's bottom shall be provided by means of easily accessible passageways, ladders or treads. Treads shall be provided with lateral support for the foot. Where the rungs of ladders are fitted against a vertical surface, the distance from the centre of the rungs to the surface shall be at least 150 mm. Where vertical manholes are fitted higher than 600 mm above the walking level, access shall be

facilitated by means of treads and hand grips with platform landings on both sides

Interpretation

If the vertical opening is at a height of more than 600 mm steps and handgrips are to be provided. In such an arrangement it should be demonstrated that an injured person can be easily evacuated.

Remarks

Conventions/Codes Requirements

Technical Provision, Resolution MSC.133(76)

4 Tunnels passing through cargo holds shall be equipped with ladders or steps at each end of the hold so that personnel may easily cross such tunnels.

Interpretation

the tunnel would mean a shaft tunnel of a ship having a cargo hold aft of engine room.

Remarks

Conventions/Codes Requirements

Technical Provision, Resolution MSC.133(76)

5 Permanent ladders, except for vertical ladders, which are fitted on vertical structures for close-up inspection or thickness measurement, shall be inclined at an angle of less than 70 º. There shall be no obstructions within 750 mm of the face of the inclined ladder, except that in way of an opening this clearance may be reduced to 600 mm. The flights of ladders shall not be more than 9 m in actual length. Resting platforms of adequate dimensions shall be provided. Ladders and handrails shall be constructed of steel or equivalent material of adequate strength and stiffness and securely attached to the tank structure by stays. The method of support and length of stay shall be such that vibration is reduced to a practical minimum. In cargo holds, ladders shall be designed and arranged so that the risk of damage from cargo handling gear is minimized

Interpretation

PMA for access to ballast tanks, cargo tanks and spaces:

For oil tankers:

1) Tanks and subdivisions of tanks having a length of 35 m or more: Inclined ladder or ladders are to be used for one of the access hatchways. For another, a vertical ladder may be used for access to a space where the vertical distance is 6 m or less between the deck and the stringer, between stringers, or between the deck or a stringer and the bottom of the space immediately below the entrance. In such a case where the vertical distance is more than 6 m but not exceeding 9 m vertical ladders comprising one or more ladder linking platforms spaced not more than 6 m apart vertically and displaced to one side of the ladder may also be used for this purpose. The uppermost, entrance section from deck, of the vertical ladder of a tank should be vertical for 2.5 m measured clear of the overhead obstructions and comprises a ladder linking platform. It should be displaced to one side of a vertical ladder. However, the vertical ladder may be down to 1.6 m to 3 m below deck structure if it lands on longitudinal or athwartship permanent means of access fitted within that range.
2) For the other access hatchway of the tank or subdivisions of tanks, an inclined ladder or combination of ladders are to be used for access to the space. The uppermost, entrance section from deck, of the ladder should be vertical for 2.5 m to clear an overhead obstructions and comprises a landing platform and continued with an inclined ladder. However, the vertical ladder may be down to 1.6 m to 3 m below deck structure if it lands on longitudinal or athwartship permanent means of access fitted within that range. The flights of the inclined ladders are not to be more than 9 meters in actual length and normally not more than 6 m in vertical height. The lowermost section of the ladders may be vertical for the vertical distance not exceeding 2.5 m.
3) Tanks less than 35 m in length and served by one access hatchway an inclined ladder or combination of ladders are to be used to the space as specified in 2) above.
4) In double hull spaces of less than 2.5 m width the access to the space may be by means of vertical ladders that comprises one or more ladder linking platforms spaced not more than 6 m apart vertically and displace to one side of the ladder. The uppermost, entrance section, of the vertical ladder of a tank from deck should be vertical for 2.5 m measured clear of the overhead obstructions and comprises a ladder linking platform. However, the vertical ladder may be down to 1.6 m to 3 m below overhead structure if it lands on longitudinal or athwartship permanent means of access fitted within that range. Adjacent sections of ladder should be laterally offset from each other by

at least the width of the ladder. (Paragraph 20 of MSC/Circ.686)

5) Access from deck to a double bottom space may be of vertical ladders through a trunk. The vertical distance from deck to a resting platform, between resting platforms or a resting platform and the tank bottom is not be more than 6 m unless otherwise approved by the Administration.

For bulk carriers:

1) A vertical ladder may be used as a means of access to topside tanks, where the vertical distance is 6 m or less between the deck and the longitudinal means of access in the tank, the stringer or the bottom of the space immediately below the entrance. The uppermost, entrance section from deck, of the vertical ladder of the tank should be vertical for 2.5 m measured clear of the overhead obstructions and comprises a ladder linking platform unless landing on the longitudinal means of access, the stringer or the bottom,
2) Unless allowed in 1) above, an inclined ladder or combination of ladders are to be used for access to a tank or a space where the vertical distance is greater than 6 m between the deck and a stringer immediately below the entrance, between stringers, or between the deck or a stringer and the bottom of the space immediately below the entrance.
3) In case of paragraph 2) above the uppermost, entrance section from deck, of the ladder should be vertical for 2.5 m clear of the overhead obstructions and connected to a landing platform and continued with an inclined ladder. The flights of the inclined ladders are not to be more than 9 meters in actual length. The height of the inclined ladder is normally not to be more than 6m. The lowermost section of the inclined ladder may be vertical for a vertical distance not exceeding 2.5 m.
4) In double side skin spaces of less than 2.5 m width between top side tanks and bilge hopper tanks the access to the space may be by means of vertical ladders that comprises one or more ladder linking platforms spaced not more than 6 m apart vertically and displace to one side of the ladder. Adjacent sections of ladder should be laterally offset from each other by at least the width of the ladder. (Paragraph 20 of MSC/Circ.686).

PMA for inspection of the vertical structure of oil tankers and of double side skin spaces of bulk carriers:

1) Vertical ladders provided for means of access to the space may be used for access for inspection of the vertical structure
2) Vertical ladders that are fitted on vertical structures for inspection should comprise one or more ladder linking platforms spaced not more than 6 m apart vertically and displace to one side of the ladder. Adjacent sections of ladder should be laterally offset from each other by at least the width of the ladder. (Paragraph 20 of MSC/Circ.686).

Obstruction distances

The minimum distance between the inclined ladder face and obstructions, i.e. 750 mm and, in way of openings, 600 mm specified in TP.5 is to be measured perpendicular to the face of the ladder.

Use of spiral ladders

A spiral ladder is considered acceptable as an alternative for inclined ladders. In this regard it is noted that the uppermost 2.5m may continue to be comprised of the spiral ladder and need not change over to vertical ladders. In such a case where it is not practicable to continue the spiral ladder within the uppermost 2.5m underneath the upper entrance such as cross deck or bottom or upper stool, a vertical ladder is to be used for that part. The design is to be according to recongnised International or National standards that are acceptable to the Administration.

Technical Background

1. It is a common practice to use a vertical ladder from deck to the first landing to clear overhead obstructions before continuing to an inclined ladder or a vertical ladder displaced to one side of the first vertical ladder.
2. As provided in paragraph 20 of Annex to MSC/Circ.686, vertical ladders are to comprise one or more ladder linking platforms spaced not more than 6 m apart vertically. Therefore for the access to a space with the vertical distance not more than 6m between stringers or the lowest stringer and the bottom a vertical ladder can also be used safely.
3. For narrow double hull spaces, i.e. less than 2.5 m width inclined ladders or vertical ladders may be installed with linking platforms spaced not more than 6 m apart.

Remarks

For vertical ladders: Paragraph 20 of Annex to MSC/Circ.686.
For spiral stairways: AMSA Marine Orders Part 32, Appendix 17.

Conventions/Codes Requirements

Technical Provision, Resolution MSC.133(76)

6 The width of ladders between stringers shall not be less than 400 mm. The treads shall be equally spaced at a distance apart, measured vertically, of between 250 mm and 300 mm. When steel is used, the treads shall be formed of two square bars of not less that 22 mm by 22 mm in section, fitted to form a horizontal step with the edges pointing upward. The treads shall be carried through the side stringers and attached thereto by double continuous welding. All sloping ladders shall be provided with handrails of substantial construction on both sides fitted at a convenient distance above the treads.

Interpretation

1) Vertical height of handrails is not to be less than [890] mm from the center of the step and two course handrails are to be provided.
2) The requirement of two square bares for treads specified in TP 6 is based upon the specification of construction of ladders in paragraph 3(e) of Annex 1 to Resolution A.272(VIII), which addresses inclined ladders. TP.3 allows for single rungs fitted to vertical surfaces, which is considered for a safe grip. For vertical ladders, when steel is used, the treads should be formed of single square bars of not less than 22 mm by 22 mm for the sake of safe grip.
3) The width of inclined ladders for access to a cargo hold is to be at least 450 mm to comply Australian AMSA Marine Orders Part 32, Appendix 17.
4) The width of inclined ladders other than an access to a cargo hold is to be not less than 400 mm.
5) The minimum width of vertical ladders is to be 350 mm and the pitch of the treads is to be equal and is to be between 250 mm and 300 mm.
6) A minimum climbing clearance in width is to be 600 mm other than the ladders placed between the hold frames.
7) The vertical ladders should be secured at intervals not exceeding 2.5 m apart to prevent vibration.

Technical Background

1. TP.6 is a continuation of TP.5, which addresses inclined ladders. Interpretations for vertical ladders are needed based upon the current standards of IMO, AMSA or the industry.
2. Interpretations 2) and 5) address vertical ladders based upon the current standards.
3. Double square bars for treads become too large for a grip for vertical ladders and single treads facilitate a safe grip.
4. Interpretation 7) is introduced consistently with the requirement and the interpretation of TP 3.

Remarks

1. Annex 1 to Resolution A.272(VIII)
2. Australian AMSA Marine Orders Part 32, Appendix 17
3. ILO Code of Practice "Safety and Health in Dockwork" – Section 3.6 Access to Ship's Holds

Conventions/Codes Requirements

Technical Provision, Resolution MSC.133(76)

7 No free-standing portable ladder shall be more than 5 m long.

Interpretation

N/A

Remarks

Technical Provision, Resolution MSC.133(76)

8 Portable ladders more than 5 m long may only be utilized if fitted with a remotely controlled mechanical device to secure the upper end of the ladder.

Interpretation

A mechanical device such as hooks for securing at the upper end of a ladder is considered as an alternative to a remotely controlled mechanical device stipulated in TP 8 if a movement fore/aft and sideways can be prevented at the upper end of the ladder.

Technical Background

Innovative design is to be accepted if it fits for the functional requirement with due consideration for safe use.

Remarks

Conventions/Codes Requirements

Technical Provision, Resolution MSC.133(76)

9 Movable means of access includes such devices as:

.1 hydraulic arm fitted with a stable base and with local control at the safety cage. The operational conditions should be in accordance with applicable safety requirements of the manufacturer; and

.2 wire lift platform.

Interpretation

Alternative means of access includes but not limited to such devices as:

.1 hydraulic arm fitted with a stable base;

.2 wire lift platform.

.3 staging

.4 Rafting

.5 Robot arm or ROV

.6 Rope access

.7 Portable ladders more than 5 m long may only be utilized if fitted with a mechanical device to secure the upper end of the ladder

.8 other means of access, approved by and acceptable to the Administration.

Technical Background

Innovative design is to be accepted if it fits for the functional requirement with due consideration for safe use.

Remarks

Conventions/Codes Requirements

Technical Provision, Resolution MSC.133(76)

10 For bulk carriers, access ladders to a cargo hold shall be:

.1 where the vertical distance between the upper surface of adjacent decks or between deck and the bottom of the cargo space is not more than 6 m, either a vertical ladder or an inclined ladder; and

.2 where the vertical distance between the upper surface of adjacent decks or between deck and the bottom of the cargo space is more than 6 m, an inclined ladder or ladders, except the uppermost 2.5 m of a cargo space measured clear of overhead obstructions and the lowest 6 m may have vertical ladders, provided that the vertical extent of the inclined.

Interpretation

1) Either a vertical or an inclined ladder or a combination of them may be used for access to a cargo hold where the vertical distance is 6 m or less from the deck to the bottom of the cargo hold.

2) An inclined ladder or a combination of ladders are to be used for access to a cargo hold where the vertical distance is more than 6 m. The uppermost, entrance section, of the ladder directly exposed to a cargo hold should be vertical for 2.5 m measured clear of overhead obstructions, connected to a landing platform and continued with an inclined ladder system. The flights of the inclined ladders are not to be more than 9 meters in actual length. The lowermost section of the combination of ladders may be vertical for the vertical distance not exceeding 6 m, provided that the vertical extent of the inclined ladder or ladders connecting the vertical ladders is not less than 2.5 m.

3) Spiral stairways are considered acceptable as an alternative for providing access to the cargo holds. In this regard it is noted that the uppermost 2.5m and lowermost 6m may continue to be comprised of the spiral stairways and need not change over to vertical ladders. In such a case where it is not practicable to continue the spiral stairways within the uppermost 2.5m underneath the upper entrance such as cross deck or bottom or upper stool, a vertical ladder may be used for that part. The design is to be according to recongnised International or National standards that are acceptable to the Administration.

4) One of the two means of access required by SOLAS Reg. 3-6-3.3 for each cargo hold is to comply with paragraph 10.2 of the technical Provisions.

Technical Background for items 4) and 5)

Present bulk carriers have two independent means of access to a cargo hold, the design of which is in compliance with the Australian requirements. Practical problems have been envisioned for inclined ladders in existing bulk carriers. Inclined ladders including spiral ladders are more prone to cargo damages than staggered vertical ladders

unless properly protected by bulkheads. It is desirable therefore that the PMA for a cargo hold are provided in two different types, one inclined ladder system and the other more robust ladder system that has been proven in existing bulk carriers with a view to minimizing possibility of damages to and consequential loss of means of access to a cargo hold at the same time due to a cargo damage during voyages and/or during cargo handling in ports. Such damages to both of the means of access to a cargo hold result in difficulty in accessing for repairs of the PMA.

Remarks

Australian AMSA Marine Orders Part 32, Appendix 17.

Conventions/Codes Requirements

Table 1 – Means of access for oil tankers, Resolution MSC.133(76)

1 Water ballast tanks, except those specified in the right column, and cargo oil tanks

Access to overhead structure

1.1 For tanks of which the height is 6 m and over, permanent means of access shall be provided in accordance with .1 to .3:

Interpretation

1) Section 1 of Table 1 is also to be applied to void spaces in cargo area, except those spaces covered by Section 2.

2) Where a permanent means of access is provided adjacent to hull structure forming a wall on one side, guard rails are to be fitted on the open side of the permanent means of access (ref. to the degree of slope).

3) The vertical distance below the overhead structure is to be measured from the underside of the main deck plating to the top of the platform of the means of access at a given location.

4) The height of the tank is to be measured at each tank. For a tank the height of which varies at different bays item 1.1 is to be applied to such bays of a tank that have height 6 m and over.

Technical Background

Item 1) The guard rails are to be arranged such that the person on the permanent means of access is well protected on the free edge.

Item 3) If the height of the tank is increasing along the length of a ship the permanent means of access is to be provided locally where the height is above 6 m.

Remarks

Paragraph 10 of Annex to MSC/Circ.686.

Conventions/Codes Requirements

Table 1 – Means of access for oil tankers, Resolution MSC.133(76)

1.1.1 continuous athwartship permanent access arranged at the transverse bulkheads and at every deck transverse, at a minimum of 1.8 m to a maximum of 2.5 m below the overhead structure. If the access is fitted on the side of the unobstructed side of the web plating, then lightening holes of at least 300 mm diameter shall be fitted in the web plating, providing access adjacent to both sides of each tripping bracket

Interpretation

1) Permanent means of access for inspection specified in 1.1.1 is to be provided for transverse bulkheads of tanks on stiffened surface.

2) When deck stiffeners are fitted outside of the tank and bulkhead connection to deck is plate to plate with no stiffeners or brackets inside the tank, then a continuous athwartship access may not be required.

3) Also, continuous athwartship permanent access may not be fitted at deck transverses for an overhead structure where deck stiffeners and transverses fitted on the out side surface of deck plating of the tank.

4) In such a case where the depth of deck transverses is less than 1800mm for design scantling and the athwartship permanent access is to be fitted to the deck transverses the required distance of 1.8 to 2.5m below the overhead structure is provided above the permanent means of access by an extension.

5) Alternatively the depth of deck transverses is to be extended so that the required distance below overhead structure is provided above the extended face plate of the deck transverses.

(Operational safety measures should be detailed in an access manual.)

Technical Background

1. Interpretation item 2): The PMA is intended for access to internal structures. In such a case where internal structures are entirely outside of the tank PMA becomes superfluous as long as deck plating and upper part of bulkhead plating are accessible outside of the tank.

2. The longitudinal permanent means of access in the upper part of the longitudinal bulkheads allows overall

inspection of deck transverses and close up surveys of their potential critical areas in the vicinity of their ends.

Remarks

Conventions/Codes Requirements

Table 1 – Means of access for oil tankers, Resolution MSC.133(76)

1.1.2 at least one longitudinal permanent means of access at a minimum of 1.8 m to a maximum of 2.5 m below the overhead structure. Where the longitudinal bulkhead contains attached framing, the access shall be provided at that side; and

Interpretation

1) Longitudinal permanent means of access is to be provided on each side of the tank if an alternative arrangement is applied in place of the continuous athwartship permanent means of access at every deck transverse.

2) For tanks with no internal stiffeners arranged in top of the longitudinal bulkheads on either side or in deck, no longitudinal permanent access are to be provided unless required by item 1.1.3 of Table 1. This will typically apply to product tankers with webframes on deck and corrugated longitudinal bulkhead.

3) In case there are vertical webs and stiffeners on longitudinal bulkheads both sides within the tank a longitudinal permanent means of access is to be provided to each side of the tank.

Technical Background

Critical areas for ESP are normally found in load bearing internals. In a tank with flush internal surfaces without load bearing internals condition of plates of the flush surfaces can be assessed from the easily accessible locations outside the tank. It is therefore considered that the permanent means of access would be of little use for the intended inspections.

However those longitudinal permanent means of access suggested above as an alternative arrangement provides sufficient overall inspection of under deck structure, deck transverses and vertical webs in way of the permanent means of access and is considered efficient for the intended purposes.

Remarks

Conventions/Codes Requirements

Table 1 – Means of access for oil tankers, Resolution MSC.133(76)

1.1.3 access between the arrangements specified in .1 and .2 and from the main deck to either .1 or .2

Interpretation

Means of access to tanks may be used for access to the permanent means of access for inspection.

Technical Background

As a matter of principle, in such a case where the means of access can be utilised for the purpose of accessing structural members for inspection there is no need of duplicated installation of the PMA.

Remarks

Conventions/Codes Requirements

Table 1 – Means of access for oil tankers, Resolution MSC.133(76)

Access to vertical structures

1.3 For tanks of which the height is 6 m and over, containing internal structures, permanent means of access shall be provided to each transverse web.

Interpretation

1) ‘Transverse web” includes vertical structures of non-watertight transverse bulkheads (swash bulkheads).

2) A combination of vertical ladders on transverse webs and alternate means as may be provided for small vessels.

4) Center and side struts (cross ties) are included as part of the ring web frame and PMA is to be provided for struts if they are at 6 m or more above the tank bottom to the extent necessary for visual inspection at a reasonable vicinity to toes of end brackets.

5) For tanks of which the height is 6 m and over, containing internal structures such as longitudinals and transverse webs, permanent means of access are to be provided to the transverse webs by means of longitudinal permanent means of access which are integrated in the structural member, which are to be in alignment with horizontal girders of transverse bulkheads.

Technical Background

1. Though the types of permanent means of access to each transverse web are not specified in paragraph 1.3 of Table 1, inclined ladders or vertical ladders would meet the requirement. In large tankers inspection of all transverse webs by climbing up and down the ladders would not be an efficient way of overall and close-up. Alternative arrangement by use of longitudinal permanent means of access is preferred. They are to be provided in alignment with horizontal girders of transverse bulkheads for structural continuation and appropriate distance between them.
2. Where the longitudinal permanent means of access is impracticable for smaller vessels a combination of vertical ladders on transverse webs and alternate means as may be provided.
3. The longitudinal permanent means of access using wider longitudinals at an appropriate distance apart through transverse webs provide sufficient access for overall inspection and sampling and, if necessary, alternative means of access or portable means of access can be used to access the remaining part of the transverse webs. Such arrangement is considered an acceptable alternative

Remarks

Conventions/Codes Requirements

Table 1 – Means of access for oil tankers, Resolution MSC.133(76)

1.4 For tanks of which the height is less than 6 m, raft or portable means may be utilized in lieu of the permanent means of access.

Interpretation

Alternative means of access may also be used in place of raft.

Remarks

Conventions/Codes Requirements

Table 1 - Means of access for oil tankers, Resolution MSC.133(76)

FOREPEAK TANKS

Interpretation

Fore peak tanks with a depth of 6 m or more at the center line of the collision bulkhead shall be provided with a suitable means of access for access to critical areas such as the deck structure, overhead structure of stringers and side shell structure.
Stringers of less than 6 m in vertical distance from the overhead structure are considered to provide suitable access in combination with portable means of access.
In case the vertical distance between deck structure and the uppermost stringer or stringers are 6 m or more alternative means of access is to be provided.

Technical Background

The unique structural configurations and feed back information form service record as well as the present requirements for coating and surveys has been taken into account for identifying the types of damages and locations for enabling risk based inspections.

Remarks

Conventions/Codes Requirements

Table 1 – Means of access for oil tankers, Resolution MSC.133(76)

Wing water ballast tanks less than 5 m width forming double side spaces and their bilge hopper sections

Access to the overhead structure

2.1 Where the vertical distance between horizontal upper stringer and deck head exceeds 6 m, one continuous permanent means of access shall be provided for the full length of the tank with a means to allow passing through transverse swash bulkheads installed a minimum of 1.8 m to a maximum of 2.5 m from the overhead structure with a vertical access ladder at each end and mid-span of tank

Interpretation

1) Section 2 of Table 1 is also to be applied to wing tanks designed as void spaces.
2) For a tank the vertical distance between horizontal upper stringer and deck head of which varies at different sections item 2.1 is to be applied to such sections that falls under the criteria.
3) The continuous permanent means of access may be a wide longitudinal, which provides access to critical details

on the opposite side by means of platforms as necessary on webframes. In case the vertical opening of the web is located in way of the open part between the wide longitudinal and the longitudinal on the opposite side, platforms shall be provided on both sides of the web to allow safe passage through the web.

Technical Background

Item 1) Reg. II-1/3-6.2.1 requires each space within the cargo area shall be provided with a permanent means of access. Though void spaces are not addressed in the technical provisions contained in Resolution MSC.133(76) it is arguable whether PMA is not required in void spaces. PMA or portable means of access are necessary arrangement to facilitate inspection of the structural condition of the space and the boundary structure. Therefore the requirements of Section 2 of Table 1 is to be applied to double hull spaces even designed as void spaces.
Item 2) The interpretation of varied tank height in item 1 of Table 1 is applied to the vertical distance between horizontal upper stringer and deck head for consistency.

Remarks

Conventions/Codes Requirements

Table 1 – Means of access for oil tankers, Resolution MSC.133(76)

2.2 For bilge hopper sections of which the vertical distance from baseline to the upper knuckle point is 6 m and over, one longitudinal permanent means of access shall be provided for the full length of the tank. It shall be accessible by vertical permanent means of access at both ends of the tank

Interpretation

1) The longitudinal continuous permanent means of access may be installed at a minimum 1.6 m to a maximum 3 m from top of bilge hopper section. When extension platform is arranged on the web, allowing hands on access to critical areas in upper knuckle point of bilge section, then the requirement to vertical ladder for access to these, as given in 2.5.1, will not apply.
2) Alternatively the longitudinal continuous permanent means of access may be installed at a minimum of 1.2 m to a maximum of 1.8 m below the top of the clear opening of the web ring in way of the knuckle point allowing a use of portable means of access to reach identified structural critical areas.
3) The longitudinal continuous permanent means of access may otherwise be installed at a location within 6 m from the knuckle point if used in combination with alternative methods to gain an access to the knuckle point.
4) Permanent means of access between the longitudinal continuous permanent means of access and the bottom of the space is to be provided.
5) The height of a bilge hopper tank located outside of the parallel part of vessel is to be taken as the maximum of the clear vertical distance measured from the bottom plating to the hopper plating of the tank.
6) The foremost and aftmost bilge hopper ballast tanks with raised bottom, of which the height is 6 m and over, a combination of transverse and vertical PMA for access to the upper knuckle point for each transverse web is to be accepted in place of the longitudinal permanent means of access.

Technical Background

Interpretation 4): The bilge hopper tanks at fore and aft of cargo area narrow due to raised bottom plating and the actual vertical distance from the bottom of the tank to hopper plating of the tank is more appropriate to judge if a portable means of access could be utilized for the purpose.
Interpretation 5): in the foremost or aftmost bilge hopper tanks where the vertical distance is 6 m or over but installation of longitudinal permanent means of access is not practicable permanent means of access of combination of transverse and vertical ladders provides an alternative means of access to the upper knuckle point.

Remarks

Conventions/Codes Requirements

Table 1 – Means of access for oil tankers, Resolution MSC.133(76)

2.3 Where the vertical distance referred to in 2.2 is less than 6 m, portable means of access may be utilised in lieu of the permanent means of access. To facilitate the operation of the portable means of access, in-line openings in horizontal stringers should be provided. The openings should be of an adequate diameter and should have suitable protective railings.

Interpretation

N/A

Remarks

Conventions/Codes Requirements

Table 1 – Means of access for oil tankers, Resolution MSC.133(76)

2.4 Whenever practicable, the distance between the overhead structure and the uppermost longitudinal stringer and between the longitudinal stringers should not exceed 6 m.

Interpretation

1) Longitudinal permanent means of access installed in accordance with paragraph 2.1 in the upper most space and at a vertical distance not exceeding 6 m within the remaining part of the double side spaces provide access to the overhead structure as well as to the vertical structure. Plated stringers are to be provided in alignment with horizontal girders of transverse bulkheads for structural continuity.The maximum distance between the deck head and the uppermost plated stringer and between the longitudinal plated stringers in any case is not to exceed 9 m.

Stringer in the context of Section 2 of Table 1 is taken to be a horizontal structure that is extended from side shell plating to a longitudinal bulkhead and provides passage of clear width of 600 mm or more. It may be a plating construction with stiffeners or a build up construction with wide longitudinals, which serves as longitudinal permanent means of access.

Technical Background

1) The functional purposes of the permanent means of access are to enable to monitor the condition of the ship and to facilitate close-up inspections and thickness measurements of the ship's structure, The plating stringers or the build-up stringers installed not exceeding 6m apart vertically provide access to underdeck structures and overhead and vertical structures above the permanent means of access, thus satisfy the technical provision of items 2.1, 2.4 and 2.5 of Table 1.

Remarks

Conventions/Codes Requirements

Table 1 – Means of access for oil tankers, Resolution MSC.133(76)

Access to the vertical structure

2.5 Vertical permanent means of access shall be provided to each transverse web in the following cases where the vertical distance is 6 m and over:

.1 from baseline to the upper knuckle point of the bilge hopper section;

.2 from the upper knuckle point of the bilge hopper section to main deck where no horizontal stringers are provided; and

.3 between horizontal stringers.

Interpretation

1) PMA for inspection of the vertical structure: (See the interpretation of stringers item 2.4 of Table 1)

2) Means for facilitating a use of a portable means of access for inspection of the upper part of transverse web is to be provided, where the vertical distance defined in paragraph 2.5 is less than 6 m and vertical PMA is not provided.

3) Vertical ladders that are fitted on vertical structures for inspection should comprise one or more ladder linking platforms spaced not more than 6 m apart vertically and displace to one side of the ladder. Adjacent sections of ladder should be laterally offset from each other by at least the width of the ladder. (Paragraph 20 of MSC/Circ.686) (Extract from the interpretation of TP.5)

4) Continuous longitudinal permanent means of access as required for deck area in 2.1 is acceptable as alternative to vertical means of access on every vertical web when distance between the longitudinal continuous permanent means is not exceeding 6 m.

5) The continuous longitudinal permanent means of access are to provide access to critical details on the opposite side by means of platforms fitted on web frames as necessary In case the vertical opening of the web is located in way of the open part between the longitudinal permanent means of access and a longitudinal on the other side of the space, platforms are to be provided on both sides of the web to allow safe passage through the web.

6) The height of a bilge hopper tank located outside of the parallel part of vessel is to be taken as the maximum of the clear vertical height measured from the bottom plating to the hopper plating of the tank.

Technical Background

1) As provided in the interpretation for paragraph 2.4 of Table 1, the longitudinal permanent means of access described therein facilitate access from the stringers to critical areas of vertical structure, i.e. transverse web and joining parts of longitudinals. Portable means of access is to be used for the higher area between the adjacent longitudinal permanent means of access which are spaced not exceeding 6m apart.
2) The interpretation of paragraph 2.5.above is in the same vein of the alternative means of access for paragraph 1.3 of Table 1, i.e. the horizontal permanent means of access in place of inclined or vertical ladders to transverse webs.

Remarks

Conventions/Codes Requirements

Table 1 – Means of access for oil tankers, Resolution MSC.133(76)

2.6 Access holes within 600 mm of the stringer shall be provided in each transverse web/swash bulkhead above each stringer and tank base

Interpretation

If the vertical opening is at a height of more than 600 mm steps and handgrips are to be provided. In all cases it should demonstrated that an injured person can be easily evacuated.

Technical Background

SOLAS Reg. II-1/3-6.5.2 allows vertical openings higher than 600 mm from the bottom shell plating if gratings or other foot holds are provided. The above interpretation aimed at a consistency with the Regulation.

Remarks

Conventions/Codes Requirements

Table 1 – Means of access for oil tankers, Resolution MSC.133(76)

2.7 In the case where the vertical distance referred to in 2.5 is less than 6 m, portable means may be utilised in lieu of the permanent means of access.

Interpretation

The interpretation of paragraph 2.2 of Table 1 refers.

Remarks

Conventions/Codes Requirements

Table 2 – Means of access for bulk carriers, Resolution MSC.133(76)

Arrangement of means of access for single side skin bulk carriers as written in the Technical Provisions

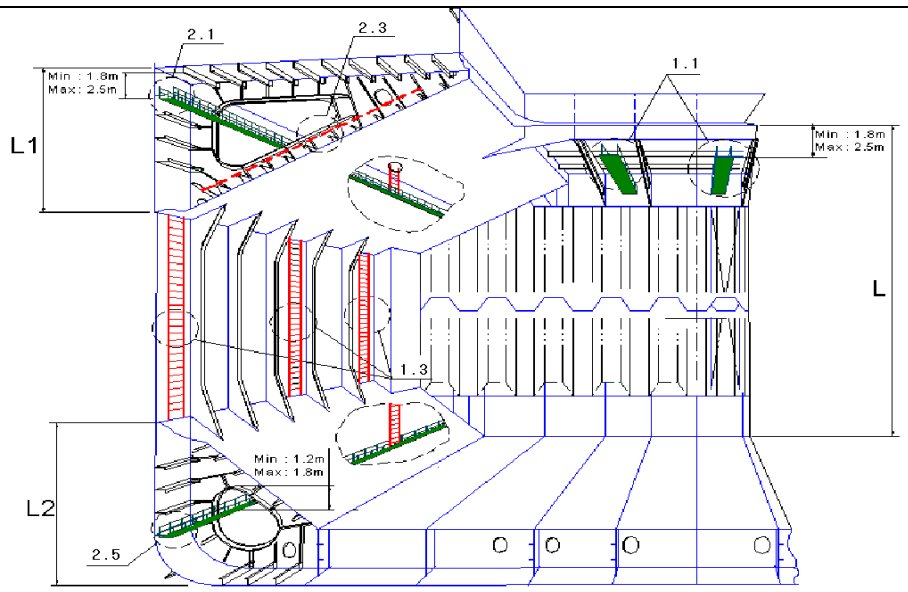


Table 2 – Means of access for bulk carriers, Resolution MSC.133(76)

1 Cargo holds

Access to overhead structure

1.1 At least 3 permanent means of access shall be fitted to provide access to the overhead structure at both sides of the cross deck and in the vicinity of the centreline. Each means of access shall be accessible from the cargo hold access or directly from the main deck and installed at a minimum of 1.8 m to a maximum of 2.5 m below the deck.

Interpretation

1) Interconnected means of access under the cross deck for access to three locations at both sides and in the vicinity of the centerline is acceptable as the three means of access.

2) Permanent means of access fitted at three separate locations accessible independently, one at each side and one in the vicinity of the centerline is acceptable.

3) Athwartship permanent means of access fitted on transverse bulkheads from side to side at a minimum 1.6 m to a maximum 3 m below the deck head is considered as an alternative to the requirement.

4) Access to the means of access to overhead structure of cross deck may be via the upper stool.

5) Attention is to be paid to the structural strength where any access opening is provided in the main deck or cross deck.

6) The requirements for bulk carrier cross deck structure is also considered applicable for ore carriers.

Technical Background

Pragmatic arrangements of the PMA are provided

Remarks

Conventions/Codes Requirements

Table 2 – Means of access for bulk carriers, Resolution MSC.133(76)

1.2 Alternatively, movable means of access may be utilized for access to the overhead structure of cross deck if its vertical distance is 17 m or less above the tank top.

Interpretation

1) The movable means of access to the underdeck structure of cross deck need not necessarily be carried on board the vessel. It is sufficient if it is made available when needed.

2) The requirements for bulk carrier cross deck structure is also considered applicable for ore carriers.

Remarks

Conventions/Codes Requirements

Table 2 – Means of access for bulk carriers, Resolution MSC.133(76)

Access to vertical structures

1.3 Permanent means of vertical access shall be provided in all cargo holds and built into the structure to allow for

an inspection of a minimum of 25 % of the total number of hold frames port and starboard equally distributed throughout the hold including at each end in way of transverse bulkheads. But in no circumstance shall this arrangement be less than 3 permanent means of vertical access fitted to each side (fore and aft ends of hold and mid-span). Means to readily secure safety cages to the permanent means of access shall be provided. Permanent means of vertical access fitted between two adjacent hold frames is counted for an access for the inspection of both hold frames. A means of portable access may be used to gain access over the sloping plating of lower hopper ballast tanks.

Interpretation

1) For practical reasons a single vertical ladder (not staggered ones) is accepted for the inspection of the hold side frames in a single side skin construction.
2) The minimum width of vertical ladders for access to hold frames is to be 350 mm measured between stringers and the maximum pitch of the treads is to be 350 mm..
3) For double side skin bulk carrier no vertical ladders for inspection of the cargo hold surfaces are to be provided. Inspection of this structure is to be provided from within the double hull space.
4) Safety cage in the context of item 1.3 of Table 1 is such that is to be arranged to protect surveyor/crews from falling form the ladder and provides rest during inspection. For example a safety harness worn by the personnel during the inspection is an acceptable equivalence. If safety harness is to be used, means should be provided for connecting the safety harness in suitable places in a practical way.

Technical Background

Item 4) Permanent installation of a safety cage is not practicable due to high risks of cargo damages. Portable one for use by individuals is to be envisioned. Alternatively safety harness may be used.
The maximum pitch of the treads of 350 mm is applied with a view to reducing trapping cargoes

Remarks

Conventions/Codes Requirements

Table 2 – Means of access for bulk carriers, Resolution MSC.133(76)

1.4 In addition, portable or movable means of access shall be utilized for access to the remaining hold frames up to their upper brackets and transverse bulkheads

Interpretation

Portable, movable or alternative means of access also is to be applied to corrugated bulkheads.

Remarks

Conventions/Codes Requirements

Table 2 – Means of access for bulk carriers, Resolution MSC.133(76)

2 Ballast tanks

Interpretation

Refer to the Observation for paragraph 2.1 of Reg. II-1/3-6.

Remarks

Conventions/Codes Requirements

Table 2 – Means of access for bulk carriers, Resolution MSC.133(76)

Top side tanks

2.1 For each topside tank of which the height is 6 m and over, one longitudinal continuous permanent means of access shall be provided along the side shell webs and installed at a minimum of 1.8 m to a maximum of 2.5 m below deck with a vertical access ladder in the vicinity of each access to that tank.

Interpretation

One continuous longitudinal permanent means of access may be provided along the side shell webs and installed at a minimum of 1.6 m to a maximum of 3 m below deck with a vertical access ladder in the vicinity of each access to that tank.

Technical Background

Structural configuration may require flexibility of the location of longitudinal continuous permanent means of access
Remarks
Conventions/Codes Requirements
Table 2 – Means of access for bulk carriers, Resolution MSC.133(76) 2.2 If no access holes are provided through the transverse ring webs within 600 mm of the tank base and the web frame rings have a web height greater than 1 m in way of side shell and sloping plating, then step rungs/grab rails shall be provided to allow safe access over each transverse web frame ring.
Interpretation
N/A
Remarks
Conventions/Codes Requirements
Table 2 – Means of access for bulk carriers, Resolution MSC.133(76) 2.3 Three permanent means of access, fitted at the end bay and middle bay of each tank, shall be provided spanning from tank base up to the intersection of the sloping plate with the hatch side girder. The existing longitudinal structure may be used as part of this means of access.
Interpretation
If the longitudinal structures on the sloping plate are fitted outside of the tank a means of access is to be provided.
Remarks
Conventions/Codes Requirements
Table 2 – Means of access for bulk carriers, Resolution MSC.133(76) 2.4 For topside tanks of which the height is less than 6 m, a portable means may be utilized in lieu of the permanent means of access.
Interpretation
N/A
Remarks
Conventions/Codes Requirements
Table 2 – Means of access for bulk carriers, Resolution MSC.133(76) **Bilge hopper tanks** 2.5 For each bilge hopper tank of which the height is 6 m and over, one longitudinal continuous permanent means of access shall be provided along the side shell webs and installed at a minimum of 1.2 m to a maximum of 1.8 m below the top of the clear opening of the web ring with a vertical access ladder in the vicinity of each access to the tank.
Interpretation
1) Permanent means of access between the longitudinal continuous permanent means of access and the bottom of the space is to be provided. 2) The longitudinal continuous permanent means of access may be alternatively located through the upper web plating above the clear opening of the web ring, when this arrangement facilitates more suitable inspection of identified structurally critical areas. A wide longitudinal frame of at least 600 mm clear width may used for the purpose of the longitudinal continuous permanent means of access. 3) The height of a bilge hopper tank located outside of the parallel part of vessel is to be taken as the maximum of the clear vertical height measured from the bottom plating to the hopper plating of the tank. 4) It should be demonstrated that portable means for inspection can deployed and made readily available in the areas where needed. 5) For double side skin bulk carriers the longitudinal continuous permanent means of access may be installed at a location within 6 m from the knuckle point if used in combination with alternative methods to gain an access to the

knuckle point.

Technical Background

The functional requirement to get access to the identified critical area can be satisfied by the alternative arrangement given in item 5)

Remarks

Conventions/Codes Requirements

Table 2 – Means of access for bulk carriers, Resolution MSC.133(76)

2.6 If no access holes are provided through the transverse ring webs within 600 mm of the tank base and the web frame rings have a web height greater than 1 m in way of side shell and sloping plating, then step rungs/grab rails shall be provided to allow safe access over each transverse web frame ring.

Interpretation

N/A

Remarks

Conventions/Codes Requirements

Table 2 – Means of access for bulk carriers, Resolution MSC.133(76)

2.7 For bilge hopper tanks of which the height is less than 6 m, a portable means may be utilized in lieu of the permanent means of access.

Interpretation

1) The interpretation of paragraph 2.7 of Table 1 refers.

2) It should be demonstrated that a portable means can deployed and made readily available for inspection in the areas where needed.

Remarks

Conventions/Codes Requirements

Table 2 – Means of access for bulk carriers, Resolution MSC.133(76)

Double side skin tanks

2.8 Permanent means of access shall be provided in accordance with the applicable sections of table 1

Interpretation

N/A

Remarks

Conventions/Codes Requirements

Table 2 - Means of access for bulk carriers, Resolution MSC.133(76)

FOREPEAK TANKS

Interpretation

Fore peak tanks with a depth of 6 m or more at the center line of the collision bulkhead shall be provided with a suitable means of access for access to critical areas such as the deck structure, overhead structure of stringers and side shell structure.

Stringers of less than 6 m in vertical distance from the overhead structure are considered to provide suitable access in combination with portable means of access.

In case the vertical distance between deck structure and the uppermost stringer or stringers are 6 m or more alternative means of access is to be provided.

Technical Background

The unique structural configurations and feed back information form service record as well as the present requirements for coating and surveys has been taken into account for identifying the types of damages and locations

for enabling risk based inspections.
Remarks
Conventions/Codes Requirements
Table 2 – Means of access for bulk carriers, Resolution MSC.133(76) **Footnote** For ore carriers, permanent means of access in wing ballast tanks shall be provided in accordance with the applicable section of table 1.
Interpretation
The requirements to Ore Carrier wing tanks arranged as void spaces should be as for wing ballast tanks.
Technical Background
The wing tanks are prone to damages even when arranged as void space, rafting is not an option and permanent means of access are needed to monitor the structural condition.
Remarks

1.180 Application of amended SOLAS regulation II-1/3-6 (resolution MSC.151(78)) and revised Technical provisions for means of access for inspections (resolution MSC.158(78))

Conventions (Amend.), Reg.		**SOLAS Regulation II-1/3-6 and Res MSC.158(78)**					
IACS UI Number	**SC191**	**UI** version	Nov. 2004/ Rev. 1, May 2005/ Rev. 2, Oct. 2005 Corr. Dec. 2005 Rev. 3, Mar. 2006/ Rev.4&Corr.1,Sep.，2011&Nov.，2011/ Rev.5, May. 2013/ Rev.6, May,2014/ Corr.1, Sep.,2014/ Rev.7, Jan., 2015/ Corr.1, Jun.,2016/ Corr.2, Dec.,2016/ Corr.3, Jan.,2017/ Rev.8, Apr.,2019	Date of implement ation	01.01.2005/ Rev. 1, 01.07.2005/Rev. 2 & Corr., 01.05.2006&01.10. 2006/01,07，2012（Rev.4&Corr.）/ Rev.5,Jun.24,2013/ Rev.6, Jul.1,2015/ Rev.7,Jul.1,2016/ Rev.8,Jul.1,2019	Means of implement ation	**Contracted for construction**

Conventions/Codes Requirements
SOLAS regulation II-1/3-6, section 1 1 Application 1.1 Except as provided for in paragraph 1.2, this regulation applies to oil tankers of 500 gross tonnage and over and bulk carriers, as defined in regulation IX/1, of 20,000 gross tonnage and over, constructed on or after 1 January 2006. 1.2 Oil tankers of 500 gross tonnage and over constructed on or after 1 October 1994 but before 1 January 2005 shall comply with the provisions of Regulation II-1/12-2 adopted by resolution MSC.27(61).
Interpretation
Oil tankers: This regulation is only applicable to oil tankers having integral tanks for carriage of oil in bulk, which is contained in the definition of oil in Annex 1 of MARPOL 73/78. Independent oil tanks can be excluded. Regulation II-1/3-6 is not normally applied to FPSO or FSO unless the Administration decides otherwise.
Technical Background
Means of Access (MA) specified in the Technical provisions contained in resolution MSC.158(78) are not specific with respect to the application to integral cargo oil tanks or also to independent cargo oil tanks. ESP requirements of oil tankers have been established assuming the target cargo oil tanks are integral tanks. The MA regulated under SOLAS regulation II-1/3-6 is for overall and close-up inspections as defined in regulation IX/1.Therefore it is assumed that the target cargo oil tanks are those of ESP, i.e. integral cargo tanks. Regulation II-1/3-6 is applicable to FPSO or FSO if they are subject to the scope of ESP as contained in the ESP

Code, as amended.

Remarks

SOLAS Regulation IX/1 and the ESP Code, as amended.

Conventions/Codes Requirements

SOLAS regulation II-1/3-6, section 2.1

2.1 Each space shall be provided with a permanent means of access to enable, throughout the life of a ship, overall and close-up inspections and thickness measurements of the ship's structures to be carried out by the Administration, the company, as defined in regulation IX/1, and the ship's personnel and others as necessary. Such means of access shall comply with the requirements of paragraph 5 and with the Technical provisions for means of access for inspections, adopted by the Maritime Safety Committee by resolution MSC.133(76), as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the Annex other than chapter 1.

Interpretation

Each space for which close-up inspection is not required such as fuel oil tanks and void spaces forward of cargo area, may be provided with a means of access necessary for overall survey intended to report on the overall conditions of the hull structure.

Conventions/Codes Requirements

SOLAS regulation II-1/3-6, section 2.2

2.2 Where a permanent means of access may be susceptible to damage during normal cargo loading and unloading operations or where it is impracticable to fit permanent means of access, the Administration may allow, in lieu thereof, the provision of movable or portable means of access, as specified in the Technical provisions, provided that the means of attaching, rigging, suspending or supporting the portable means of access forms a permanent part of the ship' structure. All portable equipment shall be capable of being readily erected or deployed by ship's personnel.

Interpretation

Some possible alternative means of access are listed under paragraph 3.9 of the Technical Provisions for means of access for inspection (TP). Always subject to acceptance as equivalent by the Administration, alternative means such as an unmanned robot arm, ROV's and dirigibles with necessary equipment of the permanent means of access for overall and close-up inspections and thickness measurements of the deck head structure such as deck transverses and deck longitudinals of cargo oil tanks and ballast tanks, are to be capable of:

- safe operation in ullage space in gas-free environment;
- introduction into the place directly from a deck access.

When considering use of alternative means of access as addressed by paragraph 3.9 of the TP, the Appendix to this Interpretation (Rev. 1) is to be applied.

When considering use of alternative means of access as addressed by paragraph 3.9 of the TP, refer to IACS Recommendation No.91 "Guidelines for Approval/Acceptance of Alternative Means of Access" (Rev. 2).

Technical Background

Innovative approaches, in particular a development of robot in place of elevated passageways, are encouraged and it is considered worthwhile to provide the functional requirement for the innovative approach.

Remarks

Conventions/Codes Requirements

SOLAS regulation II-1/3-6, section 2.3

2.3 The construction and materials of all means of access and their attachment to the ship' structure shall be to the satisfaction of the Administration. The means of access shall be subject to survey prior to, or in conjunction with, its use in carrying out surveys in accordance with regulation I/10.

Interpretation

Inspection

The MA arrangements, including portable equipment and attachments, are to be periodically inspected by the crew or competent inspectors as and when it is going to be used to confirm that the MAs remain in serviceable condition.
Procedures
1. Any Company authorised person using the MA shall assume the role of inspector and check for obvious damage prior to using the access arrangements. Whilst using the MA the inspector is to verify the condition of the sections used by close up examination of those sections and note any deterioration in the provisions. Should any damage or deterioration be found, the effect of such deterioration is to be assessed as to whether the damage or deterioration affects the safety for continued use of the access.
Deterioration found that is considered to affect safe use is to be determined as "substantial damage" and measures are to be put in place to ensure that the affected section(s) are not to be further used prior effective repair.
2. Statutory survey of any space that contains MA shall include verification of the continued effectiveness of the MA in that space. Survey of the MA shall not be expected to exceed the scope and extent of the survey being undertaken. If the MA is found deficient the scope of survey is to be extended if this is considered appropriate.
3. Records of all inspections are to be established based on the requirements detailed in the ships Safety Management System. The records are to be readily available to persons using the MAs and a copy attached to the MA Manual. The latest record for the portion of the MA inspected is to include as a minimum the date of the inspection, the name and title of the inspector, a confirmation signature, the sections of MA inspected, verification of continued serviceable condition or details of any deterioration or substantial damage found. A file of permits issued is to be maintained for verification.

Technical Background

It is recognised that MA may be subject to deterioration in the long term due to corrosive environment and external forces from ship motions and sloshing of liquid contained in the tank. MA therefore is to be inspected at every opportunity of tank/space entry. The above interpretation is to be contained in a section of the MA Manual.

Remarks

Conventions/Codes Requirements

SOLAS regulation II-1/3-6, section 3.1

3 Safe access to cargo holds, cargo tanks, ballast tanks and other spaces

3.1 Safe access* to cargo holds, cofferdams, ballast tanks, cargo tanks and other spaces in the cargo area shall be direct from the open deck and such as to ensure their complete inspection. Safe access to double bottom spaces or to forward ballast tanks may be from a pump-room, deep cofferdam, pipe tunnel, cargo hold, double hull space or similar compartment not intended for the carriage of oil or hazardous cargoes.

* Refer to the Revised recommendations for entering enclosed spaces aboard ships, adopted by the Organization by resolution A.1050(27).

Interpretation

Access to a double side skin space of bulk carriers may be either from a topside tank or double bottom tank or from both.
The wording "not intended for the carriage of oil or hazardous cargoes" applies only to "similar compartments", i.e. safe access can be through a pump-room, deep cofferdam, pipe tunnel, cargo hold or double hull space.

Technical Background

Unless used for other purposes, the double side skin space is to be designed as a part of a large U-shaped ballast tank and such space is to be accessed through the adjacent part of the tank, i.e. topside tank or double bottom/bilge hopper tank. Access to the double side skin space from the adjacent part rather than direct from the open deck is justified. Any such arrangement is to provide a directly routed, logical and safe access that facilitates easy evacuation of the space.

Remarks

Conventions/Codes Requirements

SOLAS regulation II-1/3-6, section 3.2

3.2 Tanks, and subdivisions of tanks, having a length of 35 m or more shall be fitted with at least two access hatchways and ladders, as far apart as practicable. Tanks less than 35 m in length shall be served by at least one access hatchway and ladder. When a tank is subdivided by one or more swash bulkheads or similar obstructions which do not allow ready means of access to the other parts of the tank, at least two hatchways and ladders shall be fitted.

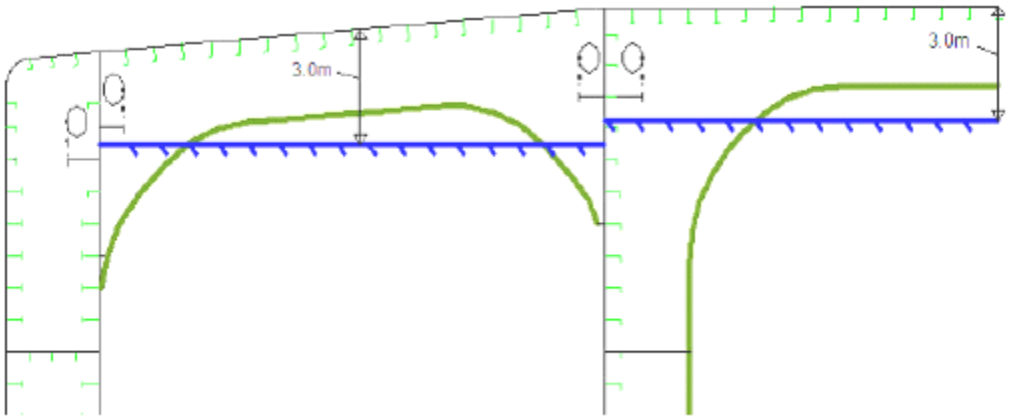
Interpretation

A cargo oil tank of less than 35 m length without a swash bulkhead requires only one access hatch.

Where rafting is indicated in the ship structures access manual as the means to gain ready access to the under deck structure, the term "*similar obstructions*" referred to in the regulation includes internal structures (e.g., webs > 1.5 m deep) which restrict the ability to raft (at the maximum water level needed for rafting of under deck structure) directly to the nearest access ladder and hatchway to deck. When rafts or boats alone, as an alternative means of access, are allowed under the conditions specified in the ESP Code, as amended, permanent means of access are to be provided to allow safe entry and exit. This means:

a) access direct from the deck via a vertical ladder and small platform fitted approximately 2m below the deck in each bay; or

b) access to deck from a longitudinal permanent platform having ladders to deck in each end of the tank. The platform shall, for the full length of the tank, be arranged in level with, or above, the maximum water level needed for rafting of under deck structure. For this purpose, the ullage corresponding to the maximum water level is to be assumed not more than 3m from the deck plate measured at the midspan of deck transverses and in the middle length of the tank. (See Figure below). A permanent means of access from the longitudinal permanent platform to the water level indicated above is to be fitted in each bay (e.g., permanent rungs on one of the deck webs inboard of the longitudinal permanent platform).



Remarks

Conventions/Codes Requirements

SOLAS regulation II-1/3-6, section 4.1

4 Ship structure access manual

4.1 A ship's means of access to carry out overall and close-up inspections and thickness measurements shall be described in a Ship structure access manual approved by the Administration, an updated copy of which shall be kept on board. The Ship structure access manual shall include the following for each space:

.1 plans showing the means of access to the space, with appropriate technical specifications and dimensions;

.2 plans showing the means of access within each space to enable an overall inspection to be carried out, with appropriate technical specifications and dimensions. The plans shall indicate from where each area in the space can be inspected;

.3 plans showing the means of access within the space to enable close-up inspections to be carried out, with appropriate technical specifications and dimensions. The plans shall indicate the positions of critical

structural areas, whether the means of access is permanent or portable and from where each area can be inspected;

.4 instructions for inspecting and maintaining the structural strength of all means of access and means of attachment, taking into account any corrosive atmosphere that may be within the space;

.5 instructions for safety guidance when rafting is used for close-up inspections and thickness measurements;

.6 instructions for the rigging and use of any portable means of access in a safe manner;

.7 an inventory of all portable means of access; and

.8 records of periodical inspections and maintenance of the ship's means of access.

Interpretation

The access manual is to address spaces listed in paragraph 3 of the Regulation II-1/3-6.

As a minimum the English version is to be provided.

The ship structure access manual is to contain at least the following two parts:

Part 1: Plans, instructions and inventory required by paragraphs 4.1.1 to 4.1.7 of regulation II-1/3-6. This part is to be approved by the Administration or the organization recognised by the Administration.

Part 2: Form of record of inspections and maintenance, and change of inventory of portable equipment due to additions or replacement after construction. This part is to be approved for its form only at new building.

The following matters are to be addressed in the ship structure access manual:

1. The access manual is to clearly cover scope as specified in the regulations for use by crews, surveyors and port State control officers.
2. Approval / re-approval procedure for the manual, i.e. any changes of the permanent, portable, movable or alternative means of access within the scope of the regulation and the Technical provisions are subject to review and approval by the Administration or by the organization recognised by the Administration.
3. Verification of MA is to be part of safety construction survey for continued effectiveness of the MA in that space which is subject to the statutory survey.
4. Inspection of MA by the crew and/or a competent inspector of the company as a part of regular inspection and maintenance (see interpretation for paragraph 2.3 of SOLAS regulation II-1/3-6).
5. Actions to be taken if MA is found unsafe to use.
6. In case of use of portable equipment plans showing the means of access within each space indicating from where and how each area in the space can be inspected.

Refer to IACS Recommendation No.90 "Ship Structural Access Manual"

Remarks

Conventions/Codes Requirements

SOLAS regulation II-1/3-6, section 4.2

4.2 For the purpose of this regulation "critical structural areas" are locations which have been identified from calculations to require monitoring or from the service history of similar or sister ships to be sensitive to cracking, buckling, deformation or corrosion which would impair the structural integrity of the ship.

Interpretation

1) Critical structural areas are to be identified by advanced calculation techniques for structural strength and fatigue performance, if available, and feed back from the service history and design development of similar or sister ships.

2) Reference is to be made to the following publications for critical structural areas, where applicable:

- Oil tankers: Guidance Manual for Tanker Structures by TSCF;
- Bulk carriers: Bulk Carriers Guidelines for Surveys, Assessment and Repair of Hull Structure by IACS;
- Oil tankers and bulk carriers: the ESP Code, as amended.

Technical Background

These documents contain the relevant information for the present ship types. However identification of critical areas

for new double hull tankers and double side skin bulk carriers of improved structural design is to be made by structural analysis at the design stage, this information is to be taken in to account to ensure appropriate access to all identified critical areas.

Remarks

Conventions/Codes Requirements

SOLAS regulation II-1/3-6, section 5.1

5 General technical specifications

5.1 For access through horizontal openings, hatches or manholes, the dimensions shall be sufficient to allow a person wearing a self-contained air-breathing apparatus and protective equipment to ascend or descend any ladder without obstruction and also provide a clear opening to facilitate the hoisting of an injured person from the bottom of the space. The minimum clear opening shall not be less than 600 mm × 600 mm. When access to a cargo hold is arranged through the cargo hatch, the top of the ladder shall be placed as close as possible to the hatch coaming. Access hatch coamings having a height greater than 900 mm shall also have steps on the outside in conjunction with the ladder.

Interpretation

The minimum clear opening of 600 mm × 600 mm may have corner radii up to 100 mm maximum. The clear opening is specified in MSC/Circ.686 to keep the opening fit for passage of personnel wearing a breathing apparatus. In such a case where as a consequence of structural analysis of a given design the stress is to be reduced around the opening, it is considered appropriate to take measures to reduce the stress such as making the opening larger with increased radii, e.g. 600 × 800 with 300 mm radii, in which a clear opening of 600 × 600 mm with corner radii up to 100 mm maximum fits.

Technical Background

The interpretation is based upon the established Guidelines in MSC/Circ.686.

Remarks

Paragraph 9 of Annex of MSC/Circ.686.

Conventions/Codes Requirements

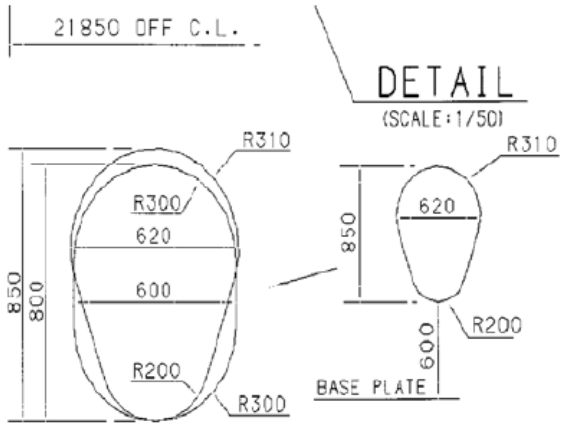
SOLAS regulation II-1/3-6, section 5.2

5.2 For access through vertical openings, or manholes, in swash bulkheads, floors, girders and web frames providing passage through the length and breadth of the space, the minimum opening shall be not less than 600 mm × 800 mm at a height of not more than 600 mm from the bottom shell plating unless gratings or other foot holds are provided.

Interpretation

1. The minimum clear opening of not less than 600 mm × 800 mm may also include an opening with corner radii of 300 mm. An opening of 600 mm in height × 800 mm in width may be accepted as access openings in vertical structures where it is not desirable to make large opening in the structural strength aspects, i.e. girders and floors in double bottom tanks.

2. Subject to verification of easy evacuation of injured person on a stretcher the vertical opening 850 mm × 620 mm with wider upper half than 600 mm, while the lower half may be less than 600 mm with the overall height not less than 850 mm is considered an acceptable alternative to the traditional opening of 600 mm × 800 mm with corner radii of 300 mm.



3. If a vertical opening is at a height of more than 600 mm steps and handgrips are to be provided. In such arrangements it is to be demonstrated that an injured person can be easily evacuated.

Technical Background

The interpretation is based upon the established Guidelines in MSC/Circ.686 and an innovative design is considered for easy access by humans through the opening.

Remarks

Ref,
Paragraph 11 of Annex to MSC/Circ.686.
Circular No.020/Total No.140 (2005) "Notice on the Revised IACS Unified Interpretation for Means of Access for Inspections on Bulk Carriers and Oil Tankers (UI SC191 Rev.1)" issued by CCS Technical Department

Conventions/Codes Requirements

Technical Provision, resolution MSC.158(78), paragraph 1.3

1. Preamble

1.3 In order to address this issue, the Organization has developed these Technical provisions for means of access for inspections (hereinafter called the "Technical provisions"), intended to facilitate close-up inspections and thickness measurements of the ship' structure referred to in SOLAS regulation II-1/3-6 on Access to and within spaces in, and forward of, the cargo area of oil tankers and bulk carriers. The Technical provisions do not apply to the cargo tanks of combined chemical/oil tankers complying with the provisions of the IBC Code.

Interpretation

A "combined chemical/oil tankers complying with the provisions of the IBC Code" is a tanker that holds both a valid IOPP certificate as tanker and a valid certificate of fitness for the carriage of dangerous chemicals in bulk, i.e. a tanker that is certified to carry both oil cargoes under MARPOL Annex I and Chemical cargoes in chapter 17 of the IBC Code either as full or part cargoes.
The Technical provisions are to be applied to ballast tanks of combined chemical/oil tankers complying with the provisions of the IBC Code.

Remarks

Conventions/Codes Requirements

Technical Provision, resolution MSC.158(78), paragraph 1.4

1.4 Permanent means of access which are designed to be integral parts of the structure itself are preferred and Administrations may allow reasonable deviations to facilitate such designs.

Interpretation

In the context of the above requirement, the deviation shall be applied only to distances between integrated PMA that are the subject of paragraph 2.1.2 of Table 1.
Deviations shall not be applied to the distances governing the installation of underdeck longitudinal walkways and dimensions that determine whether permanent access are required or not, such as height of the spaces and height to elements of the structure (e.g. cross-ties).

Remarks

Conventions/Codes Requirements

Technical Provision, resolution MSC.158(78), paragraph 3.1

3.1 Structural members subject to the close-up inspections and thickness measurements of the ship's structure referred to in SOLAS regulation II-1/ 3-6, except those in double bottom spaces, shall be provided with a permanent means of access to the extent as specified in table 1 and table 2, as applicable. For oil tankers and wing ballast tanks of ore carriers, approved alternative methods may be used in combination with the fitted permanent means of access, provided that the structure allows for its safe and effective use.

Interpretation

The permanent means of access to a space can be credited for the permanent means of access for inspection.

Technical Background

The Technical provisions specify means of access to a space and to hull structure for carrying out overall and close up surveys and inspections. Requirements of MA to hull structure may not always be suitable for access to a space. However if the MA for access to a space can also be used for the intended surveys and inspections such MA can be credited for the MA for use for surveys and inspections.

Remarks

Conventions/Codes Requirements

Technical Provision, resolution MSC.158(78), paragraph 3.3

3.3 Elevated passageways forming sections of a permanent means of access, where fitted, shall have a minimum clear width of 600 mm, except for going around vertical webs where the minimum clear width may be reduced to 450 mm, and have guard rails over the open side of their entire length. Sloping structure providing part of the access shall be of a non-skid construction. Guard rails shall be 1,000 mm in height and consist of a rail and intermediate **bar** 500 mm in height and of substantial construction. Stanchions shall be not more than 3 m apart.

Interpretation

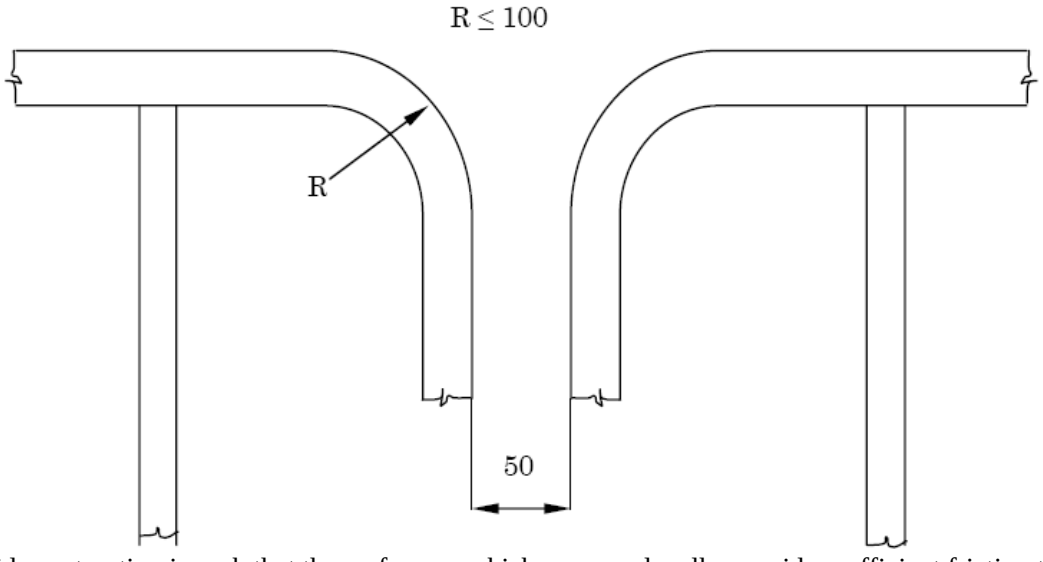
1. Sloping structures are structures that are sloped by 5 or more degrees from horizontal plane when a ship is in upright position at even-keel.
2. Guard rails are to be fitted on the open side **and should be at least 1,000 mm in height.** For stand alone passageways guard rails are to be fitted on both sides of these structures. **Guardrail stanchions are to be attached to the PMA. The distance between the passageway and the intermediate bar and the distance between intermediate bar and the top rail shall not be more than 500 mm.**
3. **Rev.3:** Discontinuous top handrails are allowed, provided the gap does not exceed 50 mm.

   The same maximum gap is to be considered between the top handrail and other structural members (i.e. bulkhead, web frame, etc.).

   The maximum distance between the adjacent stanchions across the handrail gaps is to be 350 mm where the top and mid handrails are not connected together and 550 mm when they are connected together.

   The maximum distance between the stanchion and other structural members is not to exceed 200 mm where the top and mid handrails are not connected together and 300 mm when they are connected together.

   When the top and mid handrails are connected by a bent rail, the outside radius of the bent part is not to exceed 100 mm (see Figure below).



4. Non-skid construction is such that the surface on which personnel walks provides sufficient friction to the sole of

boots even if the surface is wet and covered with thin sediment.
5. "Substantial construction" is taken to refer to the as-designed strength as well as the residual strength during the service life of the vessel. Durability of passageways together with guard rails is to be ensured by the initial corrosion protection and inspection and maintenance during services.
6. For guard rails, use of alternative materials such as GRP is to be subject to compatibility with the liquid carried in the tank. Non-fire resistant materials are not to be used for means of access to a space with a view to securing an escape route at a high temperature.
7. Requirements for resting platforms placed between ladders are equivalent to those applicable to elevated passageways.

Remarks

Paragraph 10 of Annex to MSC/Circ.686

Conventions/Codes Requirements

Technical Provision, resolution MSC.158(78), paragraph 3.4

3.4 Access to permanent means of access and vertical openings from the ship's bottom shall be provided by means of easily accessible passageways, ladders or treads. Treads shall be provided with lateral support for the foot. Where the rungs of ladders are fitted against a vertical surface, the distance from the centre of the rungs to the surface shall be at least 150 mm. Where vertical manholes are fitted higher than 600 mm above the walking level, access shall be facilitated by means of treads and hand grips with platform landings on both sides.

Interpretation

Where the vertical manhole is at a height of more than 600 mm above the walking level, it shall be demonstrated that an injured person can be easily evacuated.

Remarks

Conventions/Codes Requirements

Technical Provision, resolution MSC.158(78), paragraph 3.5

3.5 Permanent inclined ladders shall be inclined at an angle of less than 70 º. There shall be no obstructions within 750 mm of the face of the inclined ladder, except that in way of an opening this clearance may be reduced to 600 mm. Resting platforms of adequate dimensions shall be provided normally at a maximum of 6 m vertical height. Ladders and handrails shall be constructed of steel or equivalent material of adequate strength and stiffness and securely attached to the structure by stays. The method of support and length of stay shall be such that vibration is reduced to a practical minimum. In cargo holds, ladders shall be designed and arranged so that cargo handling difficulties are not increased and the risk of damage from cargo handling gear is minimized.

Interpretation

MA for access to ballast tanks, cargo tanks and spaces other than fore peak tanks:

For oil tankers:

1. Tanks and subdivisions of tanks having a length of 35 m or more with two access hatchways:

First access hatchway: Inclined ladder or ladders are to be used.

Second access hatchway:

i. A vertical ladder may be used. In such a case where the vertical distance is more than 6 m, vertical ladders are to comprise one or more ladder linking platforms spaced not more than 6 m apart vertically and displaced to one side of the ladder.

The uppermost section of the vertical ladder, measured clear of the overhead obstructions in way of the tank entrance, is not to be less than 2.5 m but not exceed 3.0 m and is to comprise a ladder linking platform which is to be displaced to one side of a vertical ladder. However, the vertical distance of the upper most section of the vertical ladder may be reduced to 1.6 m, measured clear of the overhead obstructions in way of the tank entrance, if the ladder lands on a longitudinal or athwartship permanent means of access fitted within that range; Adjacent sections of the ladder are to be laterally offset from each other by at least the width of the ladder (see paragraph 20 of MSC/Circ.686 and refer to the interpretation of Technical Provision, resolution

MSC.158(78), paragraph 3.13.2 and paragraph 3.13.6); or

ii. Where an inclined ladder or combination of ladders is used for access to the space, the uppermost section of the ladder, measured clear of the overhead obstructions in way of the tank entrance, is to be vertical for not less than 2.5 m but not exceed 3.0 m and is to comprise a landing platform continuing with an inclined ladder. However, the vertical distance of the upper most section of the vertical ladder may be reduced to 1.6 m, measured clear of the overhead obstructions in way of the tank entrance, if the ladder lands on a longitudinal or athwartship permanent means of access fitted within that range. The flights of the inclined ladders are normally to be not more than 6 m in vertical height. The lowermost section of the ladders may be vertical for the vertical distance not exceeding 2.5 m.

2. Tanks less than 35 m in length and served by one access hatchway an inclined ladder or combination of ladders are to be used to the space as specified in 1.ii above.

3. In double hull spaces of less than 2.5 m width the access to the space may be by means of vertical ladders that comprises one or more ladder linking platforms spaced not more than 6 m apart vertically and displaced to one side of the ladder. The uppermost section of the vertical ladder, measured clear of the overhead obstructions in way of the tank entrance, is not to be less than 2.5 m but not exceed 3.0 m and is to comprise a ladder linking platform which is to be displaced to one side of a vertical ladder. However, the vertical distance of the upper most section of the vertical ladder may be reduced to 1.6 m, measured clear of the overhead obstructions in way of the tank entrance, if the ladder lands on a longitudinal or athwartship permanent means of access fitted within that range. Adjacent sections of the ladder are to be laterally offset from each other by at least the width of the ladder (see paragraph 20 of MSC/Circ.686 and refer to the interpretation of Technical Provision, resolution MSC.158(78), paragraph 3.13.2 and paragraph 3.13.6).

4. Access from deck to a double bottom space may be by means of vertical ladders through a trunk. The vertical distance from deck to a resting platform, between resting platforms or a resting platform and the tank bottom is not to be more than 6 m unless otherwise approved by the Administration.

MA for inspection of the vertical structure of oil tankers:

Vertical ladders provided for means of access to the space may be used for access for inspection of the vertical structure.

Unless stated otherwise in Table 1 of TP, vertical ladders that are fitted on vertical structures for inspection are to comprise one or more ladder linking platforms spaced not more than 6 m apart vertically and displace to one side of the ladder. Adjacent sections of ladder are to be laterally offset from each other by at least the width of the ladder (paragraph 20 of MSC/Circ.686 and refer to the interpretation of Technical Provision, resolution MSC.158(78), paragraph 3.13.2 and paragraph 3.13.6).

Obstruction distances

The minimum distance between the inclined ladder face and obstructions, i.e. 750 mm and, in way of openings, 600 mm specified in TP 3.5 is to be measured perpendicular to the face of the ladder.

Technical Background

It is a common practice to use a vertical ladder from deck to the first landing to clear overhead obstructions before continuing to an inclined ladder or a vertical ladder displaced to one side of the first vertical ladder.

Remarks

For vertical ladders: Paragraph 20 of the annex to MSC/Circ.686.

Conventions/Codes Requirements

Technical Provision, resolution MSC.158(78), paragraph 3.6

3.6 The width of inclined ladders between stringers shall not be less than 400 mm. The treads shall be equally spaced at a distance apart, measured vertically, of between 200 mm and 300 mm. When steel is used, the treads shall be formed of two square bars of not less than 22 mm by 22 mm in section, fitted to form a horizontal step with the edges pointing upward. The treads shall be carried through the side stringers and attached thereto by double continuous welding. All inclined ladders shall be provided with handrails of substantial construction on both sides

fitted at a convenient distance above the treads.

Interpretation

1. Vertical height of handrails is not to be less than 890 mm from the center of the step and two course handrails **need only** be provided **where the gap between stringer and top handrail is greater than 500 mm.**

2. The requirement of two square bars for treads specified in TP, paragraph 3.6, is based upon the specification of construction of ladders in paragraph 3(e) of Annex 1 to resolution A.272(VIII), which addresses inclined ladders. TP, paragraph 3.4, allows for single rungs fitted to vertical surfaces, which is considered for a safe grip. For vertical ladders, when steel is used, the rungs are to be formed of single square bars of not less than 22 mm by 22 mm for the sake of safe grip.

3. The width of inclined ladders for access to a cargo hold is to be at least 450 mm to comply with the Australian AMSA Marine Orders Part 32, Appendix 17[①].

4. The width of inclined ladders other than an access to a cargo hold is to be not less than 400 mm.

5. The minimum width of vertical ladders is to be 350 mm and the vertical distance between the rungs is to be equal and is to be between 250 mm and 350 mm.

6. A minimum climbing clearance in width is to be 600 mm other than the ladders placed between the hold frames.

7. The vertical ladders are to be secured at intervals not exceeding 2.5 m apart to prevent vibration.

Technical Background

- TP, paragraph 3.6, is a continuation of TP, paragraph 3.5, which addresses inclined ladders. Interpretation for vertical ladders are needed based upon the current standards of IMO, AMSA or the industry.
- Interpretation 2 and 5 address vertical ladders based upon the current standards.
- Double square bars for treads become too large for a grip for vertical ladders and single rungs facilitate a safe grip.
- Interpretation 7 is introduced consistently with the requirement and the interpretation of TP, paragraph 3.4.

Remarks

- Annex 1 to resolution A.272(VIII).
- Australian AMSA Marine Orders Part 32, Appendix 17[①].
- ILO Code of Practice "Safety and Health in Dockwork" – Section 3.6 Access to Ship's Holds.

Conventions/Codes Requirements

Technical Provision, resolution MSC.158(78), paragraph 3.9.6

3.9.6 Portable ladders more than 5 m long may only be utilized if fitted with a mechanical device to secure the upper end of the ladder.

Interpretation

A mechanical device such as hooks for securing at the upper end of a ladder is to be considered as an appropriate securing device if a movement fore/aft and sideways can be prevented at the upper end of the ladder.

Technical Background

Innovative design is to be accepted if it fits the functional requirement with due consideration for safe use.

Remarks

Conventions/Codes Requirements

Technical Provision, resolution MSC.158(78), paragraph 3.10 and 3.11

3.10 For access through horizontal openings, hatches or manholes, the minimum clear opening shall not be less than 600 mm × 600 mm. When access to a cargo hold is arranged through the cargo hatch, the top of the ladder shall be placed as close as possible to the hatch coaming. Access hatch coamings having a height greater than 900 mm shall also have steps on the outside in conjunction with the ladder.

3.11 For access through vertical openings, or manholes, in swash bulkheads, floors, girders and web frames

① The latest version of this command is Marine Order 32 (Cargo handling equipment) 2016

providing passage through the length and breadth of the space, the minimum opening shall be not less than 600 mm × 800 mm at a height of not more than 600 mm from the passage unless gratings or other foot holds are provided

Interpretation

See interpretation for paragraphs 5.1 and 5.2 of SOLAS regulation II-1/3-6.

Remarks

Conventions/Codes Requirements

Technical Provision, resolution MSC.158(78), paragraph 3.13.1

3.13. For bulk carriers, access ladders to a cargo hold shall be:

.1 where the vertical distance between the upper surface of adjacent decks or between deck and the bottom of the cargo space is not more than 6 m, either a vertical ladder or an inclined ladder; and

Interpretation

Either a vertical or an inclined ladder or a combination of them may be used for access to a cargo hold where the vertical distance is 6 m or less from the deck to the bottom of the cargo hold.

Remarks

Technical Provision, resolution MSC.158(78), paragraph 3.13.2 and paragraph 3.13.6

3.13. For bulk carriers, access ladders to a cargo hold shall be:

.2 Where the vertical distance between the upper surface of adjacent decks or between deck and the bottom of the cargo space is more than 6 m, an inclined ladder or series of inclined ladders at one end of the cargo hold, except the uppermost 2.5 m of a cargo space measured clear of overhead obstructions and the lowest 6 m may have vertical ladders, provided that the vertical extent of the inclined ladder or ladders connecting the vertical ladders is not less than 2.5 m.

The second means of access at the other end of the cargo hold may be formed of a series of staggered vertical ladders, which should comprise of one or more ladder linking platforms spaced not more than 6 m apart vertically and displaced to one side of the ladder. Adjacent sections of ladder should be laterally offset from each other by at least the width of the ladder. The uppermost entrance section of the ladder directly exposed to a cargo hold should be vertical for a distance of 2.5 m measured clear of overhead obstructions and connected to a ladder-linking platform.

.6 In double-side skin spaces of less than 2.5 m width, the access to the space may be by means of vertical ladders that comprise of one or more ladder linking platforms spaced mnot more than 6 m apart vertically and displaced to one side of the ladder. Adjacent sections of ladder should be laterally offset from each other by at least the width of the ladder.

Interpretation

Adjacent sections of vertical ladder need to be installed so that the following provisions are complied with:

- the minimum “lateral offset” between two adjacent sections of vertical ladder, is the distance between the sections, upper and lower, so that the adjacent stringers are spaced at least 200 mm apart, measured from half thickness of each stringer.
- adjacent sections of vertical ladder shall be installed so that the upper end of the lower section is vertically overlapped, in respect to the lower end of the upper section, to a height of 1500 mm in order to permit a safe transfer between ladders.
- no section of the access ladder shall be terminated directly or partly above an access opening.

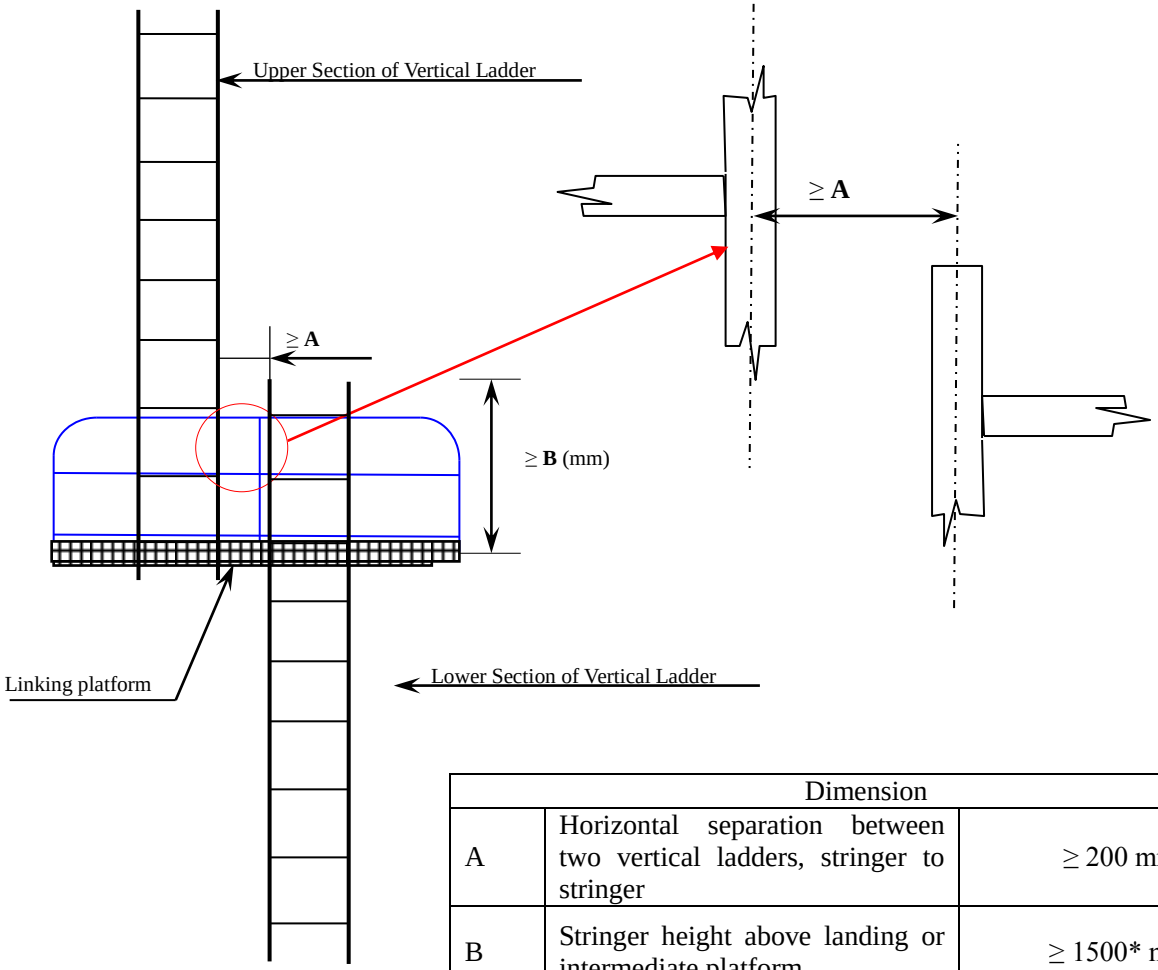
Technical Background

The aims of the above are to:

a. Reduce the risk of accidents due to tiredness by providing a rest platform at appropriate intervals.

b. Reduce the risk of collateral injury from falling or dropping items of equipment by preventing the lateral overlap of two ladders.

Figure "A"
Vertical Ladder – Ladder through the linking platform



Dimension		
A	Horizontal separation between two vertical ladders, stringer to stringer	≥ 200 mm
B	Stringer height above landing or intermediate platform	≥ 1500* mm
C	Horizontal separation between ladder and platform	100 mm ≤C< 300 mm
*Note: the minimum height of the handrail ~~stanchions~~ of resting platform is of 1000 mm (Technical Provision, resolution MSC.158(78), paragraph 3.3)		

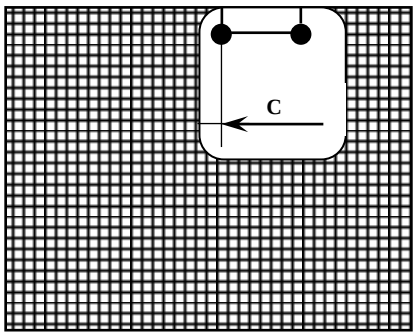
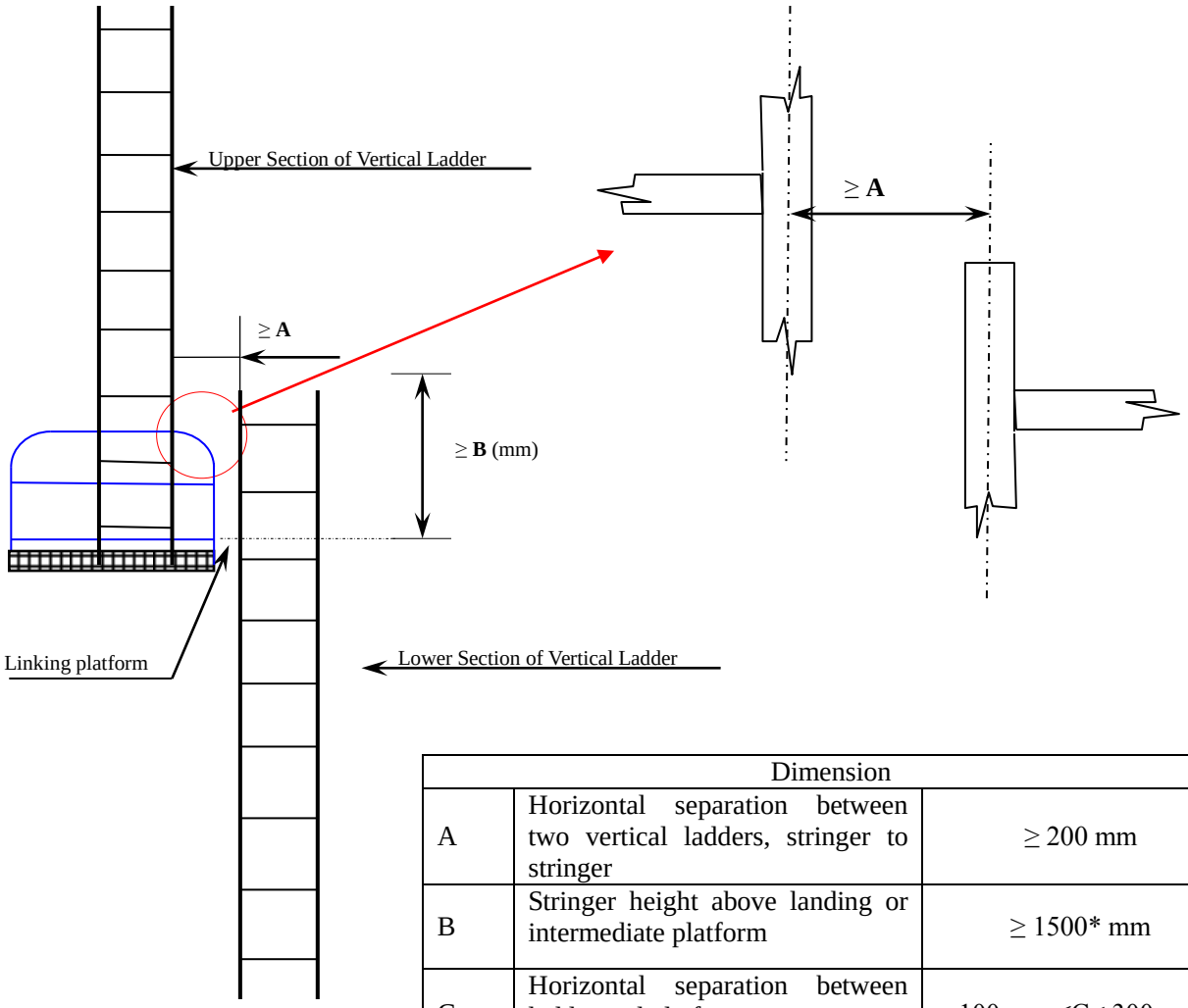
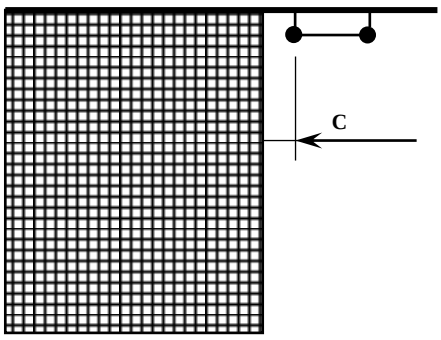


Figure "B"
Vertical Ladder – Side mount



Dimension		
A	Horizontal separation between two vertical ladders, stringer to stringer	≥ 200 mm
B	Stringer height above landing or intermediate platform	≥ 1500* mm
C	Horizontal separation between ladder and platform	100 mm ≤C< 300 mm
*Note: the minimum height of the handrail ~~stanchions~~ of resting platform is of 1000 mm (Technical Provision, resolution MSC.158(78), paragraph 3.3)		



Remarks

Conventions/Codes Requirements

Technical Provision, resolution MSC.158(78), paragraph 3.14

3.14 The uppermost entrance section from deck of the vertical ladder providing access to a tank should be vertical for a distance of 2.5 m measured clear of overhead obstructions and comprise a ladder linking platform, displaced to one side of a vertical ladder. The vertical ladder can be between 1.6 m and 3 m below deck structure if it lands on a longitudinal or athwartship permanent means of access fitted within that range

Interpretation

Deck is defined as "weather deck".

Remarks

Conventions/Codes Requirements

Table **1** – Means of access for oil tankers, resolution **MSC.158(78)**, paragraph 1.1

1 Water ballast tanks, except those specified in the right column, and cargo oil tanks
Access to overhead structure

1.1 For tanks of which the height is 6 m and over containing internal structures, permanent means of access shall be provided in accordance with .1 to .6:

Interpretation

1. Sub-paragraphs .1, .2 and .3 define access to underdeck structure, access to the uppermost sections of transverse webs and connection between these structures.
2. Sub-paragraphs .4, .5 and .6 define access to vertical structures only and are linked to the presence of transverse webs on longitudinal bulkheads.
3. If there are no underdeck structures (deck longitudinals and deck transverses) but there are vertical structures in the cargo tank supporting transverse and longitudinal bulkheads, access in accordance with sub-paragraphs from .1 through to .6 is to be provided for inspection of the upper parts of vertical structure on transverse and longitudinal bulkheads.
4. If there is no structure in the cargo tank, section 1.1 of Table 1 is not to be applied.
5. Section 1 of Table 1 is also to be applied to void spaces in cargo area, comparable in volume to spaces covered by the regulation II-1/3-6, except those spaces covered by Section 2.
6. The vertical distance below the overhead structure is to be measured from the underside of the main deck plating to the top of the platform of the means of access at a given location.
7. The height of the tank is to be measured at each tank. For a tank the height of which varies at different bays, item 1.1 is to be applied to such bays of a tank that have height 6 m and over.

Technical Background

Interpretation 7: If the height of the tank is increasing along the length of a ship the permanent means of access is to be provided locally where the height is above 6 m.

Remarks

Paragraph 10 of the Annex to MSC/Circ.686.

Conventions/Codes Requirements

Table **1 –** Means of access for oil tankers, resolution **MSC.158(78)**, paragraph **1.1.2**

1.1.2 at least one continuous longitudinal permanent means of access at each side of the tank. One of these accesses shall be at a minimum of 1.6 m to a maximum of 6 m below the deck head and the other shall be at a minimum of 1.6 m to a maximum of 3 m below the deck head;

Interpretation

There is need to provide continuous longitudinal permanent means of access when the deck longitudinals and deck transverses are fitted on deck but supporting brackets are fitted under the deck.

Remarks

Conventions/Codes Requirements

Table **1 –** Means of access for oil tankers, resolution **MSC.158(78)**, paragraph **1.1.3**

1.1.3 access between the arrangements specified in .1 and .2 and from the main deck to either .1 or .2.

Interpretation

Means of access to tanks may be used for access to the permanent means of access for inspection.

Technical Background

As a matter of principle, in such a case where the means of access can be utilised for the purpose of accessing structural members for inspection there is no need of duplicated installation of the MA.

Remarks

Conventions/Codes Requirements

Table **1 –** Means of access for oil tankers, resolution **MSC.158(78)**, paragraph **1.1.4**

1.1.4 continuous longitudinal permanent means of access which are integrated in the structural member on the stiffened surface of a longitudinal bulkhead, in alignment, where possible, with horizontal girders of transverse bulkheads are to be provided for access to the transverse webs unless permanent fittings are installed at the uppermost platform for use of alternative means as defined in paragraph 3.9 of the Technical provisions for inspection at intermediate heights;

Interpretation

The permanent fittings required to serve alternative means of access such as wire lift platform, that are to be used by crew and surveyors for inspection shall provide at least an equal level of safety as the permanent means of access stated by the same paragraph. These means of access shall be carried on board the ship and be readily available for use without filling of water in the tank.

Therefore, rafting is not to be acceptable under this provision.

Alternative means of access are to be part of Access Manual which is to be approved on behalf of the flag State.

For water ballast tanks of 5 m or more in width, such as on an ore carrier, side shell plating shall be considered in the same way as "longitudinal bulkhead".

Remarks

Conventions/Codes Requirements

Table **1 –** Means of access for oil tankers, resolution **MSC.158(78)**, paragraph **2.1**

2 Water ballast wing tanks of less than 5 m width forming double side spaces and their bilge hopper sections
Access to the underdeck structure

2.1 For double side spaces above the upper knuckle point of the bilge hopper sections, permanent means of access are to be provided in accordance with .1 and .2:

Interpretation

Section 2 of Table 1 is also to be applied to wing tanks designed as void spaces.

Paragraph 2.1.1 represents requirements for access to underdeck structures, while paragraph 2.1.2 is a requirement for access for survey and inspection of vertical structures on longitudinal bulkheads (transverse webs).

Technical Background

Regulation II-1/3-6.2.1 requires each space to be provided with means of access. Though void spaces are not addressed in the technical provisions contained in resolution MSC.158(78) it is arguable whether MA is not required in void spaces. MA or portable means of access are necessary arrangement to facilitate inspection of the structural condition of the space and the boundary structure. Therefore the requirements of Section 2 of Table 1 is to be applied to double hull spaces even designed as void spaces.

Remarks

Conventions/Codes Requirements

Table **1 –** Means of access for oil tankers, resolution **MSC.158(78)**, paragraph **2.1.1**

2. Wing water ballast tanks less than 5 m width forming double side spaces and their bilge hopper sections
Access to the underdeck structure

2.1.1 Where the vertical distance between horizontal uppermost stringer and deck head is 6 m or more, one continuous permanent means of access shall be provided for the full length of the tank with a means to allow passing through transverse webs installed a minimum of 1.6 m to a maximum of 3 m below the deck head with a vertical access ladder at each end of tank;

Interpretation

1. For a tank, the vertical distance between horizontal upper stringer and deck head of which varies at different sections, item 2.1.1 is to be applied to such sections that fall under the criteria.
2. The continuous permanent means of access may be a wide longitudinal, which provides access to critical details on the opposite side by means of platforms as necessary on web frames. In case the vertical opening of the web frame is located in way of the open part between the wide longitudinal and the longitudinal on the opposite side, platforms shall be provided on both sides of the web frames to allow safe passage through the web frame.
3. Where two access hatches are required by SOLAS regulation II-1/3-6.3.2, access ladders at each end of the tank are to lead to the deck.

Technical Background

Interpretation 1: The interpretation of varied tank height in item 1 of Table 1 is applied to the vertical distance between horizontal upper stringer and deck head for consistency.

Remarks

Conventions/Codes Requirements

Table 1 – Means of access for oil tankers, resolution **MSC.158(78)**, paragraph **2.1.2**

2.1.2 continuous longitudinal permanent means of access, which are integrated in the structure, at a vertical distance not exceeding 6 m apart; and

Interpretation

The continuous permanent means of access may be a wide longitudinal, which provides access to critical details on the opposite side by means of platforms as necessary on web frames. In case the vertical opening of the web is located in way of the open part between the wide longitudinal and the longitudinal on the opposite side, platforms shall be provided on both sides of the web to allow safe passage through the web.

A "reasonable deviation", as noted in TP, paragraph 1.4, of not more than 10% may be applied where the permanent means of access is integral with the structure itself.

Remarks

Conventions/Codes Requirements

Table **1 –** Means of access for oil tankers, resolution **MSC.158(78)**, paragraph **2.2**

2.2 For bilge hopper sections of which the vertical distance from the tank bottom to the upper knuckle point is 6 m and over, one longitudinal permanent means of access shall be provided for the full length of the tank. It shall be accessible by vertical permanent means of access at both ends of the tank.

Interpretation

1. Permanent means of access between the longitudinal continuous permanent means of access and the bottom of the space is to be provided.
2. The height of a bilge hopper tank located outside of the parallel part of vessel is to be taken as the maximum of the clear vertical distance measured from the bottom plating to the hopper plating of the tank.
3. The foremost and aftmost bilge hopper ballast tanks with raised bottom, of which the height is 6 m and over, a combination of transverse and vertical MA for access to the upper knuckle point for each transverse web is to be accepted in place of the longitudinal permanent means of access.

Technical Background

Interpretation 2: The bilge hopper tanks at fore and aft of cargo area narrow due to raised bottom plating and the actual vertical distance from the bottom of the tank to hopper plating of the tank is more appropriate to judge if a portable means of access could be utilized for the purpose.

Interpretation 3: in the foremost or aftmost bilge hopper tanks where the vertical distance is 6 m or over but installation of longitudinal permanent means of access is not practicable permanent means of access of combination of transverse and vertical ladders provides an alternative means of access to the upper knuckle point.

Remarks

Conventions/Codes Requirements

Table **2 –** Means of access for bulk carriers, resolution **MSC.158(78)**, paragraph **1.1**

1 Cargo holds

Access to underdeck structure

1.1 Permanent means of access shall be fitted to provide access to the overhead structure at both sides of the cross deck and in the vicinity of the centreline. Each means of access shall be accessible from the cargo hold access or directly from the main deck and installed at a minimum of 1.6 m to a maximum of 3 m below the deck.

Interpretation

1. Means of access shall be provided to the crossdeck structures of the foremost and aftermost part of the each cargo hold.
2. Interconnected means of access under the cross deck for access to three locations at both sides and in the vicinity of the centerline is to be acceptable as the three means of access.
3. Permanent means of access fitted at three separate locations accessible independently, one at each side and one in the vicinity of the centerline is to be acceptable.
4. Special attention is to be paid to the structural strength where any access opening is provided in the main deck or cross deck.
5. The requirements for bulk carrier cross deck structure are also to be considered applicable to ore carriers.

Technical Background

Pragmatic arrangements of the MA are provided.

Remarks

Conventions/Codes Requirements

Table **2 –** Means of access for bulk carriers, resolution **MSC.158(78)**, paragraph **1.3**

1.3 Access to the permanent means of access to overhead structure of the cross deck may also be via the upper stool.

Interpretation

Particular attention is to be paid to preserve the structural strength in way of access opening provided in the main deck or cross deck.

Remarks

Conventions/Codes Requirements

Table **2 –** Means of access for bulk carriers, resolution **MSC.158(78)**, paragraph **1.4**

1.4 Ships having transverse bulkheads with full upper stools with access from the main deck which allows monitoring of all framing and plates from inside, do not require permanent means of access of the cross deck.

Interpretation

"Full upper stools" are understood to be stools with a full extension between top side tanks and between hatch end beams.

Remarks

Conventions/Codes Requirements

Table **2 –** Means of access for bulk carriers, resolution **MSC.158(78)**, paragraph **1.5**

1.5 Alternatively, movable means of access may be utilized for access to the overhead structure of cross deck if its vertical distance is 17 m or less above the tank top.

Interpretation

1. The movable means of access to the underdeck structure of cross deck need not necessarily be carried on board the vessel. It is sufficient if it is made available when needed.
2. The requirements for bulk carrier cross deck structure are also to be considered applicable to ore carriers.

Remarks

Conventions/Codes Requirements

Table **2 –** Means of access for bulk carriers, resolution **MSC.158(78)**, paragraph **1.6**

1.6 Permanent means of vertical access shall be provided in all cargo holds and built into the structure to allow for an inspection of a minimum of 25 % of the total number of hold frames port and starboard equally distributed throughout the hold including at each end in way of transverse bulkheads. But in no circumstance shall this arrangement be less than 3 permanent means of vertical access fitted to each side (fore and aft ends of hold and mid-span). Permanent means of vertical access fitted between two adjacent hold frames is counted for an access for the inspection of both hold frames. A means of portable access may be used to gain access over the sloping plating of lower hopper ballast tanks.

Interpretation

The maximum vertical distance of the rungs of vertical ladders for access to hold frames is to be 350 mm.

If safety harness is to be used, means are to be provided for connecting the safety harness in suitable places in a practical way.

Technical Background

The maximum vertical distance of the rungs of 350 mm is applied with a view to reducing trapping cargoes.

Remarks

Conventions/Codes Requirements

Table **2 –** Means of access for bulk carriers, resolution **MSC.158(78)**, paragraph **1.7**

1.7 In addition, portable or movable means of access shall be utilized for access to the remaining hold frames up to their upper brackets and transverse bulkheads.

Interpretation

Portable, movable or alternative means of access also is to be applied to corrugated bulkheads.

Remarks

Conventions/Codes Requirements

Table 2 – Means of access for bulk carriers, resolution MSC.158(78), paragraph 1.8

1.8 Portable or movable means of access may be utilized for access to hold frames up to their upper bracket in place of the permanent means required in 1.6. These means of access shall be carried on board the ship and readily available for use.

Interpretation

Readily available means;-

Able to be transported to location in cargo hold and safely erected by ship's staff.

Remarks

Conventions/Codes Requirements

Table **2 –** Means of access for bulk carriers, resolution **MSC.158(78)**, paragraph **2.3**

2.3 Three permanent means of access, fitted at the end bay and middle bay of each tank, shall be provided spanning from tank base up to the intersection of the sloping plate with the hatch side girder. The existing longitudinal structure may be used as part of this means of access.

Interpretation

If the longitudinal structures on the sloping plate are fitted outside of the tank a means of access is to be provided

Remarks

Conventions/Codes Requirements

Table **2 –** Means of access for bulk carriers, resolution **MSC.158(78)**, paragraph **2.5**

Bilge hopper tanks

2.5 For each bilge hopper tank of which the height is 6 m and over, one longitudinal continuous permanent means of access shall be provided along the side shell webs and installed at a minimum of 1.2 m below the top of the clear opening of the web ring with a vertical access ladder in the vicinity of each access to the tank.

Interpretation

1. The height of a bilge hopper tank located outside of the parallel part of vessel is to be taken as the maximum of the clear vertical height measured from the bottom plating to the hopper plating of the tank.
2. It is to be demonstrated that portable means for inspection can deployed and made readily available in the areas where needed.

Remarks

Conventions/Codes Requirements

Table **2 –** Means of access for bulk carriers, resolution **MSC.158(78)**, paragraph **2.5.2**

Bilge hopper tanks

2.5.2 Alternatively, the longitudinal continuous permanent means of access can be located through the upper web plating above the clear opening of the web ring, at a minimum of 1.6 m below the deck head, when this arrangement facilitates more suitable inspection of identified structurally critical areas. An enlarged longitudinal frame can be used for the purpose of the walkway.

Interpretation

A wide longitudinal frame of at least 600 mm clear width may be used for the purpose of the longitudinal continuous permanent means of access**. The foremost and aftermost bilge hopper ballast tanks with raised bottom, of which the height is 6 m and over, a combination of transverse and vertical MA for access to the sloping plate of hopper tank connection with side shell plating for each transverse web can be accepted in place of the longitudinal permanent means of access.**

Remarks

Conventions/Codes Requirements

Table **2 –** Means of access for bulk carriers, resolution **MSC.158(78)**, paragraph **2.6**

2.6 If no access holes are provided through the transverse ring webs within 600 mm of the tank base and the web frame rings have a web height greater than 1 m in way of side shell and sloping plating, then step rungs/grab rails shall be provided to allow safe access over each transverse web frame ring.

Interpretation

The height of web frame rings is to be measured in way of side shell and tank base.

Technical Background

In the bilge hopper tank the sloping plating is above the opening, while the movement of the surveyor is along the bottom of the tank. Therefore the measurement of 1 m is to be taken from the bottom of the tank.
Remarks

1.181 Arrangement of galley ducts

Conventions (Amend.), Reg.		Regulation **II-2/9.7.2.1** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC192**	**UI** version	**Dec., 2004**	Date of implementation	**01.07.2005**	Means of implementation	Keel laying
Conventions/Codes Requirements							
The ventilation systems for machinery spaces of category A, vehicle spaces, ro-ro spaces, galleys, special category spaces and cargo spaces shall, in general, be separated from each other and from the ventilation systems serving other spaces, except that the galley ventilation systems on cargo ships of less than 4,000 gross tonnage and in passenger ships carrying not more than 36 passengers need not be completely separated, but may be served by separate ducts from a ventilation unit serving other spaces. In any case, an automatic fire damper shall be fitted in the galley ventilation duct near the ventilation unit.							
Interpretation							
The expression "in any case" means, in this context, "for any duct section" and this sentence actually applies to arrangements where a ventilation unit serves some spaces and a galley by a separate duct, as permitted for cargo ships of less than 4,000 gross tonnage and for passenger ships carrying not more than 36 passengers.							
Remarks							
In Circular No.010/Total No.130 (2005) "Notice on the Implementation of IACS UI SC192" by issued CCS Technical Department, the expression "in any case" is interpreted as follows: In cargo ships of less than 4,000 gross tonnage and passenger ships carrying not more than 36 passengers where the galley ventilation is provided by a ventilation unit serving other spaces instead of a separated ventilation system, then, irrespective of the size of the galley ventilation duct, an automatic fire damper shall be fitted in the ventilation duct near the ventilation unit.							

1.182 Installation of electrical and electronic appliances on the bridge and vicinity of the bridge

Conventions (Amend.), Reg.		Regulation **17** of **SOLAS Chapter V** as amended by IMO resolutions up to MSC.350(92)					
IACS UI Number	**SC194**	**UI** version	**Sept.,2005/ Rev.1,Feb.,2021**	Date of implementation	**Jan. 1,2007/ Rev.1,July 1,2022**	Means of implementation	**Contracted for construction**
Conventions/Codes Requirements							
1. Administrations shall ensure that all electrical and electronic equipment on the bridge or in the vicinity of the bridge, on ships constructed on or after 1 July 2002, is tested for electromagnetic compatibility, taking into account the recommendations developed by the Organization.* 2. Electrical and electronic equipment shall be so tested that electromagnetic interference does not affect the proper function of navigational systems and equipment. 3. Portable electrical and electronic equipment shall not be operated on the bridge if it may affect the proper function of navigational systems and equipment. * Refer to the General requirements for electromagnetic compatibility for all electrical and electronic ship's equipment adopted by the Organization by resolution A.813 (19).							
Interpretation							
1.Scope All electrical and electronic appliances installed on the bridge and vicinity of the bridge other than mandatory navigation and communication equipment having been type tested according to IEC 60945:2002, as well as loose equipment placed on board by the builders or owners shall have been EMC tested for Conducted and Radiated Emission. Bridge and vicinity of the bridge covers deck and bridge zone, i.e. – the wheelhouse including bridge wings – control rooms, characterized by equipment for inter-communication, signal processing, radio communication and navigation, auxiliary equipment							

– area in close proximity to receiving and/or transmitting antennas and large openings in the metallic structure (equipment beyond 5 meters need not be considered for this purposes).

2. Test standards

The following are acceptable test standards:

– IEC 60945:2002

– IEC 60533:2015

For the purpose of this UI, equipment need be tested for Conducted and Radiated Emission only.

Note:

Equipment having been type tested for EMC in accordance with other appropriate standards will have to be considered.

In particular the level of radiated emission in the frequency band from 156 to 165 MHz and the location of the equipment shall be evaluated.

IEC standard 60533:2015 gives guidance to type of equipment and applicable tests.

Passive-EM equipment, defined below, which is excluded from the scope of the EMC since it is considered not liable to cause or be susceptible to disturbances need not to be tested but shall be provided with an exemption statement.

Definition:

Equipment is considered a passive-EM equipment if, when used as intended (without internal protection measures such as filtering or shielding) and without any user intervention, it does not create or produce any switching or oscillation of current or voltage and is not affected by electromagnetic disturbances.

Example of equipment which include no active electronic part:

– cables and cabling systems, cables accessories.

– equipment containing only resistive loads without any automatic switching device; e.g. simple domestic heaters with no controls, thermostat, or fan.

– batteries and accumulators.

3. Evidence to be provided

All electrical and electronic appliances installed on the bridge and vicinity of the bridge other than mandatory navigation and communication equipment having been type tested according to IEC 60945:2002, as well as loose equipment placed on board by the builders or owners shall be listed and be provided with at least the following information. The list and the evidence of equipment are to be kept onboard.

– equipment description

– manufacturer

– type / model

– evidence of EMC compatibility which may be:

- type approval certificate covering EMC requirements for bridge installations;
- test certificate or report / conformity statement; or
- exemption statement.

Remarks

1.183 Performance standards for universal automatic identification systems (AIS) (SOLAS Reg. V/18.2)

Conventions (Amend.), Reg.		Regulation **V/18.2** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC195**	**UI** version	**Sept.,2005**	Date of implementation	**01.04.2006**	Means of implementation	

Conventions/Codes Requirements

Résumé:

Chapter V, Regulation 18.2 of SOLAS requires that the Automatic Identification System installed on ships conforms to appropriate performance standards not inferior to those adopted by the Organisation and refers to resolution MSC.74 (69), annex 3.

IMO have published voluntary installation guidelines necessary for the effective performance of the system in document SN/Circ.227 that apply additional requirements to the above mentioned MSC resolution

Interpretation

Automatic Identification System (AIS) in addition to compliance with the above mentioned Performance Standards are also to comply with paragraphs 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 4.4, 4.5 and paragraph 6 of IMO document SN/Circ.227, "Guidelines for the installation of a shipborne automatic identification system (AIS)".

Note: Paragraph 2.2.1 is to be complied with as far as practicable.
Remarks

1.184 Document of Compliance for the carriage of dangerous goods (DoC)

Conventions (Amend.), Reg.		Regulation **II-2/19.4** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC196**	**UI** version	**Mar. ,2005**	Date of implementation	**01.07.2005**	Means of implementation	

Conventions/Codes Requirements

The Administration shall provide the ship with an appropriate document as evidence of compliance of construction and equipment with the requirements of this regulation.

Interpretation

1. Ships constructed on or after 1 July 2002 have to comply with SOLAS Reg. II-2/19 and all the requirements introduced with 2000 SOLAS amendments and should be issued with a DoC in pursuance of Regulation II-2/19.
2. Ships constructed on or after 1 July 1998 and before 1 July 2002 have to comply with SOLAS Regulation II-2/54 and all the requirements introduced with 1996 SOLAS amendments and should be issued with a DoC in pursuance of regulation II-2/54.
3. Ships constructed on or after 1 September 1984 and before 1 July 1998 have to comply with SOLAS Regulation II-2/54 and all the requirements introduced with 1981 SOLAS amendments and should be issued with a DoC in pursuance of Regulation II-2/54.
4. Ships constructed before 1 September 1984, upon request of the owner, should be issued with a DoC in pursuance of Regulation II-2/54 provided they comply with the requirements of Regulation II-2/54 and other Regulations referred to in reg. II-2/54.

Remarks

1.185 Non-combustible cargoes

Conventions (Amend.), Reg.		SOLAS Regulation II-2/10.7.1.4					
IACS UI Number	**SC197**	**UI** version	**Mar.,2005/ Rev.1,Aug,2006/ Rev.2 ,Mar.,2021**	Date of implementation	**Jan.7,2005**	Means of implementation	

Conventions/Codes Requirements

SOLAS Regulation II-2/10.7.1.4 reads:

The Administration may exempt from the requirements of paragraphs 7.1.3 and 7.2 cargo spaces of any cargo ship if constructed, and solely intended, for the carriage of ore, coal, grain, unseasoned timber, non-combustible cargoes or cargoes which, in the opinion of the Administration, constitute a low fire risk. Such exemptions may be granted only if the ship is fitted with steel hatch covers and effective means of closing all ventilators and other openings leading to the cargo spaces. When such exemptions are granted, the Administration shall issue an Exemption Certificate, irrespective of the date of construction of the ship concerned, in accordance with regulation I/12(a)(vi), and shall ensure that the list of cargoes the ship is permitted to carry is attached to the Exemption Certificate.*

**Refer to the IMSBC Code (resolution MSC.268(85), as amended), appendix 1, entry for coal, and to the Lists of solid bulk cargoes for which a fixed gas fire-extinguishing system may be exempted or for which a fixed gas fire-extinguishing system is ineffective (MSC.1/Circ.1395 Rev. 4).*

Interpretation

1. Non-combustible cargoes, such as materials listed in paragraph 1 of Annex 2 to the 2010 FTP Code, need not be mentioned on exemption certificates issued under Reg.II-2/10.7.1.4.
2. The document of compliance with Reg.II-2/19 may not permit more cargoes than indicated in the list of cargoes attached to the exemption certificate issued under Reg.II-2/10.7.1.4.(MSC.1/Circ.1203)

Technical Background

The SOLAS regulation's text referenced in the UI was not up to date.
Remarks
1. This UI is to be uniformly implemented by IACS Members and Associates from 1 July 2005. 2. Rev.1 of this UI is editorially amended to refer to MSC.1/Circ.1203. 3. Rev.2 of the UI is editorially amended to refer to the 2010 FTP Code.

1.186 Sections in local application fire extinguishing systems

Conventions (Amend.), Reg.		Regulation **II-2/10.5.6.3** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC198**	**UI** version	**June ,2005**	Date of implementation	**01.01.2006**	Means of implementation	
Conventions/Codes Requirements							
Fixed local application fire-extinguishing systems are to protect areas such as the following without the necessity of engine shutdown, personnel evacuation, or sealing of the spaces: .1 the fire hazards portions of internal combustion machinery…							
Interpretation							
In multi-engine installations, at least two sections should be arranged.							
Technical Background							
Proposals were considered on the minimum required number of sections to be provided for multi-engine installations. Bearing in mind that the local fire fighting system is designed to fight a fire as early and locally as possible, while the total flooding would come if the fire extends, it was considered that at least two sections would be necessary.							
Remarks							
Circular No.033/Total No.153 (2005) "Notice on the Implementation of IACS UI SC198" issued by CCS' Technical Department							

1.187 Fire fighting systems in cargo sampling lockers

Conventions (Amend.), Reg.		Regulation **II-2/10.6.3.2** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC199**	**UI** version	**June ,2005**	Date of implementation	**01.01.2006**	Means of implementation	Keel laying
Conventions/Codes Requirements							
Flammable liquid lockers shall be protected by an appropriate fire-extinguishing arrangement approved by the Administration.							
Interpretation							
The requirements given in SOLAS Reg. II-2/10.6.3.2 and 10.6.3.3 are not considered applicable for cargo service spaces intended for the stowage of cargo samples, when such spaces are positioned within the cargo area onboard tankers.							
Technical Background							
An increased number of questions concerning fire protection of lockers containing cargo samples are received from operators of oil and chemical tankers following comments from part state inspectors or charter's inspectors. Classification Societies have treated these spaces on board oil tankers as "isolated cargo handling gear lockers" as discussed in SOLAS Reg. II-2/4.5.1.2. These spaces have not been required to be fitted with fixed fire extinguishing system. In this context, it should also be noted that these spaces should not contain ignition sources. Further these spaces are arranged on weather deck within the cargo area, considered protected by the deck foam system. For chemical tankers, the IBC Code 16.5 allows space for stowage of cargo samples within the cargo area, but does not mention that this space shall be protected by a fixed fire extinguishing system. Furthermore, within this Code they are defined as cargo service spaces, possibly excluding them from service spaces.							

Based on the above, IACS considers a fire extinguishing system is not required for the cargo sample lockers and an interpretation was drafted for this purpose.
Remarks
Circular No.034/Total No.154 (2005) "Notice on the Implementation of IACS UI SC199" issued by CCS' Technical Department

1.188 Container storage arrangement for equivalent fixed gas fire extinguishing systems

Conventions (Amend.), Reg.		Paragraph **2.5**, Chapter **5** of **FSS** Code					
IACS UI Number	**SC200**	**UI** version	**June ,2005**	Date of implementation	**01.01.2006**	Means of implementation	Keel laying

Conventions/Codes Requirements

Fixed gas fire-extinguishing systems equivalent to those specified in paragraphs 2.2 to 2.4 shall be approved by the Administration based on the guidelines developed by the Organisation.

Interpretation

Agent containers stored in a protected space shall be distributed throughout the space with bottles or groups of bottles located in at least six separate locations. Duplicate power release lines shall be arranged to release all bottles simultaneously. The release lines shall be so arranged that in the event of damage to any power release line, five sixth of the fire extinguishing gas can still be discharged. The bottle valves are considered to be part of the release lines and a single failure shall include also failure of the bottle valve.

For systems that need less than six cylinders (using the smallest bottles available), the total amount of extinguishing gas on the bottles shall be such that in the event of a single failure to one of the release lines (including bottle valve), five sixth of the fire extinguishing gas can still be discharged. This may be achieved by for instance using more extinguishing gas than required so that if one bottle is not discharging due to a single fault, the remaining bottles will discharge the minimum five sixth of the required amount of gas. This can be achieved with minimum two bottles. However, NOAEL values calculated at the highest expected engine room temperature are not to be exceeded when discharging the total amount of extinguishing gas simultaneously.

Systems that can not comply with the above, for instance systems using only one bottle located inside the protected space, can not be accepted. Such systems shall be designed with the bottle(s) located outside the protected space, in a dedicated room in compliance with SOLAS Reg.II-2/10.4.3.

Technical Background

This UI was developed to ensure a proper distribution of the containers of extinguishing gas where they are stored within the protected space, and on the basis of MSC/Circ. 848, paragraph 11.

Remarks

Circular No.039/Total No.159 (2005) "Notice on the Implementation of IACS UI SC200" issued by CCS' Technical Department

1.189 Location of paint lockers within cargo block

Conventions (Amend.), Reg.		Regulations **II-2/4.5.1.2 & 4.5.1.3** of Amendments **2000** to **SOLAS 1974** Paragraph **3.2.1** of **IBC** Code					
IACS UI Number	**SC201**	**UI** version	**Sept. ,2005/ Rev.1, 01.04.2006**	Date of implementation	**01.01.2006/ 01.07.2006 (Rev.1)**	Means of implementation	**Construction or installation**

Conventions/Codes Requirements

SOLAS Regulations **II-2/4.5.1.2** and **4.5.1.3** read:

II-2/4.5.1.2

Main cargo control stations, control stations, accommodation and service spaces (excluding isolated cargo handling gear lockers) shall be positioned aft of cargo tanks, slop tanks, and spaces which isolate cargo or slop tanks from machinery spaces, but not necessarily aft of the oil fuel bunker tanks and ballast tanks, and shall be arranged in such a way that a single failure of a deck or bulkhead shall not permit the entry of gas or fumes from the cargo tanks into the

main cargo control stations, control stations, or accommodation and service spaces. A recess provided in accordance with paragraph 5.1.1 need not be taken into account when the position of these spaces is being determined.
II-2/4.5.1.3
However, where deemed necessary, the Administration may permit main cargo control stations, control stations, accommodation and service spaces forward of the cargo tanks, slop tanks and spaces which isolate cargo and slop tanks from machinery spaces, but not necessarily forward of oil fuel bunker tanks or ballast tanks. Machinery spaces, other than those of category A, may be permitted forward of the cargo tanks and slop tanks provided they are isolated from the cargo tanks and slop tanks by cofferdams, cargo pump-rooms, oil fuel bunker tanks or ballast tanks, and have at least one portable fire extinguisher. In cases where they contain internal combustion machinery, one approved foam-type extinguisher of at least 45 l capacity or equivalent shall be arranged in addition to portable fire extinguishers. If operation of a semiportable fire extinguisher is impracticable, this fire extinguisher may be replaced by two additional portable fire extinguishers. Main cargo control stations, control stations and accommodation and service spaces shall be arranged in such a way that a single failure of a deck or bulkhead shall not permit the entry of gas or fumes from the cargo tanks into such spaces. In addition, where deemed necessary for the safety or navigation of the ship, the Administration may permit machinery spaces containing internal combustion machinery not being main propulsion machinery having an output greater than 375 kW to be located forward of the cargo area provided the arrangements are in accordance with the provisions of this paragraph.
Paragraph 3.2.1 of IBC Code reads: No accommodation or service spaces or control stations should be located within the cargo area except over a cargo pump-room recess or pump-room recess that complies with Regulation II-2/56 of the 1983 SOLAS amendments and no cargo or slop tank should be aft of the forward end of any accommodation.

Interpretation

Paint lockers, regardless of their use, cannot be located above the tanks and spaces defined in SOLAS II-2/4.5.1.2 for oil tankers and the cargo area for chemical tankers. (Rev. 1)

Technical Background

1. It is proposed by ABS that as paint lockers that are used solely for storage have more fire risks than cargo handling gear lockers, the paint lockers used solely for storage can be located above the cargo block on oil and chemical tankers providing certain measures are adopted(e.g. ventilation) to reduce fire risk.
2. The original text of Unified Interpretation SC201 was presented to FP 50 but was not accepted, because the Sub-Committee "expressed the view that there was no justification for this interpretation since the SOLAS requirements were clear on this issue". Therefore, IACS decided that the UI should be revised accordingly. (Rev. 1)

Remarks

Circular No.036 /Total No.156 (2005) "Notice on the Implementation of IACS UI SC201" issued by CCS' Technical Department

1.190 Carriage requirements for shipborne navigational systems and equipment

Conventions (Amend.), Reg.		Regulations **V/19.2.2.1 & 19.2.5.1** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC203**	**UI** version	**Mar. ,2006/ Corr.1,May ,2007**	Date of implementation	**01.01.2007**	Means of implementation	contracted for construction

Conventions/Codes Requirements

SOLAS Regulation V/19.2.2.1 reads:
2.2 All ships of 150 gross tonnage and upwards and passenger ships irrespective of size shall, in addition to the requirements of paragraph 2.1, be fitted with:
.1 a spare magnetic compass interchangeable with the magnetic compass, as referred to in paragraph 2.1.1, or other means to perform the function referred to in paragraph 2.1.1 by means of replacement or duplicate equipment;
SOLAS regulation V/19.2.5.1 reads:
2.5 All ships of 500 gross tonnage and upwards shall, in addition to meeting the requirements of paragraph 2.3 with the exception of paragraphs 2.3.3 and 2.3.5, and the requirements of paragraph 2.4, have:
.1 a gyro compass, or other means, to determine and display their heading by shipborne non-magnetic means and to transmit heading information for input to the equipment referred in paragraphs 2.3.2, 2.4 and 2.5.5;

Interpretation

A gyrocompass can be fitted, as the "other means" mentioned in regulation V/19.2.2.1, to comply with that Regulation. However, this gyrocompass:
– cannot be credited to fulfill regulation V/19.2.5.1; and
– shall be fed by both main and emergency power supply and, in addition, it shall be provided with a transitional

source of power (e.g. a battery).*(MSC.1/Circ.1224)*

Technical Background

Corr.1 was submitted at NAV 52, approved by the subcommittee and included into MSC/Circ, which was then adopted by the 82th session of MSC.
The original version was editorially amended to refer to MSC.1/Circ.1224.

Remarks

1. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.
2. Refer to Circular No.050/Total No.214 (2006) "Notice on the Implementation of IACS UI SC203- Carriage requirements for shipborne navigational systems and equipment" issued by CCS' Technical Department.

1.191 Storage of fire-extinguishing media forward the cargo holds

Conventions (Amend.), Reg.		Regulation **II-2/10.4.3** of Amendments **2000** to **SOLAS 1974** Paragraph **2.1.3.3**, Chapter **5** of **FSS** Code					
IACS UI Number	**SC204**	**UI** version	**April ,2006**	Date of implementation	**01.01.2007**	Means of implementation	

Conventions/Codes Requirements

SOLAS Regulation **II-2/10.4.3** reads:
When the fire-extinguishing medium is stored outside a protected space, it shall be stored in a room which is located behind the forward collision bulkhead, and is used for no other purposes. Any entrance to such a storage room shall preferably be from the open deck and shall be independent of the protected space. If the storage space is located below deck, it shall be located no more than one deck below the open deck and shall be directly accessible by a stairway or ladder from the open deck. Spaces which are located below deck or spaces where access from the open deck is not provided, shall be fitted with a mechanical ventilation system designed to take exhaust air from the bottom of the space and shall be sized to provide at least 6 air changes per hour. Access doors shall open outwards, and bulkheads and decks including doors and other means of closing any opening therein, which form the boundaries between such rooms and adjacent enclosed spaces shall be gastight. For the purpose of the application of tables 9.1 to 9.8, such storage rooms shall be treated as fire control stations.
Paragraph **2.1.3.3**, Chapter **5** of **FSS** Code reads:
The means of control of any fixed gas fire-extinguishing system shall be readily accessible, simple to operate and shall be grouped together in as few locations as possible at positions not likely to be cut off by a fire in a protected space.

Interpretation

Fire-extinguishing media protecting the cargo holds may be stored in a room located forward the cargo holds, but aft of the collision bulkhead, provided that both the local manual release mechanism and remote control(s) for the release of the media are fitted, and the latter is of robust construction or so protected as to remain operable in case of fire in the protected spaces. The remote controls shall be placed in the accommodation area in order to facilitate their ready accessibility by the crew. The capability to release different quantities of fire-extinguishing media into different cargo holds so protected shall be included in the remote release arrangement.

Technical Background

Arrangements have been found where the storage rooms of fire-extinguishing medium of systems protecting cargo holds are located in the forward part of the ship but aft of the collision bulkhead.
It is noted that release of the fire-extinguishing medium (generally CO_2) into a cargo hold is usually performed locally from inside the storage room by manually controlling the release of gas into the concerned space; however, this type of arrangement seems not to meet the requirement of paragraph 2.1.3.3, Chapter 5, of the FSS Code, as the controls could be cut off in the case of a cargo hold fire and, therefore the means of control would not be readily accessible.
The UI was developed with the aim of specifying the criteria on the basis of which arrangements where the fixed fire-fighting media are stored in room located forward the protected cargo holds may be accepted.

Remarks

1.192 Portable fire-fighting appliances in cargo holds loaded with vehicles with fuel in their tanks

Conventions (Amend.), Reg.		Regulation **II-2/20.6.2** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC205**	**UI** version	**May ,2006**	Date of implementation	**01.07.2006**	Means of implementation	

Conventions/Codes Requirements

Regulation II-2/20.6.2 reads:

6.2 Portable fire extinguishers

6.2.1 Portable extinguishers shall be provided at each deck level in each hold or compartment where vehicles are carried, spaced not more than 20 m apart on both sides of the space. At least one portable fire-extinguisher shall be located at each access to such a cargo space.

6.2.2 In addition to the provision of paragraph 6.2.1, the following fire extinguishing appliances shall be provided in vehicle, ro-ro and special category spaces intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion:

.1 at least three water-fog applicators; and

.2 one portable foam applicator unit complying with the provisions of the Fire Safety Systems Code, provided that at least two such units are available in the ship for use in such spaces.

Interpretation

Cargo holds, loaded with vehicles with fuel in their tanks and stowed in open or closed containers need not to be provided with the portable fire extinguishers, water fog applicators and foam applicator unit.

Technical Background

It is necessary to clarify how to comply with SOLAS Regulation II-2/20.6.2 for cargo holds in ships carrying vehicles with fuel in their tanks in open or closed containers. The requirements of SOLAS Regulation II-2/20.6.2 are not intended for such cargo holds due to the following factors: the design of ship cargo holds (e.g., presence of cell guides, lack of continuous deck except at the bottom), the impracticality of gaining access to and consequently the utility of the portable fire extinguishers, and such cargo holds being fitted with fixed fire-extinguishing systems. The above Interpretation was prepared and submitted to FP 51.

Remarks

1.193 SOLAS XII/5 in terms of Structural Strength of Bulk Carriers in case of Accidental Hold Flooding

Conventions (Amend.), Reg.		Regulation **XII/5** of **SOLAS 1974**					
IACS UI Number	**SC207**	**UI version**	**Jun.,2006/ Corr.1,Oct.,2007/ Corr.2,Jan. ,2020**	**Date of impleme ntation**	**Jul.1,2006**	**Means of impleme ntation**	

Conventions/Codes Requirements

Regulation XII/5 reads:

"Regulation 5 Structural strength of bulk carriers

1 Bulk carriers of 150 m in length and upwards of single-side skin construction, designed to carry solid bulk cargoes having a density of 1,000 kg/m^3 and above constructed on or after 1 July 1999, shall have sufficient strength to withstand flooding of any one cargo hold to the water level outside the ship in that flooded condition in all loading and ballast conditions, taking also into account dynamic effects resulting from the presence of water in the hold, and taking into account the recommendations adopted by the Organization.

2 Bulk carriers of 150 m in length and upwards of double-side skin construction, in which any part of longitudinal bulkhead is located within B/5 or 11.5 m, whichever is less, inboard from the ship's side at right angle to the centreline at the assigned summer load line, designed to carry bulk cargoes having a density of 1,000 kg/m^3 and above constructed on or after 1 July 2006, shall comply with the structural strength provisions of paragraph 1."

Interpretation

Regardless of the date of contract for construction, or the cargo hold cross section configuration, of ships which shall comply with SOLAS XII/5.2, such ships are to comply with IACS Unified Requirements as amended (UR) S17, S18 for corrugated transverse bulkheads, where fitted, and S20, if they do not comply with the IACS CSR for Bulk Carriers and Oil Tankers.

Technical Background

In the Amendments of SOLAS Chapter XII, adopted by MSC as resolution MSC.170(79), which comes into force on 1 July 2006, the definition of Bulk Carriers has been extended from those in the SOLAS Chapter XII before the amendments and IACS Unified Requirements Z11.2.2.

According to UR Z11.2.2, bulk carriers means ships constructed generally with single deck, double bottom, hopper side tanks and topside tanks and with single or double side skin construction in cargo length area, etc. However, the new definition of the amended SOLAS XII does not refer to such cargo hold cross section configurations specified in UR Z11.2.2. In addition, for the purpose of their application regarding coming into force date, SOLAS XII uses keel laying date but IACS UR S17, S18 and S20 use contract date. As a result, IACS UR S17, S18 and S20, which have been referred to from MSC Resolution 6, do not cover all ships which shall comply with the amended SOLAS XII/ 5 in terms of application date and definition of bulk carriers. Therefore, IACS developed Unified Interpretation (UI) incorporating IACS URs S17/S18/S20 to bridge the gap between the 1 July 2006 contract for construction date associated with the amended IACS URs and the 1 July 2006 keel laying date associated with the entry into force of the revised SOLAS XII as per MSC.170(79) in order to properly address bulk carriers of double side skin construction subject to the revised SOLAS XII/5.2.

Remarks

1. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.
2. Circular No. 038/Total No. 202 (2006) "Notice on Implementation of IACS UI SC207" issued by CCS' Technical Department.

1.194 SOLAS XII/6.5.1 in terms of protection of cargo holds from loading/discharge equipment

Conventions (Amend.), Reg.		Regulation **XII/6.5.1** of **SOLAS 1974**					
IACS UI Number	**SC208**	**UI** version	**Jun.,2006/ Corr.1,Oct.,2007/ Corr.2, Jun.,2009**	Date of implementation	**Jul.1,2006/ Jun.,2009**	Means of implementation	

Conventions/Codes Requirements

SOLAS regulation XII/6.5.1 reads:

"In bulk carriers of 150 m in length and upwards, carrying solid bulk cargoes having a density of 1,000 kg/m^3 and above, constructed on or after 1 July 2006:

.1 the structure of cargo holds shall be such that all contemplated cargoes can be loaded and discharged by standard loading/discharge equipment and procedures without damage which may compromise the safety of the structure."

Unified Interpretation (SLS.14./Circ.250)

The paragraph 1 for SOLAS regulation XII/6.5.1 in SLS.14/Circ.250 reads:

"Regulation XII/6.5.1 Protection of cargo holds from loading/discharge equipment

1. The protection of the structure of the cargo holds should be achieved by structural design features such as mandatory application of classification society grab notation.

2. The protection of hatchways and coamings from grab wire damage may be achieved by fitting protection bars (e.g., half-round bar) on the hatch-side girder (e.g., upper portion of top-side tank plates), hatch-end beams and the upper portion of hatch coamings."

Interpretation

Bulk Carriers which shall comply with SOLAS regulation XII/6.5.1 and which do not comply with the IACS CSR for Bulk Carriers, are to comply with the following:

1. The Society's "Grab Notation";

2. Wire rope grooving in way of cargo holds openings is to be prevented by fitting suitable protection such as half-round bar on the hatch side girders (i.e. upper portion of top side tank plates)/hatch end beams in cargo hold and upper portion of hatch coamings.

Technical Background

The definition of bulk carriers in the revised SOLAS XII which comes into force on 1 July 2006 is expanded from the IACS definition as described in UR Z11.2.2 in terms of the cargo hold cross section configuration. In addition, the coming into force date of revised SOLAS XII/6.5.1 is different from that of IACS CSR. Therefore, IACS developed Unified Interpretation (UI) codifying SLS.14/Circ.250 and the approach adopted by IACS CSR for compliance with SOLAS XII/6.5.1. According to the Interpretation, Bulk Carriers which shall comply with SOLAS regulation XII/6.5.1 and which do not comply with the IACS CSR for Bulk Carriers, are to comply with the new UI developed in accordance with SLS.14/Circ.250 and SOLAS requirements, i.e., adding "Grab Notation" and requirements for protection of wire rope grooving in way of cargo holds opening.

Remarks
1. Corr.1 of this UI contains the interpretation of the "contracted for construction" date. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29. 2.Before Corr.2, half-round bars can be fitted on the hatch-side girder (e.g., upper portion of top-side tank plates), hatch-end beams and the upper portion of hatch coamings. The corrected interpretation in Corr.2 is not applicable retrospectively (i.e. to ships contracted for construction before 1 July 2009). 3. Circular No. 039/Total No. 203 (2006) "Notice on Implementation of IACS UI SC208" issued by CCS' Technical Department. 4. CCS 2007 Amendments to Rules for Classification of Sea-going Steel Ships.

1.195 Redundancy of stiffening structural members for vessels not designed according to CSR

Conventions (Amend.), Reg.		Regulation **XII/6.4.3** of **SOLAS 1974 and SLS.14/Circ.250**					
IACS UI Number	**SC209**	**UI** version	**Jun.2006/ Rev.1,Dec.,2019**	Date of impleme ntation	**01.07.2006/ Rev.1,July 1, 2020**	Means of implement ation	**Contracted for construction (Rev.1)**

Conventions/Codes Requirements
Regulation 6 "Structural and other requirements for bulk carriers" contains the following in Regulation XII/6.4: In bulk carriers of 150 m in length and upwards, carrying solid bulk cargoes having a density of 1,000 kg/m^3 and above, constructed on or after 1 July 2006: .1 the structure of cargo holds shall be such that all contemplated cargoes can be loaded and discharged by standard loading/discharge equipment and procedures without damage which may compromise the safety of the structure; .2 effective continuity between the side shell structure and the rest of the hull structure shall be assured; and .3 the structure of cargo areas shall be such that single failure of one stiffening structural member will not lead to immediate consequential failure of other structural items potentially leading to the collapse of the entire stiffened panels.
Interpretation
Ships which shall comply with SOLAS XII/6.**4**.3 are to satisfy either 1) or 2) as given below: 1) CSR (Common Structural Rules for Bulk Carriers and Oil Tankers), Pt 1, Ch 3, Sec.1 "Materials" and Pt 1, Ch. 8, Sec. 5, "Buckling Capacity". 2) For ships not designed according to CSR (Pt 1, Ch 3, Sec1 and Ch 8, Sec 5): a) For ships with single side structures the material grade shall not be less than grade D/DH for: - lower bracket of side frame - side shell plate between two points located to 0.125*l* above and 0.125*l* below the intersection of side shell and bilge hopper sloping plate or inner bottom plate. The span of the side frame, l, is defined as the distance between the supporting structures. In case of side frames built with multiple spans, the above requirements apply to the lower part only. (See Fig.1)

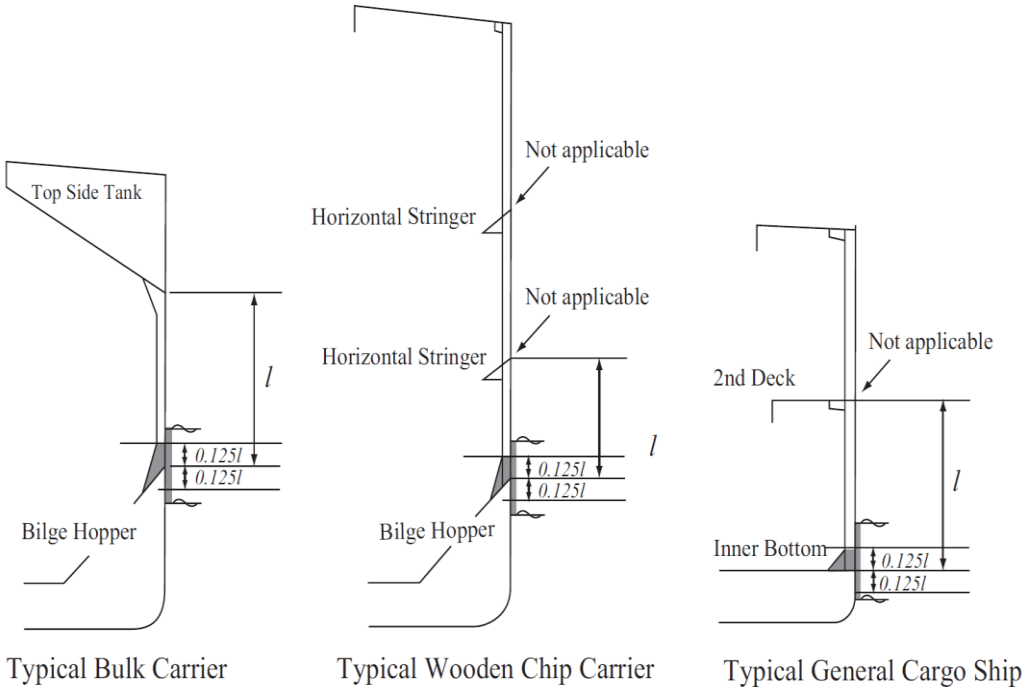


Fig. 1

b) The safety factor with respect to lateral buckling of longitudinal and transverse ordinary stiffeners is to be increased by a factor at least of 1.15 (allowable utilization factor to be reduced by at least 1/1.15 = 0.87) for the following areas:

- hatchway coaming
- inner bottom
- sloped stiffened panel of topside tanks and hopper tanks (if any)
- inner side (if any)
- top stool and bottom stool of transverse bulkhead (if any)
- stiffened transverse bulkhead (if any)
- side shell (if directly bounding the cargo hold)

The lateral buckling requirements of ordinary stiffeners shall be in accordance with the Rules of the Classification Society.

Technical Background

In the Amendments of SOLAS Chapter XII, adopted by MSC as resolution MSC.170 (79), which comes into force on 1 July 2006, the definition of Bulk Carriers has been extended from those in the SOLAS Chapter XII before the amendments and IACS Unified Requirements Z11.2.2. According to UR Z11.2.2, bulk carries mean ships constructed generally with single deck, double bottom, hopper side tanks and topside tanks and with single or double side skin construction in cargo length area, etc. However, the new definition of the amended SOLAS XII does not refer to such cargo hold cross section configuration specified in UR Z11.2.2.

Therefore, IACS has developed this Unified Interpretation (UI) to bridge the gap between

- the 1 April 2006 contract for construction date associated with CSR for bulk carriers and the 1 July 2006 keel laying date associated with the entry into force of the amended SOLAS XII as per MSC.170(79) and
- the definition of bulk carries according to UR Z11.2.2 and the new definition of the amended SOLAS XII as per MSC.170(79)

and to give an equivalent criteria regarding lateral buckling of ordinary stiffeners for ships which shall comply with SOLAS XII/6.4.3, but are not designed according to CSR for bulk carriers Ch. 6 Sec. 3.

Remarks

1.Circular No.040/Total No.204 (2006) “Notice on the Implementation of IACS UI SC209” issued by CCS’ Technical Department.

2.Revision 1 of this UI is to be applied by IACS Societies to ships contracted for construction on or after 1 July 2020.

1.196 Double-side skin construction on bulk carriers

Conventions (Amend.), Reg.		Regulations **XII/1.4** & **6.2** of Amendments **2004** to **SOLAS 1974**					
IACS UI Number	**SC210**	**UI** version	**June 2006**	Date of implementation	**01.07.2006**	Means of implementation	

Conventions/Codes Requirements

SOLAS Regulations **XII/1.4** & **6.2:**

Regulation XII/1.4: Double-side skin means a configuration where each ship side is constructed by the side shell and a longitudinal bulkhead connecting the double bottom and the deck. Hopper side tanks and top-side tanks may, where fitted, be integral parts of the double-side skin configuration.

Regulation XII/6.2: Bulk carriers of 150 m in length and upwards constructed on or after 1 July 2006, in all areas with double-side skin construction shall comply with the following requirements:

.1 …

.2 Subject to the provisions below, the distance between the outer shell and the inner shell at any transverse section shall not be less than 1,000 mm measured perpendicular to the side shell. The double side skin construction shall be such as to allow access for inspection as provided in regulation II-1/3-6 and the Technical Provisions referring thereto.

.1 The clearances below need not be maintained in way of cross ties, upper and lower end brackets of transverse framing or end brackets of longitudinal framing.

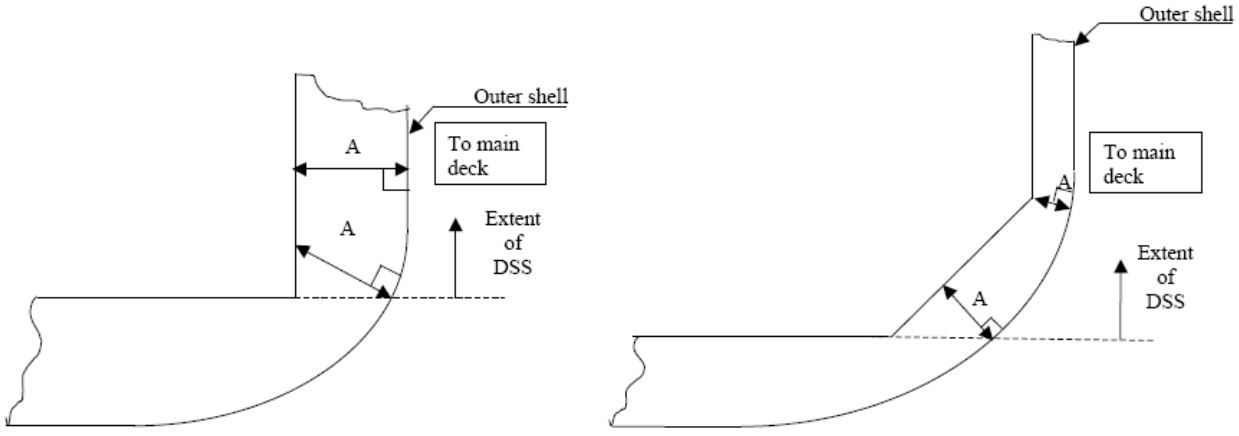
.2 The minimum width of the clear passage through the double-side skin space in way of obstructions such as piping or vertical ladders shall not be less than 600 mm.

Interpretation

1. The extent of the double-side skin defined in regulation XII/1.4, where the 1000 mm minimum distance specified in XII/6.2.2 is to be met, is to be measured perpendicular to the outer shell from the top of the double bottom to the main deck, as indicated in the attached sketches.

2. The 1000 mm minimum distance specified in XII/6.2.2 is measured between the outer shell and the inner shell and shall be maintained throughout the whole double-side skin construction as defined in paragraph 1, above, and as indicated in the attached sketches.

Distance between inner and outer shell in way of double-side skin



The value of A shall not be less than 1000 mm

Technical Background

The present UI has been developed in order to give guidance on how the minimum distance within the extent of the

double-side skin construction shall be measured, bearing in mind that that a “double-side skin”, by definition, extends from the double bottom to the deck.
Remarks

1.197 Protection of fuel oil

Conventions (Amend.), Reg.		Regulations **II-2/3.6** & **4.5.1.1** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC211**	**UI** version	**Jun.,2006/ Corr.1, Oct.,2007**	Date of implementation	**Jul.1,2006**	Means of implementation	**Contracted for construction**

Conventions/Codes Requirements

SOLAS II-2/3.6

“Cargo area is that part of the ship that contains cargo holds, cargo tanks, slop tanks and cargo pump-rooms including pump-rooms, cofferdams, ballast and void spaces adjacent to cargo tanks and also deck areas throughout the entire length and breadth of the part of the ship over the above-mentioned spaces.”

SOLAS II-2/4.5.1.1

“Cargo pump-rooms, cargo tanks, slop tanks and cofferdams shall be positioned forward of machinery spaces. However, oil fuel bunker tanks need not be forward of machinery spaces.

Cargo tanks and slop tanks shall be isolated from machinery spaces by cofferdams, cargo pump-rooms, oil bunker tanks or ballast tanks. Pump-rooms containing pumps and their accessories for ballasting those spaces situated adjacent to cargo tanks and slop tanks and pumps for oil fuel transfer, shall be considered as equivalent to a cargo pump-room within the context of this regulation provided that such pump rooms have the same safety standard as that required for cargo pump-rooms. Pump-rooms intended solely for ballast or oil fuel transfer, however, need not comply with the requirements of regulation 10.9. The lower portion of the pump-room may be recessed into machinery spaces of category A to accommodate pumps, provided that the deck head of the recess is in general not more than one third of the moulded depth above the keel, except that in the case of ships of not more than 25,000 tonnes deadweight, where it can be demonstrated that for reasons of access and satisfactory piping arrangements this is impracticable, the Administration may permit a recess in excess of such height, but not exceeding one half of the moulded depth above the keel.”

Interpretation

Void space or ballast water tank protecting fuel oil tank as shown in Fig. 1 at Annex, need not be considered as "cargo area" defined in Reg. II-2/3.6 even though they have a cruciform contact with the cargo oil tank or slop tank.

The void space protecting fuel oil tank is not considered as a cofferdam specified in Reg. II-2/4.5.1.1. There is no objection to the locations of the void space shown in Fig. 1, even though they have a cruciform contact with the slop tank.

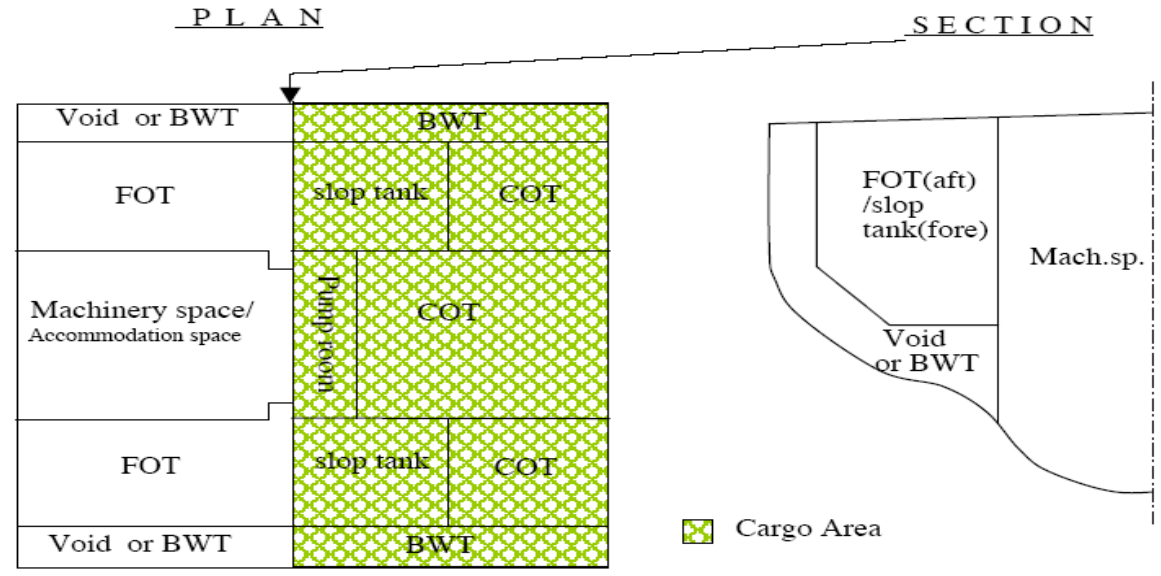


Figure 1

FOT Fuel oil tank； COT Cargo oil tank； BWT ballast water tank；

Technical Background
According to the new addition Reg.12A by the res.MEPC141(54), all ships with an aggregate oil fuel capacity of 600 m^3 and above ,which are delivered on or after 1 August 2010, or for which the building contract is placed on or after 1 August 2007, shall be protected by using the void space or ballast water tank to prevent pollution by oil outflow in the event of collision. Here, "Void space or ballast water tank" are for the purpose to protect the fuel oil tank, not for the purpose to isolate the cargo and slop tanks from the machinery space. Therefore, this UI is developed by IACS to clarify.
Remarks
1. Corr.1 of this UI contains the interpretation of the "contracted for construction" date. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29. 2. Circular No. 041/Total No. 205 (2006) "Notice on Implementation of IACS UI SC211 Protection of fuel oil" issued by CCS' Technical Department.

1.198 Shipboard fittings and supporting hull structures associated with towing and mooring on conventional vessels

Conventions (Amend.), Reg.		Regulation **II-1/3-8** of **SOLAS 1974**					
IACS UI Number	**SC212**	**UI** version	**Sep.,2006/ Corr.1,Jul.,2007/ Corr.2, Oct.,2007/ Corr.3, Dec.,2019**	Date of implementation	**Jul.1,2007**	Means of implementation	**Keel laying**
Conventions/Codes Requirements							
SOLAS Reg. II-1 Regulation 3-8 Towing and mooring equipment							
Interpretation							
Regardless of the date of contract for construction, ships with a keel laying date on or after1 January 2007 are to							

comply with IACS Unified Requirement (UR) A2.
Technical Background
This is to clarify that the newly amended UR A2 (Requirements concerning MOORING AND ANCHORING, revised according to MSC/Circ.1175) applies to ships with a keel laying date on or after 1 January 2007. (IACS developed this UI to bridge the gap between the 1 January 2007 contract for construction date associated with the amended IACS UR A2 and the 1 January 2007 keel laying date associated with the entry into force of the revised SOLAS Reg. II-1/3-8 as per MSC.194(80)).
Remarks
Corr.2 of this UI contains the interpretation of the "contracted for construction" date. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.199 Arrangements for remotely located survival craft

Conventions(Amend), Reg.		SOLAS Regulations III/31.1.4, III/7.2.1.4, III/11.4, III/11.7, III/13.1.3, III/16.7 and LSA Code paragraph 4.1.3.2					
IACS UI number	**SC213**	**UI** version	**Aug.,2006/ Corr.1,Oct.,2007/ Rev.1,Jun.,2008/ Corr.2,Jun.,2011/ Rev.2,Nov.,2013/ Rev.3,Dec.,2015/ Rev.4,Nov.,2016/ Rev.5,Sep.,2021**	Date of impleme ntation	**Jan.1,2007/ -/ Rev.1,Jul.1,2008/ -/ Rev.2,Jul.1,2014/ Rev.3,Jan.1,2017/ Rev.4,Jan.1,2017/ Rev.5,Jan.1,2023**	Means of implement ation	contrac ted for constru ction.
Conventions/Code Requirements							

SOLAS Regulations:

Regulation III/31.1.4 reads:

"Cargo ships where the horizontal distance from the extreme end of the stem or stern of the ship to the nearest end of the closest survival craft is more than 100 m shall carry, in addition to the liferafts required by paragraphs 1.1.2 and 1.2.2, a liferaft stowed as far forward or aft, or one as far forward and another as far aft, as is reasonable and practicable. Such liferaft or liferafts may be securely fastened so as to permit manual release and need not be of the type which can be launched from an approved launching device"

Regulation III/7.2.1.4

"a sufficient number of lifejackets shall be carried for persons on watch and for use at remotely located survival craft stations. The lifejackets carried for persons on watch should be stowed on the bridge, in the engine control room and at any other manned watchstation."

Regulation III/11.4

"Muster and embarkation stations shall be adequately illuminated by lighting supplied from the emergency source of electrical power required by regulation II-1/42 or II-1/43, as appropriate."

Regulation III/11.7

"An embarkation ladder complying with the requirements of paragraph 6.1.6 of the Code extending, in a single length, from the deck to the waterline in the lightest seagoing condition under all conditions of trim of up to 10^o and a list of up to 20^o either way shall be provided at each embarkation station or at every two adjacent embarkation stations for survival craft launched down the side of the ship. However, the Administration may permit such ladders to be replaced by approved devices to afford access to the survival craft when waterborne, provided that there shall be at least one embarkation ladder on each side of the ship. Other means of embarkation enabling descent to the water in a controlled manner may be permitted for the liferafts required by regulation 31.1.4."

Regulation III/13.1.3

"1 Each survival craft shall be stowed:

...

.3 in a state of continuous readiness so that two crew members can carry out preparations for embarkation and launching in less than 5 min"

Regulation III/16.7

"During preparation and launching, the survival craft, its launching appliance, and the area of water into which it is to be launched shall be adequately illuminated by lighting supplied from the emergency source of electrical power required by regulation II-1/42 or II-1/43, as appropriate."

LSA Code paragraph 4.1.3.2

"The liferaft shall be fitted with an efficient painter of length equal to not less than 10 m plus the distance from the stowed position to the waterline in the lightest seagoing condition or 15 m whichever is the greater. ..."

Interpretation

1. Liferafts required by SOLAS III/31.1.4 shall be regarded as "remotely located survival craft" with regard to SOLAS III/7.2.1.4.

2. The area where these remotely located survival craft are stowed shall be provided with:

.1 a minimum number of two lifejackets and two immersion suits;

.2 adequate means of illumination complying with *SOLAS* III/16.7, either fixed or portable, which shall be capable of illuminating the liferaft stowage position as well as the area of water into which the liferaft should be launched. Portable lights, when used, shall have brackets to permit their positioning on both sides of the vessel;

.3 an embarkation ladder or other means of embarkation enabling descent to the water in a controlled manner* as per *SOLAS* III/11.7; and

.4 self-contained battery-powered lamps (i.e. luminaires) may be accepted as means of illumination for complying with *SOLAS* III/16.7. Such lamps shall be capable of being recharged from the ship's main and emergency source of electrical power, and shall be stowed close to the liferaft and embarkation ladder they are intended to serve, under charge. When disconnected from the ship's power, the lamp shall give a minimum duration of three hours of undiminished performance. The lamps shall comply with the requirements of the LSA Code section 1.2.3. The lamps (i.e. luminaires) should meet the requirements of Ingress Protection rating IP 55. The batteries for the subject lamps should comply with IACS Unified Requirement (UR) E18 requirements irrespective of whether the expiry date is marked by the manufacturer or not.

3. With regard to the distance between the embarkation station and stowage location of the liferaft as required by *SOLAS* III/31.1.4 (remotely located survival craft), the embarkation station shall be so arranged that the requirements of *SOLAS* III/13.1.3 can be satisfied.

4. Exceptionally, the embarkation station and stowage position of the liferaft (remotely located survival craft) may be located on different decks provided that the liferaft can be launched from the stowage deck using the attached painter to relocate it to the embarkation ladder positioned on the other deck (traversing a stairway between different decks with the liferaft carried by crew members is not acceptable).

5. Notwithstanding paragraph 2, where the exceptional cases mentioned in paragraph 4 exist, the following provisions shall be applied:

.1 the lifejackets and the immersion suits required by paragraph 2.1 may be stowed at the embarkation station;

.2 adequate means of illumination complying with paragraph 2.2, shall also illuminate the liferaft stowage position, embarkation station and area of water where the liferaft is to be embarked;

.3 the embarkation ladder or other means of embarkation as required by paragraph 2.3 may be stowed at the embarkation station; and

.4 notwithstanding the requirements in LSA Code paragraph 4.1.3.2, the painter is to be long enough to reach the relevant embarkation station.

* Note: Controlled manner: a knotted rope is not acceptable for this purpose.
Technical Background
MSC 97 agreed to the text of the revised UI with some minor modifications clarifying that the battery powered lamps should be stowed 'close to the liferaft they and embarkation ladder they are intended to serve'. IACS Safety Panel has revised the UI to align with MSC.1/Circ.1490/Rev.1.
Remarks
1.This UI is to be uniformly implemented by IACS Societies for ships contracted for construction on or after 1 January 2007. 2.Rev.1 of this UI is to be uniformly implemented by IACS Societies for ships contracted for construction on or after 1 July 2008. 3.Rev.2 of this UI is to be uniformly implemented by IACS Societies for ships contracted for construction on or after 1 July 2014. 4.Rev.3 of this UI is to be uniformly implemented by IACS Societies for ships contracted for construction on or after 1 January 2017. 5.Rev.4 of this UI is to be uniformly implemented by IACS Societies for ships contracted for construction on or after 1 January 2017. 6.Rev.5 of this UI is to be uniformly implemented by IACS Societies for ships contracted for construction on or after 1 January 2023. 7.The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.200 Portions of open decks utilized for the storage of gas bottles

Conventions (Amend.), Reg.		Regulation **II-2/4.3** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC214**	**UI** version	**Jul. 30 2006**	Date of implementation	**01.07.2007**	Means of implementation	

Conventions/Codes Requirements
Regulation II-2/4.3 Arrangements for gaseous fuel for domestic purposes Gaseous fuel systems used for domestic purposes shall be approved by the Administration. Storage of gas bottles shall be located on the open deck or in a well ventilated space which opens only to the open deck.
Interpretation
A portion of open deck, recessed into a deck structure, machinery casing, deck house, etc., utilized for the exclusive storage of gas bottles is considered acceptable for the purpose of reg. II-2/4.3 provided that: (1) such a recess has an unobstructed opening, except for small appurtenant structures, such as opening corner radii, small sills, pillars, etc. The opening may be provided with grating walls and door; (2) the depth of such a recess is not greater than 1 m. A portion of open deck meeting the above shall be considered as open deck in applying tables 9.1 to 9.8 of SOLAS Chapter II-2.
Technical Background
The UI has been developed with the aim of clarifying the criteria to be adopted to consider portions of open decks utilized for the storage of gas bottles as "well ventilated" spaces in the light of SOLAS reg. II-2/4.3. The UI also clarifies that these portions of open decks need not be categorized, for the purposes of SOLAS reg. II-2/9, as enclosed spaces.
Remarks

1.201 Embarkation Ladder

Conventions (Amend.), Reg.		Regulations **III/31.1.3** & **16.1** of **SOLAS 1974**					
IACS UI Number	**SC215**	**UI** version	**Feb.,2007/ Corr.1,Oct.,2007**	Date of implementation	**Jul.1,2007**	Means of implementation	**Contracted for construction**

Conventions/Codes Requirements

SOLAS Regulation III/16.1 reads:

Unless expressly provided otherwise, launching and embarkation appliances complying with the requirements of section 6.1 of the Code shall be provided for all survival craft except those which are:

.1 boarded from a position on deck less than 4.5 m above the waterline in the lightest seagoing condition and which have a mass of not more than 185 kg; or

.2 boarded from a position on deck less than 4.5 m above the waterline in the lightest seagoing condition and which are stowed for launching directly from the stowed position under unfavourable conditions of trim of up to 10 degrees and list of up to 20 degrees either way; or

.3 carried in excess of the survival craft for 200% of the total number of persons on board the ship and which have a mass of not more than 185 kg; or

.4 carried in excess of the survival craft for 200% of the total number of persons on board the ship, are stowed for launching directly from the stowed position under unfavourable conditions of trim of up to 10 degrees and list of up to 20 degrees either way, or

.5 provided for use in conjunction with a marine evacuation system, complying with the requirements of section 6.2 of the Code and stowed for launching directly from the stowed position under unfavourable conditions of trim of up to 10 degrees and list of up to 20 degrees either way.

SOLAS Regulation III/31.1.3 reads:

In lieu of meeting the requirements of paragraph 1.1 or 1.2, cargo ships of less than 85 m in length other than oil tankers, chemical tankers and gas carriers, may comply with the following:

.1 they shall carry on each side of the ship, one or more inflatable or rigid liferafts complying with the requirements of section 4.2 or 4.3 of the Code and of such aggregate capacity as will accommodate the total number of persons on board;

.2 unless the liferafts required by paragraph 1.3.1 are stowed in a position providing for easy side-to-side transfer at single open deck level, additional liferafts shall be provided so that the total capacity available on each side will accommodate 150% of the total number of persons on board;

.3 if the rescue boat required by paragraph 2 is also a totally enclosed lifeboat complying with the requirements of section 4.6 of the Code, it may be included in the aggregate capacity required by paragraph 1.3.1, provided that the total capacity available on either side of the ship is at least 150% of the total number of persons on board; and

.4 in the event of any one survival craft being lost or rendered unserviceable, there shall be sufficient survival craft available for use on each side, including any which are stowed in a position providing for easy side-to-side transfer at a single open deck level, to accommodate the total number of persons on board.

Interpretation

Ships as defined in SOLAS III/31.1.3 and which are fitted with non-davit launched liferafts as per regulation III/16.1 shall be provided with an embarkation ladder at each side of the ship.

Technical Background

1. This UI is proposed by CCS. 2. SOLAS Regulation III/31.1.3 allows cargo ships of less than 85 m in length other than oil tankers, chemical tankers and gas carriers to carry on sufficient inflatable or rigid liferafts and rescue boats in lieu of free-fall lifeboats. This is among the exceptional circumstances for launching and embarking appliances as specified by SOLAS Regulation III/16.1, which is in contradiction with SOLAS Regulation III/11.7 that an embarkation ladder is to be provided at each embarkation station or at every two adjacent embarkation stations for survival craft launched down the side of the ship. Therefore, this UI is developed to clarify.
Remarks
Corr.1 of this UI contains the interpretation of the "contracted for construction" date. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.202 FSS Code – Water-based fire-extinguishing systems

Conventions (Amend.), Reg.		Regulations **II-2/10.5.1.1, 10.5.2.1, 10.5.6** & **10.6** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC216**	**UI** version	**Aug.,2007**	Date of implementation	**Jan.1,2008**	Means of implementation	Contracted for construction
Conventions/Codes Requirements							
SOLAS Regulation II-2/10.5.1.1 reads: 5.1.1 Fixed fire-extinguishing systems Machinery spaces of category A containing oil-fired boilers or oil fuel units shall be provided with any one of the fixed fire-extinguishing systems in paragraph 4.1.... **SOLAS Regulation II-2/10.5.2.1 reads:** 5.2.1 Fixed fire-extinguishing systems Machinery spaces of category A containing internal combustion machinery shall be provided with one of the fixed fire-extinguishing systems in paragraph 4.1. **SOLAS Regulation II-2/10.5.6 reads:** 5.6 Fixed local application fire-extinguishing systems **SOLAS Regulation II-2/10.6 reads:** Fire-extinguishing arrangements in control stations, accommodation and service spaces							
Interpretation							
Deleted							
Technical Background							
Deleted							
Remarks							
Withdrawn on 11 August 2008 until conclusion of IMO FP52 CG becomes available.							

1.203 Nozzles installation for fixed water based local application fire-fighting systems for use in category A machinery spaces (MSC/Circ 913)

Conventions (Amend.), Reg.		**IMO MSC/Circular 913 Paragraphs 3.4.2.1, 3.4.2.2 & 3.4.2.4 in the Appendix of the Annex**					
IACS UI Number	**SC217**	**UI** version	**Aug.,2007/ Corr.1,Sep.,2007**	Date of implementation	**Apr.1,2008**	Means of implementation	Contracted for construction
Conventions/Codes Requirements							
IMO MSC/Circular 913 paragraphs 3.4.2.1 and 3.4.2.2 in the Appendix of the Annex read:- 3.4.2 The results of the tests should be interpreted as follows: .1 Systems (utilizing a 3 x 3 nozzle grid) that extinguish fires referred to in 3.3.2.1 to 3.3.2.3 are considered to have successfully completed the protocol with the condition that the outer nozzles should be installed outside of the							

protected area a distance of at least 1/4 of the maximum nozzle spacing.
.2 Systems (utilizing either a 2 x 2 or 3 x 3 nozzle grid) that extinguish fires referred to in 3.3.2.3 to 3.3.2.5 are considered to have successfully completed the protocol and can be designed with the outer nozzles located at the edge of the protected area. This does not prohibit the location of the nozzles outside of the protected area.
Paragraph 3.4.2.4 in the Appendix of the Annex reads:
.4 For installations which may be adequately protected using individual nozzles or a single row of nozzles, the effective nozzle coverage (width and length) is defined as 1/2 the maximum nozzle spacing.

Interpretation

The end nozzles of a single line of nozzles shall be positioned:

i) outside the hazard where paragraph 3.4.2.1 is applicable, to the distance established in testing, and

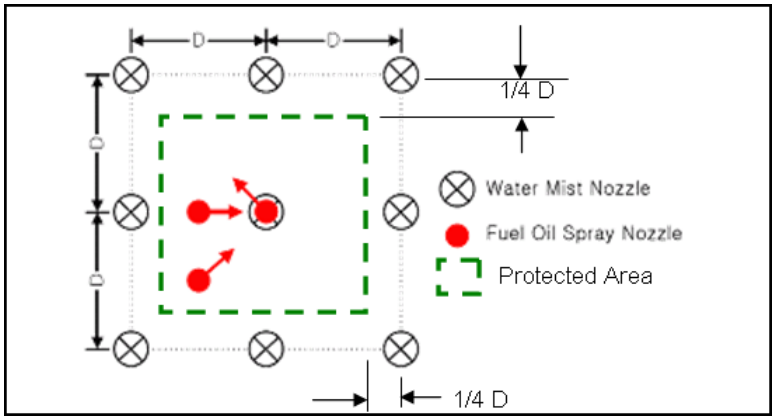
ii) at the edge or outside of the protected area where paragraph 3.4.2.2 is applicable.

A single nozzle shall be located above the fire source and at the centre of an area having dimensions $D/2 \times D/2$.

Sketches of acceptable arrangements are shown in the Annex.

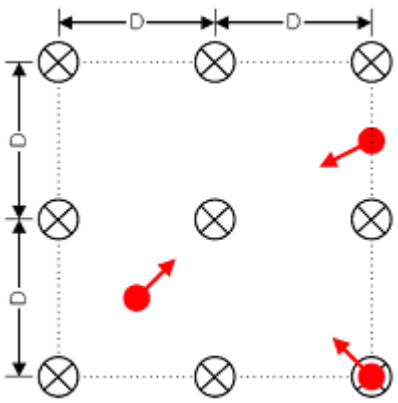
ANNEX

a. System (utilizing a 3 X 3 nozzle grid) that extinguishes fires referred to in 3.3.2.1 to 3.3.2.3 of Appendix of Annex of MSC/Circ.913.



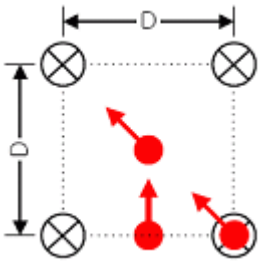
For this system, the outer nozzles should be installed outside of the protected area a distance of at least 1/4 of the maximum nozzle spacing.

b. System (utilizing a 3 X 3 nozzle grid) that extinguishes fires referred to in 3.3.2.3 to 3.3.2.5



For this system, outer nozzles can be located either at the edge of the protected area or outside of the protected area.

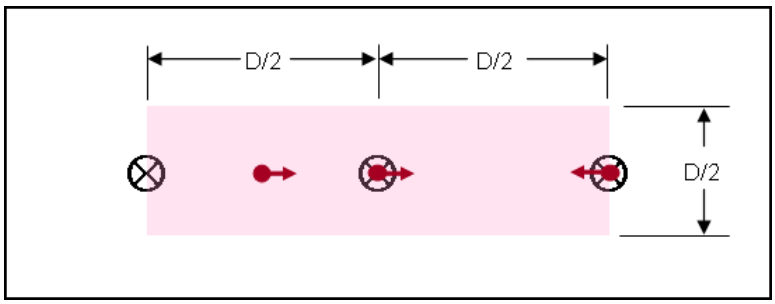
c. System (utilizing a 2 X 2 nozzle grid) that extinguishes fires referred to in 3.3.2.3 to 3.3.2.5



For this system, outer nozzles can be located either at the edge of the protected area or outside of the protected area.

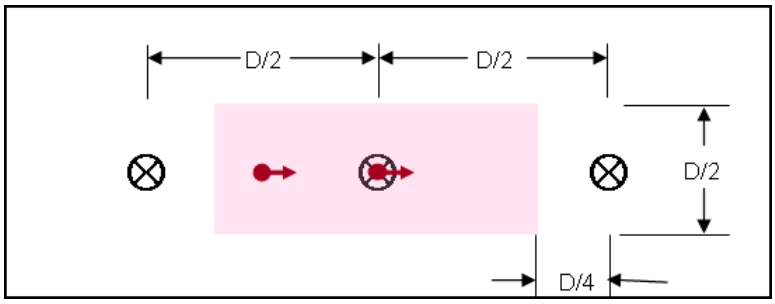
d. A single row of nozzles

i) System that extinguishes fires referred to in 3.3.2.3 to 3.3.2.5



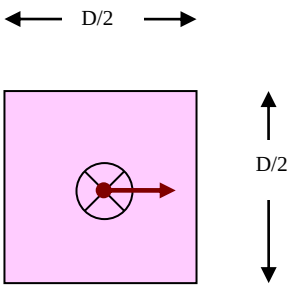
For this system, outer nozzles should be placed at least at the edge of the protected area.

ii) System that extinguishes fires referred to in 3.3.2.1 to 3.3.2.3



For this system, the outer nozzles should be placed outside of the protected area a distance of at least 1/4 of the maximum nozzle spacing.

e. Single nozzle



Technical Background

Single row nozzles/single nozzles arrangements in paragraph 3.4.2.4 of Appendix of Annex of MSC/Circ.913, particularly the expression 'width and length', are further interpreted by IACS.
Remarks
1. This Unified Interpretation may be applied by all Members and Associates before 1 April 2008. 2. Circular No. 018/Total No. 253 (2007) "Revised Interpretation for Fixed Water Based Local Application Fire-fighting Systems for Use in Category A Machinery Spaces" issued by CCS' Technical Department.

1.204 Fire Testing of Equivalent Water-Based Fire Extinguishing Systems (IMO MSC/Circ.1165, Appendix B, 4.5.1)

Conventions (Amend.), Reg.		**IMO MSC/Circ.1165, Appendix B, Paragraph 4.5.1**					
IACS UI Number	**SC218**	**UI** version	**Oct.,2007**	Date of implementation	**Jul.1,2008**	Means of implementation	**Approved system**
Conventions/Codes Requirements							
4.5 Procedure 4.5.1 The trays used in the test should be filled with at least 50 mm fuel on a water base. Freeboard is to be 150 mm ±10 mm.							
Interpretation							
It has been recognized that this cannot be achieved for the 3 m^2 top tray as the total height of this particular tray is only 100 mm. The freeboard requirement of 150 mm applies consequently only to the 0.1 m^2, 0.5 m^2, 2.1 m^2 and 4 m^2 tray (see IMO MSC/Circ.1165, Appendix B, Figure 1). Freeboard in the 3m^2 top tray measured from heptane level (which is same as top of notch) to the top of this tray shall be 50 mm.							

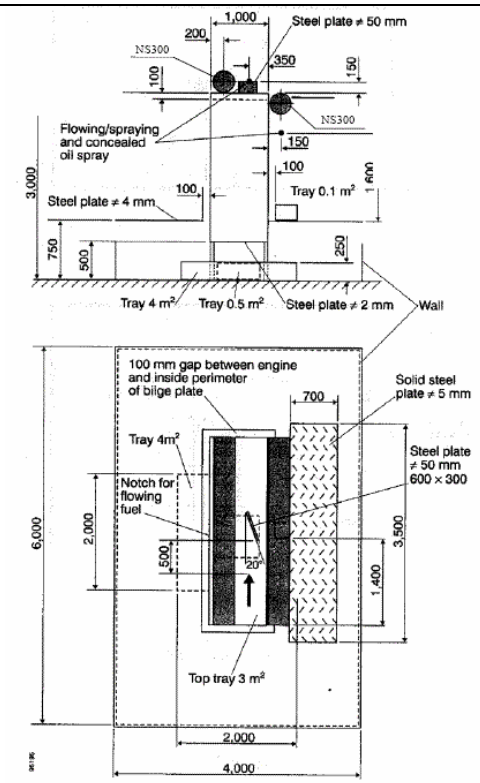


Figure 1

Technical Background

It has been recognised that the 150 mm freeboard requirement of IMO MSC/Circ.1165, annex B, 4.5.1 (second part) cannot be achieved for the top 3 m^2 top tray as the total height of this particular tray is only 100 mm.
With 50 mm fuel on water, this freeboard will be 50 mm (measured from the notch or the heptane level). This typo has for instance been corrected in the new draft standard for inside air foam (IMO FP correspondence group, USCG draft report to FP52). Also, guidance from the new draft standard for inside air foam on how the top tray should be filled, when the fuel should be ignited and when to measure the pre-burn are specified to clarify flowing fire test scenarios.

Remarks

1.205 Fire Testing of Equivalent Water-Based Fire Extinguishing Systems (IMO MSC/Circ.1165, Appendix B, 4.5.4.1)

Conventions (Amend.), Reg.		**IMO MSC/Circ.1165, Appendix B, Paragraph 4.5.4.1**					
IACS UI Number	**SC219**	**UI** version	**Oct.,2007**	Date of implementation	**Jul.1,2008**	Means of implementation	**Approved system**

Conventions/Codes Requirements

Regulation (IMO MSC/Circ.1165, Appendix B, 4.5.4.1)
4.5.4 Duration of test
4.5.4.1 After ignition of all fuel sources, a 2-min preburn time is required before the extinguishing agent is discharged for the fuel tray fires and 5-15 s for the fuel spray and heptane fires and 30 s for the Class A fire test (Test No.7).

Interpretation

For flowing fire (Test No. 6), the 4 m^2 fire tray below the engine mock-up should be filled with a 50 mm water base and the 3 m^2 fire tray on top of the engine mock-up should be filled with a 40 mm water base. The fuel should be ignited when flowing down the side of the mock-up, approximately 1m below the notch. The pre-burn time should be measured from the ignition of the fuel.

Technical Background

It has been recognised that the 150 mm freeboard requirement of IMO MSC/Circ.1165, annex B, 4.5.1 (second part) cannot be achieved for the top 3 m^2 top tray as the total height of this particular tray is only 100 mm.

With 50 mm fuel on water, this freeboard will be 50 mm (measured from the notch or the heptane level). This typo has for instance been corrected in the new draft standard for inside air foam (IMO FP correspondence group, USCG draft report to FP52). Also, guidance from the new draft standard for inside air foam on how the top tray should be filled, when the fuel should be ignited and when to measure the pre-burn are specified to clarify flowing fire test scenarios.
Remarks

1.206 Special requirements for ro-ro passenger ships

Conventions (Amend.), Reg.		Regulation **II-1/17-1.1.1 and 20-2.1** of **SOLAS 1974**					
IACS UI Number	**SC 220**	**UI** version	**Rev.1, Feb., 2010/ Corr.1, Sept.,2016/ Corr.2 Mar., 2017**	Date of implementation	**Apr.15,2008**	Means of implementation	

Conventions/Codes Requirements

SOLAS regulation II-1/20-2 (SOLAS/CONF.3/46, Resolution 1)
1 Subject to the provisions of subparagraphs .2 and .3, all accesses that lead to spaces below the bulkhead deck shall have a lowest point which is not less than 2.5 m above the bulkhead deck;

SOLAS regulation II-1/17-1.1.1 (MSC.194(80))
1 subject to the provisions of subparagraphs 1.2 and 1.3, all accesses that lead to spaces below the bulkhead deck shall have a lowest point which is not less than 2.5 m above the bulkhead deck;

Interpretation

(a) Stern, bow and side doors of large dimensions, when manual devices would not be readily accessible, are to be normally secured by means of power systems.
Alternative means of securing are also to be provided for emergency use in case of failure of the power systems.

(b) In ro-ro passenger ships, constructed before 1 July 1997, all access doors or hatchways to spaces below the ro-ro deck, which may be used at sea, are to have sills or coamings not less than 380 mm in height above the ro-ro deck, and are to be provided with doors or covers considered weathertight in relation to their position, refer to SOLAS regulation II-1/20-2 (SOLAS/CONF.3/46, Resolution 1).

For ro-ro passenger ships constructed on or after 1 July 1997, but before 1 January 2009, refer to SOLAS regulation II-1/20-2 (SOLAS/CONF.3/46, Resolution 1).

The ro-ro deck, referred to in the preceding paragraph is the deck above which the stern, bow or side doors are fitted, or the first deck above the load waterline.

Technical Background

During the preparation and review of the draft submission paper to SDC 4, minor editorials were made in the IACS UI SC220.

Remarks

This revision contains editorial amendment and there is no need to specify new implementation date.

1.207 Separation of Galley Exhaust Ducts from Spaces (Reg II-2/9)

Conventions (Amend.), Reg.		Regulations **II-2/9.7.2.1, 9.7.2.2 & 9.7.5.2.1** of Amendments **2000** to **SOLAS 1974**					
IACS UI Number	**SC221**	**UI** version	**Oct.,2007/ Sept., 2017**	Date of implementation	**Jan.1,2008/ Deleted**	Means of implementation	

Conventions/Codes Requirements

Reg. II-2/9.7.2.1 reads:

"The ventilation systems for machinery spaces of category A, vehicle spaces, ro-ro spaces, galleys, special category spaces and cargo spaces shall, in general, be separated from each other and from the ventilation systems serving other spaces. Except that the galley ventilation systems on cargo ships of less than 4,000 gross tonnage and in passenger ships carrying not more than 36 passengers, need not…….

except that penetrations of main zone divisions shall also comply with the requirements of paragraph 4.1.1.8."

Reg. II-2/9.7.2.2 reads:

"Ducts provided for ventilation to accommodation spaces, service spaces or control stations shall not pass through machinery spaces of category A, galleys, vehicle spaces, ro-ro spaces or special category spaces unless they comply with the conditions specified in paragraphs 7.2.2.1.1 to 7.2.2.1.3 or 7.2.2.2.1 and 7.2.2.2.2 below:

……

except that penetrations of main zone divisions shall also comply with the requirements of paragraph 4.1.1.8."

Reg. II-2/9.7.5.2.1 reads:

"Where they pass through accommodation spaces or spaces containing combustible materials, the exhaust ducts from galley ranges shall be constructed of "A" class divisions. Each exhaust duct shall be fitted with:

…..

.4 fixed means for extinguishing a fire within the duct."

Interpretation

With respect to the application of SOLAS regulations II-2/9.7.2.1, 9.7.2.2 and 9.7.5.2.1 for determining fire insulation for trunks and ducts which pass through an enclosed space, the term "pass through" pertains to the part of the trunk/duct contiguous to the enclosed space.

Sketches at Annex are given as examples.

ANNEX

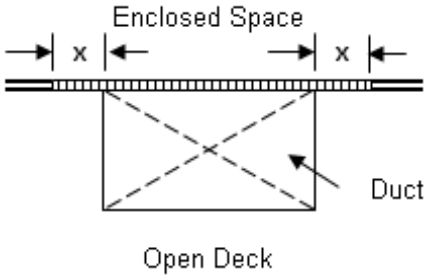


Figure 1

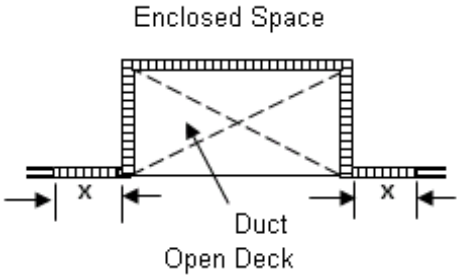


Figure 2

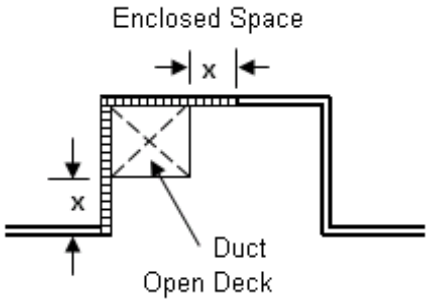


Figure 3

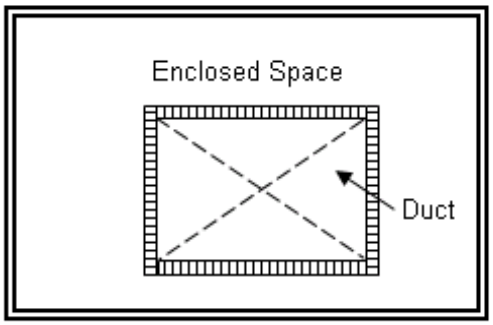


Figure 4

= fire insulation

x = 450 mm

Examples of galley ducts contiguous to enclosed space

Technical Background

SOLAS regulations II-2/9.7.2.1, 9.7.2.2 and 9.7.5.2.1 provide the fire insulation requirements for trunks and ducts which pass through an enclosed space. To provide for a greater extent of uniformity in the application of the above regulations to trunks and ducts which pass through an enclosed space via sharing a surface or surfaces that are contiguous with an enclosed space, the UI was developed.

Remarks

Considering that the content of this UI has been covered by SOLAS Reg.II-2/9.7.2.5, IACS decided to delete the UI in Sept., 2017.

1.208 Stripe coats and salt measurement

Conventions (Amend.), Reg.		**Resolution MSC.215(82)**					
IACS UI Number	**SC222**	**UI** version	**Mar.,2008**	Date of implementation	**Jul.1,2008**	Means of implementation	

Conventions/Codes Requirements

Resolution MSC.215(82) Performance standard for protective coatings for dedicated seawater ballast tanks in all types of ships and double-side skin spaces of bulk carriers

Table 1 – Basic coating system requirements for dedicated seawater ballast tanks of all type of ships and double-side skin spaces of bulk carriers of 150 m and upwards

	Characteristic/ Reference standards	***Requirement***
	1 Design of coating system	
.4	*Job specification*	*…* *Stripe coats shall be applied by brush or roller. Roller to be used for scallops, ratholes, etc., only.* *…*

Table 1 – Basic coating system requirements for dedicated seawater ballast tanks of all type of ships and double-side skin spaces of bulk carriers of 150 m and upwards

	Characteristic/ Reference standards	***Requirement***
	2 PSP (Primary surface preparation)	
.2	*Water soluble salt limit equivalent to NaCl [8)]*	*≤ 50 mg/m^2 of sodium chloride.*
	3 Secondary surface preparation	
.6	*Water soluble salts limit equivalent to NaCl after blasting/grinding[8)]*	*≤ 50 mg/m^2 of sodium chloride*

[8)] Conductivity measured in accordance with ISO 8502-9:1998. Preparation of steel substrate before application of paints and related products – Test for the assessment of surface cleanliness.

Interpretation

Deleted

Technical Background

Withdrawn from 1 July 2008. Contents incorporated into UI SC 223.

Remarks

1.209 For Application of SOLAS Regulation II-1/3-2 Performance Standard for Protective Coatings (PSPC) for Dedicated Seawater Ballast Tanks in All Types of Ships and Double-side Skin Spaces of Bulk Carriers, adopted by Resolution MSC.215(82)

Conventions (Amend.), Reg.		**Regulation II-1/3-2 of SOLAS 1974**					
IACS UI Number	**SC223**	**UI version**	**Jun.,2008/ Corr.1,Jul.,2008/ Corr.2,Apr.,2009/ Rev.1/Jul.,2010/ Rev.2/Jul.,2011/ Corr.1,Jun.,2012/ Rev.3,Sep.,2013/ Corr.1, Oct.,2014**	**Date of impleme ntation**	**Jul.1,2008/ Jul.1,2011/ Jul.1,2012/ Rev.3,Jan.1,20 14**	**Means of impleme ntation**	**contracted for construction**

Conventions/Codes Requirements

PSPC 2 DEFINITIONS

For the purpose of this Standard, the following definitions apply.

...

2.6 "GOOD" condition is the condition with minor spot rusting as defined in resolution A.1049(27) (2011 ESP Code), as amended, *for assessing the ballast tank coatings for tankers.*

Interpretation

GOOD: Condition with spot rusting on less than 3% of the area under consideration without visible failure of the coating. Rusting at edges or welds, must be on less than 20 % of edges or weld lines in the area under consideration.
Coating Technical File: A term used for the collection of documents describing issues related to the coating system and its application from the point in time when the first document is provided and for the entire life of the ship including the inspection agreement and all elements of PSPC 3.4.

Conventions/Codes Requirements

PSPC 3 GENERAL PRINCIPLES

"3.2 Inspection of surface preparation and coating processes shall be agreed upon between the ship owner, the shipyard and the coating manufacturer and presented to the Administration for review. Clear evidence of these inspections shall be reported and included in the Coating Technical File (CTF) (see subsection 3.4)."

Interpretation

1. Inspection of surface preparation and coating processes agreement shall be signed by shipyard, shipowner and coating manufacturer and shall be presented by the shipyard to the Administration for review prior to commencement of any coating work on any stage of a new building and as a minimum shall comply with the PSPC.
2. To facilitate the review, the following from the CTF, shall be available:
a) Coating specification including selection of areas (spaces) to be coated, selection of coating system, surface preparation and coating process.
b) Statement of Compliance or Type Approval of the coating system.
3. The agreement shall be included in the CTF and shall at least cover:
a) Inspection process, including scope of inspection, who carries out the inspection, the qualifications of the coating inspector(s) and appointment of one qualified coating inspector (responsible for verifying that the coating is applied in accordance with the PSPC). Where more than one coating inspector will be used then their areas of responsibility shall be identified. (For example, multiple construction sites).
b) Language to be used for documentation.
4. Any deviations in the procedure relative to the PSPC noted during the review shall be raised with the shipyard, which is responsible for identifying and implementing the corrective actions.
5. A Passenger Ship Safety Certificate or Cargo Ship Safety Certificate or Cargo Ship Safety Construction Certificate, as appropriate, shall not be issued until all required corrective actions have been closed to the satisfaction of the Administration.

Conventions/Codes Requirements

"3.4 Coating Technical File

3.4.1 Specification of the coating system applied to the dedicated seawater ballast tanks and double-side skin spaces, record of the shipyard's and shipowner's coating work, detailed criteria for coating selection, job specifications, inspection, maintenance and repair shall be documented in the Coating Technical File (CTF), and the

Coating Technical File shall be reviewed by the Administration.

3.4.2 New construction stage

The Coating Technical File shall contain at least the following items relating to this Standard and shall be delivered by the shipyard at new ship construction stage:

.1 copy of Statement of Compliance or Type Approval Certificate;

.2 copy of Technical Data Sheet, including:

.2.1 product name and identification mark and/or number;

.2.2 materials, components and composition of the coating system, colours;

.2.3 minimum and maximum dry film thickness;

.2.4 application methods, tools and/or machines;

.2.5 condition of surface to be coated (de-rusting grade, cleanness, profile, etc.); and

.2.6 environmental limitations (temperature and humidity);

.3 shipyard work records of coating application, including:

.3.1 applied actual space and area (in square meters) of each compartment;

.3.2 applied coating system;

.3.3 time of coating, thickness, number of layers, etc.;

.3.4 ambient condition during coating; and

.3.5 method of surface preparation;

.4 procedures for inspection and repair of coating system during ship construction;

.5 coating log issued by the coating inspector, stating that the coating was applied in accordance with the specifications to the satisfaction of the coating supplier representative and specifying deviations from the specifications (example of daily log and non-conformity report (see annex 2));

.6 shipyard's verified inspection report, including:

.6.1 completion date of inspection;

.6.2 result of inspection;

.6.3 remarks (if given); and

.6.4 inspector signature; and

.7 procedures for in-service maintenance and repair of coating system.

3.4.3 In-service maintenance, repair and partial re-coating

In-service maintenance, repair and partial re-coating activities shall be recorded in the Coating Technical File in accordance with the relevant section of the Guidelines for coating maintenance and repair.

3.4.4 Re-coating

If a full re-coating is carried out, the items specified in 3.4.2 shall be recorded in the Coating Technical File.

3.4.5 The Coating Technical File shall be kept on board and maintained throughout the life of the ship."

Interpretation

Procedure for Coating Technical File Review

1 The shipyard is responsible for compiling the Coating Technical File (CTF) either in paper or electronic format, or a combination of the two.

2 The CTF is to contain all the information required by the PSPC 3.4 and the inspection of surface preparation and the coating processes agreement (see PSPC 3.2).

3 The CTF shall be reviewed for content in accordance with the PSPC 3.4.2.

4 Any deviations found under 3 shall be raised with the shipyard, which is responsible for identifying and implementing the corrective actions.

5 A Passenger Ship Safety Certificate or Cargo Ship Safety Certificate or Cargo Ship Safety Construction Certificate, as appropriate, shall not be issued until all required corrective actions have been closed to the satisfaction of the Administration.

Conventions/Codes Requirements

"3.5 ***Health and safety***

The shipyard is responsible for implementation of national regulations to ensure the health and safety of individuals and to minimize the risk of fire and explosion."

Interpretation

In order to document compliance with PSPC 3.5, relevant documentation from the coating manufacturer concerning health and safety aspects such as Material Safety Data Sheet is recommended to be included in the CTF for information.

Conventions/Codes Requirements

PSPC 4 COATING STANDARD

"4.3 Special application

4.3.1 This Standard covers protective coating requirements for the ship's steel structure. It is noted that other independent items are fitted within the tanks to which coatings are applied to provide protection against corrosion.

4.3.2 It is recommended that this Standard is applied, to the extent possible, to those portions of permanent means of access provided for inspection not integral to the ship's structure, such as rails, independent platforms, ladders, etc. Other equivalent methods of providing corrosion protection for the non-integral items may also be used, provided they do not impair the performance of the coatings of the surrounding structure. Access arrangements that are integral to the ship structure, such as increased stiffener depths for walkways, stringers, etc., are to fully comply with this Standard.

4.3.3 It is also recommended that supports for piping, measuring devices, etc., be coated in accordance with the non-integral items indicated in 4.3.2."

Interpretation

Reference is made to the non-mandatory MSC/Circ.1279 "Guidelines for corrosion protection of permanent means of access arrangements", adopted by MSC 84 in May 2008.

Conventions/Codes Requirements

PSPC 4 Table 1: Footnotes of Standards

"Footnotes:

5 Type of gauge and calibration in accordance with SSPC-PA2:2004. Paint Application Specification No.2.

6 Reference standard: ISO 8501-1:1988/Suppl:1994. Preparation of steel substrate before application of paints and related products – Visual assessment of surface cleanliness.

7 Reference standard: ISO 8503-1/2:1988. Preparation of steel substrate before application of paints and related products – Surface roughness characteristics of blast-cleaned steel substrates.

8 Conductivity measured in accordance with the following standards:

.1 ISO 8502-9:1998. Preparation of steel substrate before application of paints and related products – Test for the assessment of surface cleanliness; or

.2 NACE SP0508-2010 Item no.21134. Standard practice methods of validating equivalence to ISO 8502-9 on measurement of the levels of soluble salts.

9 Reference standard: ISO 8501-3:2001 (grade P2). Preparation of steel substrate before application of paints and related products – Visual assessment of surface cleanliness. (referred in 3.1).

10 Reference standard: ISO 8502-3:1993. Preparation of steel substrate before application of paints and related products – Test for the assessment of surface cleanliness. (referred in 3.5)."

Interpretation

Only the footnoted standards referred to in PSPC Table 1 are to be applied, i.e. they are mandatory.

Conventions/Codes Requirements

PSPC 4 Table 1: 1 Design of coating system

"1.3 Coating pre-qualification test

Epoxy-based systems tested prior to the date of entry into force of this Standard in a laboratory by a method corresponding to the test procedure in annex 1 or equivalent, which as a minimum meets the requirements for rusting and blistering; or which have documented field exposure for 5 years with a final coating condition of not less than "GOOD" may be accepted.

For all other systems, testing according to the procedure in annex 1, or equivalent, is required."

Interpretation

Procedure for Coating System Approval

Type Approval Certificate showing compliance with the PSPC 5 shall be issued if the results of either method A+D, or B+D, or C+D are found satisfactory by the Administration.

The Type Approval Certificate shall indicate the Product and the Shop Primer tested. The certificate shall also indicate other type approved shop primers with which the product may be used which have under gone the cross over test in a laboratory meeting the requirements in Method A, 1.1 of this UI.

The documents required to be submitted are identified in the following sections, in addition for all type approvals the following documentation is required:

Technical Data Sheet showing all the information required by PSPC 3.4.2.2.

Winter type epoxy is required separate prequalification test including shop primer compatibility test according to PSPC Annex 1. Winter and summer type coating are considered different unless Infrared (IR) identification and Specific Gravity (SG) demonstrates that they are the same.

Method A: Laboratory Test

1.1 Coating pre-qualification test shall be carried out by the test laboratory which is recognized by the Administration and the test laboratory shall meet the requirements set out in IACS UR Z17.

1.2 Results from satisfactory pre-qualification tests (PSPC Table 1: 1.3) of the coating system shall be documented and submitted to the Administration.

1.3.1 Type Approval tests shall be carried out for the epoxy based system with the stated shop primer in accordance with the PSPC Annex 1. If the tests are satisfactory, a Type Approval Certificate will be issued to include both the epoxy and the shop primer. The Type Approval Certificate will allow the use of the epoxy either with the named shop primer or on bare prepared steel.

1.3.2 An epoxy based system may be used with shop primers other than the one with which it was originally tested provided that, the other shop primers are approved as part of a system, PSPC Table 1: 2.3 and Table 1: 3.2, and have been tested according to PSPC Annex 1, Appendix 1, 1.7, which is known as the "Crossover Test". If the test or tests are satisfactory, a Type Approval Certificate will be issued. In this instance the Type Approval Certificate will include the details of the epoxy and a list of all shop primers with which it has been tested that have passed these requirements. The Type Approval Certificate will allow the use of the epoxy with all the named shop primers or on bare prepared steel.

1.3.3 Alternatively the epoxy can be tested without shop primer on bare prepared steel to the requirements of the PSPC Annex 1. If the test or tests are satisfactory, a Type Approval Certificate will be issued. The Type Approval Certificate will just record the epoxy. The certificate will allow the use of the epoxy on bare prepared steel only. If in addition, crossover tests are satisfactorily carried out with shop primers, which are approved as part of a system, the Type Approval Certificate will include the details of shop primers which have satisfactorily passed the crossover test. In this instance the Type Approval Certificate will allow the use of the epoxy based system with all the named shop primers or on bare prepared steel.

1.3.4 The Type Approval Certificate is invalid if the formulation of either the epoxy or the shop primer is changed. It is the responsibility of the coating manufacturer to inform the Administration immediately of any changes to the formulation.

1.3.5 For the coating pre-qualification test, the measured average dry film thickness (DFT) on each prepared test panels shall not exceed a nominal DFT (NDFT) of 320 microns plus 20% unless a paint manufacturer specifies a NDFT greater than 320 microns. In the latter case, the average DFT shall not exceed the specified NDFT plus 20% and the coating system shall be certified to the specified NDFT if the system passes the tests according to Annex 1 of MSC 215(82). The measured DFT shall meet the "90/10" rule and the maximum DFT shall be always below the maximum DFT value specified by the manufacturer.

Method B: 5 years field exposure

1.4 Coating manufacturer's records, which shall at least include the information indicated in 1.4.1, shall be examined to confirm coating system has 5 years field exposure, and the current product is the same as that being assessed.

1.4.1 Manufacturer's Records

- Original application records
- Original coating specification
- Original technical data sheet
- Current formulation's unique identification (Code or number)
- If the mixing ratio of base and curing agent has changed, a statement from the coating manufacturer confirming that the composition mixed product is the same as the original composition. This shall be accompanied by an explanation of the modifications made.
- Current technical data sheet for the current production site
- SG and IR identification of original product
- SG and IR identification of the current product
- If original SG and IR cannot be provided then a statement from the coating manufacturer confirming the readings for the current product are the same as those of the original.

1.5 Either survey records from an Administration or a joint (coating manufacturer and Administration) survey of all ballast tanks of a selected vessel is to be carried out for the purpose of verification of compliance with the requirements of 1.4 and 1.9. The reporting of the coating condition in both cases shall be in accordance with the IACS Recommendation 87, section 2 (IACS Recommendation 87 is not mandatory).

1.6 The selected vessel is to have ballast tanks in regular use, of which:

- At least one tank is approximately 2000 m3 or more in capacity

- At least one tank shall be adjacent to a heated tank and
- At least one tank contains an underdeck exposed to the sun.

1.7 In the case that the selected vessel does not meet the requirements in 1.6 then the limitations shall be clearly stated on the type approval certificate. For example, the coating cannot be used in tanks adjacent to heated tanks or underdeck or tanks with volume greater than the size surveyed.

1.8 In all cases of approval by Method B, the shop primer shall be removed prior to application of the approved epoxy based system coating, unless it can be confirmed that the shop primer applied during construction, is identical in formulation to that applied in the selected vessel used as a basis of the approval.

1.9 All ballast tanks shall be in "GOOD" condition excluding mechanical damages, without touch up or repair in the prior 5 years.

1.9.1 "Good" is defined as: Condition with spot rusting on less than 3% of the area under consideration without visible failure of the coating. Rusting at edges or welds, must be on less than 20% of edges or welds in the area under consideration.

1.9.2 Examples of how to report coating conditions with respect to areas under consideration should be as those given in IACS Recommendation 87.

1.10 If the applied NDFT is greater than required by the PSPC, the applied NDFT will be the minimum to be applied during construction. This will be reported prominently on the Type Approval Certificate.

1.11 If the results of the inspection are satisfactory, a Type Approval Certificate shall be issued to include both the epoxy based system and the shop primer. The Type Approval Certificate shall allow the use of the epoxy based system either with the named shop primer or on bare prepared steel. The Type Approval Certificate shall reference the inspection report which will also form part of the Coating Technical File.

1.12 The Type Approval Certificate is invalid if the formulation of either the epoxy based system or the shop primer is changed. It is the responsibility of the coating manufacturer to inform the Administration immediately of any changes to the formulation.

Method C: Existing Marintek B1 Approvals

1.13 Epoxy based system Coatings Systems with existing satisfactory Marintek test reports minimum level B1 including relevant IR identification and SG, issued before 8 December 2006 can be accepted. If original SG and IR documentation cannot be provided, then a statement shall be provided by the coating manufacturer confirming that the readings for the current product are the same as those of the original.

1.14 The Marintek test report with IR and SG information shall be reviewed and if satisfactory, a Type Approval certificate shall be issued. The certificate shall record the report reference and the shop primer used. The Type Approval Certificate shall allow the use of the epoxy based system either with the named shop primer, unless there is evidence to indicate that it is unsuitable, or on bare prepared steel.

1.15 The epoxy based system approved by this method may be used with other shop primers if satisfactory crossover tests are carried out with shop primers which are approved as part of a system, see Method A, 1.3.2. In this instance, the Type Approval Certificate will include the details of the epoxy based system and a list of all shop primers which have passed these requirements. The Type Approval Certificate will allow the use of the epoxy based system with all the named shop primers or on bare prepared steel.

1.16 Such coatings shall be applied in accordance with PSPC Table 1 rather than the application conditions used during the approval test which may differ from the PSPC, unless these are more stringent than PSPC Annex 1, for example if the NDFT is higher or high pressure water washing and or sweep blasting of the shop primer is used. In such cases these limiting conditions shall be added to the type approval certificate and shall be followed during coating application in the shipyard.

1.17 The Type Approval Certificate is invalid if the formulation of either the epoxy based system or the shop primer is changed. It is the responsibility of the coating manufacturer to inform the Administration immediately of any changes to the formulation.

Method D: Coating Manufacturer

1.18 The coating/shop primer manufacturer shall meet the requirements set out in IACS UR Z17 paragraphs 4, 5, 6 and 7, (except for 4.6) and paragraphs 1.18.1 to 1.18.6 below, which shall be verified by the Administration.

1.18.1 Coating Manufacturers

(a) Extent of Engagement – Production of coating systems in accordance with PSPC and this UI.

(b) These requirements apply to both the main coating manufacturer and the shop primer manufacturer where both coatings form part of the total system.

(c) The coating manufacturer should provide to the Administration the following information;

- A detailed list of the production facilities.
- Names and location of raw material suppliers will be clearly stated.
- A detailed list of the test standards and equipment to be used, (Scope of approval).
- Details of quality control procedures employed.
- Details of any sub-contracting agreements.
- List of quality manuals, test procedures and instructions, records, etc.
- Copy of any relevant certificates with their issue number and/or date e.g. Quality Management System certification.

(d) Inspection and audit of the manufacturer's facilities will be based on the requirements of the PSPC.

(e) With the exception of early 'scale up' from laboratory to full production, adjustment outside the limitations listed in the QC instruction referred to below is not acceptable, unless justified by trials during the coating system's development programme, or subsequent testing. Any such adjustments must be agreed by the formulating technical centre.

(f) If formulation adjustment is envisaged during the production process the maximum allowable limits will be approved by the formulating technical centre and clearly stated in the QC working procedures.

(g) The manufacturer's quality control system will ensure that all current production is the same formulation as that supplied for the Type Approval Certificate. Formulation change is not permissible without testing in accordance with the test procedures in the PSPC and the issue of a Type Approval Certificate by the Administration.

(h) Batch records including all QC test results such as viscosity, specific gravity and airless spray characteristics will be accurately recorded. Details of any additions will also be included.

(i) Whenever possible, raw material supply and lot details for each coating batch will be traceable. Exceptions may be where bulk supply such as solvents and pre-dissolved solid epoxies are stored in tanks, in which case it may only be possible to record the supplier's blend.

(j) Dates, batch numbers and quantities supplied to each coating contract will be clearly recorded.

1.18.2 All raw material supply must be accompanied the supplier's 'Certificate of Conformance'. The certificate will include all requirements listed in the coating manufacturer's QC system.

1.18.3 In the absence of a raw material supplier's certificate of conformance, the coating manufacturer must verify conformance to all requirements listed in the coating manufacturer's QC system.

1.18.4 Drums must be clearly marked with the details as described on the 'Type Approval Certificate'.

1.18.5 Product Technical Data Sheets must comply with all the PSPC requirements. The QC system will ensure that all Product Technical Data Sheets are current.

1.18.6 QC procedures of the originating technical centre will verify that all production units comply with the above stipulations and that all raw material supply is approved by the technical centre.

1.19 In the case that a coating manufacturer wishes to have products which are manufactured in different locations under the same name, then IR identification and SG shall be used to demonstrate that they are the same coating, or individual approval tests will be required for the paint manufactured in each location.

1.20 The Type Approval Certificate is invalid if the formulation of either the epoxy based system or the shop primer is changed. It is the responsibility of the coating manufacturer to inform class immediately of any changes to the formulation. Failure to inform class of an alteration to the formulation will lead to cancellation of the certificates for that manufacturer's products.

Conventions/Codes Requirements

"1.4 Job specification

There shall be a minimum of two stripe coats and two spray coats, except that the second stripe coat, by way of welded seams only, may be reduced in scope where it is proven that the NDFT can be met by the coats applied, in order to avoid unnecessary over-thickness. Any reduction in scope of the second stripe coat shall be fully detailed in the CTF.

Stripe coats shall be applied by brush or roller. Roller to be used for scallops, rat holes, etc., only.

Each main coating layer shall be appropriately cured before application of the next coat, in accordance with coating manufacturer's recommendations. Surface contaminants such as rust, grease, dust, salt, oil, etc., shall be removed prior to painting with proper method according to the paint manufacturer's recommendation. Abrasive inclusions embedded in the coating shall be removed. Job specifications shall include the dry-to-recoat times and walk-on time given by the manufacturer.

1.5 NDFT (nominal total dry film thickness)[5]

NDFT 320 µm with 90/10 rule for epoxy-based coatings; other systems to coating manufacturer's specifications.

Maximum total dry film thickness according to manufacturer's detailed specifications.

Care shall be taken to avoid increasing the thickness in an exaggerated way. Wet film thickness shall be regularly

checked during application. Thinner shall be limited to those types and quantities recommended by the manufacturer."

Interpretation

Wet film thickness shall be regularly checked during application for quality control by the Builder. PSPC does not state who should check WFT, it is accepted for this to be the Builder. Measurement of DFT shall be done as part of the inspection required in PSPC 6.

Stripe coats should be applied as a coherent film showing good film formation and no visible defects. The application method employed should insure that all areas that require stripe coating are properly coated by brush or roller. A roller may be used for scallops, ratholes etc., but not for edges and welds.

Conventions/Codes Requirements

PSPC 4 Table 1: 2 PSP (Primary Surface Preparation)

"2. PSP (Primary Surface Preparation)

2.1 Blasting and profile[6, 7]

Sa 21/2; with profiles between 30-75 µm

Blasting shall not be carried out when:

.1 the relative humidity is above 85%; or

.2 the surface temperature of steel is less than 3 ℃ above the dew point.

Checking of the steel surface cleanliness and roughness profile shall be carried out at the end of the surface preparation and before the application of the primer, in accordance with the manufacturer's recommendations.

2.2 Water soluble salt limit equivalent to NaCl[8]

≤ 50 mg/m^2 of sodium chloride.

2.3 Shop primer

Zinc containing inhibitor free zinc silicate based or equivalent. Compatibility with main coating system shall be confirmed by the coating manufacturer."

Interpretation

of para 2.2:

The conductivity of soluble salts is measured in accordance with ISO 8502-6 and ISO 8502-9 or equivalent method as validated according to NACE SP0508-2010, and compared with the conductivity of 50 mg/m2 NaCl. If the measured conductivity is less than or equal to, then it is acceptable. Minimum readings to be taken are one (1) per plate in the case of manually applied shop primer. In cases where an automatic process for application of shop primer is used, there should be means to demonstrate compliance with PSPC through a Quality Control System, which should include a monthly test.

of para 2.3:

Shop primers not containing zinc or not silicate based are considered to be "alternative systems" and therefore equivalency is to be established in accordance with Section 8 of the PSPC with test acceptance criteria for "alternative systems" given in section 3.1 (right columns) of Appendixes 1 and 2 to ANNEX 1 of MSC.215(82).

Procedure for review of Quality Control of Automated Shop Primer plants

1 It is recognised that the inspection requirements of PSPC 6.2 may be difficult to apply to an automated shop primer plant and a Quality Control approach would be a more practical way of enabling compliance with the requirements of PSPC.

2 As required in PSPC it is the responsibility of the coating inspector to confirm that the quality control procedures are ensuring compliance with PSPC.

3 When reviewing the Quality Control for automated shop primer plants the following procedures should be included.

3.1 Procedures for management of the blasting grit including measurement of salt and contamination.

3.2 Procedures recording the following; steel surface temperature, relative humidity, dewpoint.

3.3 Procedures for controlling or monitoring surface cleanliness, surface profile, oil, grease, dust and other contamination.

3.4 Procedures for recording/measuring soluble salts.

3.5 Procedures for verifying thickness and curing of the shop primer conforms to the values specified in the Technical Specification.

Conventions/Codes Requirements

PSPC 4 Table 1: 3 SSP (Secondary Surface Preparation)

"3.2 Sa 21/2 on damaged shop primers and welds

Sa 2 removing at least 70% of intact shop primer, which has not past a prequalification certified by test procedures in 1.3."

"3.3 Surface treatment after erection6

Butts St 3 or better or Sa 21/2 where practicable. Small damages up to 2% of total area: St 3. Contiguous damages over 25 m2 or over 2% of the total area of the tank, Sa 21/2 shall be applied.

Coating in overlap shall be feathered."

"3.4 In case of full or partial blasting 30-75 µm, otherwise as recommended by the coating manufacturer."

Interpretation

Usually, the fillet welding on tank boundary watertight bulkhead is left without coating on block stage (because not yet be leakage tested), in which case it can be categorized as erection joint ("butt") to be power tooled to St 3.

Conventions/Codes Requirements

PSPC 4 Table 1: 3 SSP (Secondary Surface Preparation)

"3.6 Water soluble salts limit equivalent to NaCl after blasting/grinding[8]

≤ 50 mg/m^2 of sodium chloride."

Interpretation

The conductivity of soluble salts is measured in accordance with ISO 8502-6 and ISO 8502-9, or equivalent method as validated according to NACE SP0508-2010, and compared with the conductivity of 50 mg/m2 NaCl. If the measured conductivity is less than or equal to, then it is acceptable.

All soluble salts have a detrimental effect on coatings to a greater or lesser degree. ISO 8502-9:1998 does not provide the actual concentration of NaCl. The % NaCl in the total soluble salts will vary from site to site. Minimum readings to be taken are one (1) reading per block/section/unit prior to applying.

Conventions/Codes Requirements

PSPC 4 Table 1: 4 Miscellaneous

"4.3 Testing of coating[5]

Destructive testing shall be avoided.

Dry film thickness shall be measured after each coat for quality control purpose and the total dry film thickness shall be confirmed after completion of final coat, using appropriate thickness gauges (see annex 3)."

Interpretation

All DFT measurements shall be measured. Only the final DFT measurements need to be measured and reported for compliance with the PSPC by the qualified coating inspector. The Coating Technical File may contain a summary of the DFT measurements which typically will consist of minimum and maximum DFT measurements, number of measurements taken and percentage above and below required DFT. The final DFT compliance with the 90/10 practice shall be calculated and confirmed, see PSPC 2.8.

Conventions/Codes Requirements

PSPC 5 COATING SYSTEM APPROVAL

"Results from pre-qualification tests (Table 1, paragraph 1.3) of the coating system shall be documented and a Statement of Compliance or Type Approval Certificate shall be issued if found satisfactory by a third party, independent of the coating manufacturer."

Interpretation

See Interpretation of PSPC Table 1: 1 Design of coating system, 1.3 Coating prequalification test.

Conventions/Codes Requirements

PSPC 6 COATING INSPECTION REQUIREMENTS

"6.1 General

6.1.1 To ensure compliance with this Standard, the following shall be carried out by qualified coating inspectors certified to NACE Coating Inspector Level 2, FROSIO Inspector Level III or equivalent as verified by the Administration.

6.1.2 Coating inspectors shall inspect surface preparation and coating application during the coating process by carrying out, as a minimum, those inspection items identified in section 6.2 to ensure compliance with this Standard. Emphasis shall be placed on initiation of each stage of surface preparation and coatings application as improper work is extremely difficult to correct later in the coating progress. Representative structural members shall be non-destructively examined for coating thickness. The inspector shall verify that appropriate collective measures

have been carried out.
6.1.3 Results from the inspection shall be recorded by the inspector and shall be included in the CTF (refer to annex 2 (Example of daily log and non-conformity report)).”

Interpretation

Procedure for Assessment of Coating Inspectors’ Qualifications

1 Coating inspectors required to carry out inspections in accordance with the PSPC 6 shall be qualified to NACE Coating Inspector Level 2, FROSIO Inspector Level III, or an equivalent qualification. Equivalent qualifications are described in 3 below.

2 However, only coating inspectors with at least 2 years relevant coating inspector experience and qualified to NACE Coating Inspector Level 2 or FROSIO Inspector Level III, or with an equivalent qualification, can write and\or authorise procedures, or decide upon corrective actions to overcome non-compliances.

3 Equivalent Qualification

3.1 Equivalent qualification is the successful completion, as determined by course tutor, of an approved course.

3.1.1 The course tutors shall be qualified with at least 2 years relevant experience and qualified to NACE Coating Inspector Level 2 or FROSIO Inspector Level III, or with an equivalent qualification.

3.1.2 Approved Course: A course that has a syllabus based on the issues associated with the PSPC including the following:

- Health Environment and Safety
- Corrosion
- Materials and design
- International standards referenced in PSPC
- Curing mechanisms
- Role of inspector
- Test instruments
- Inspection Procedures
- Coating specification
- Application Procedures
- Coating Failures
- Pre-job conference
- MSDS and product data sheet review
- Coating technical file
- Surface preparation
- Dehumidification
- Waterjetting
- Coating types and inspection criteria
- Specialized Application Equipment
- Use of inspection procedures for destructive testing and non destructive testing instruments.
- Inspection instruments and test methods
- Coating inspection techniques
- Cathodic protection
- Practical exercises, case studies.

Examples of approved courses may be internal courses run by the coating manufacturers or shipyards etc.

3.1.3 Such a course shall have an acceptable measurement of performance, such as an examination with both theoretical and practical elements. The course and examination shall be approved by the Administration.

3.2 Equivalent qualification arising from practical experience: An individual may be qualified without attending a course where it can be shown that the individual:

- has a minimum of 5-years practical work experience as a coating inspector of ballast tanks during new construction within the last 10 years, and
- has successfully completed the examination given in 3.1.3.

4 Assistants to coating Inspectors

4.1 If the coating inspectors requires assistance from other persons to perform part of the inspections, those persons shall perform the inspections under the coating inspector’s supervision and shall be trained to the coating inspector’s satisfaction.

4.2 Such training should be recorded and endorsed either by the inspector, the yard's training organisation or inspection equipment manufacturer to confirm competence in using the measuring equipment and confirm

knowledge of the measurements required by the PSPC.
4.3 Training records shall be available for verification.

Conventions/Codes Requirements

PSPC 7 COATING VERIFICATION REQUIREMENTS
"The following shall be carried out by the Administration prior to reviewing the Coating Technical File for the ship subject to this Standard:
.1 check that the Technical Data Sheet and Statement of Compliance or Type Approval Certificate comply with this Standard;
.2 check that the coating identification on representative containers is consistent with the coating identified in the Technical Data Sheet and Statement of Compliance or Type Approval Certificate;
.3 check that the inspector is qualified in accordance with the qualification standards in paragraph 6.1.1;
.4 check that the inspector's reports of surface preparation and the coating's application indicate compliance with the manufacturer's Technical Data Sheet and Statement of Compliance or Type Approval Certificate; and
.5 monitor implementation of the coating inspection requirements."

Interpretation

Procedure for Verification of Application of the PSPC
1 The verification requirements of PSPC 7 shall be carried out by the Administration.
1.1 Monitoring implementation of the coating inspection requirements, as called for in PSPC 7.5 means checking, on a sampling basis, that the inspectors are using the correct equipment, techniques and reporting methods as described in the inspection procedures reviewed by the Administration.
2 Any deviations found under 1.1 shall be raised initially with the coating inspector, who is responsible for identifying and implementing the corrective actions.
3 In the event that corrective actions are not acceptable to the Administration or in the event that corrective actions are not closed out then the shipyard shall be informed.
4 A Passenger Ship Safety Certificate or Cargo Ship Safety Certificate or Cargo Ship Safety Construction Certificate, as appropriate, shall not be issued until all required corrective actions have been closed out to the satisfaction of the Administration.

Conventions/Codes Requirements

PSPC Annex 1: TEST PROCEDURES FOR COATING QUALIFICATION FOR DEDICATED SEAWATER BALLAST TANK OF ALL TYPES OF SHIPS AND DOUBLE-SIDE SKIN SPACES OF BULK CARRIERS
Annex 1 Footnotes of Standards

"Footnotes:
10 Reference standard: ISO 2811-1/4:1997. Paints and varnishes. Determination of density.
11 Reference standards: ISO 4628/2:2003. Paints and varnishes – Evaluation of degradation of coatings – Designation of quantity and size of defects, and of intensity of uniform changes in appearance – Part 2. ISO 4628:2003. Paints and varnishes – Evaluation of degradation of coatings – Designation of quantity and size of common types of defect – Part 3: Designation of degree of rusting.
12 Nine equally distributed measuring points are used on panel's size 150 mm x 150 mm or 15 equally distributed measuring points on panel's size 200 mm x 400 mm.
13 Reference standard: ISO 4624:2002. Pull-off test for adhesion.
14 Reference standards: ASTM D4145:1983. Standard Test Method for Coating Flexibility of Prepainted Sheet.
16 Reference standard: ISO 6270-1:1998 Paints and varnishes – Determination of resistance to humidity – Part 1: Continuous condensation."

Interpretation

Only the footnoted standards referred to in Annex 1 are to be applied, i.e. they are mandatory.

Technical Background

According to IMO MSC.1/Circ.1465, UI SC223 is revised.

Remarks

The "contracted for construction" date means the date on which the contract to build the vessel is signed between

the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.210 Measurement of Distances

Conventions (Amend.), Reg.		**IMO instruments (e.g., ICLL, SOLAS and MARPOL Conventions, the IBC Code and the IGC Code, etc.)**					
IACS UI Number	**SC224**	**UI** version	**Aug.,2008**	Date of implementation	**Apr.1,2009**	Means of implementation	Contracted for construction
Conventions/Codes Requirements							
Several IMO instruments (e.g., ICLL, SOLAS and MARPOL Conventions, the IBC Code and the IGC Code, etc.) require distances to be measured such as tank length, height, width, ship (or subdivision or waterline) length, etc..							
Interpretation							
Unless explicitly stipulated otherwise in the text of the regulations in SOLAS, Load Line and MARPOL Conventions and any of their mandatory Codes, distances are to be measured by using moulded dimensions.							
Technical Background							
Remarks							

1.211 The occupied volume by flooded water of a flooded space in the SOLAS Chapter II-1 (Regulation 2(14))

Conventions (Amend.), Reg.		Regulation **II-1/2(14)** of **SOLAS 1974**					
IACS UI Number	**SC225**	**UI** version	**Sept.,2008/ Corr.1,Mar.,2021**	Date of implementation	**Apr.1,2009**	Means of implementation	
Conventions/Codes Requirements							
Reg.2(14) of SOLAS II-1 (as in MSC.194(80)) reads: *"Permeability (μ) of a space is the proportion of the immersed volume of that space which can be occupied by water."*							
Interpretation							
In determining the permeability of a space, the volume of a space is to be taken as the moulded volume, i.e. the immersed volume of a space shall be the under water moulded volume of that space multiplied by the permeability.							
Technical Background							
The contents of the UI has been used in an IMO circular and a note to this effect has been added.							
Remarks							
The UI of SOLAS Chapter II-1 is also provided in IMO circular MSC.1/Circ.1362.							

1.212 IACS Unified Interpretations (UI) on the application of SOLAS regulations to conversions of Single-Hull Oil Tankers to Double-Hull Oil Tankers or Bulk Carriers

Conventions (Amend.), Reg.		**Regulations II-1/1.3, 3-2.2&3-2.4, 3-6, 3-8, Part B & Part B-1; II-2/1.3; III/1.4.2, 31.1.8; V/22; XII/4, 5.1 & 5.2, 6.1, 6.2, 6.3, 6.4, 7.1, 7.2, 8, 9, 10, 11, 12, 13, 14 of SOLAS 1974**					
IACS UI Number	**SC226**	**UI** version	**Nov., 2008/ Rev. 1, Dec.,2012**	Date of implementation	**Jan.01,2009/ Jan.01,2014**	Means of implementation	
Conventions/Codes Requirements							
SC226.1 Alterations and modifications of a major character **SOLAS Chapter II-1 Reg. 1.3 (as amended by MSC.216(82))** **SOLAS Chapter II-1, Reg. 1 'Application':** *"3 All ships which undergo repairs, alterations, modifications and outfitting related thereto shall continue to*							

comply with at least the requirements previously applicable to these ships. Such ships, if constructed before the date on which any relevant amendments enter into force, shall, as a rule, comply with the requirements for ships constructed on or after that date to at least the same extent as they did before undergoing such repairs, alterations, modifications or outfitting. Repairs, alterations and modifications of a major character and outfitting related thereto shall meet the requirements for ships constructed on or after the date on which any relevant amendments enter into force, in so far as the Administration deems reasonable and practicable."

Interpretation

1. The date on which a conversion occurs for the purposes of determining the applicability of requirements for ships constructed on or after the date on which any relevant amendments enters into force is to be:
   - .1 the date on which the contract is placed for the conversion; or
   - .2 in the absence of a contract, the date on which the work identifiable with the specific conversion begins; or
   - .3 the completion date of the conversion, if that occurs more than three years after the date specified in subparagraph .1 above or 30 months after the date specified in subparagraph .2 above, either as applicable.

2 As for paragraph 1 above, the following applies:
   - .1 Where the completion date of the conversion has been subject to delay beyond the period referred to in paragraph 1.3 above due to unforeseen circumstances beyond the control of the builder and the owner, the date on which contract is placed for the conversion or, if applicable, the date on which the work identifiable with the specific conversion begins may be accepted by the Administration in lieu of the completion date of the conversion. The treatment of such ships is to be considered by the Administration on a case-by-case basis, bearing in mind the particular circumstances.
   - .2 It is important that ships accepted by the Administration under the provisions of subparagraph .1 above are also to be accepted as such by port States. In order to ensure this, the following practice is recommended to Administrations when considering an application for such a ship:
     - .1 the Administration should thoroughly consider applications on a case-by-case basis, bearing in mind the particular circumstances.
       In doing so in the case of a ship converted in a foreign country, the Administration may require a formal report from the authorities of the country in which the ship was converted, stating that the delay was due to unforeseen circumstances beyond the control of the builder and the owner;
     - .2 when a ship is accepted by the Administration under the provisions of subparagraph .1 above, information on the conversion date annotated on the relevant certificates is to be footnoted to indicate that the ship is accepted by the Administration under the unforeseen delay in completion of the conversion provisions of this interpretation; and
     - .3 the Administration should report to the Organization on the identity of the ship and the grounds on which the ship has been accepted under the unforeseen delay in the completion of the conversion provisions of this interpretation.

For conversions of single-hull oil tankers to double-hull oil tankers or bulk carriers, the following is to apply:

- .1 Conversions of single-hull oil tankers to double-hull oil tankers or bulk carriers is to be regarded as modifications of a major character for the purposes of SOLAS chapter II-1.
- .2 Repairs, alterations and modifications of a major character include:
  - .1 Substantial alteration of the dimensions of a ship, for example lengthening of a ship by adding a new midbody. The new midbody is to comply with SOLAS chapter II-1.
  - .2 A change of ship type, for example an oil tanker converted to a bulk carrier. Any structure, machinery and systems that are added or modified is to comply with SOLAS chapter II-1, taking into account the interpretation of SOLAS chapter II-1 regulations as contained herein.

Remarks

Conventions/Codes Requirements

SC226.2 Protective coatings of dedicated seawater ballast tanks in all types of ships and double-side skin spaces of bulk carriers

SOLAS Chapter II-1 Reg. 3-2, 2 and Reg. 3-2, 4 (as amended by MSC.216(82))

SOLAS Chapter II-1, Reg. 3-2:

"2 All dedicated seawater ballast tanks arranged in ships and double-side skin spaces arranged in bulk carriers of 150 m in length and upwards shall be coated during construction in accordance with the Performance standard for

protective coatings for dedicated seawater ballast tanks in all types of ships and double-side skin spaces of bulk carriers, adopted by the Maritime Safety Committee by resolution MSC.215(82), as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the Annex other than chapter I."

and

"4 Maintenance of the protective coating system shall be included in the overall ship's maintenance scheme. The effectiveness of the protective coating system shall be verified during the life of a ship by the Administration or an organization recognized by the Administration, based on the guidelines developed by the Organization."*

Interpretation

1. For single-hull oil tanker conversion into double-hull oil tanker, SOLAS regulation II-1/3-2 as adopted by resolution MSC.216(82) is to apply to dedicated water ballast tanks if constructed with all structural members being entirely new. If converting existing spaces into water ballast tanks with part of the existing structural members remaining in place, revised SOLAS regulation II-1/3-2 (MSC.216(82)) need not be applied. However, dedicated sea water ballast tanks are to have an efficient corrosion prevention system such as hard protective coatings or equivalent and be of light colour.
2. For single-hull oil tanker conversion into bulk carrier, SOLAS regulation II-1/3-2 as adopted by resolution MSC.216(82) is to apply to dedicated water ballast tanks and double-side skin spaces of bulk carriers if constructed with all structural members being entirely new. If converting existing spaces into dedicated water ballast tanks or double-side skin space of bulk carriers with part of the existing structural members remaining in place, revised SOLAS regulation II-1/3-2 (MSC.216(82)) need not be applied. However, dedicated sea water ballast tanks are to have an efficient corrosion prevention system such as hard protective coatings or equivalent and be of light colour.

Remarks

Conventions/Codes Requirements

SC226.3 Access to and within spaces in, and forward of, the cargo area of oil tankers and bulk carriers
SOLAS Chapter II-1 Reg. 3-6 (as amended by MSC.194(80))
Regulation texts are not inserted here.

Interpretation

1. For single-hull oil tanker conversion into double-hull oil tanker

1.1 Permanent means of access contained in table 1 of the Technical provisions for means of access for inspections (resolution MSC.158(78)) need not apply. However, if, in the course of conversion, substantial new structures are added, these new structures are to comply with the regulation.

1.2 The term "substantial new structures" means hull structures that are entirely renewed or augmented by new double bottom and/or double-side construction (e.g., replacing the entire structure within cargo area or adding a new double bottom and/or double-side section to the existing cargo area).

1.3 Additionally, an approved Ship Structure Access Manual is to be provided.

2. For single-hull oil tanker conversion into bulk carrier

2.1 Permanent means of access contained in table 2 of the Technical provisions for means of access for inspections (resolution MSC.158(78)) need not apply. However, if, in the course of conversion, substantial new structures are added, these new structures are to comply with the regulation.

2.2 The term "substantial new structures" means hull structures that are entirely renewed or augmented by new double bottom and/or double-side skin construction (e.g., replacing the entire structure within cargo area or adding a new double bottom and/or double-side section to the existing cargo area).

2.3 Additionally, an approved Ship Structure Access Manual is to be provided.

Remarks

Conventions/Codes Requirements

SC226.4 Towing and Mooring Equipment
SOLAS Chapter II-1 Reg. 3-8 (as amended by MSC.194(80))
Regulation texts are not inserted here.

Interpretation

For single-hull oil tanker conversion into double-hull oil tanker or bulk carrier

This regulation is to be applied when equipment and fittings for mooring/towing are replaced, modified or the safe working load of the existing equipment and fittings is known. Where the latter cannot be ascertained, alternative

compliance with SOLAS regulation II-1/3-8 is to be sought (e.g., the equipment is to be replaced, tested or modified).

Remarks

Conventions/Codes Requirements

SC226.5 Subdivision and stability
SOLAS Chapter II-1 Part B and Part B-1 (as amended by MSC.216(82)
Regulation texts are not inserted here.

Interpretation

1. **For single-hull oil tanker conversion into double-hull oil tanker**
   Oil tankers complying with damage stability requirements contained in Annex I to MARPOL 73/78 (except for combination carriers with type B freeboards) may be excluded from the damage stability requirements contained in SOLAS chapter II-1, part B-1.
2. **For single-hull oil tanker conversion into bulk carrier**

2.1 A bulk carrier which is assigned a B reduced freeboard complying with damage stability requirements contained in regulation 27 of the 1966 Load Line Convention, and resolutions A.320(IX) and A.514(13); or regulation 27 of the 1988 Load Line Protocol, may be excluded from the damage stability requirements contained in SOLAS chapter II-1, part B-1.

2.2 For a bulk carrier which is assigned a B freeboard, SOLAS chapter II-1, Parts B and B-1 are to be applied.

Remarks

Conventions/Codes Requirements

SC226.6 Repairs, alterations, modifications and outfitting
SOLAS Chapter II-2 Reg. 1.3
SOLAS Chapter II-2, Reg. 1.3 'Repairs, alterations, modifications and outfitting':
"3.1 All ships which undergo repairs, alterations, modifications and outfitting related thereto shall continue to comply with at least the requirements previously applicable to these ships. Such ships, if constructed before 1 July 2002, shall, as a rule, comply with the requirements for ships constructed on or after that date to at least the same extent as they did before undergoing such repairs, alterations, modifications or outfitting.
3.2 Repairs, alterations and modifications which substantially alter the dimensions of a ship or the passenger accommodation spaces, or substantially increase a ship's service life and outfitting related thereto shall meet the requirements for ships constructed on or after 1 July 2002 in so far as the Administration deems reasonable and practicable."

Interpretation

For single-hull oil tanker conversion into double-hull oil tanker or bulk carrier, new and converted parts are to comply with the latest applicable requirements.

Remarks

Conventions/Codes Requirements

SC226.7 Alterations and modifications of a major character
SOLAS Chapter III Reg. 1.4.2
SOLAS Chapter III, Reg. 1 'Application':
"4 For ships constructed before 1 July 1998, the Administration shall:
.1 ……; and
.2 ensure that when life-saving appliances or arrangements on such ships are replaced or such ships undergo repairs, alterations or modifications of a major character which involve replacement of, or any addition to, their existing life-saving appliances or arrangements, such life-saving appliances or arrangements, in so far as is reasonable and practicable, comply with the requirements of this chapter. However, if a survival craft other than an inflatable liferaft is replaced without replacing its launching appliance, or vice versa, the survival craft or launching appliance may be of the same type as that replaced."

Interpretation

For single-hull oil tanker conversion into double-hull oil tanker or bulk carrier, this to be considered as an alteration or modification of a major character.

Remarks

Conventions/Codes Requirements

SC226.8 Survival craft and rescue boats

SOLAS Chapter III Reg. 31.1.8

SOLAS Chapter III, Reg. 31 'Survival craft and rescue boats':

"1.2 In lieu of meeting the requirements of paragraph 1.1, cargo ships may carry:

.1 one or more free-fall lifeboats, complying with the requirements of section 4.7 of the Code, capable of being free-fall launched over the stern of the ship of such aggregate capacity as will accommodate the total number of persons on board; and

.2 in addition, one or more inflatable or rigid liferafts complying with the requirements of section 4.2 or 4.3 of the Code, on each side of the ship, of such aggregate capacity as will accommodate the total number of persons on board. The liferafts on at least one side of the ship shall be served by launching appliances."

and

"1.8 Notwithstanding the requirements of paragraph 1.1, bulk carriers as defined in regulation IX/1.6 constructed on or after 1 July 2006 shall comply with the requirements of paragraph 1.2."

Interpretation

1. For single-hull oil tanker conversion into double-hull oil tanker, this regulation is not relevant.
2. For single-hull oil tanker conversion into bulk carrier, SOLAS regulation III/31.1.8 is to be met as for new ships, except where the space available for fitting and/or launching a free-fall lifeboat in accordance with regulation III/31.1.2.1 is not adequate, in which case the Administration is to be contacted to determine whether or not existing arrangement may be accepted.

Remarks

Conventions/Codes Requirements

SC226.9 Navigation bridge visibility

SOLAS Chapter V Reg. 22

Regulation text is not inserted here.

Interpretation

For single-hull oil tanker conversion into double-hull oil tanker or bulk carrier, the level of visibility possessed by the ship prior to the conversion at the ballast loading condition is to be maintained after the conversion. Where a conversion involves the modification of structural arrangements used to establish minimum bridge visibility, the provisions of SOLAS regulation V/22 is to apply.

Remarks

Conventions/Codes Requirements

SC226.10 Damage stability requirements applicable to bulk carriers

SOLAS regulation XII/4, structural strength of bulk carriers SOLAS regulation XII/5.1 and 5.2, structural and other requirements for bulk carriers SOLAS regulation XII/6.1, XII/6.2, XII/6.3 (MSC.216(82) Annex 1) and XII/6.4 (MSC.216(82) Annex 1), survey and maintenance of bulk carriers SOLAS regulation XII/7.1 and XII/7.2, information on compliance with requirements for bulk carriers SOLAS regulation XII/8, Requirements for bulk carriers not being capable of complying with regulation 4.3 due to the design configuration of their cargo holds SOLAS regulation XII/9, Solid bulk cargo density declaration SOLAS regulation XII/10, Loading instrument SOLAS regulation XII/11, Hold, ballast and dry space water ingress alarms SOLAS regulation XII/12, Availability of pumping systems SOLAS regulation XII/13, Restrictions from sailing with any hold empty SOLAS regulation XII/14

Regulation texts are not inserted here.

Interpretation

1. For single-hull oil tanker conversion into double-hull oil tanker, these regulations are not relevant.
2. For single-hull oil tanker conversion into bulk carrier, the provisions of chapter XII applicable for ships constructed on or after the date on which conversion occurs, are to be applied as for a new ship to the entire bulk carrier, i.e. all new and existing parts and spaces, as indicated in the table below.

Table of application of the Regulations of SOLAS Chapter XII to the conversions of Single Hull Tankers to Bulk Carriers/Ore Carriers

Regulation	Applicability	Note
4.1	Apply	

4.2	Apply, based on the Unified interpretations of SOLAS regulations XII/4.2 and XII/5.2 (MSC.1/Circ.1178).	
4.3	NA	
4.4	NA	This regulation is referred to within regulations 4.1 and 4.2
4.5	NA	
4.6	Apply	
4.7	Apply	
5.1	Apply	
5.2	Apply, based on the Unified interpretations of SOLAS regulations XII/4.2 and XII/5.2 (MSC.1/Circ.1178).	
6.1	NA	
6.2	Apply	
6.3	Apply	
6.4	Apply	
7.1	NA. However, SOLAS regulation XI-1/2 is applicable.	
7.2	Apply	
8.1	Apply	
8.2	NA	
8.3	NA	
9	NA	
10.1	Apply	
10.2	NA	
11.1	Apply	
11.2	NA	
11.3	Apply	
12.1	Apply	
12.2	Apply	
12.3	NA	
13.1	Apply	
13.2	NA	
14	NA	

Remarks

1.213 The dedicated seawater ballast tanks in SOLAS Chapter II-1 (Regulation 3-2)

Conventions (Amend.), Reg.		Regulation **II-1/3-2.1** of **SOLAS 1974**					
IACS UI Number	**SC227**	**UI** version	**01.2009/ Rev.1, 05.2011/ Rev.2, 11.2016**	Date of implementation	**01.07.2008 / 01.07.2017**	Means of implementation	**Contracted for construction**

Conventions/Codes Requirements

Reg.3-2 of SOLAS II-1 (as in MSC.216(82)) reads:

"2 All dedicated seawater ballast tanks arranged in ships and double-side skin spaces arranged in bulk carriers of 150 m in length and upwards shall be coated during construction in accordance with the Performance standard for protective coatings for dedicated seawater ballast tanks in all types of ships and double-side skin spaces of bulk carriers, adopted by the Maritime Safety Committee by resolution MSC.215(82), as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the

provisions of article VIII of the present Convention concerning the amendment procedures applicable to the Annex other than chapter I."

Interpretation

The following tanks shall not be considered to be dedicated seawater ballast tanks and shall therefore be exempted from the application and requirements of the Performance standard for protective coatings for dedicated seawater ballast tanks in all types of ships and double-side skin spaces of bulk carriers (resolution MSC.215(82)), provided the coatings applied in the tanks described in paragraphs 2. and 3. below are confirmed by the coating manufacturer to be resistant to the media stored in these tanks and provided such coatings are applied and maintained according to the coating manufacturer's procedures.

1. Ballast tank identified as "Spaces included in Net Tonnage" in the 1969 ITC Certificate;
2. Sea water ballast tanks in passenger vessels also designated for the carriage of grey water or black water;
3. Sea water ballast tanks in livestock carriers also designated for the carriage of the livestock dung.

Technical Background

Reviewing the outcome of MSC 96 (MSC.1/Circ.1539), text of UI SC 227 is to be adjusted.

Remarks

Rev.2 to the interpretation is applicable to IACS members for ships contracted for construction on or after 1 July 2017.

1.214 Machinery shutoff arrangements - Oil mist detector arrangements

Conventions (Amend.), Reg.		Regulation **II-1/2(14)** of **SOLAS 1974**					
IACS UI Number	**SC228**	**UI** version	**Dec.,2008**	Date of implementation	**Jan.1,2010**	Means of implementation	Contracted for construction

Conventions/Codes Requirements

SOLAS Regulation II-1/27.5: Machinery – Automatic shutoff arrangements:

"Main turbine propulsion machinery and, where applicable, main internal combustion propulsion machinery and auxiliary machinery shall be provided with automatic shutoff arrangements in the case of failures ... which could lead rapidly to ... serious damage or explosion. The administration may permit overriding automatic shutoff devices."

Interpretation

The OMD arrangements (or engine bearing temperature monitors or equivalent devices) are part of the automatic shutoff arrangements required by SOLAS Reg. II-1/27.5, in the case of medium and high speed diesel engines of 2,250 kW and above or having cylinders of more than 300 mm bore.

For the case of low speed diesel engines of 2,250 kW and above or having cylinders of more than 300 mm bore, the OMD arrangements (or engine bearing temperature monitors or equivalent devices) are to initiate the alarm and slow down procedures.

The consequences of overriding automatic shutoff arrangements are to be established and documented.
The above interpretation applies to engines when an application for certification is dated on or after 1 January 2010, or which are installed in new ships for which the date of contract for construction is on or after 1 January 2010.

Technical Background

Engines are to be fitted with safety system in accordance with SOLAS Reg. II-1/27.5, 31.2.10, 31.3 and 47.2. For periodically unattended machinery, engines larger than a given size are to be equipped with oil mist detectors or bearing temperature monitors or equivalent devices (SOLAS does not specify which action they are to initiate); the

same applies to machinery systems under automatic or remote control or under remote manual supervision. As a result, the interpretation of SOLAS Reg. II-1/27.5 is given in SC 228.

Remarks

This UI is to be uniformly implemented by IACS Members and Associates from 1 January 2010.

1.215 Steam Boilers and Boiler Feed Systems

Conventions (Amend.), Reg.		Regulation **II-1/32.4** of **SOLAS 1974**					
IACS UI Number	**SC232**	**UI** version	**May,2009**	Date of implementation	**Jan.1,2010**	Means of implementation	

Conventions/Codes Requirements

Every steam generating system which provides services essential for the safety of the ship, or which could be rendered dangerous by the failure of its feedwater supply, shall be provided with not less than two separate feedwater systems from and including the feed pumps, noting that a single penetration of the steam drum is acceptable. Unless overpressure is prevented by the pump characteristics, means shall be provided which will prevent overpressure in any part of the systems.

Interpretation

Where a steam generation system consists of two or more adequately sized boilers, and the feed water for each of these boilers is supplied by a single feed water pipe, the level of redundancy for the piping of the feedwater system is considered to comply with SOLAS II-1/32.4.

Technical Background

SOLAS II-1/32.4 specifically uses the phrase “every steam generating system”, it does not use the term “boiler” as used in the other paragraphs of II-1/32. Where a vessel is fitted with two boilers, the phrase “steam generating system” refers to the combination of the two boilers making up the “steam generating system”. If each of two adequately sized boilers are fitted with a single feed water pipe, there are in fact two separate feed water systems for the “steam generating system”. The interpretation is given in SC 232.

Remarks

1.216 lifeboat exterior colour

Conventions (Amend.), Reg.		**LSA Code item 1.2.2.6**					
IACS UI Number	**SC233**	**UI** version	**Feb.,2009/ Rev.1,Nov.,2012**	Date of implementation	**July.1,2010/ July.1,2013**	Means of implementation	

Conventions/Codes Requirements

LSA Code item 1.2.2.6 as amended by MSC Res. 207(81) reads:

“be of international or vivid reddish orange, or a comparably highly visible colour on all parts where this will assist detection at sea;"

Interpretation

'Highly visible colour' only includes colours of strong chromatic content, i.e. pure achromatic colours such as white and all shades of grey shall not be accepted as 'comparable' colours.

The above is applicable to the exterior of the rigid watertight enclosure of totally enclosed lifeboats and the exterior of the canopy of partially enclosed lifeboats.

Technical Background

Lifeboat manufacturers occasionally suggest using white as the colour on the exterior of the lifeboats claiming this to be fully in compliance with the 'highly visible colour' requirement of the above said regulation.

A 'highly visible colour' should as a minimum be of a kind that clearly separates itself from its surroundings in such a way that it brings attention to itself. In a sea-state environment colours such as orange-reddish or yellow possess these qualities while a white coloured object normally will be very difficult to distinguish from its surroundings due to the characteristics of e.g. stirred seas.

The above is applicable to the exterior of the canopy and the hull (in order to ensure that the lifeboat is visible if it capsizes) of both fully enclosed and partially enclosed lifeboats.

Remarks

1. This UI is to be uniformly implemented by IACS Societies for approvals issued in accordance with SOLAS III/34

and the LSA Code from 1 July 2010.
2. Rev.1 of this UI is to be uniformly implemented by IACS Societies for approvals issued in accordance with SOLAS III/34 and the LSA Code from 1 July 2013.

1.217 Initial Statutory Surveys at New Construction

Conventions (Amend.), Reg.		**SOLAS Convention**					
IACS UI Number	**SC234**	**UI** version	**Apr.,2009/ Corr.1,Jul., 2010/ Rev.1,Feb., 2014/ Rev.2,Dec.,2014**	Date of implementation	**Jul.1,2010/ Rev.1,Jul.1,2014/ Rev.2,Jul.1,2015**	Means of implementation	Contracted for construction

Conventions/Codes Requirements and Interpretations

Deleted

Technical Background

Remarks

IACS deleted the UI in June 2016.

1.218 Navigation bridge visibility to ship's side

Conventions (Amend.), Reg.		**Regulation V/22 of Amendments 2000 to SOLAS 1974**					
IACS UI Number	**SC235**	**UI version**	Jan.2011/ Corr.1, Dec.2011/ Corr.2, Jun. 2013	**Date of implementation**	Jan.1,2011	**Means of implementation**	contracted for construction

Conventions/Codes Requirements

22 Navigation bridge visibility

1 Ships of not less than 55 m in length, as defined in regulation 2.4, constructed on or after 1 July 1998, shall meet the following requirements:

.6 The ship's side shall be visible from the bridge wing.

3 *On ships of unconventional design which, in the opinion of the Administration, cannot comply with this regulation, arrangements shall be provided to achieve a level of visibility that is as near as practical to that described in this regulation.*

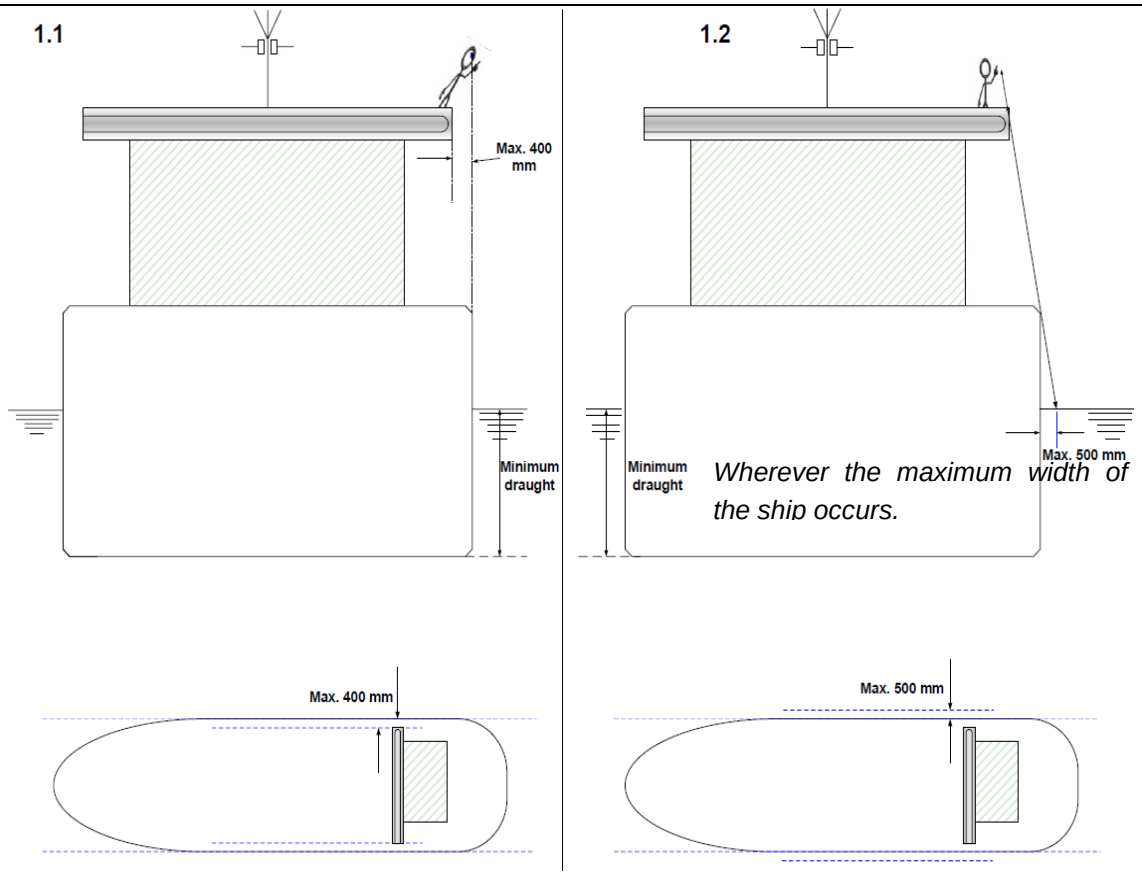
Interpretation

1. The requirements of SOLAS regulation V/22.1.6 are accomplished when:

1.1 a view from the bridge wing plus a distance corresponding to a reasonable and safe distance of a seafarer leaning over the side of the bridge wing, which needs not to be more than 400 mm, to the location vertically right under the maximum beam of the ship at the lowest seagoing draught is not obscured; or

1.2 the sea surface at the lowest seagoing draught and with a transverse distance of 500 mm and more from the maximum beam throughout the ship's length is visible from the side of the bridge wing.

2. A schematic diagram depicting the unified interpretations is also attached herewith.



3. For particular types of ships * such as tug/tow boat, offshore supply vessel (OSV), rescue ship, work ship (e.g. floating crane), in meeting the requirements of SOLAS regulation V/22.1.6, the bridge wings shall at least extend to a location from which the sea surface, at the lowest seagoing draught and at a transverse distance of 1,500 mm from the maximum beam throughout the ship's length, is visible. If this ship type is changed to a type other than those addressed in this paragraph then the interpretation in this paragraph would no longer apply.

Note *: Ships that are designed such that, in normal operations, they come along side, or operate in close proximity to, other vessels or offshore structures at sea.

4. The use of a remote camera system may be accepted for ships of unconventional design, other than those mentioned in paragraph 3 above, as means for achieving the view of the ship's side from the bridge wing, provided:

— the installed remote camera system is to be redundant from the circuit breaker to the camera and screen, including communication cables, i.e. the system is to provide on each side of the ship redundancy of:*

- the power cables and circuit breakers from the main switchboard to the camera and the screen;
- the camera;
- the screen;
- the transmission lines from the camera to the display screen; and
- the components associated with these lines and cables;

— the remote camera system is powered from the ship's main source of electrical power and is not required to be powered by the emergency source of electrical power;

— the remote camera system is capable of continuous operation under environmental conditions as per UR E10;

— the view provided by the remote camera system complies with the requirements of regulation V/22.1.6 and is also displayed at locations where the manoeuvring of the ship may take place;

— the upper edge of the ship's side abeam is directly visible by the observer from locations where the manoeuvring of the ship may take place.

Technical Background

Corr.1 is combined by SC235 andSC139 Rev.1. But in Corr.2, paragraphs 3 and 4 of the UI are amended to be in line withMSC.1/Circ.1350/Rev.1.

Remarks
The “contracted for construction” date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of “contract for construction”, refer to IACS Procedural Requirement (PR) No. 29.

1.219 Insulation with approved non-combustible materials (Reg. II-2/3.2.3)

Conventions (Amend.), Reg.		Regulation **II-2/3.2.3** of **SOLAS 1974**					
IACS UI Number	**SC239**	**UI** version	**Jun.,2010**	Date of implementation	**Jan.1,2012**	Means of implementation	Contracted for construction

Conventions/Codes Requirements

Regulation

2 "A" class divisions are those divisions formed by bulkheads and decks which comply with the following criteria:

.3 They are insulated with approved non-combustible materials such that the average temperature of the unexposed side will not rise more than 140℃ above the original temperature, nor will the temperature, at any one point, including any joint, rise more than 180℃ above the original temperature, within the time listed below:

class “A-60"	*60 min*
class "A-30"	*30 min*
class "A-15"	*15 min*
class "A-0"	*0 min*

Interpretation

Insulated “A” class bulkheads and decks used on board ships, including the means of affixing the insulation to the "A” class structural members, shall be consistent with the materials, details and arrangements used during, and documented in the test reports issued for, the approval test for that insulating material.

Technical Background

This UI was developed to ensure that the yards will be aware that the details of the fastening methods mentioned in type approval certificates will have to be complied with when installing A-class insulation in bulkheads and decks.

Remarks

1.This UI is to be implemented uniformly in connection with UI FTP5. The implementation date for the UI FTP5 is 1 July 2011 and for this UI SC is 1 January 2012. The reasoning behind these implementation dates took into account:
1) that the surveyor is to ensure insulation is installed in accordance with type approval report, regardless if the type approval is provided in accordance with the new FTP UI or not; and
2) that the FTP UI will allow existing type approvals to expire thus avoiding a wholesale renewal of the certification on or before the implementation date of the new FTP UI.
2.The “contracted for construction” date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of “contract for construction”, refer to IACS Procedural Requirement (PR) No. 29.

1.220 Closing device for ventilation of battery rooms

Conventions (Amend.), Reg.		Regulation **II-2/5.2.1.1** of **SOLAS 1974**					
IACS UI Number	**SC240**	**UI** version	**Oct.,2010/Corr.1, Sep.,2011**	Date of implementation	**Jul.1,2011**	Means of implementation	**contracted for construction**

Conventions/Codes Requirements
SOLAS Reg. II-2/5.2.1.1 *The main inlets and outlets of all ventilation systems shall be capable of being closed from outside the spaces being ventilated. The means of closing shall be easily accessible as well as prominently and permanently marked and shall indicate whether the shut-off is open or closed.*
Interpretation
Battery room ventilators are to be fitted with a means of closing whenever: i) The battery room does not open directly onto an exposed deck. ii) The ventilation opening for the battery room is required to be fitted with a closing device according to the Load Line Convention (i.e. the height of the opening does not extend to more than 4.5 m (14.8 feet) above the deck for position 1 or to more than 2.3 m (7.5 feet) above the deck in position 2; or iii) The battery room is fitted with a fixed gas fire extinguishing system. Where a battery room ventilator is fitted with a closing device, then a warning notice stating, for example "This closing device is to be kept open and only closed in the event of fire or other emergency – Explosive gas", is to be provided at the closing device to mitigate the possibility of inadvertent closing.
Technical Background
This is interpretation of the Convention by the Statutory Panel, considering that battery rooms pose a significant hazard due to the possible accumulation of explosive gasses. In this regulation, SOLAS requires main ventilation openings to be capable of being closed from the outside. This regulation does not take into account the specific hazards associated with battery rooms.
Remarks
The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.221 Manually operated call points

Conventions (Amend.), Reg.		Regulation **II-2/7.7** of **SOLAS 1974**					
IACS UI Number	**SC241**	**UI version**	**Nov.,2010**	**Date of implementation**	**Dec.1,2010**	**Means of implementation**	
Conventions/Codes Requirements							
SOLAS Ch. II-2 Reg. 7.7 *Manually operated call points complying with the Fire Safety Systems Code shall be installed throughout the accommodation spaces, service spaces and control stations. One manually operated call point shall be located at each exit. Manually operated call points shall be readily accessible in the corridors of each deck such that no part of the corridor is more than 20 m from a manually operated call point.*							

Interpretation
The phrase 'Manually operated call points complying with the Fire Safety Systems Code shall be installed throughout the accommodation spaces, service spaces and control stations' does not require the fitting of a manually operated call point in an individual space within the accommodation spaces, service spaces and control stations. However, a manually operated call point shall be located at each exit (inside or outside) to the open deck from the corridor such that no part of the corridor is more than 20 m from a manually operated call point. Service spaces and control stations which have only one access, leading directly to the open deck, shall have a manually operated call point not more than 20 m (measured along the access route using the deck, stairs and/or corridors) from the exit. A manually operated call point is not required to be installed for spaces having little or no fire risk, such as voids and carbon dioxide rooms, nor at each exit from the navigation bridge, in cases where the control panel is located in the navigation bridge.
Technical Background
The above interpretation of the Convention is made by the Statutory Panel to deal with deficiencies raised by PSC.
Remarks
This UI may be applied to existing ships if the need so arises.

1.222 Arrangements for steering capability and function on ships fitted with propulsion and steering systems other than traditional arrangements for a ship's directional control

Conventions (Amend.), Reg.		**Chapter II-1, Regulations 28.3, 29.1, 29.2.1, 29.3, 29.4, 29.6.1, 29.14 and 30.2**					
IACS UI Number	**SC242**	**UI version**	**01.2011/ Corr.1,08.2011/ Rev.1,04.2016/ Rev.1 04.2016, Deleted on 20.12.2017/ Corr.1, 08.2011 reinstated/ Rev.2,Jan ,2020**	**Date of implementation**	**01.01.2012/ Rev.1,01.07.2017/ 21.12.2017/ Rev.2, 01.07. 2020**	**Means of implementation**	**application for certification of steering systems or contracted for construction of new ships**

Conventions/Codes Requirements

Regulation 28 - Means of going astern

28.3 The stopping times, ship headings and distances recorded on trials, together with the results of trials to determine the ability of ships having multiple propellers to navigate and manoeuvre with one or more propellers inoperative, shall be available on board for the use of the master or designated personnel.

Regulation 29 – Steering gear

29.1 Unless expressly provided otherwise, every ship shall be provided with a main steering gear and an auxiliary steering gear to the satisfaction of the administration. The main steering gear and the auxiliary steering gear shall be so arranged that the failure of one of them will not render the other one inoperative.

29.2.1 All the steering gear components and the rudder stock are to be of sound reliable construction to the satisfaction of the Administration. Special consideration shall be given to the suitability of any essential component which is not duplicated. Any such essential component shall, where appropriate, utilize anti-friction bearings such as ball bearings, roller bearings or sleeve bearings which shall be permanently lubricated or provided with lubrication fittings.

29.3 The main steering gear and rudder stock shall be:
.1 of adequate strength and capable of steering the ship at maximum ahead service speed

which shall be demonstrated;

.2 capable of putting the rudder over from 35 °on one side to 35 °on the other side with the ship at its deepest seagoing draught and running ahead at maximum ahead service speed and under the same conditions, from 35 °on either side to 30 °on the other side in not more than 28 s; where it is impractical to demonstrate compliance with this requirement during sea trials with the ship at its deepest seagoing draught and running ahead at the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch, ships regardless of date of construction may demonstrate compliance with this requirement by one of the following methods:

.1 during sea trials the ship is at even keel and the rudder fully submerged whilst running ahead at the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch; or

.2 where full rudder immersion during sea trials cannot be achieved, an appropriate ahead speed shall be calculated using the submerged rudder blade area in the proposed sea trial loading condition. The calculated ahead speed shall result in a force and torque applied to the main steering gear which is at least as great as if it was being tested with the ship at its deepest seagoing draught and running ahead at the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch; or

.3 the rudder force and torque at the sea trial loading condition have been reliably predicted and extrapolated to the full load condition. The speed of the ship shall correspond to the number of maximum continuous revolutions of the main engine and maximum design pitch of the propeller;

.3 operated by power where necessary to meet the requirements of paragraph 3.2 and in any case when the Administration requires a rudder stock of over 120 mm diameter in way of the tiller, excluding strengthening for navigation in ice;

.4 so designed that they will not be damaged at maximum astern speed; however, this design requirement need not be proved by trials at maximum astern speed and maximum rudder angle.

29.4 The auxiliary steering gear shall be:

.1 of adequate strength and capable of steering the ship at navigable speed and of being brought speedily into action in an emergency;

.2 capable of putting the rudder over from 15 °on one side to 15 °on the other side in not more than 60 s with the ship at its deepest sea-going draught and running ahead at one half of the maximum ahead service speed or 7 knots, whichever is the greater; where it is impractical to demonstrate compliance with this requirement during sea trials with the ship at its deepest seagoing draught and running ahead at one half of the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch or 7 knots, whichever is greater, ships regardless of date of construction, including those constructed before 1 January 2009, may demonstrate compliance with this requirement by one of the following methods:

.1 during sea trials the ship is at even keel and the rudder fully submerged whilst running ahead at one half of the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch or 7 knots, whichever is greater; or

.2 where full rudder immersion during sea trials cannot be achieved, an appropriate ahead speed shall be calculated using the submerged rudder blade area in the proposed sea trial loading condition. The calculated ahead speed shall result in a force and torque applied to the auxiliary steering gear which is at least as great as if it was being tested with the ship at its deepest seagoing draught and running ahead at one half of the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch or 7 knots, whichever is greater; or

.3 the rudder force and torque at the sea trial loading condition have been reliably predicted and extrapolated to the full load condition; and

.3 operated by power where necessary to meet the requirements of paragraph 4.2 and in any case when the Administration requires a rudder stock of over 230 mm diameter in way of the tiller, excluding strengthening for navigation in ice.

29.6.1 Where the main steering gear comprises two or more identical power units, an auxiliary steering gear need

not be fitted, provided that:

.1 in a passenger ship, the main steering gear is capable of operating the rudder as required by paragraph 3.2 while any one of the power units is out of operation;

.2 in a cargo ship, the main steering gear is capable of operating the rudder as required by paragraph 3.2 while operating with all power units;

.3 the main steering gear is arranged so that after a single failure in its piping system or in one of the power units the defect can be isolated so that steering capability can be maintained or speedily regained.

29.14 Where the rudder stock is required to be over 230 mm diameter in way of the tiller, excluding strengthening for navigation in ice, an alternative power supply, sufficient at least to supply the steering gear power unit which complies with the requirements of paragraph 4.2 and also its associated control system and the rudder angle indicator, shall be provided automatically, within 45 s, either from the emergency source of electrical power or from an independent source of power located in the steering gear compartment. This independent source of power shall be used only for this purpose. In every ship of 10,000 gross tonnage and upwards, the alternative power supply shall have a capacity for at least 30 min of continuous operation and in any other ship for at least 10 min.

Regulation 30 - Additional requirements for electric and electrohydraulic steering gear

30.2 Each electric or electrohydraulic steering gear comprising one or more power units shall be served by at least two exclusive circuits fed directly from the main switchboard; however, one of the circuits may be supplied through the emergency switchboard. An auxiliary electric or electrohydraulic steering gear associated with a main electric or electrohydraulic steering gear may be connected to one of the circuits supplying this main steering gear. The circuits supplying an electric or electro hydraulic steering gear shall have adequate rating for supplying all motors which can be simultaneously connected to them and may be required to operate simultaneously.

Interpretation

Regulation 28 - Means of going astern

28.3 The stopping times, ship headings and distances recorded on trials, together with the results of trials to determine the ability of ships having multiple propulsion/steering arrangements to navigate and manoeuvre with one or more of these devices inoperative, shall be available on board for the use of the master or designated personnel.

Regulation 29 – Steering gear

29.1 For a ship fitted with multiple steering-propulsion units, such as but not limited to azimuthing propulsors or water jet propulsion systems each of the steering-propulsion units shall be provided with a main steering gear and an auxiliary steering gear or with two or more identical steering actuating systems in compliance with interpretation of SOLAS regulation II-1/29.6.1 The main steering gear and the auxiliary steering gear shall be so arranged that the failure of one of them will not render the other one inoperative.

For a ship fitted with a single steering-propulsion unit, the requirement in SOLAS regulation II-1/29.1 is considered satisfied if the steering gear is provided with two or more steering actuating systems and is in compliance with interpretation of SOLAS regulation II-1/29.6.1. A detailed risk assessment is to be submitted in order to demonstrate that in the case of any single failure in the steering gear, control system and power supply the ship steering is maintained.

29.2.1 All components used in steering arrangements for ship directional control are to be of sound reliable construction to the satisfaction of the Administration or recognized organizations acting on its behalf. Special consideration shall be given to the suitability of any essential component which is not duplicated. Any such essential component shall, where appropriate, utilize anti-friction bearings such as ball bearings, roller bearings or sleeve bearings which shall be permanently lubricated or provided with lubrication fittings.

29.3 The main steering arrangements for ship directional control shall be:

.1 of adequate strength and capable of steering the ship at maximum ahead service speed which shall be demonstrated;

.2 capable of changing direction of the steering-propulsion unit from one side to the other at declared steering

angle limits at an average turning speed of not less than 2.3 °/s with the ship running ahead at maximum ahead service speed;

.3 for all ships, operated by power; and

.4 so designed that they will not be damaged at maximum astern speed; this design requirement need not be proved by trials at maximum astern speed and declared steering angle limits.

Ship manoeuvrability tests, such as according to Resolution MSC.137(76) on Standards for ship manoeuvrability, are to be carried out with steering angles not exceeding the declared steering angle limits.

29.4 The auxiliary steering arrangements for ship directional control shall be:

.1 of adequate strength and capable of steering the ship at navigable speed and of being brought speedily into action in an emergency;

.2 capable of changing direction of the ship's directional control system from one side to the other at declared steering angle limits at an average turning speed, of not less than 0.5 °/s; with the ship running ahead at one half of the maximum ahead service speed or 7 knots, whichever is the greater; and

.3 for all ships, operated by power where necessary to meet the requirements of SOLAS regulation II-1/29.4.2 and in any ship having power of more than 2,500 kW propulsion power per steering-propulsion unit.

Ship manoeuvrability tests, such as according to Resolution MSC.137(76), are to be carried out with steering angles not exceeding the declared steering angle limits.

29.6.1 For a ship fitted with a single steering-propulsion unit where the main steering gear comprises two or more identical power units and two or more identical steering actuators, an auxiliary steering gear need not be fitted, provided that the steering gear:

.1 in a passenger ship, is capable of satisfying the requirements in interpretation to SOLAS regulation II-1/29.3 while any one of the power units is out of operation;

.2 in a cargo ship, is capable of satisfying the requirements in interpretation to SOLAS regulation II-1/29.3 while operating with all power units; and

.3 is arranged so that after a single failure in its piping system or in one of the power units, steering capability can be maintained or speedily regained.

For a ship fitted with multiple steering-propulsion units, where each main steering system comprises two or more identical steering actuating systems, an auxiliary steering gear need not be fitted, provided that each steering gear:

-.1 in a passenger ship, is capable of satisfying the requirements in Interpretation to SOLAS regulation II-1/29.3 while any one of the steering gear steering actuating systems is out of operation;

-.2 in a cargo ship, is capable of satisfying the requirements in Interpretation to SOLAS regulation II-1/29.3 while operating with all steering gear steering actuating systems;

-.3 is arranged so that after a single failure in its piping or in one of the steering actuating systems, steering capability can be maintained or speedily regained.

the above capacity requirements apply regardless whether the steering systems are arranged with common dedicated power units.

29.14 Where the propulsion power exceeds 2,500kW per thruster unit, an alternative power supply, sufficient at least to supply the steering arrangements which complies with the requirements of SOLAS regulation II-1/29.4.2 and also its associated control system and the steering gear response indicator, shall be provided automatically, within 45 s, either from the emergency source of electrical power or from an independent source of power located in the steering gear compartment. This independent source of power shall be used only for this purpose. In every ship of 10,000 gross tonnage and upwards, the alternative power supply shall have a capacity for at least 30 min of continuous operation and in any other ship for at least 10 min.(This interpretation is valid to the steering-propulsion units having a certain proven steering capability due to vessel speed also in case propulsion power has failed.)

Regulation 30 - Additional requirements for electric and electrohydraulic steering gear

30.2 For a ship fitted with multiple steering systems, the requirements in SOLAS regulation II-1/30.2 are to be applied to each of the steering systems.

Technical Background

SOLAS requirements for steering gear were designed for ships with one set of traditional propulsion system and one rudder. For ships fitted with alternative propulsion and steering arrangements, such as but not limited to azimuthing propulsors or water jet propulsion systems, the requirement in SOLAS Reg. II-1/28.3, 29.1, 29.1, 29.2.1, 29.3, 29.4, 29.6.1, 29.14 and 30.2 are interpreted as above. The interpretation for 29.14 is only valid to the steering systems having a certain proven steering capability due to vessel speed also in case propulsion power has failed.

Remarks

1.Definition:

"Declared steering angle limits" are the operational limits in terms of maximum steering angle, or equivalent, according to manufacturers guidelines for safe operation, also taking into account the ship's speed or propeller torque/speed or other limitation; the "declared steering angle limits" are to be declared by the directional control system manufacturer for each ship specific non-traditional steering mean; ship's manoeuvrability tests, such as those in the Standards for ship manoeuvrability (resolution MSC.137(76)) are to be carried out with steering angles not exceeding the declared steering angle limits.

Steering Gear Power unit - For the purposes of alternative steering arrangements, the steering gear power unit is to be considered as defined in SOLAS Reg.II-1/3. For electric steering gears, refer to SOLAS II-1/3~~,~~; electric steering motors are to be considered as part of power unit and actuator.

2. Rev.2 of this UI is to be uniformly implemented by IACS Societies for propulsion and steering systems other than traditional arrangements for a ship's directional control:

a) when an application for certification of non traditional steering systems is dated on or after 1 July 2020; or

b) which are installed in a new ship for which the date of contract for construction is on or after 1 July 2020.

1.223 Access to controls for closing of ventilation of vehicle, special category and ro-ro spaces (SOLAS II-2/20.3.1.4.1)

Conventions (Amend.), Reg.		**1974 SOLAS II-2/20.3.1.4.1**					
IACS UI Number	**SC243**	**UI version**	**Mar.2011/ Rev.1,May,2012**	**Date of implementation**	**Jan.1,2012/ Jan.1,2013**	**Means of implementation**	**contracted for construction**

Conventions/Codes Requirements

SOLAS Ch. II-2 Reg. 20.3.1.4.1

Arrangements shall be provided to permit a rapid shutdown and effective closure of the ventilation system from outside of the space in case of fire, taking into account the weather and sea conditions.

Interpretation

Access routes to the controls for closure of the ventilation system "permit a rapid shutdown" and adequately "take into account the weather and sea conditions" if the routes:

- are clearly marked and at least 600 mm clear width;
- are provided with a single handrail or wire rope lifeline not less than 10 mm in diameter, supported by stanchions not more than 10 m apart in way of any route which involves traversing a deck exposed to weather; and
- are fitted with appropriate means of access (such as ladders or steps) to the closing devices of ventilators located in high positions (i.e. 1.8 m and above).

Alternatively, remote closing and position indicator arrangements from the bridge or a fire control station for those

ventilator closures is acceptable.
Technical Background
1. For ro-ro ships, it is found that there is an implementation issue for crew to pass through access routes to close the ventilation openings during the closure of ventilation system of ro-ro spaces, such as crew is required to pass through the deck above ro-ro space, or pass through the open deck, or arrive at a higher position, which is involved in the relevant requirements of " a rapid shutdown and effective closure of the ventilation system" and "taking into account the weather and sea conditions" in SOLAS Reg. II-2/20.3.1.4.1. For this purpose, unified interpretation shall be provided to ensure the personal safety, on the other hand, to be capable of rapid shutdown and convenient closure of the ventilation openings in ro-ro spaces. 2. (Rev.1) Editorially amended so as to be consistent with the UI adopted by FP55.
Remarks
The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.224 Load testing of hooks for primary release of lifeboats and rescue boats

Conventions (Amend.), Reg.		**IMO Res. MSC.81(70), Part 2, Ch. 5.3.4**					
IACS UI Number	**SC244**	**UI version**	**May, 2011/ Rev.1,Nov., 2012/ Corr.1,Nov., 2015**	**Date of implementation**	**Jul.1, 2012/ Jan.1, 2014/ --**	**Means of implementation**	
Conventions/Codes Requirements							
5.3.4 The connection of each release gear which is fixed to the boat should be subjected to a load equal to the weight of the boat with its full complement of persons and equipment (or two times the weight of the boat in the case of single fall systems). There should be no damage to the release gear or its connection to the boat.							
Interpretation							
1. The above regulation applies only to lifeboats and rescue boats launched by falls. *2. The test does not apply to the secondary means of launching for freefall lifeboats.* *3. The test may be carried out onboard the ship or onshore, either at the manufacturer's plant or at the shipyard, by using an appropriate mock-up of the launching arrangements which is equivalent to the launching arrangement installed onboard the ship.* *4. The "weight of the boat" to be considered for the load in the case of single fall systems is the "weight of the boat with its full complement of persons and equipment", which according to MSC.81(70), Part 2, Paragraph 5.3.4 shall be multiplied by two.*							
Technical Background							
Due to their arrangement the loads seen by a hook on a FFLB are different from the loads on a hook for a davit launched arrangement. Therefore the normal load as seen by the hook should be used as basis for the load testing.							
Remarks							
1. This UI is to be uniformly implemented by IACS Societies on ships the keels of which are laid from 1 July 2012. *2. Rev.1 of this UI is to be uniformly implemented by IACS Societies on ships the keels of which are laid from 1 January 2014.*							

1.225 Suction and discharge piping of emergency fire pumps, which are run through the machinery space

Conventions (Amend.), Reg.		**SOLAS Chapter II-2,Regulation 10.2.1.4.1**					
IACS UI Number	**SC245**	**UI** version	**Jun.,2011/ Corr.1,Jan.,2012**	Date of implemen	**Jul.1,2012**	Means of implementation	**contracted for**

				tation			**construction**

Conventions/Codes Requirements

The emergency fire pump, its seawater inlet, and suction and delivery pipes and isolating valves shall be located outside the machinery space. If this arrangement cannot be made, the sea-chest may be fitted in the machinery space if the valve is remotely controlled from a position in the same compartment as the emergency fire pump and the suction pipe is as short as practicable. Short lengths of suction or discharge piping may penetrate the machinery space, provided they are enclosed in a substantial steel casing, or are insulated to "A-60" class standards. The pipes shall have substantial wall thickness, but in no case less than 11 mm, and shall be welded except for the flanged connection to the sea inlet valve.

Interpretation

.1 "the valve" in second sentence means "sea inlet valve";

.2 in cases where suction or discharge piping penetrating machinery spaces are enclosed in a substantial steel casing, or are insulated to "A-60" class standards, it is not necessary to enclose or insulate "distance pieces", "sea inlet valves" and "sea-chests". For this purpose, the discharge piping means piping between the emergency fire pump and the isolating valve;

.3 the method for insulating pipes to ""A-60" class standards" is that they are to be covered/protected in a practical manner by insulation material which is approved as a part of "A-60" class divisions in accordance with the FTP Code; and

.4 where the sea inlet valve is in the machinery space, the valve should not be a fail-close type. Where the sea inlet valve is in the machinery space and is not a fail-open type, measures should be taken so that the valve can be opened in the event of fire, e.g. control piping, actuating devices and/or electric cables with fire resistant protection equivalent to "A-60" class standards.

.5 In cases where main fire pumps are provided in compartments outside machinery spaces and where the emergency fire pump suction or discharge piping penetrates such compartments, the above interpretation is to be applied to the piping.

Technical Background

1. At first, a proposal for clarification was submitted to IMO FP 54th session by IACS, the FP sub-committee agreed IACS to make unified interpretation. This interpretation has been made considering that the end part, sea inlet valve and the inside of sea chest are usually wet, and it is impossible to insulate the rotating parts, such as handle, extending rod connector and brake, and meanwhile, taking account of that it is unacceptable for a fail-close type pump when the control piping and electric cable are in failure in case of fire, thus the pump is to be kept open.

In the case of that suction or discharge pipe of emergency fire pump and that of main fire pump are provided by the same sea chest, i.e. the suction or discharge pipe penetrates the space where the main fire pump is located, it is also to be implemented in accordance with this interpretation.

2.（Corr.1）Only editorial revision to words.

Remarks

The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.226 Steering gear test with the vessel not at the deepest seagoing draught

Conventions (Amend.), Reg.		**SOLAS 1974 Chapter II-1,Regulation 29.3 & 29.4 of**					
IACS UI Number	**SC246**	**UI version**	**June 2011 Corr.1, Dec 2011/ Rev.1, Sept 2015**	**Date of implementation**	**Rev.1, 1 Jan 2017**	**Means of implementation**	**Contracted for construction**

Conventions/Codes Requirements

1. SOLAS II-1/29.3

The main steering gear and rudder stock shall be:

.1 of adequate strength and capable of steering the ship at maximum ahead service speed which shall be demonstrated;

.2 capable of putting the rudder over from 35 ° on one side to 35 ° on the other side with the ship at its deepest seagoing draught and running ahead at maximum ahead service speed and, under the same conditions, from 35 ° on either side to 30 °on the other side in not more than 28 s;

where it is impractical to demonstrate compliance with this requirement during sea trials with the ship at its deepest seagoing draught and running ahead at the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch, ships regardless of date of construction may demonstrate compliance with this requirement by one of the following methods:

.1 during sea trials the ship is at even keel and the rudder fully submerged whilst running ahead at the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch; or

.2 where full rudder immersion during sea trials cannot be achieved, an appropriate ahead speed shall be calculated using the submerged rudder blade area in the proposed sea trial loading condition. The calculated ahead speed shall result in a force and torque applied to the main steering gear which is at least as great as if it was being tested with the ship at its deepest seagoing draught and running ahead at the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch; or

.3 the rudder force and torque at the sea trial loading condition have been reliably predicted and extrapolated to the full load condition. The speed of the ship shall correspond to the number of maximum continuous revolutions of the main engine and maximum design pitch of the propeller;

.3 operated by power where necessary to meet the requirements of paragraph 3.2 and in any case when the Administration requires a rudder stock of over 120 mm diameter in way of the tiller, excluding strengthening for navigation in ice; and

4 so designed that they will not be damaged at maximum astern speed; however, this design requirement need not be proved by trials at maximum astern speed and maximum rudder angle.

2. SOLAS II-1/29.4:

The auxiliary steering gear shall be:

.1 of adequate strength and capable of steering the ship at navigable speed and of being brought speedily into action in an emergency;

.2 capable of putting the rudder over from 15 °on one side to 15 °on the other side in not more than 60 s with the ship at its deepest seagoing draught and running ahead at one half of the maximum ahead service speed or 7 knots, whichever is the greater;

where it is impractical to demonstrate compliance with this requirement during sea trials with the ship at its deepest seagoing draught and running ahead at one half of the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch or 7 knots, whichever is greater, ships regardless of date of construction, including those constructed before 1 January 2009, may demonstrate compliance with this requirement by one of the following methods:

.1 during sea trials the ship is at even keel and the rudder fully submerged whilst running ahead at one half of the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch or 7 knots, whichever is greater; or

.2 where full rudder immersion during sea trials cannot be achieved, an appropriate ahead speed shall be calculated using the submerged rudder blade area in the proposed sea trial loading condition. The calculated ahead speed shall result in a force and torque applied to the auxiliary steering gear which is at least as great as if it was being tested with the ship at its deepest seagoing draught and running ahead at one half of the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch or 7 knots, whichever is greater; or

.3 the rudder force and torque at the sea trial loading condition have been reliably predicted and extrapolated to the full load condition; and

.3 operated by power where necessary to meet the requirements of paragraph 4.2 and in any case when the Administration requires a rudder stock of over 230 mm diameter in way of the tiller, excluding strengthening for navigation in ice.

Interpretation

In order for ships to comply with the performance requirements stated in regulations 29.3.2 and 29.4.2 they are to have steering gear capable of meeting these performance requirements when at their deepest seagoing draught.

In order to demonstrate this ability, the trials may be conducted in accordance with Section 6.1.5.1 of ISO 19019:2005 Sea-going vessels and marine technology – Instructions for planning, carrying out and reporting sea trials.

On all occasions when trials are conducted with the vessel not at the deepest seagoing draught the loading condition can be accepted on the conditions that either:

1. the rudder is fully submerged (at zero speed waterline) and the vessel is in an acceptable trim condition.
2. the rudder torque at the trial loading condition have been reliably predicted (based on the system pressure measurement) and extrapolated to the maximum seagoing draught condition using the following method to predict the equivalent torque and actuator pressure at the deepest seagoing draught:

$$Q_F = Q_T \alpha$$

$$\alpha = 1.25\left(\frac{A_F}{A_T}\right)\left(\frac{V_F}{V_T}\right)^2$$

Where:

α is the Extrapolation factor.

Q_F is the rudder stock moment for the deepest service draught and maximum service speed condition.

Q_T is the rudder stock moment for the trial condition.

A_F is the total immersed projected area of the movable part of the rudder in the deepest seagoing condition.

A_T is the total immersed projected area of the movable part of the rudder in the trial condition.

V_F is the contractual design speed of the vessel corresponding to the maximum continuous revolutions of the main engine at the deepest seagoing draught.

V_T is the measured speed of the vessel (considering current) in the trial condition.

Where the rudder actuator system pressure is shown to have a linear relationship to the rudder stock torque the above equation can be taken as:

$$P_F = P_T \alpha$$

Where:

P_F is the estimated steering actuator hydraulic pressure in the deepest seagoing draught condition.

P_T is the maximum measured actuator hydraulic pressure in the trial condition.

Where constant volume fixed displacement pumps are utilised then the regulations can be deemed satisfied if the estimated steering actuator hydraulic pressure at the deepest draught is less than the specified maximum working pressure of the rudder actuator. Where a variable delivery pump is utilised pump data should be supplied and interpreted to estimate the delivered flow rate corresponds to the deepest seagoing draught in order to calculate the steering time and allow it to be compared to the required time.

Where A_T is greater than $0.95A_F$ there is no need for extrapolation methods to be applied.

3. Alternatively the designer or builder may use computational fluid dynamic (CFD) studies or experimental investigations to predict the rudder stock moment at the full sea going draught condition and service speed. These calculations or experimental investigations are to be to the satisfaction of the Society.

In any case for the main steering gear trial, the speed of the ship corresponding to the number of maximum continuous revolution of main engine and maximum design pitch applies.

Technical Background

The Maritime Safety Committee of International Maritime Organization, at its ninety-third session that was held in May 2014, adopted resolution MSC.365(93) on amendments to SOLAS regulation II-1/29 on steering gear, which will enter into force on 1 January 2016. In order to effectively implement MSC.365 (93) resolution requirements, International Classification Society (IACS) enacted UI SC246 (Rev.1, Sept 2015) in September 2015 for unified interpretations on amendments of SOLAS II-1/29.3 and II-1/29.4. Rev.1 of UI SC246 is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2017.

Remarks

1. This UI is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 July 2012.
2. Rev.1 of UI SC246 is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2017.
3. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.227 Emergency exit hatches to open deck

Conventions (Amend.), Reg.		**Reg. II-2/13.1 to SOLAS 1974**					
IACS UI Number	**SC247**	**UI version**	**Sep.2011**	**Date of implementation**	**Jul.1,2012**	**Means of implementation**	**Contracted for construction**

Conventions/Codes Requirements

SOLAS Reg. II-2/13.1 Purpose

The purpose of this regulation is to provide means of escape so that persons on board can safely and swiftly escape to the lifeboat and liferaft embarkation deck. For this purpose, the following functional requirements shall be met:
.1 safe escape routes shall be provided;
.2 escape routes shall be maintained in a safe condition, clear of obstacles; and
.3 additional aids for escape shall be provided as necessary to ensure accessibility, clear marking, and adequate design for emergency situations.

Interpretation

To facilitate a swift and safe means of escape to the lifeboat and liferaft embarkation deck, the following provisions apply to overhead hatches fitted along the escape routes addressed by Reg. II-2/13:

1. the securing devices shall be of a type which can be opened from both sides;

2. the maximum force needed to open the hatch cover should not exceed 150 N; and

3. the use of a spring equalizing, counterbalance or other suitable device on the hinge side to reduce the force needed for opening is acceptable.

Technical Background

For hatches used as means of escape, it is experienced that the hatches may be heavy and hard to open, in particular for a person standing in the exit ladder below deck or if the hatch is not arranged with counterbalance weights or springs. The interpretation of the SOLAS regulation above was developed by IACS with reference to Chinese standards CB/T3842-2000, CB/T3728-95 and German standards DIN 83414.

Remarks

1.228 Greatest Launching Height for a Free-Fall Lifeboat

Conventions (Amend.), Reg.		**LSA Code 1.1.4**					
IACS UI Number	**SC248**	**UI version**	**Sep.2011/ Rev.1, Apr., 2015**	**Date of implement ation**	**Jul.1,2012/ Rev.1, Jul.1,2015**	**Means of implemen tation**	**Contracted for construction**

Conventions/Codes Requirements

LSA Code, paragraph 1.1.4 (Free-fall certification height):

"Free-fall certification height is the greatest launching height for which the lifeboat is to be approved, measured from the still water surface to the lowest point on the lifeboat when the lifeboat is in the launch configuration."

LSA Code, section 4.7.3 (Performance requirements):

"4.7.3.1 Each free-fall lifeboat shall make positive headway immediately after water entry and shall not come into contact with the ship after a free-fall launching against a trim of up to 10o and a list of up to 20o either way from the certification height when fully equipped and loaded…

4.7.3.2 For oil tankers, chemical tankers and gas carriers with a final angle of heel greater than 20o calculated in accordance with the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, and the recommendations of the Organization,* as applicable, a lifeboat shall be capable of being free-fall launched at the final angle of heel and on the base of the final waterline of that calculation."

LSA Code, paragraph 6.1.1.1 (Launching and embarkation appliances):

"With the exception of the secondary means of launching for free-fall lifeboats, each launching appliance shall be so arranged that the fully equipped survival craft or rescue boat it serves can be safely launched against unfavourable conditions of trim of up to 10o and a list of up to 20o either way…"

LSA Code, paragraph 6.1.4.4 (Launching appliances for free-fall lifeboats):

"The launching appliance shall be designed and arranged so that in its ready to launch position, the distance from the lowest point on the lifeboat it serves to the water surface with the ship in its lightest seagoing condition does not exceed the lifeboat's free-fall certification height, taking into consideration the requirements of paragraph 4.7.3."

SOLAS regulation III/3.13 (Lightest seagoing condition):

"Lightest sea going condition is the loading condition with the ship on even keel, without cargo, with 10% stores and fuel remaining and in the case of a passenger ship with the full number of passengers and crew and their luggage."

Interpretation

Interpretation

1. *The "greatest launching height" of a free-fall lifeboat shall be determined based on the lightest seagoing condition as defined in SOLAS III/3.13.*
2. *The "water surface" used in determining the distance referred to in 6.1.4.4 of the LSA Code is the waterline typically associated with the lightest sea going condition as defined in SOLAS regulation III/3.13.*
3. *The trim and heel conditions in paragraph 6.1.1.1 of the LSA Code and in the phrase "taking into consideration the requirements of paragraph 4.7.3" in paragraph 6.1.4.4 of the Code should be used only to determine the ability of the lifeboat to be safely launched within the operational capabilities of the equipment and without contacting the ship under the specified conditions, and not in the determination of the "greatest launching height".*

Technical Background

Resolution MSC.218 (82) revised the LSA Code, removing paragraph 1.1.8 regarding the definition of "required free-fall height" with the view that it would be included in SOLAS. However, this never occurred. At present therefore, we do not have any accept criteria (in SOLAS or in the LSA Code) about the "greatest launching height (certification height)" to be used when determining the ability of the free-fall lifeboat to be safely launched against a trim of up to 10° and list of up to 20° either way. This UI seeks to redress this omission and to align with MSC.1/Circ.1468, and also aims to clarify the "greatest launching height (certification height)" of a free-fall lifeboat shall be determined based on the "lightest seagoing condition" as defined in SOLAS III/3.13. The determination of the ability of the lifeboat to be safely launched against a trim of up to 10° and list of up to 20° either way, as required by LSA Code, need not assume a launching height greater than this "greatest launching height (certification height)". For the free-fall lifeboat in its conventional position is at the stern, whereas a conventional cargo ship in its actual "lightest sea going condition" the trim would be considerably by the stern, so the "greatest launching height (certification height)" determined by the "lightest sea going condition" of SOLAS III/3.13 is based on an even keel condition, this will give a conservative result.

Remarks
The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.229 Implementation of SOLAS II-1, Regulation 3-5 and MSC.1/Circ.1379

Conventions (Amend.), Reg.		SOLAS Chapter II-1, Regulation 3-5 and MSC.1/Circ.1379					
IACS UI Number	**SC249**	**UI version**	**Oct.,2011/ Corr.1 Apr.,2012/ Rev.1 Feb.,2013**	**Date of implementation**	**Jul.1,2012/ Jul.1,2013**	**Means of implementation**	

Conventions/Codes Requirements

SOLAS Chapter II-1, Regulation 3-5

"From 1 January 2011, for all ships, new installation of materials which contain asbestos shall be prohibited."

MSC.1/Circ.1379

"In the context of this regulation, new installation of materials containing asbestos means any new physical installation on board. Any material purchased prior to 1 January 2011 being kept in the ship's store or in the shipyard for a ship under construction, should not be permitted to be installed after 1 January 2011 as a working part."

Interpretation

SOLAS II-1, Regulation 3-5

1. Verification that *"new installation of materials which contain asbestos"* under SOLAS II-1/3-5 is not made on ships requires the Recognized Organization to review asbestos-free declarations and supporting documentation, for the structure, machinery, electrical installations and equipment covered by the SOLAS Convention, which is to be provided to the Recognized Organization by shipyards, repair yards, and equipment manufacturers taking into account appendix 8 of the 2011 Guidelines for the development of the inventory of hazardous materials (resolution MEPC.197(62)) for:

- new construction (keel laid, or at a similar stage of construction, on or after 1 July 2012);
- conversions (contract date for the conversion or, in the absence of a contract, the date on which the work identifiable with the specific conversion begins) on or after 1 July 2012;

MSC.1/Circ.1379

2. The phrase *"new installation of materials containing asbestos"* in MSC.1/Circ.1379:

- means that material used (i.e., repaired, replaced, maintained or added) as a working part of the ship as per Annex 1 which is installed on or after 1 July 2012 is required to be documented with an asbestos-free declaration. The Recognized Organization will, in consultation with the Company's nominated person responsible to control asbestos-containing material onboard as per the Safety Management System in accordance with MSC/Circ.1045, audit this documentation during annual safety construction and safety equipment surveys; and
- does not preclude the stowage of material which contains asbestos onboard (e.g.,spare parts existing on board as of 1 July 2012).

3. The phrase *"should not be permitted to be installed after 1 January 2011 as a working part"* in MSC.1/Circ.1379 means that replacement, maintenance or addition of materials used for the structure, machinery, electrical installations and equipment covered by the SOLAS Convention is prohibited.

Annex 1

Structure and/or equipment	Component
Propeller shafting	Packing with low pressure hydraulic piping flange Packing with casing Clutch Brake lining Synthetic stern tubes
Diesel engine	Packing with piping flange Lagging material for fuel pipe Lagging material for exhaust pipe Lagging material turbocharger

Turbine engine	Lagging material for casing Packing with flange of piping and valve for steam line, exhaust line and drain line Lagging material for piping and valve of steam line, exhaust line and drain line
Boiler	Insulation in combustion chamber Packing for casing door Lagging material for exhaust pipe Gasket for manhole Gasket for hand hole Gas shield packing for soot blower and other hole Packing with flange of piping and valve for steam line, exhaust line, fuel line and drain line Lagging material for piping and valve of steam line, exhaust line, fuel line and drain line
Exhaust gas economizer	Packing for casing door Packing with manhole Packing with hand hole Gas shield packing for soot blower Packing with flange of piping and valve for steam line, exhaust line, fuel line and drain line Lagging material for piping and valve of steam line, exhaust line, fuel line and drain line
Incinerator	Packing for casing door Packing with manhole Packing with hand hole Lagging material for exhaust pipe
Auxiliary machinery (pump, compressor, oil purifier, crane)	Packing for casing door and valve Gland packing Brake lining
Heat exchanger	Packing with casing Gland packing for valve Lagging material and insulation
Valve	Gland packing with valve, sheet packing with piping flange Gasket with flange of high pressure and/or high temperature
Pipe, duct	Lagging material and insulation
Tank (fuel tank, hot water, tank, condenser), other equipments (fuel strainer, lubricant oil strainer)	Lagging material and insulation
Electric equipment	Insulation material
Ceiling, floor and wall in accommodation area	Ceiling, floor, wall
Fire door	Packing, construction and insulation of the fire door
Inert gas system	Packing for casing, etc.
Air-conditioning system	Sheet packing, lagging material for piping and flexible joint
Miscellaneous	Ropes Thermal insulating materials Fire shields/fire proofing Space/duct insulation Electrical cable materials Brake linings Floor tiles/deck underlay Steam/water/vent flange gaskets Adhesives/mastics/fillers Sound damping Moulded plastic products

	Sealing putty Shaft/valve packing Electrical bulkhead penetration packing Circuit breaker arc chutes Pipe hanger inserts Weld shop protectors/burn covers Fire-fighting blankets/clothing/equipment Concrete ballast

Technical Background

The unified interpretation is intended to provide a practical method based on statement and supporting documents to prove that the newly installed material on board does not contain asbestos.

Remarks

1.230 Fire-Extinguishing Arrangements in Cargo Spaces

Conventions (Amend.), Reg.		**IMSBC Code （Res. MSC.268(85)）**					
IACS UI Number	**SC250**	**UI version**	**Oct.,2011/ Corr.1,Jul.,2012**	**Date of implementation**	**Jul.1,2012**	**Means of implementation**	

Conventions/Codes Requirements

For certain individual schedules of solid bulk cargoes in Appendix 1 of the IMSBC Code as amended, such as FISHMEAL (FISHSCRAP) STABILIZED UN 2216, SEED CAKE, containing vegetable oil UN 1386, SEED CAKE UN 2217, the following ventilation requirement is present:

If the temperature of the cargo exceeds 55℃ and continues to increase, ventilation to the cargo space shall be stopped. If self-heating continues, then carbon dioxide or inert gas shall be introduced to the cargo space.s

Interpretation

This self-heating phenomenon shall be regarded as an emergency condition such that it is not necessary to provide a separate fixed carbon dioxide fire-extinguishing system or inert gas system dedicated to the control of the self-heating of the cargo within the cargo holds. The fixed carbon dioxide or inert gas fire-extinguishing system complying with the provisions of the Fire Safety Systems Code required by SOLAS Regulations II-2/10.7.1.3 or II-2/10.7.2 may be used for this purpose. Fixed gas fire-extinguishing systems or inert gas systems installed on board dedicated to the protection of protect spaces other than cargo spaces cannot be used for this purpose.

Technical Background

For certain special cargoes (such as fishmeal and seed cake) which are liable to continuous self-heating, IMSBC Code does not require fixed fire-extinguishing system, on the other hand, it worries that ventilation may cause self-heating. In particular, self-heating can not be controlled by stopping ventilating system, and additional measures are needed, such as introducing CO_2 or inert gas to cargo hold. Considering that it is not mandatory for such cargoes to provide fixed fire-fighting system in cargo hold, IACS concluded that self-heating phenomenon of cargo is to be regarded as abnormal condition, and it is not necessary to provide a separate fixed carbon dioxide fire-extinguishing system or inert gas system dedicated to the control of the self-heating of the cargo within the cargo hold. Fire-extinguishing systems installed on board to protect cargo spaces can be used for this purpose.

Remarks

1.231 Controls of emergency bilge suction valve in periodically unattended machinery spaces

Conventions (Amend.), Reg.		**SOLAS regulations II-1/48.3**					
IACS UI Number	**SC251**	**UI version**	**Oct.,2011**	**Date of implementation**	**Jan.1,2013**	**Means of implementation**	

Conventions/Codes Requirements

SOLAS Regulation II-1/48.3 reads:

Regulation 48
Protection against flooding

3 The location of the controls of any valve serving a sea inlet, a discharge below the waterline or a bilge injection system shall be so sited as to allow adequate time for operation in case of influx of water to the space, having regard to the time likely to be required in order to reach and operate such controls. If the level to which the space could become flooded with the ship in the fully loaded condition so requires, arrangements shall be made to operate the controls from a position above such level.

Interpretation

(A) 'Bilge injection system' is same as 'direct suction' referred in SOLAS Reg.II-1/35-1 3.7.1 and 3.7.2 and is understood to mean 'Emergency bilge suction', which is used to discharge overboard large quantities of sea water accumulated in engine room bilges using the main circulating pump or another suitable pump as permitted by 35-1 3.7.2.

(B) The requirements for the controls of the "valves serving a sea inlet, a discharge below the waterline or a bilge injection system" are not applicable to valves serving an emergency bilge system provided:

(1) The emergency bilge valve is normally maintained in a closed position,

(2) A non-return device is installed in the emergency bilge piping, and

(Note: A normally closed non-return valve with positive means of closing is considered to satisfy both (1) and (2) above.)

(3) The emergency bilge suction piping is located inboard of a shell valve that is fitted with the control arrangements required by SOLAS Reg. II-1/48.3.

Technical Background

Aiming at the condition that certain port State Administrations apply requirements for the controls of the valve serving "bilge injection system" in SOLAS Reg. II-1/48.3 to valves serving "emergency bilge suction", IACS members carried out special discussion and reached an agreement to above interpretation.

Remarks

1. This UI is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2013.
2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.232 Controls for releasing carbon dioxide and activating the alarm in the protected space

Conventions (Amend.), Reg.		**FSS Code 5.2.2.2**					
IACS UI Number	**SC252**	**UI version**	**Oct.,2011**	**Date of implementation**	**Jul.1,2012**	**Means of implementation**	**contracted for construction**
Conventions/Codes Requirements							

FSS CODE, Chapter 5, Paragraph 2.1.3.2, *System control requirements*

Means shall be provided for automatically giving audible warning of the release of fire-extinguishing medium into any ro-ro spaces and other spaces in which personnel normally work or to which they have access. The pre-discharge alarm shall be automatically activated (e.g., by opening of the release cabinet door). The alarm shall operate for the length of time needed to evacuate the space, but in no case less than 20 s before the medium is released. Conventional cargo spaces and small spaces (such as compressor rooms, paint lockers, etc.) with only a local release need not be provided with such an alarm.

FSS CODE, Chapter 5, Paragraph 2.2.2, *Controls*

Carbon dioxide systems shall comply with the following requirements:

.1 two separate controls shall be provided for releasing carbon dioxide into a protected space and to ensure the activation of the alarm. One control shall be used for opening the valve of the piping which conveys the gas into the protected space and a second control shall be used to discharge the gas from its storage containers. Positive means shall be provided so they can only be operated in that order; and

.2 the two controls shall be located inside a release box clearly identified for the particular space. If the box containing the controls is to be locked, a key to the box shall be in a break-glass-type enclosure conspicuously located adjacent to the box.

Interpretation

The pre-discharge alarm may be activated before the two separate system release controls are operated (e.g. by a micro-switch that activates the pre-discharge alarm upon opening the release cabinet door as per paragraph 2.1.3.2). Therefore, the two separate controls for releasing carbon dioxide into the protected space (i.e. one control to open the valve of the piping which conveys the gas into the protected space and a second control used to discharge the gas from its storage containers) as per paragraph 2.2.2 can be independent of the control for activating the alarm.

Technical Background

Because Reg.2.1.3.2 (single control for activation of alarm) and Reg.2.2.2.1 (two controls for activation of alarm) of Chapter 5 of FSS Code are contradictory each other, IACS developed this UI.

Remarks

The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.233 Fire resistance requirements for fibre-reinforced plastic (FRP) gratings used for safe access to tanker bows

Conventions (Amend.), Reg.		**IMO Res. MSC.62(67)**					
IACS UI Number	**SC253**	**UI** version	**Dec 2011/ Rev.1 May 2016**	Date of implementation	**1 January 2017**	Means of implementation	**contracted for construction**
Conventions/Codes Requirements							
Regulation							

Tankers, including oil tankers as defined in SOLAS regulation II-1/2.12, chemical tankers as defined in regulation VII/8.2 and gas carriers as defined in regulation VII/11.2, should be provided with means to enable the crew to gain safe access to the bow even in severe weather conditions. For tankers constructed on or after 1 July 1998, the access should be by means of either a walkway on the deck or a permanently constructed gangway of substantial strength at or above the level of the superstructure deck or the first tier of a deckhouse which should:

…

.3 be constructed of **fire resistant** and non-slip material;

…

Interpretation

Fibre Reinforced Plastic (FRP) gratings used in lieu of steel gratings for safe access to tanker bows shall possess:

1. low flame spread characteristics and shall not generate excessive quantities of smoke and toxic products as per the International Code for Application of Fire Test Procedures, 2010 (2010 FTP Code);

and

2. adequate structural fire integrity as per recognized standards* after undergoing tests in accordance with the above standards.

* For example, the Standard Specification for Fibre Reinforced Polymer (FRP) Gratings Used in Marine Construction and Shipbuilding (ASTM F3059-14).

Technical Background

MSC.1/Circ.1504 revised the reference standard on the structural fire integrity for Fibre Reinforced Plastic (FRP) gratings used in lieu of steel gratings for safe access to tanker bows, IACS made the modification accordingly on SC253 to be aligned with the IMO interpretation.

Remarks

1. This UI is to be uniformly implemented by IACS Societies on ships the keels of which are laid or which are at a similar stage of construction from 1 January 2013.

2. Rev.1 of this UI is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2017.

3. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29

1.234 Fall Preventer Devices

Conventions (Amend.), Reg.		**MSC.1/Circ.1392 and Circ.1327**					
IACS UI Number	**SC254**	**UI version**	**Apr.,2012**	**Date of implementation**	**Jan.1,2013**	**Means of implementation**	**the approval of FPDs submitted**

Conventions/Codes Requirements

MSC.1/Circ.1392, Paragraph 4

Member Governments are strongly urged to ensure that all ships which are fitted with on-load release systems for lifeboats, are equipped with fall preventer devices as per paragraph 6 of these Guidelines at the earliest opportunity.

MSC.1/Circ.1392, Annex Paragraph 6

On each ship, fall preventer devices in accordance with the Guidelines for the fitting and use of fall preventer devices (FPDs) (MSC.1/Circ.1327) should be employed for each existing lifeboat release and retrieval system ……

MSC.1/Circ.1327, Paragraph 2

The use of FPDs should be considered as an interim risk mitigation measure, only to be used in connection with existing on-load release hooks, at the discretion of the master, pending the wide implementation of improved hook designs with enhanced safety features.

Interpretation

1. Where locking pins are provided as a FPD, the pins shall be designed so that they have a minimum factor of safety of 6 as per LSA Code Paragraph 6.1.1.6. Where existing on-load release hooks are drilled to provide a locking pin insertion point, the strength of the hooks shall continue to satisfy the relevant requirements in the LSA Code and MSC 81(70), Part.2 section 5.3.1 and shall comply with the requirements of MSC.1/Circ.1327 paragraph 2.1. The modification of the hook in this respect must be acceptable to the manufacturer of the hook.

2. Where strops or slings with fittings (with fittings e.g. shackles) are used as a FPD, they shall be approved against the following test requirements:

(1). Environment tests as set out in MSC 81(70) Part 1, Paragraphs 1.2.1 or equivalent.

(2). Tests for rot-proof, colour-fast and resistant to deterioration from exposure to sunlight and that they are not unduly affected by seawater, oil or fungal attack as set out in MSC 81(70) Part 1, Paragraphs 2.4 or equivalent.

(3). Prototype test to a factor of safety of 6.

(4). A factory acceptance test of 2.2 x SWL.

Note: the factor of safety shall be based upon the SWL, which shall be not less than the total weight of the lifeboat when loaded with its full complement of persons and equipment.

3. It is the responsibility of the lifeboat and davit manufacturer, to confirm that the attachment eye is suitable for the use of the proposed FPD. If the lifeboat and/or davit manufacturer is no longer available, the suitability is to be determined by an independent service provider.

Technical Background

MSC.1/Circ.1392, Paragraph 4, strongly urges the fitting of FPDs pending verification that the lifeboat on-load release and retrieval system has been confirmed as complying with paragraphs 4.4.7.6.4 to 4.4.7.6.6 of the revised LSA Code. Guidance is contained within MSC.1/Circ.1327 regarding the fitting and use of FPDs, but standards for their strength and suitability for use in the marine environment are not given. These standards shall be identified.

Remarks

This Unified Interpretation is to be uniformly implemented by IACS Societies for the approval of FPDs submitted on or after 1 January 2013.

1.235 Fuel pump arrangement required for ships to maintain normal operation of propulsion machinery when operating in emission control areas and non-restricted areas

Conventions (Amend.), Reg.		1974 SOLAS II-I/26.3.4					
IACS UI Number	SC255	UI version	Jul.,2012 /Corr.1Nov., 2013	Date of implementation	Jul.1,2013	Means of implementation	contracted for construction

Conventions/Codes Requirements

SOLAS II-I 26-3. (Partially)
Means shall be provided whereby normal operation of propulsion machinery can be sustained or restored even though one of the essential auxiliaries becomes inoperative. Special consideration shall be given to the malfunctioning of:

.4 the fuel oil supply systems for boilers or engines;

Interpretation

For ships intending to use Heavy Fuel Oil (HFO) or Marine Diesel Oil (MDO) in non-restricted areas and marine fuels with a sulphur content not exceeding 0,1 % m/m and minimum viscosity of 2 cSt in emission control areas, the following arrangements are considered to be in compliance with SOLAS II-I/26.3.4.

1) In non-restricted areas, ships provided with two (2) fuel oil pumps that can each supply the fuel primarily used by the ship (i.e. HFO or MDO) in the required capacity for normal operation of the propulsion machinery.
2) In emission control areas one of the following configurations:
   a) Fuel oil pumps as in 1), provided these are each suitable for marine fuels with a sulphur content not exceeding 0,1 % m/m and minimum viscosity of 2 cSt operation at the required capacity for normal operation of propulsion machinery,
   b) When the fuel oil pumps in 1) are suitable to operate on marine fuels with a sulphur content not exceeding 0,1 % m/m and minimum viscosity of 2 cSt but one pump alone is not capable of delivering marine fuels with a sulphur content not exceeding 0,1 % m/m and minimum viscosity of 2 cSt at the required capacity, then both pumps may operate in parallel to achieve the required capacity for normal operation of propulsion machinery. In this case, one additional(third) fuel oil pump shall be provided. The additional pump shall, when operating in parallel with one of the pumps in 1), be suitable for and capable of delivering marine fuels with a sulphur content not exceeding 0,1 % m/m and minimum viscosity of 2 cSt at the required capacity for normal operation of the propulsion machinery.
   c) In addition to 1), two separate fuel oil pumps shall be provided, each capable of and suitable for supplying marine fuels with a sulphur content not exceeding 0,1 % m/m and minimum viscosity of 2 cSt at the required capacity for normal operation of propulsion machinery.

Note 1:
For the purpose of this interpretation if a marine distillate grade fuel with a different maximum sulphur content is specified by regulation for the area of operation of the ship (e.g., ECA, specific ports or local areas, etc.) then that maximum is to be applied.

Note 2:
URM 35.4.1 (automatic start of standby pumps) applies independent of the pump arrangement for vessels holding the class notation for unattended machinery space.

Note 3:
Where electrical power is required for the operation of propulsion machinery, the requirements are also applicable for machinery for power generation when such machinery is supplied by common fuel supply pumps.

Technical Background

1. The implementation of regulations to reduce SOx emissions in accordance with Annex VI of MARPOL (Phase III of Reg.14) and CARB (Phase II) requires the use of marine fuels with a sulphur content not exceeding 0,1 % m/m and minimum viscosity of 2 cSt for main engines within emission control areas.
2. On the other hand, SOLAS Reg. II-1/26.3 requires the redundancy of fuel oil supply systems.

   SOLAS Reg. II-1/26.3 states:

Means shall be provided whereby normal operation of propulsion machinery can be sustained or restored even though one of the essential auxiliaries becomes inoperative.

3. Shipyards and owners began developing new designs to comply with the above regulations, but there was some question regarding the degree of redundancy required for the use of marine fuels with a sulphur content not exceeding 0,1 % m/m and minimum viscosity of 2 cSt. Moreover, fuel oil pumps may need to be modified if marine fuels with a sulphur content not exceeding 0,1 % m/m and minimum viscosity of 2 cSt is used because of compatibility issues with respect to engines and boilers, i.e., low lubricity and low viscosity of the marine fuels with a sulphur content not exceeding 0,1 % m/m and minimum viscosity of 2 cSt.
4. With respect to the application of SOLAS Reg. II-1/26.3 to fuel oil pumps for the normal operation of propulsion systems, an interpretation for the arrangement of fuel pumps was developed to provide sufficient capacity for normal operation of propulsion machinery, even if one pump becomes inoperable while using marine fuels with a sulphur content not exceeding 0,1 % m/m and minimum viscosity of 2 cSt in emission control areas.
5. The wording “the required capacity for normal operation of propulsion machinery” refers to the capacity and pressure necessary for sustaining normal output for the concerned propulsion machinery as contractually specified by owners and shipyards.

Remarks

1. This Unified Interpretation is to be applied by IACS Societies on ships contracted for construction on or after 1 July 2013.

2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.236 Date of Delivery under SOLAS and MARPOL Conventions

Conventions (Amend.), Reg.		Certain provisions of the **SOLAS** and **MARPOL** Conventions					
IACS UI Number	**SC256-MPC100**	**UI version**	**Jun.,2012**	**Date of implementation**	**Jun.28,2012**	**Means of implementation**	

Conventions/Codes Requirements

Under certain provisions of the SOLAS and MARPOL Conventions, the application of regulations to a new ship is governed by the dates:

1. for which the building contract is placed on or after dd/mm/yyyy; or
2. in the absence of a building contract, the keel of which is laid or which is at a similar stage of construction on or after dd/mm/yyyy; or
3. the delivery of which is on or after dd/mm/yyyy.

Interpretation

For the purpose of determining the application of mandatory requirements of the SOLAS and MARPOL Conventions to a new ship, the date of “delivery" means the completion date (day, month and year) of the survey on which the certificate is based (i.e. the initial survey before the ship is put into service and certificate issued for the first time) as entered on the relevant statutory certificates.

Technical Background

Remarks

1.237 Pilot Transfer Arrangements

Conventions (Amend.), Reg.		SOLAS V/23 as amended by Resolution MSC.308(88)					
IACS UI Number	**SC257**	**UI version**	**Nov.,2012/ Corr.1,Apr.,2013 / Rev.1, Oct.,2016**	**Date of implementation**	**Jul.01,2013**	**Means of implementation**	**Contracted for construction**

Conventions/Codes Requirements

Chapter V of SOLAS convention

Regulation 23 Pilot Transfer Arrangements

3.3 Safe and convenient access to, and egress from, the ship shall be provided by either:

.1 a pilot ladder requiring a climb of not less than 1.5 m and not more than 9 m above the surface of the water so positioned and secured that:

.4 the single length of pilot ladder is capable of reaching the water from the point of access to, or egress from, the ship and due allowance is made for all conditions of loading and trim of the ship, and for an adverse list of 15°; the securing strong point, shackles and securing ropes shall be at least as strong as the side ropes; or

.2 an accommodation ladder in conjunction with the pilot ladder (i.e. a combination arrangement), or other equally safe and convenient means, whenever the distance from the surface of the water to the point of access to the ship is more than 9 m.

Interpretation

Sub-paragraphs 1 and 2 of SOLAS regulation V/23.3.3. address two different and distinct arrangements --- the former when only a pilot ladder is provided ; the latter when a combined arrangement of "*an accommodation ladder used in conjunction with the pilot ladder*" is provided .

1. SOLAS regulation V/23.3.3.1 prescribes an operational instruction that limits the climb to not more than 9m on a single ladder regardless of the trim or list of the ship.

2. SOLAS regulation V/23.3.3.2 and Section 3 of Resolution A.1045(27) applies to a combined arrangement of "*an accommodation ladder used in conjunction with the pilot ladder"* for "*Safe and convenient access to, and egress from, the ship*" for which a 15° list requirement does not apply.

Technical Background

The UI is intended to clarify the circumstances under which the *"adverse list of 15°"* as quoted in SOLAS regulation V/23.3.3.1.4 should be applied to both single lengths of pilot ladder, and an accommodation ladder used in conjunction with the pilot ladder. Corr.1 of the UI is to clarify the UI to avoid any misunderstandings.

IMO agreed with UI SC257 and subsequently approved MSC.1/Circ.1495. It was acknowledged that SOLAS regulation V/23 clearly prescribe that a pilot shall never have to climb a single pilot ladder more than nine metres from the surface of the water. However, it was subsequently noted that there was some confusion as to the intent of the circular as it appear to specify design/installation criteria. The UI SC 257 Rev.1 was provided to clarify the intent to both the UI and the MSC Circular.

Remarks

The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.238 For Application of Regulation 3-11, Part A-1, Chapter II-1 of the SOLAS Convention(Corrosion Protection of Cargo Oil Tanks of Crude Oil Tankers), adopted by Resolution MSC.289 (87) The Performance Standard for Alternative Means of Corrosion Protection for Cargo Oil Tanks of Crude Oil Tankers

Conventions (Amend.), Reg.		Regulation II-1/3-11 of SOLAS 1974					
IACS UI Number	**SC258**	**UI version**	**Jan.,2013**	**Date of implementation**	**Jan.1,2013**	**Means of implementation**	**contracted for construction**

Conventions/Codes Requirements

PSPC-COT Alt 2.1 General Principles

Interpretation

1. Normal and higher strength *Corrosion Resistant Steels* as defined within this UI, is steel whose corrosion resistance performance in the bottom or top of the internal cargo oil tank is tested and approved to satisfy the requirements in this MSC.289 (87) in addition to other relevant requirements for ship material, structure strength and construction. It is not the intention of this document to suggest that Corrosion Resistant Steels be used for corrosion resistant applications in other areas of a vessel.

2. *Corrosion Resistant Steels* are similar to conventional ship construction steels in terms of chemical composition and mechanical properties.

3. The weldability of *Corrosion Resistant Steels* is similar to the weldability of conventional ship construction steels and therefore normal shipyard welding requirements in terms of qualification by the approval of welding consumables and welding procedure qualification also apply.

Conventions/Codes Requirements

PSPC-COT Alt 2.2 Technical File

Interpretation

1. The shipbuilder is to prepare and submit the Technical File to the Administration for verification. If the applicable corrosion protection method varies for different locations, the information required for the technical file is to include each location and corrosion protection method separately. Once verified, one copy of the Technical File is to be placed onboard the ship. The following construction records are to be included in the Technical File:

1.1 The copy of the Type Approval Certificate.

1.2 Other technical data is to include:

(a) Detail of the brand of welding consumables and welding process used.

(b) Repair method. Only to be included when specially recommended by the manufacturer of corrosion resistant steel.

1.3 Application records

(a) Areas of application / location of corrosion resistant steel.

(b) Brand of corrosion resistant steel and thickness.

Note: Items (a) and (b) above may be substituted by the information given in the hull-related approved drawings. However, each brand of corrosion resistant steel used and its location is to be indicated on the approved drawings, the drawings are to be included in the Technical File.

1.4 The test certificates and actual measured values of plate thickness of each corrosion resistant steel, and individual welding conditions need not be included.

2. After the ship enters service, the ship owner or operator is to maintain repair data in the Technical File for review by the Administration. The information required is to include each location and corrosion protection method separately. These records should include:

2.1 Where repairs are made in service to the cargo oil tank in which corrosion resistant steel is used, the following information is to be added to the Technical File.

(a) Areas of repair work

(b) Repair method (replacement by corrosion resistant steel or coating)

(c) Records of the brand of corrosion resistant steel used, plate thickness and welding consumables (brand name and welding method) if corrosion resistant steel is used.

(d) Records in accordance with Performance Standard for Protective Coatings for Cargo Oil Tanks (MSC.288 (87)), if coating is used.

2.2 Repairs that require records to be maintained as mentioned in paragraph 2.1 above include the following:

(a) Replacement by corrosion resistant steel

(b) Application of coating on members in which corrosion resistant steel is used (including cases where corrosion resistant steel is replaced with conventional steel and coating). (Note 1)

(c) Repairs of pitted parts. (Note 2)

Note 1: Details of coating on repairs to corrosion resistant steel are to be recorded in the Corrosion Resistant Steel Technical File. In such cases, duplicates of these coating records do not need to be included in the Coating Technical File.

Note 2: The wastage limit of the pitted part or area is to be as deemed appropriate by CCS and/or Administration. However, the standard value of the permissible wastage amount is to be taken as about 40% of the original thickness. In this case weld repairs are required. Only welding consumables approved for the relevant corrosion resistant steel

are to be used. The full depth of the pitting is to be filled up by the weld metal. If non-approved welding consumables are used, an appropriate area around the repaired part is to be coated suitably after the repairs in accordance with the IMO Performance Standard for Protective Coatings for Cargo Oil Tanks.

2.3 Plate thickness records during periodical surveys need not be recorded in the Technical File.

Conventions/Codes Requirements

PSPC-COT Alt 3.3 Special Application

Interpretation

1. Where other items of structure, such as appurtenances, are not clearly identified, the application of the PSPC-**COT Alt** to these items is described here.

1.1 Means of access, to be used for ship inspections, which are not integral to the ship structure.

1.1.1 Permanent means of access which are not integral to the ship's structure include:

- Ladders
- Rails
- Independent platforms
- Steps

1.1.2 Appropriate corrosion protection measures are to be adopted for permanent means of access mentioned in paragraph 1.1.1 above.

1.1.3 When corrosion resistant steel is used, in principle, a corrosion resistant steel of the same brand as used in the main structure is to be used for the means of access and the attachments.

1.1.4 When conventional steel is used, and is welded to corrosion resistant steel, corrosion protection measures for the attachment and weld are recommended to be in accordance with Performance Standard for Protective Coatings for Cargo Oil Tanks (MSC.288 (87)).

1.1.5 Other corrosion protection measures are to be left to the discretion of the Administration.

1.1.6 Where other corrosion protection measures other than those stated above, for example cathodic protection are used, the performance of the corrosion resistant steel of the surrounding structure is not to be impaired.

1.2 Access arrangements integral to the ship's structure

1.2.1 The phrase "Access arrangements that are integral to the ship structure" in paragraph 3.2.2 of the Annex to Performance Standard for Alternative Means of Corrosion Protection for Cargo Oil Tanks (MSC.291(87)) means access arrangements integral to the ship structure such as the items mentioned below, for access in the cargo oil tanks.

- Stiffeners and girders with increased depth for walkways

1.2.2 Appropriate corrosion protection measures are to be adopted for access arrangement given in paragraph 1.2.1. If coating is applied, the provisions of Performance Standard for Protective Coatings for Cargo Oil Tanks (MSC.288 (87)) are to be followed. If corrosion resistant steel is used on the above arrangements, in principle, corrosion resistant steel of the same brand/type as that used in the cargo oil tanks, is to be used.

1.3 Supporting members, etc.

1.3.1 It is recommended that pipes and supporting members for measuring equipment or outfitting items that are not strength members of the hull be protected either by coating or by use of corrosion resistant steel in accordance with the provisions of paragraph 1.1.4.

1.4 Work Attachments

1.4.1 In the case of attachments (conventional steel) used only during construction work such as hanging pieces, if welding consumables which are not indicated on the Type Approval Certificate of the corrosion resistant steel are used, it is recommended that the welded part is coated in accordance with Fig. 3.3.1.

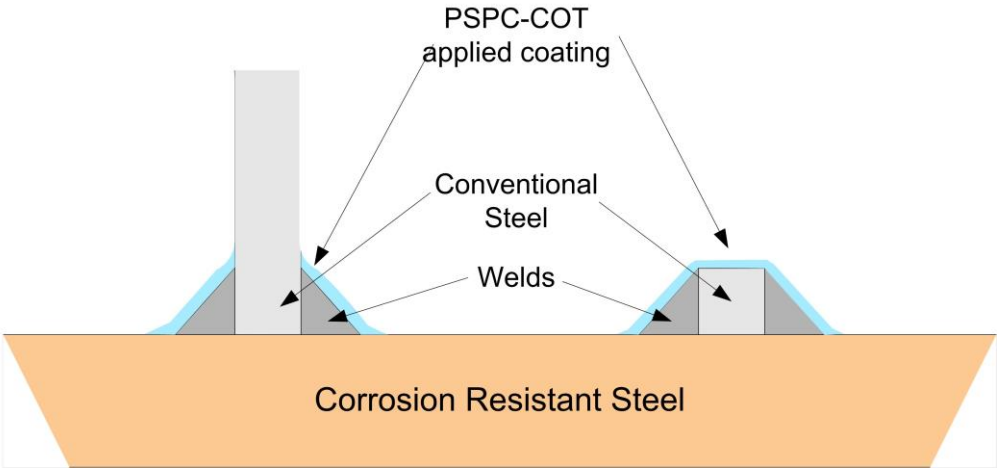


Fig. 3.3.1 Range of coating when work attachments are welded to corrosion resistant steel

Conventions/Codes Requirements

PSPC-COT Alt 3.4 Area of Application

Interpretation

1. Structural members in the COT that require protection measures against corrosion are specified in **MSC.289 (87) The Performance Standard for Alternative Means of Corrosion Protection for Cargo Oil Tanks of Crude Oil Tankers**.

2. Different methods of corrosion protection (coating and corrosion resistant steel) may be adopted for (a) and (b) above. Moreover, a combination of different corrosion protection methods may be used for each of the structural members within the areas identified by (a) and (b).

3. Acceptable combinations of corrosion protection methods are shown in Table 1.

Table 1 - Acceptable combinations of corrosion protection methods

Member		Lower surface of strength deck (a)	Upper surface of inner bottom plating (b)
Corrosion protection method	Case 1	Corrosion resistant steel – Brand A*	Corrosion resistant steel – Brand B*
	Case 2	Coating	Corrosion resistant steel – Brand B*
	Case 3	Corrosion resistant steel – Brand A*	Coating
	Case 4	Corrosion resistant steel – Brand C*	Corrosion resistant steel – Brand C*
*Corrosion Resistant Steel and coating may be used on the same member.			

4. If different corrosion protection methods (coating and corrosion resistant steel) are selected for either (a) or (b), the selected procedure for each member is to comply with the relevant performance standards.

5. Where corrosion resistant steel is used it is to be type approved by the Administration.

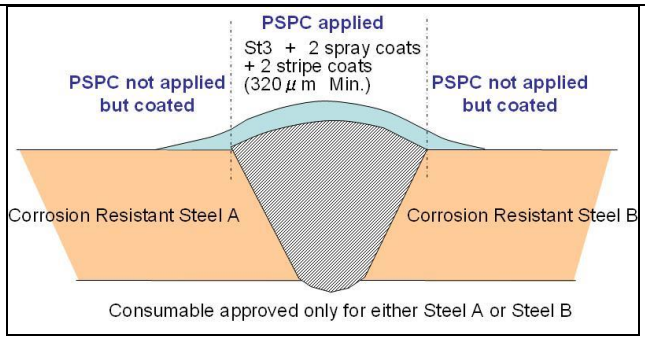


Figure 3.4.1

6. Where different brands of corrosion resistant steels are used in the same structural member, see Figure 3.4.1, the weld joining the two different steels is to be coated. Coating is to be in accordance with Performance Standard for Protective Coatings for Cargo Oil Tanks (MSC.288 (87)). However, coating of the weld is not required if the welding consumable used to produce the weld has been subject to the necessary corrosion tests. In such a case, a type approval certificate is required for the both steel brands in association with the welding consumable used.

7. When corrosion resistant steel and conventional steel are used together in an area where corrosion protection is necessary, see Figure 3.4.2., the conventional steel and the weld is to be coated in accordance with Performance Standard for Protective Coatings for Cargo Oil Tanks (MSC.288 (87)),

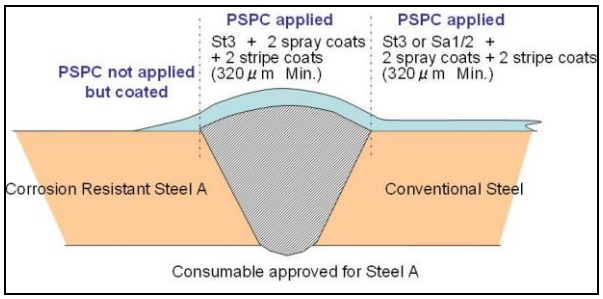


Figure 3.4.2

8. Where the welding consumable used is different from that indicated on the Type Approval Certificate of corrosion resistant steel, the weld is to be coated in accordance with Performance Standard for Protective Coatings for COT (MSC.288 (87)), see Figure 3.4.3.

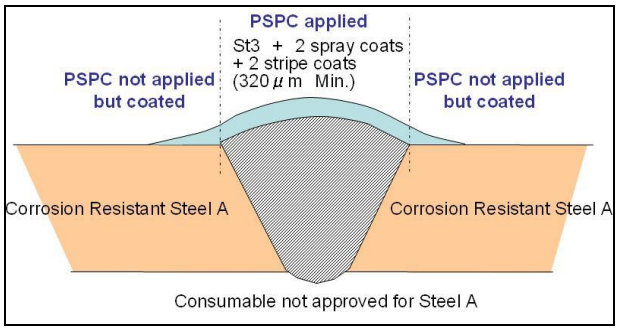


Figure 3.4.3

Conventions/Codes Requirements

PSPC-COT Alt 4 Approval

Interpretation

1. Approval procedure

1.1 The steel must be approved and graded accordingly.

1.2 The approval procedure for corrosion testing of corrosion resistant steel is described in the Annex to

Performance Standard for Alternative Means of Corrosion Protection for Cargo Oil Tanks (MSC.289 (87)).

1.3 The Administration's approval is not needed for the testing laboratory where a surveyor of the Administration is present at specified stages to witness the approval tests.

1.4 In the case where the Administration is not present at specified stages to witness the approval tests, the testing laboratory is to be approved.

1.5 Where the scope of approval changes, for example for additions to the applicable welding consumables, the effects of these changes are to be subjected to corrosion resistance tests for the welded joints specified in the Annex to Performance Standard for Alternative Means of Corrosion Protection for Cargo Oil Tanks (MSC.289(87)).

2. Type Approval Certificate

2.1 The Type Approval Certificate for approved corrosion resistant steel is to include the following items:

(a) Brand name, manufacturer and certificate number

(b) Steel grade and area of application designation

(c) Chemical composition range (including additive and/or controlling element percentages to improve corrosion resistance)

(d) Maximum thickness

(e) Steelmaking process

(f) Casting process

(g) Delivery condition

(h) Brand of welding consumables and welding method

(i) Period of validity of approval

2.2 The Type Approval Certificate is valid for a maximum period of 5 years from the date of approval. When the renewal of approval is carried out, the period of validity will be a maximum period of 5 years from the next day after the expiry date of the previous validity.

Conventions/Codes Requirements

PSPC-COT Alt 5 Inspection and Verification Requirements

Interpretation

1. General requirements

1.1 The general requirements are as follows:

(a) Corrosion resistant steel type approved by the Administration is to be used.

(b) Welding consumables used are to be the Brand specified on the type approval certificate.

(c) Welding work is to be implemented according to the approved welding procedure.

(d) The correct use of corrosion resistant steel is verified by engineering review and survey.

(e) The shipbuilder is to prepare a Technical File after the construction work has been completed, and submit it to the Administration for verification.

(f) The Technical File is to be maintained onboard the ship.

1.2 If any of the items in 1.1(a) to 1.1(f) above are not complied with, the Administration notifies the shipbuilder immediately who confirms the corrective action to be followed and its completion. A SOLAS Safety Construction Certificate shall not be issued until all required corrective actions have been closed to the satisfaction of the Administration.

2 Procedure applicable to new ships

2.1. Product inspection is to be carried out as part of material certification. The control range of the chemical composition is determined as follows:

2.1.1 The manufacturer is to supply data relating to the control of applicable chemical elements that the manufacturer has intentionally added or is controlling to improve corrosion resistance. Upper and lower limits for all such elements and any relationship between these elements are to be disclosed. The manufacturer is to obtain the Administration’s approval for these additions and the relationships.

2.1.2 The effect of variation of each element is to be assessed by using sufficient corrosion tests to determine the effects of variation with variations of other elements used to enhance corrosion resistance.

2.1.3 The corrosion resistance test is to be conducted in accordance with Appendix of Annex 3 to Performance Standard for the Alternative Means of Corrosion Protection for Cargo Oil Tanks (MSC.289 (87)).

2.2 Survey during the construction stage

2.2.1 The Administration's surveyor is to verify that corrosion resistant steel has been used correctly at the appropriate locations.

2.2.2 The verification in 2.2.1 is to be implemented periodically, and the frequency is to be determined on assessment of quality control feedback of each shipyard. However, if some deficiency is found, the shipyard is to formulate the necessary remedial action with regard to both the deficient location and counter measures to be taken to improve inspection methods.

3. Procedure applicable to ships in service

3.1 If the repair method is described in the Technical File, repairs are to be carried out in accordance with the said method.

3.2 If corrosion resistant steel or coated member is to be replaced, the same corrosion protection method to the one used during construction is recommended.

3.3 If corrosion resistant steel is to be used during repairs, use of the corrosion resistant steel of the same brand as that used during construction is recommended.

3.4 If conventional steel is used in a corrosion resistant steel member that is to be replaced, coating is to be applied to the conventional steel. In this case, it is required that the coating complies with 3.4.3 of the Performance Standard for Protective Coatings for Crude Oil Tanks (MSC.288 (87)), see Figure 3.4.2.

3.5 The application of welding consumables to be used is to be confirmed through the latest Type Approval Certificate of the relevant corrosion resistant steel to ensure conformity (brands of the welding consumables are indicated on the Type Approval Certificate).

3.6 If the welding consumables specified in the Type Approval Certificate for the corrosion resistant steel cannot be used, the weld is to be coated, see Figure 3.4.3. In this case, it is required that the coating complies with 3.4.3 of the Performance Standard for Protective Coatings for Cargo Oil Tanks (MSC.288 (87)).

4. Welding Considerations

4.1 Welding workmanship standards accepted for conventional steel may be used.

4.2 An approved welding procedure is to be used for welding work as appropriate to the grades (excluding subscripts related to corrosion resistance), welding consumables, welding position and plate thickness, etc., of the corrosion resistant steel to be used.

Conventions/Codes Requirements

PSPC-COT Alt Appendix - Test Procedures for Qualification of Corrosion Resistant Steel for Cargo Tanks in Crude Oil Tankers

Interpretation

1. Test on simulated upper deck conditions

1.1 Test condition

(a) The chemical composition of the conventional shipbuilding steel used for test purposes (Table 1 in the Annex to the Performance Standard for Alternative Means of Corrosion Protection for Cargo Oil Tanks (MSC.289 (87))) is to be based on ladle analysis given in the mill certificate. Steel complying with a national standard that meets the requirements of Table 1 is also acceptable.

(b) All the base material specimens should be located in one tank. Figure 2 in the Annex to the Performance Standard for Alternative Means of Corrosion Protection for Cargo Oil Tanks (MSC.289 (87)) only shows locations of 20 specimens. The tank can be designed to hold 25 or more specimens; alternatively specimens can be added and removed as necessary so that the appropriate time periods are achieved within the total timescale of 98 days.

(c) Since certain factors such as control and measurement of temperature and size of chamber may affect the corrosion rate achieved, it should be confirmed that the corrosion rate of conventional steel in the conditions and equipment of the test, satisfies the rate criteria, before carrying out corrosion test for evaluation of corrosion resistant steel.

(d) To remove specimens, the chamber is to be purged with 100% nitrogen gas while the specimens are in the high temperature region until the specimens are dry.

(e) The cycling pattern of specimen temperature and temperature of distilled water should be controlled such that each cycle is as identical as possible throughout the whole corrosion test period. These temperatures must be recorded. See Figure App 1.

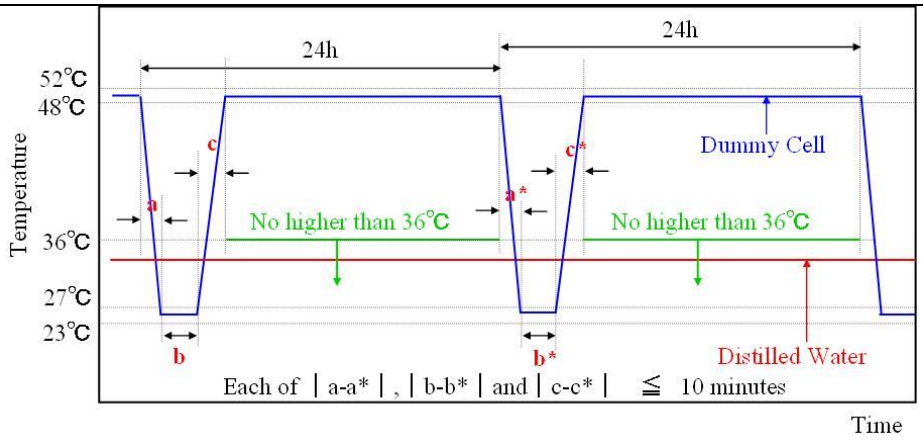


Figure App 1 - Schematic view of temperature controlling accuracy of specimens and distilled water during corrosion test

(f) The transition time, a, a*, c and c* in figure App 1 is the time from when the cooling and heating commences until the lower or upper temperature is reached, see Figure App 2. The transition of each cycle is to be as identical as possible throughout the whole corrosion test period.

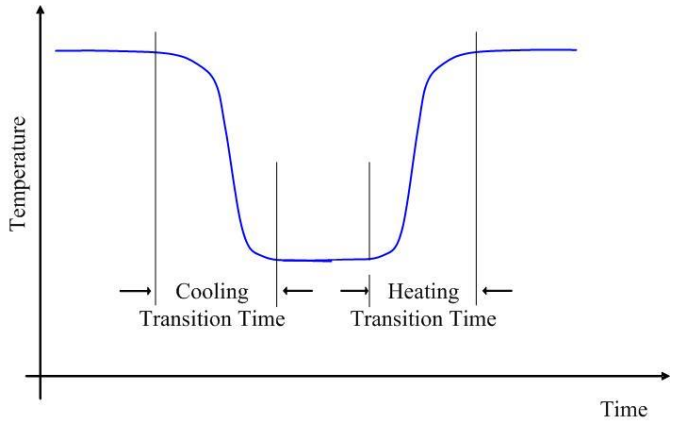


Figure App 2 - Transition time definition

(g) The temperature of both the specimens and the water is to be continuously recorded throughout the test.

(h) Welded specimens may be tested with the parent material tests or tested separately against 5 conventional steel specimens.

(i) Base material is to be prepared such that the surface to be tested is to be taken from a position within 2 mm of one rolled surface. This surface is to be ground to bare steel and polished to 600 grit finish.

(j) For welded samples, a test assembly is to be made from the same steel cast as the base material test in (i) but may be from a plate of different thickness. The assembly is to be welded using the process and consumable to be approved for use with the base material. The surface to be tested is to be selected such that the width of weld metal, excluding heat affected zone, is to be between 10 and 20 mm. This surface is to be ground to bare steel and polished to 600 grit finish.

(k) Specimens are to be weighed to an accuracy of ± 1 mg.

(l) Where the calculated corrosion loss of conventional steel is less than 0.05mm/year, the concentration of H_2S may be increased in the simulated cargo oil tank gas. All tests will be carried out at this increased level.

(m) At least 3 values of individual weight loss of conventional steel should be in the range of maximum X and minimum Y measured in grams.

$X = (0.11 \times S \times D)/10$

$Y = (0.05 \times S \times D)/10$

Where

S = surface area (cm^2)

D = density (g/cm^3)

2. Test on simulated inner bottom conditions

2.1 Test condition

(a) The conventional steel used should also meet the requirements of Table 1 in the Annex to the Performance Standard for Alternative Means of Corrosion Protection for Cargo Oil Tanks (MSC.289 (87)) and interpretations 1.1 (a) above.

(b) Base material is to be prepared such that one surface is to be taken from a position within 2 mm of one rolled surface. All surfaces are to be ground to bare steel and polished to 600 grit finish.

(c) For welded samples, a test assembly is to be made from the same steel cast as the base material test in (e) but may be from a plate of different thickness. The assembly is to be welded using the process and consumable to be approved for use with the base material. The surface to be tested is to be selected such that the width of weld metal, excluding heat affected zone, is to be between 10 and 20mm. This surface is to be ground to bare steel and polished to 600 grit finish.

(d) Specimens are to be weighed to an accuracy of ± 1 mg.

(e) One specimen that has a corrosion rate deviating from the average corrosion rate by more than +25% may be eliminated from the results, provided that the cause of the accelerated corrosion is demonstrated to be due to localized corrosion around the hanging hole and/or stamp (e.g. crevice corrosion, pitting corrosion, etc.).

3. Interpretation of weld discontinuity

3.1 Preparation of samples after corrosion test

(a) All five samples are to be prepared as follows.

(b) Two full thickness specimens approximately 20 mm long x 5 mm wide are to be sectioned with their principle axis perpendicular to the weld fusion line. Each specimen is to be located such that the weld fusion line is located approximately at its mid length. See Figure App 3.

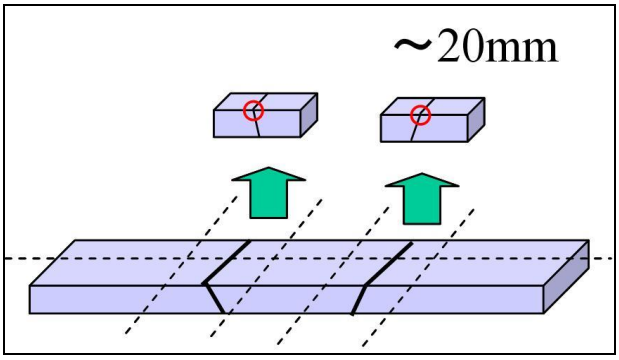


Figure App 3 - Sectioning plan

(c) The specimens are to be mounted in resin to allow polishing of the cross section.The specimens are to be etched in Nital after polishing to reveal the fusion boundary.

(d) A photomicrograph is to be taken at a magnification of approximately 100 X.

3.2 Evaluation of depth step

(a) On the photomicrograph, construct a line **A–B**, perpendicular to the corrosion surface through the point where fusion line and the surface cross. See Figure App 4.

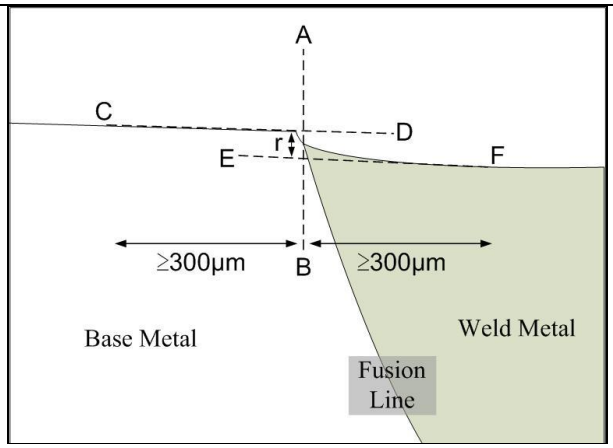


Figure App 4 - Determination of corrosion depth on photomicrograph

(b) Construct two parallel lines **C-D** and **E-F** one representing the higher level, the other the lower level. Each line is to be constructed over a distance of ≥ 300 μm from line A-B on the base metal and weld metal side, respectively.

(c) Measure the distance r mm between the intersection point at line A-B and each average surface line on the photomicrograph.

(d) If the intersection point at line A-B and average surface line of welded metal part is above that of base metal part, then the existence of step should be neglected for this sample.

(e) Calculate the depth of discontinuous step **R** in μm from the actual photomicrograph magnification M as follows.

$$R(\mu m) = \frac{r(mm) \times 1000}{M}$$

3.3 Evaluation of step angle

(a) Evaluation for angle of step is unnecessary if the depth of step calculated on both samples see 3.2, are not greater than 30 μm or if either step exceeds 50 μm for a single specimen. Otherwise the angle of step is to be calculated as follows.

(b) Produce a photomicrograph at a magnification of approximately 250 X, see Figure App 5.

(c) Draw an average surface line C-D for base metal part and E-F for weld metal part.

(d) Find the closest intersection point with the step of the base metal surface profile and the constructed line C-D and the closest intersection point with the step for weld metal constructed line E-F respectively, and connect those two intersection points.

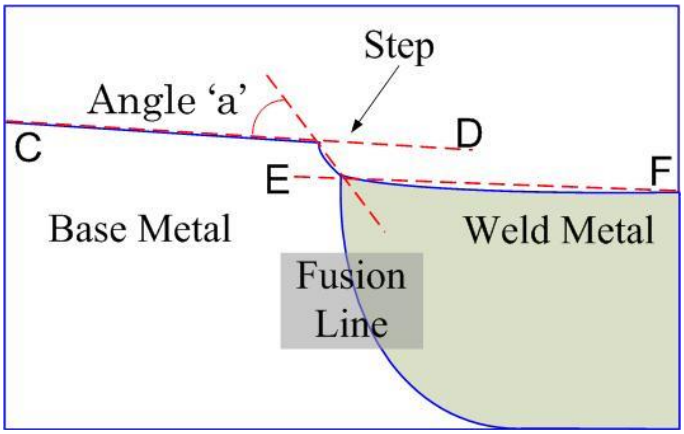


Figure App 5 - Calculation of step angle

(e) Measure the angle 'a' in degrees given by the line C-D and the connected line described in paragraph d, see Figure App 2.

3.4 Acceptance Criteria

(a) If the depth of both steps are less than or equal to 30 μm then the measurement of angle is unnecessary, and the sample is considered to be acceptable.

(b) If the depth of steps on both photomicrographs are less than or equal to 50 μm and in addition if both the measured angles are less than or equal to 15 degrees, then the sample is considered to be acceptable.

(c) If either of the conditions described in paragraphs a or b above are not in compliance, the sample is considered to contain a *"discontinuous surface"* and fails the test.

(d) Welds should be evaluated as "*without discontinuous surface"* when all 5 corrosion test samples are considered acceptable.

Technical Background

Regulation 3-11, Part A-1, Chapter II-1 of the SOLAS(Corrosion Protection of Cargo Oil Tanks of Crude Oil Tankers) is adopted by IMO MSC. For implement of IMO Resolution, IACS developed UI SC258 in order to give explanation to outstanding issues of Performance Standard for Alternative Means of Corrosion Protection for Cargo Oil Tanks of Crude Oil Tankers.

Remarks

1. This UI is to be applied by CCS for ships subject to SOLAS Chapter II-1, Part A-1, Reg.3-11, as amended by resolution MSC.291 (87) when acting as a recognized organization, authorized by flag State Administrations to act on their behalf, unless otherwise advised, from 1 January 2013.
2. Rev.0 to the interpretation is applicable to members for ships contracted for construction on or after 1 January 2013.
3. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.239 For Application of SOLAS Regulation II-1/3-11 Performance Standard for Protective Coatings for Cargo Oil Tanks of Crude Oil Tankers (PSPC-COT), adopted by Resolution MSC.288(87)

Conventions (Amend.), Reg.		**Regulation II-1/3-11 of SOLAS 1974**					
IACS UI Number	**SC259**	UI version	**Oct.,2013/ Corr.1,May,2014/ Rev.1,Jun.,2014/ Corr.1,Oct.,2014**	Date of implementation	**Jul.1,2014**	Means of implementation	**contracted for construction**

Conventions/Codes Requirements

PSPC-COT 2 DEFINITIONS

For the purpose of this Standard, the following definitions apply.

…

2.6 "GOOD" condition is the condition with minor spot rusting as defined in resolution A.1049(27) (2011 ESP Code), as amended, *for assessing the ballast tank coatings for tankers.*

Interpretation

GOOD: Condition with spot rusting on less than 3% of the area under consideration without visible failure of the coating, or no-perforated blistering. Breakdown at edges or welds should be less than 20 % of edges or weld lines in the area under consideration.

Coating Technical File: A term used for the collection of documents describing issues related to the coating system and its application from the point in time when the first document is provided and for the entire life of the ship including the inspection agreement and all elements of PSPC-COT 3.4.

Conventions/Codes Requirements

PSPC-COT 3 GENERAL PRINCIPLES

"3.2 Inspection of surface preparation and coating processes shall be agreed upon between the ship owner, the shipyard and the coating manufacturer and presented to the Administration for review. Clear evidence of these inspections shall be reported and included in the Coating Technical File (CTF) (see subsection 3.4)."

Interpretation

1. Inspection of surface preparation and coating processes agreement shall be signed by shipyard, shipowner and coating manufacturer and shall be presented by the shipyard to the Administration for review prior to commencement of any coating work on any stage of a new building and as a minimum shall comply with the PSPC-COT.

2. To facilitate the review, the following from the CTF, shall be available:

a) Coating specification including selection of areas (spaces) to be coated, selection of coating system, surface preparation and coating process.

b) Statement of Compliance or Type Approval of the coating system.

3. The agreement shall be included in the CTF and shall at least cover:

a) Inspection process, including scope of inspection, who carries out the inspection, the qualifications of the coating inspector(s) and appointment of one qualified coating inspector (responsible for verifying that the coating is applied in accordance with the PSPC-COT). Where more than one coating inspector will be used then their areas of responsibility shall be identified. (For example, multiple construction sites).

b) Language to be used for documentation.

4. Any deviations in the procedure relative to the PSPC-COT noted during the review shall be raised with the shipyard, which is responsible for identifying and implementing the corrective actions.

5. Cargo Ship Safety Certificate or Cargo Ship Safety Construction Certificate, as appropriate, shall not be issued until all required corrective actions have been closed to the satisfaction of the Administration.

Conventions/Codes Requirements

*"3.4 **Coating Technical File (CTF)***

3.4.1 Specification of the cargo oil tank coating system applied, record of the shipyard's and shipowner's coating work, detailed criteria for coating selection, job specifications, inspection, maintenance and repair shall be included in the Coating Technical File required by resolution MSC.215(82).

3.4.2 New construction stage

The Coating Technical File shall contain at least the following items relating to this Standard and shall be delivered by the shipyard at new ship construction stage:

.1 copy of Statement of Compliance or Type Approval Certificate;

.2 copy of Technical Data Sheet, including:

.2.1 product name and identification mark and/or number;

.2.2 materials, components and composition of the coating system,

.2.3 minimum and maximum dry film thickness;

.2.4 application methods, tools and/or machines;

.2.5 condition of surface to be coated (de-rusting grade, cleanness, profile, etc.); and

.2.6 environmental limitations (temperature and humidity);

.3 shipyard work records of coating application, including:

.3.1 applied actual areas (in square metres) of coating in each cargo oil tank;

.3.2 applied coating system;

.3.3 time of coating, thickness, number of layers, etc.;

.3.4 ambient conditions during coating; and

.3.5 details of surface preparation;

.4 procedures for inspection and repair of coating system during ship construction;

.5 coating log issued by the coating inspector – stating that the coating was applied in accordance with the specifications to the satisfaction of the coating supplier representative and specifying deviations from the specifications (see annex 2);

.6 shipyard's verified inspection report, including:

.6.1 completion date of inspection;

.6.2 result of inspection;

.6.3 remarks (if given); and

.6.4 inspector signature; and

*.7 procedures for in-service maintenance and repair of coating systems.**

**Guidelines to be developed by the Organization.*

3.4.3 In-service maintenance and repair

In-service maintenance and repair activities shall be recorded in the Coating Technical File in accordance with the relevant section of the Guidelines for coating maintenance and repair.

3.4.4 The Coating Technical File shall be kept on board and maintained throughout the life of the ship."

Interpretation

Procedure for Coating Technical File Review

1 The shipyard is responsible for compiling the Coating Technical File (CTF) either in paper or electronic format, or a combination of the two.

2 The CTF is to contain all the information required by the PSPC 3.4 and the inspection of surface preparation and the coating processes agreement (see PSPC-COT 3.2).

3 The CTF shall be reviewed for content in accordance with the PSPC-COT 3.4.2.

4 Any deviations found under 3 shall be raised with the shipyard, which is responsible for identifying and implementing the corrective actions.

5 Cargo Ship Safety Certificate or Cargo Ship Safety Construction Certificate, as appropriate, shall not be issued until all required corrective actions have been closed to the satisfaction of the Administration.

Conventions/Codes Requirements

"3.5 ***Health and safety***

The shipyard is responsible for implementation of national regulations to ensure the health and safety of individuals and to minimize the risk of fire and explosion."

Interpretation

In order to document compliance with PSPC-COT 3.5, relevant documentation from the coating manufacturer concerning health and safety aspects such as Material Safety Data Sheet is recommended to be included in the CTF for information.

Conventions/Codes Requirements

PSPC-COT 4 COATING STANDARD

"4.5 Special application

4.5.1 This Standard covers protective coating requirements for steel structure within cargo oil tanks. It is noted that there are other independent items that are fitted within the cargo oil tanks and to which coatings are applied to provide protection against corrosion.

4.5.2 It is recommended that this Standard is applied, to the extent practicable, to those portions of means of access provided for inspection within the areas specified in subsection 4.4 that are not integral to the ship structure, such as rails, independent platforms, ladders, etc. Other equivalent methods of providing corrosion protection for non-integral items may also be used, provided they do not impair the performance of the coatings of the surrounding structure. Access arrangements that are integral to the ship structure, such as stiffener depths for walkways, stringers, etc., are to fully comply with this Standard when located within the coated areas.

4.5.3 It is also recommended that supports for piping, measuring devices, etc., be coated as a minimum in accordance with the non-integral items indicated in paragraph 4.5.2.

Interpretation

Reference is made to the non-mandatory MSC/Circ.1279 "Guidelines for corrosion protection of permanent means of access arrangements", adopted by MSC 84 in May 2008.

Conventions/Codes Requirements

PSPC-COT 4 Table 1: Footnotes of Standards

"Footnotes:

1 Type of gauge and calibration in accordance with SSPC-PA2:2004 Paint Application Specification No.2.

2 Refer to standard ISO 8501-1: 1988/Suppl: 1994. Preparation of steel substrate before application of paints and related products – Visual assessment of surface cleanliness.

3 Refer to standard ISO 8503-1/2: 1988. Preparation of steel substrate before application of paints and related products – Surface roughness characteristics of blast-cleaned steel substrates.

4 Conductivity measured in accordance with the following standards:

.1 ISO 8502-9:1998. Preparation of steel substrate before application of paints and related products – Test for the assessment of surface cleanliness; or

.2 NACE SP0508-2010 Item no.21134. Standard practice methods of validating equivalence to ISO 8502-9 on measurement of the levels of soluble salts.

5 Refer to standard ISO 8501-3: 2001. Preparation of steel substrate before application of paints and related products – Visual assessment of surface cleanliness.

6 See footnote 2 above
7 See footnote 3 above
8 Refer to standard ISO 8502-3:1993. Preparation of steel substrate before application of paints and related products – Test for the assessment of surface cleanliness.
9 See footnote 4 above
10 See footnote 1 above"

Interpretation

Only the footnoted standards referred to in PSPC-COT Table 1 are to be applied, i.e. they are mandatory.

Conventions/Codes Requirements

PSPC-COT 4 Table 1: 1 Design of coating system

"1.3 Coating test

Epoxy-based systems tested prior to the date of entry into force of this Standard in a laboratory by a method corresponding to the test procedure in annex 1 or equivalent, which as a minimum meets the requirements for rusting and blistering, or which have documented field exposure for 5 years with a final coating condition of not less than "GOOD", may be accepted.

For epoxy-based systems approved on or after entry into force of this Standard, testing according to the procedure in annex 1, or equivalent, is required."

Interpretation

Procedure for Coating System Approval

Type Approval Certificate showing compliance with the PSPC-COT 5 shall be issued if the results of either method A+C, or B+C are found satisfactory by the Administration.

The Type Approval Certificate shall indicate the Product and the Shop Primer tested. The certificate shall also indicate other type approved shop primers with which the product may be used which have under gone the cross over test in a laboratory meeting the requirements in Method A, 1.1 of this UI.

The documents required to be submitted are identified in the following sections, in addition for all type approvals the following documentation is required:

Technical Data Sheet showing all the information required by PSPC-COT 3.4.2.2.

Winter type epoxy is required separate prequalification test including shop primer compatibility test according to PSPC-COT Annex 1. Winter and summer type coating are considered different unless Infrared (IR) identification and Specific Gravity (SG) demonstrates that they are the same.

Method A: Laboratory Test

1.1 Coating pre-qualification test shall be carried out by the test laboratory which is recognized by the Administration.

1.2 Results from satisfactory pre-qualification tests (PSPC-COT Table 1: 1.3) of the coating system shall be documented and submitted to the Administration.

1.3.1 Type Approval tests shall be carried out for the epoxy based system with the stated shop primer in accordance with the PSPC-COT Annex 1. If the tests are satisfactory, a Type Approval Certificate will be issued to include both the epoxy and the shop primer. The Type Approval Certificate will allow the use of the epoxy either with the named shop primer or on bare prepared steel.

1.3.2 An epoxy based system may be used with shop primers other than the one with which it was originally tested provided that, the other shop primers are approved as part of a system, PSPC-COT Table 1: 2.3 and Table 1: 3.2, and have been tested according to the immersion test of PSPC-COT Annex 1 or in accordance with Res.MSC.215(82), which is known as the "Crossover Test". If the test or tests are satisfactory, a Type Approval Certificate will be issued. In this instance the Type Approval Certificate will include the details of the epoxy and a list of all shop primers with which it has been tested that have passed these requirements. The Type Approval Certificate will allow the use of the epoxy with all the named shop primers or on bare prepared steel.

1.3.3 Alternatively the epoxy can be tested without shop primer on bare prepared steel to the requirements of the PSPC-COT Annex 1. If the test or tests are satisfactory, a Type Approval Certificate will be issued. The Type Approval Certificate will just record the epoxy. The certificate will allow the use of the epoxy on bare prepared steel only. If in addition, crossover tests are satisfactorily carried out with shop primers, which are approved as part of a system, the Type Approval Certificate will include the details of shop primers which have satisfactorily passed the crossover test. In this instance the Type Approval Certificate will allow the use of the epoxy based system with all the named shop primers or on bare prepared steel.

1.3.4 The Type Approval Certificate is invalid if the formulation of either the epoxy or the shop primer is changed. It is the responsibility of the coating manufacturer to inform the Administration immediately of any changes to the formulation.

1.3.5 For the coating pre-qualification test, the measured average dry film thickness (DFT) on each prepared test

panels shall not exceed a nominal DFT (NDFT) of 320 microns plus 20% unless a paint manufacturer specifies a NDFT greater than 320 microns. In the latter case, the average DFT shall not exceed the specified NDFT plus 20% and the coating system shall be certified to the specified NDFT if the system passes the tests according to Annex 1 of PSPC-COT. The measured DFT shall meet the "90/10" rule and the maximum DFT shall be always below the maximum DFT value specified by the manufacturer.

Method B: 5 years field exposure

1.4 Coating manufacturer's records, which shall at least include the information indicated in 1.4.1, shall be examined to confirm coating system has 5 years field exposure, and the current product is the same as that being assessed.

1.4.1 Manufacturer's Records

- Original application records
- Original coating specification
- Original technical data sheet
- Current formulation's unique identification (Code or number)
- If the mixing ratio of base and curing agent has changed, a statement from the coating manufacturer confirming that the composition mixed product is the same as the original composition. This shall be accompanied by an explanation of the modifications made.
- Current technical data sheet for the current production site
- SG and IR identification of original product
- SG and IR identification of the current product
- If original SG and IR cannot be provided then a statement from the coating manufacturer confirming the readings for the current product are the same as those of the original.

1.5 Either class survey records from an Administration or a joint (coating manufacturer and Administration) survey of cargo tanks of a selected vessel is to be carried out for the purpose of verification of compliance with the requirements of 1.4 and 1.9. The reporting of the coating condition in both cases shall be in accordance with the principles given in section 4 of MSC.1/Circ.1399.

1.6 The selected vessel is to have cargo tanks in regular use, of which:

- At least one tank is exposed to minimum temperature of 60 degree C plus or minus 3 degree
- For field exposure the ship should be trading in varied trade routes and carrying substantial varieties of crude oils including highest temperature and lowest pH limits to ensure a realistic sample: for example, three ships on three different trade areas with different varieties of crude cargoes.

1.7 In the case that the selected vessel does not meet the requirements in 1.6 then the limitations on lowest pH and Highest temperature of crude oils carried shall be clearly stated on the type approval certificate.

1.8 In all cases of approval by Method B, the shop primer shall be removed prior to application of the approved epoxy based system coating, unless it can be confirmed that the shop primer applied during construction, is identical in formulation to that applied in the selected vessel used as a basis of the approval.

1.9 All cargo tanks shall be in "GOOD" condition excluding mechanical damages, without touch up or repair in the prior 5 years.

1.9.1 "Good" is defined as: Condition with spot rusting on less than 5% of the area under consideration without visible failure of the coating, or no perforated blistering. Breakdown at edges or welds should be less than 20% of edges or welds in the area under consideration.

1.9.2 Examples of how to report coating conditions with respect to areas under consideration should be as those given in the principles given in section 4 of MSC.1/Circ.1399.

1.10 If the applied NDFT is greater than required by the PSPC, the applied NDFT will be the minimum to be applied during construction. This will be reported prominently on the Type Approval Certificate.

1.11 If the results of the inspection are satisfactory, a Type Approval Certificate shall be issued to include both the epoxy based system and the shop primer. The Type Approval Certificate shall allow the use of the epoxy based system either with the named shop primer or on bare prepared steel. The Type Approval Certificate shall reference the inspection report which will also form part of the Coating Technical File.

1.12 The Type Approval Certificate is invalid if the formulation of either the epoxy based system or the shop primer is changed. It is the responsibility of the coating manufacturer to inform the Administration immediately of any changes to the formulation.

Method C: Coating Manufacturer

1.13 The coating/shop primer manufacturer shall meet the requirements set out in IACS UR Z17 paragraphs 4, 5, 6 and 7, (except for 4.6) and paragraphs 1.13.1 to 1.13.6 below, which shall be verified by the Administration.

1.13.1 Coating Manufacturers

(a) Extent of Engagement – Production of coating systems in accordance with PSPC-COT and this UI.

(b) These requirements apply to both the main coating manufacturer and the shop primer manufacturer where both coatings form part of the total system.

(c) The coating manufacturer should provide to the Administration the following information;

- A detailed list of the production facilities.
- Names and location of raw material suppliers will be clearly stated.
- A detailed list of the test standards and equipment to be used, (Scope of approval).
- Details of quality control procedures employed.
- Details of any sub-contracting agreements.
- List of quality manuals, test procedures and instructions, records, etc.
- Copy of any relevant certificates with their issue number and/or date e.g. Quality Management System certification.

(d) Inspection and audit of the manufacturer's facilities will be based on the requirements of the PSPC-COT.

(e) With the exception of early 'scale up' from laboratory to full production, adjustment outside the limitations listed in the QC instruction referred to below is not acceptable, unless justified by trials during the coating system's development programme, or subsequent testing. Any such adjustments must be agreed by the formulating technical centre.

(f) If formulation adjustment is envisaged during the production process the maximum allowable limits will be approved by the formulating technical centre and clearly stated in the QC working procedures.

(g) The manufacturer's quality control system will ensure that all current production is the same formulation as that supplied for the Type Approval Certificate. Formulation change is not permissible without testing in accordance with the test procedures in the PSPC-COT and the issue of a Type Approval Certificate by the Administration.

(h) Batch records including all QC test results such as viscosity, specific gravity and airless spray characteristics will be accurately recorded. Details of any additions will also be included.

(i) Whenever possible, raw material supply and lot details for each coating batch will be traceable. Exceptions may be where bulk supply such as solvents and pre-dissolved solid epoxies are stored in tanks, in which case it may only be possible to record the supplier's blend.

(j) Dates, batch numbers and quantities supplied to each coating contract will be clearly recorded.

1.13.2 All raw material supply must be accompanied the supplier's 'Certificate of Conformance'. The certificate will include all requirements listed in the coating manufacturer's QC system.

1.13.3 In the absence of a raw material supplier's certificate of conformance, the coating manufacturer must verify conformance to all requirements listed in the coating manufacturer's QC system.

1.13.4 Drums must be clearly marked with the details as described on the 'Type Approval Certificate'.

1.13.5 Product Technical Data Sheets must comply with all the PSPC-COT requirements. The QC system will ensure that all Product Technical Data Sheets are current.

1.13.6 QC procedures of the originating technical centre will verify that all production units comply with the above stipulations and that all raw material supply is approved by the technical centre.

1.14 In the case that a coating manufacturer wishes to have products which are manufactured in different locations under the same name, then IR identification and SG shall be used to demonstrate that they are the same coating, or individual approval tests will be required for the paint manufactured in each location.

1.15 The Type Approval Certificate is invalid if the formulation of either the epoxy based system or the shop primer is changed. It is the responsibility of the coating manufacturer to inform CCS immediately of any changes to the formulation. Failure to inform CCS of an alteration to the formulation will lead to cancellation of the certificates for that manufacturer's products.

Conventions/Codes Requirements

"1.4 Job specification

There shall be a minimum of two stripe coats and two spray coats, except that the second stripe coat, by way of welded seams only, may be reduced in scope where it is proven that the NDFT can be met by the coats applied in order to avoid unnecessary over thickness. Any reduction in scope of the second stripe coat shall be fully detailed in the CTF.

Stripe coat shall be applied by brush or roller. Roller shall be used for scallops, ratholes, etc., only.

Each main coating layer shall be appropriately cured before application of the next coat, in accordance with the coating manufacturer's recommendations.

Job specifications shall include the dry-to-recoat times and walk-on time given by the manufacturer.

Surface contaminants such as rust, grease, dust, salt, oil, etc., shall be removed prior to painting. The method to be

according to the paint manufacturer's recommendations. Abrasive inclusions embedded in the coating shall be removed.

1.5 NDFT (nominal total dry film thickness)[5]

NDFT 320 µm with 90/10 rule for epoxy-based systems; other systems to the coating manufacturer's specifications. Maximum total dry film thickness according to the manufacturer's detailed specifications.

Care shall be taken to avoid increasing the DFT in an exaggerated way. Wet film thickness shall be regularly checked during application.

Thinners shall be limited to those types and quantities recommended by the manufacturer."

Interpretation

Wet film thickness shall be regularly checked during application for quality control by the Builder. PSPC-COT does not state who should check WFT, it is accepted for this to be the Builder. Measurement of DFT shall be done as part of the inspection required in PSPC-COT 6.

Stripe coats should be applied as a coherent film showing good film formation and no visible defects. The application method employed should insure that all areas that require stripe coating are properly coated by brush or roller. A roller may be used for scallops, ratholes etc., but not for edges and welds.

Conventions/Codes Requirements

PSPC-COT 4 Table 1: 2 PSP (Primary Surface Preparation)

"2. PSP (Primary Surface Preparation)

2.1 Blasting and profile[2, 3]

Sa $2^{1/2}$; with profiles between 30-75 µm

Blasting shall not be carried out when:

.1 the relative humidity is above 85%; or

.2 the surface temperature of steel is less than 3 ℃ above the dew point.

Checking of the steel surface cleanliness and roughness profile shall be carried out at the end of the surface preparation and before the application of the primer, and in accordance with the coating manufacturer's recommendations.

2.2 Water soluble salt limit equivalent to NaCl[4]

$\leq$ 50 mg/m^2 of sodium chloride.

2.3 Shop primer

Zinc containing inhibitor free zinc silicate based or equivalent. Compatibility with main coating system shall be confirmed by the coating manufacturer."

Interpretation

of para 2.2:

The conductivity of soluble salts is measured in accordance with ISO 8502-6 and ISO 8502-9 or equivalent method as validated according to NACE SP0508-2010, and compared with the conductivity of 50 mg/m^2 NaCl. If the measured conductivity is less than or equal to, then it is acceptable. Minimum readings to be taken are one (1) per plate in the case of manually applied shop primer. In cases where an automatic process for application of shop primer is used, there should be means to demonstrate compliance with PSPC-COT through a Quality Control System, which should include a monthly test.

of para 2.3:

Shop primers not containing zinc or not silicate based are considered to be "alternative systems" and therefore equivalency is to be established in accordance with Section 8 of the PSPC-COT with test acceptance criteria for "alternative systems" given in section 3.1 (right columns) of Appendixes 1 and 2 to ANNEX 1 of PSPC-COT.

Procedure for review of Quality Control of Automated Shop Primer plants

1 It is recognised that the inspection requirements of PSPC-COT 6.2 may be difficult to apply to an automated shop primer plant and a Quality Control approach would be a more practical way of enabling compliance with the requirements of PSPC-COT.

2 As required in PSPC it is the responsibility of the coating inspector to confirm that the quality control procedures are ensuring compliance with PSPC-COT.

3 When reviewing the Quality Control for automated shop primer plants the following procedures should be included.

3.1 Procedures for management of the blasting grit including measurement of salt and contamination.

3.2 Procedures recording the following; steel surface temperature, relative humidity, dewpoint.

3.3 Procedures for controlling or monitoring surface cleanliness, surface profile, oil, grease, dust and other contamination.

3.4 Procedures for recording/measuring soluble salts.

3.5 Procedures for verifying thickness and curing of the shop primer conforms to the values specified in the Technical Specification.

Conventions/Codes Requirements

PSPC-COT 4 Table 1: 3 SSP (Secondary Surface Preparation)

"3.2 Sa 2 $^1/_2$ on damaged shop primers and welds

All surfaces to be coated shall be blasted to Sa 2 removing at least 70% of intact shop primer, which has not past a prequalification certified by test procedures in table 1.3."

"3.3 Surface treatment after erection

Erection joints St 3 or better or Sa $2^1/_2$ where practicable.

For inner bottom:

- *Damages up to 20% of the area to be coated to be treated to minimum St 3.*
- *Contiguous damages over 25 m^2 or over 20% of the area to be coated, Sa $2^1/_2$ shall be applied.*

For underdeck:

- *Damages up to 3% of area to be coated to be treated to minimum St 3.*
- *Contiguous damages over 25 m^2 or over 3% of the area to be coated, Sa $2^1/_2$ shall be applied.*

Coating in overlap shall be feathered."

"3.4 In case of full or partial blasting 30-75 µm, otherwise as recommended by the coating manufacturer."

Interpretation

Usually, the fillet welding on tank boundary watertight bulkhead is left without coating on block stage (because not yet be leakage tested), in which case it can be categorized as erection joint ("butt") to be power tooled to St 3.

Conventions/Codes Requirements

PSPC-COT 4 Table 1: 3 SSP (Secondary Surface Preparation)

"3.6 Water soluble salts limit equivalent to NaCl after blasting/grinding[9]

≤ 50 mg/m^2 of sodium chloride."

Interpretation

The conductivity of soluble salts is measured in accordance with ISO 8502-6 and ISO 8502-9, or equivalent method as validated according to NACE SP0508-2010, and compared with the conductivity of 50 mg/m2 NaCl. If the measured conductivity is less than or equal to, then it is acceptable.

All soluble salts have a detrimental effect on coatings to a greater or lesser degree. ISO 8502-9:1998 does not provide the actual concentration of NaCl. The % NaCl in the total soluble salts will vary from site to site. Minimum readings to be taken are one (1) reading per block/section/unit prior to applying.

Conventions/Codes Requirements

PSPC-COT 4 Table 1: 4 Miscellaneous

"4.3 Testing of coating[10]

Destructive testing should be avoided.

Sample dry film thickness shall be measured after each coat for quality control purpose and the total dry film thickness shall be confirmed after completion of final coat, using appropriate thickness gauges."

Interpretation

All DFT measurements shall be measured. Only the final DFT measurements need to be measured and reported for compliance with the PSPC-COT by the qualified coating inspector. The Coating Technical File may contain a summary of the DFT measurements which typically will consist of minimum and maximum DFT measurements, number of measurements taken and percentage above and below required DFT. The final DFT compliance with the 90/10 practice shall be calculated and confirmed, see PSPC-COT 2.8.

Conventions/Codes Requirements

PSPC-COT 5 COATING SYSTEM APPROVAL

"Results from pre-qualification tests (Table 1, paragraph 1.3) of the coating system shall be documented and a Statement of Compliance or Type Approval Certificate shall be issued if found satisfactory by a third party, independent of the coating manufacturer."

Interpretation

See Interpretation of PSPC-COT Table 1: 1 Design of coating system, 1.3 Coating prequalification test.

Conventions/Codes Requirements

PSPC-COT 6 COATING INSPECTION REQUIREMENTS

"6.1 General

6.1.1 To ensure compliance with this Standard, the following shall be carried out by qualified coating inspectors certified to NACE Coating Inspector Level 2, FROSIO Inspector Level III or equivalent as verified by the Administration.

6.1.2 Coating inspectors shall inspect surface preparation and coating application during the coating process by carrying out, as a minimum, those inspection items identified in subsection 6.2 to ensure compliance with this Standard. Emphasis shall be placed on initiation of each stage of surface preparation and coatings application as improper work is extremely difficult to correct later in the coating progress. Representative structural members shall be non-destructively examined for coating thickness. The inspector shall verify that appropriate collective measures have been carried out.

6.1.3 Results from the inspection shall be recorded by the inspector and shall be included in the CTF (refer to annex 2)."

Interpretation

Procedure for Assessment of Coating Inspectors' Qualifications

1 Coating inspectors required to carry out inspections in accordance with the PSPC-COT 6 shall be qualified to NACE Coating Inspector Level 2, FROSIO Inspector Level III, or an equivalent qualification. Equivalent qualifications are described in 3 below.

2 However, only coating inspectors with at least 2 years relevant coating inspector experience and qualified to NACE Coating Inspector Level 2 or FROSIO Inspector Level III, or with an equivalent qualification, can write and/or authorise procedures, or decide upon corrective actions to overcome non-compliances.

3 Equivalent Qualification

3.1 Equivalent qualification is the successful completion, as determined by course tutor, of an approved course.

3.1.1 The course tutors shall be qualified with at least 2 years relevant experience and qualified to NACE Coating Inspector Level 2 or FROSIO Inspector Level III, or with an equivalent qualification.

3.1.2 Approved Course: A course that has a syllabus based on the issues associated with the PSPC including the following:

- Health Environment and Safety
- Corrosion
- Materials and design
- International standards referenced in PSPC
- Curing mechanisms
- Role of inspector
- Test instruments
- Inspection Procedures
- Coating specification
- Application Procedures
- Coating Failures
- Pre-job conference
- MSDS and product data sheet review
- Coating technical file
- Surface preparation
- Dehumidification
- Waterjetting
- Coating types and inspection criteria
- Specialized Application Equipment
- Use of inspection procedures for destructive testing and non destructive testing instruments.
- Inspection instruments and test methods
- Coating inspection techniques
- Cathodic protection
- Practical exercises, case studies.

Examples of approved courses may be internal courses run by the coating manufacturers or shipyards etc.

3.1.3 Such a course shall have an acceptable measurement of performance, such as an examination with both theoretical and practical elements. The course and examination shall be approved by the Administration.

3.2 Equivalent qualification arising from practical experience: An individual may be qualified without

attending a course where it can be shown that the individual:

- has a minimum of 5-years practical work experience as a coating inspector of ballast tanks and/or cargo tanks during new construction within the last 10 years, and
- has successfully completed the examination given in 3.1.3.

4 Assistants to coating Inspectors

4.1 If the coating inspectors requires assistance from other persons to perform part of the inspections, those persons shall perform the inspections under the coating inspector's supervision and shall be trained to the coating inspector's satisfaction.

4.2 Such training should be recorded and endorsed either by the inspector, the yard's training organisation or inspection equipment manufacturer to confirm competence in using the measuring equipment and confirm knowledge of the measurements required by the PSPC-COT.

4.3 Training records shall be available for verification if required.

Conventions/Codes Requirements

PSPC-COT 7 COATING VERIFICATION REQUIREMENTS

"The following shall be carried out by the Administration prior to reviewing the Coating Technical File for the ship subject to this Standard:

.1 check that the Technical Data Sheet and Statement of Compliance or Type Approval Certificate comply with the Standard;

.2 check that the coating identification on representative containers is consistent with the coating identified in the Technical Data Sheet and Statement of Compliance or Type Approval Certificate;

.3 check that the inspector is qualified in accordance with the qualification standards in paragraph 6.1.1;

.4 check that the inspector's reports of surface preparation and the coating's application indicate compliance with the manufacturer's Technical Data Sheet and Statement of Compliance or Type Approval Certificate; and

.5 monitor implementation of the coating inspection requirements."

Interpretation

Procedure for Verification of Application of the PSPC-COT

1 The verification requirements of PSPC-COT 7 shall be carried out by the Administration.

1.1 Monitoring implementation of the coating inspection requirements, as called for in PSPC-COT 7.5 means checking, on a sampling basis, that the inspectors are using the correct equipment, techniques and reporting methods as described in the inspection procedures reviewed by the Administration.

2 Any deviations found under 1.1 shall be raised initially with the coating inspector, who is responsible for identifying and implementing the corrective actions.

3 In the event that corrective actions are not acceptable to the Administration or in the event that corrective actions are not closed out then the shipyard shall be informed.

4 Cargo Ship Safety Certificate or Cargo Ship Safety Construction Certificate, as appropriate, shall not be issued until all required corrective actions have been closed out to the satisfaction of the Administration.

Conventions/Codes Requirements

PSPC-COT Annex 1: TEST PROCEDURES FOR COATING QUALIFICATION FOR CARGO OIL TANKS OF CRUDE OIL CARRIERS

Annex 1 Footnotes of Standards

"Footnotes:

12 Related test method is derived from, but not identical to, standard ISO 2812-1:2007 -Paints and varnishes - Determination of resistance to liquids - Part 1: Immersion in liquids other than water.

13 Refer to standard ISO 8217:2005 - Petroleum products - Fuels (class F) - Specifications of marine fuels.

14 Refer to standard ISO 6618:1997 - Petroleum products and lubricants - Determination of acid or base number - Colour-indicator titration method.

15 Refer to standard ASTM D1141 - 98(2008) - Standard Practice for the Preparation of Substitute Ocean Water.

16 Refer to standard ISO 2811-1/4:1997 - Paints and varnishes. Determination of density.

17 Six equally distributed measuring points are used on panels size 150 mm x 100 mm.

18 Refer to the following standards:

.1 ISO 4628-1:2003 - Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 1: General introduction and designation system;

.2 ISO 4628-2:2003 - Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 2: Assessment of degree of blistering; and

.3 ISO 4628:2003 - Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of common types of defect - Part 3: Designation of degree of rusting.

19 It should be noted that the test is valid irrespective of production site, meaning that no individual testing of product from different production sites is required.

20 Refer to the following standards:

.1 ISO 8502-6:2006. Preparation of steel substrates before application of paints and related products Tests for the assessment of surface cleanliness - Part 6: Extraction of soluble contaminants for analysis - The Bresle method; and

.2 ISO 8502-9:1998. Preparation of steel substrates before application of paints and related products - Tests for the assessment of surface cleanliness - Part 9: Field method for the conductometric determination of water-soluble salts.

21 Both of actual specimen data and manufacturer's requirement/recommendation.

22 See footnote 12 above

23 See footnote 16 above

24 Six equally distributed measuring points are used on panels size 150 mm x 100 mm.

25 See footnote 18 above

26 It should be noted that the test is valid irrespective of production site, meaning that no individual testing of product from different production sites is required.

27 See footnote 20 above

28 Both of actual specimen data and manufacturer's requirement/recommendation."

Interpretation

Only the footnoted standards referred to in Annex 1 are to be applied, i.e. they are mandatory.

Technical Background

According to UI SC223(Rev.3), UI SC259 is revised.

Remarks

The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.240 Sample Extraction Smoke Detection System

Conventions (Amend.), Reg.		**FSS Code / Chapter 10 / 2.4.1.2 as amended by MSC.292 (87)**					
IACS UI Number	**SC260**	**UI** version	**Mar 2013/ Rev.1, Jun., 2015**	Date of implementation	**Rev.1, Jan.1, 2016**	Means of implementation	
Conventions/Codes Requirements							
FSS Code 10.2.4.1.2:							

The control panel shall be located on the navigation bridge or in the fire control station. An indicating unit shall be located on the navigation bridge if the control panel is located in the fire control station.

SOLAS II-2/3.18 (Definitions):

Control stations are 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.

SOLAS II-2/10.4.3 (Storage rooms of fire extinguishing medium):

When the fire extinguishing medium is stored outside a protected space, it shall be stored in a room which is located behind the forward collision bulkhead, and is used for no other purposes. Any entrance to such a storage room shall preferably be from the open deck and shall be independent of the protected space. If the storage space is located below deck, it shall be located no more than one deck below the open deck and shall be directly accessible by a stairway or ladder from the open deck. Spaces which are located below deck or spaces where access from the open deck is not provided, shall be fitted with a mechanical ventilation system designed to take exhaust air from the bottom of the space and shall be sized to provide at least 6 air changes per hour. Access doors shall open outwards, and bulkheads and decks including doors and other means of closing any opening therein, which form the boundaries between such rooms and adjacent enclosed spaces shall be gastight. For the purpose of the application of tables 9.1 to 9.8, such storage rooms shall be treated as fire control stations.

Interpretation

If the CO_2 system discharge pipes are used for the sample extraction smoke detection system, the control panel can be located in the CO_2 room provided that an indicating unit* is located on the navigation bridge. Such arrangements are considered to satisfy the requirements of the regulation of FSS Code 10.2.4.1.2 as amended by MSC.292(87).

*Indicating unit has the same meaning as repeater panel and observation of smoke should be made either by electrical means or by visual on repeater panel.

Technical Background

To align SC260 with text of MSC.1/Circ.1487.

Remarks

1. This Unified Interpretation is to be uniformly implemented by IACS Societies not later than 1 January 2014.
2. Rev.1 of this Unified Interpretation is to be uniformly implemented by IACS Societies not later than 1 January 2016.

1.241 Interpretation of Performance Standards for voyage data recorders (VDRs)

Conventions (Amend.), Reg.		**Resolution MSC.333(90)**					
IACS UI Number	**SC261**	**UI version**	May. 2013	**Date of implementation**	Jul.1,2014	**Means of implementation**	

Conventions/Codes Requirements

Operative paragraph 2 of resolution MSC.333(90) read:

2. RECOMMENDS Governments to ensure that VDRs:

.1 if installed on or after 1 July 2014, conform to performance standards not inferior to those specified in the annex to the present resolution; and

.2 if installed before 1 July 2014, conform to performance standards not inferior to those specified in the annex to resolution A.861(20), as amended by resolution MSC.214(81).

Interpretation

For application of resolution MSC.333(90), the phrase "installed on or after 1 July 2014" shall be interpreted as follows:

(a) for ships for which the building contract is placed on or after 1 July 2014, or in the absence of the contract,

constructed on or after 1 July 2014, "installed on or after 1 July 2014" means any installation on the ship; and
(b) for ships other than those ships prescribed in (a) above, "installed on or after 1 July 2014" means a contractual delivery date for the equipment or, in the absence of a contractual delivery date, the actual delivery of the equipment to the ship on or after 1 July 2014.

Technical Background

The source of the interpretation of "install" is similar to MSC.1/Circ.1375/Rev.1 given therein.

Remarks

The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.242 Fixed Foam Fire Extinguishing Systems, Foam generating Capacity

Conventions (Amend.), Reg.		**FSS Code CHAPTER 6 3.2.1.2 and 3.3.1.2 as amended by Res. MSC.327(90)**					
IACS UI Number	**SC262**	**UI** version	**Jun., 2013/ Rev.1, May 2015**	Date of implementation	**Rev.1，Jan.1, 2016**	Means of implementation	**contracted for construction**

Conventions/Codes Requirements

FSS Code Ch. 6, (as amended by Res. MSC.327(90)) 3.2.1.2 and 3.3.1.2:
Sufficient foam-generating capacity shall be provided to ensure the minimum design filling rate for the system is met and in addition shall be adequate to completely fill the largest protected space within 10 min.

Interpretation

1. This interpretation of the term "largest protected space" applies to a Machinery space of category A protected by a fixed high-expansion foam fire-extinguishing system complying with the provisions of the FSS Code.
2. Where such a machinery space includes a casing (e.g. an engine casing in a machinery space of category A containing internal combustion machinery, and/or a boiler), the volume of such casing, above the level up to which foam shall be filled to protect the highest position of the fire risk objects within the machinery space, need not be included in the volume of the protected space (See Figure 1).
3. The level up to which foam shall be filled to protect the highest positioned fire risk objects within the machinery space shall not be less than:
• 1 m above the highest point of any such object; or
• the lowest part of the casing,
whichever is higher (See Figure 1).
4. Where such a machinery space does not include a casing, the volume of the largest protected space shall be that of the space in its entirety, irrespective of the location of any fire risk object therein (See Figure 2).
5. Fire risk objects include, but may not be limited to, those listed in SOLAS regulation II-2/3.31, and those defined in regulation II-2/3.34. Although not referred to in those regulations, they may also include items having a similar fire risk such as exhaust gas boilers or oil fuel tanks.

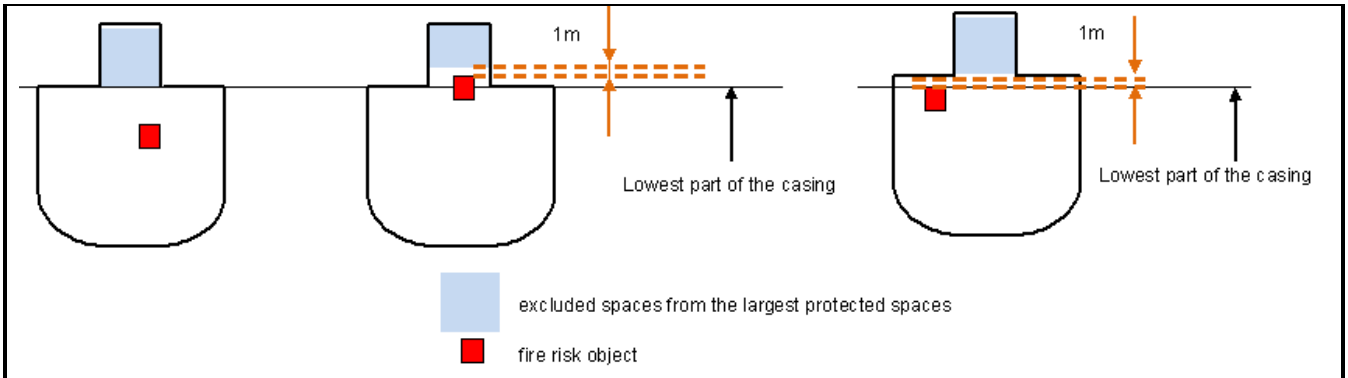


Figure 1 Machinery space including a casing

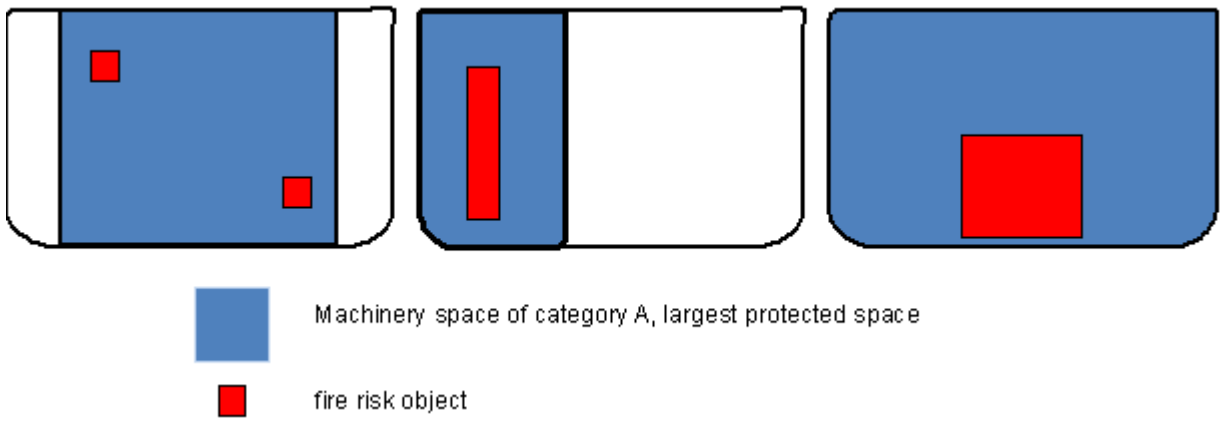


Figure 2 Machinery space not including a casing

Technical Background
To clarify a definition of the term “largest protected space” together with explanatory figures and other fire risk items, taking into account the comments made by Member States at SSE 1 held in March 2014.
Remarks
1. This Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2014. 2. Rev.1 is to be applied by IACS Societies on ships contracted for construction on or after 1 January 2016. 3. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.243 Gaskets in fixed gas fire-extinguishing systems

Conventions (Amend.), Reg.		**Regulation of SOLAS II-2/10.4 International Code for Fire Safety Systems (FSS Code) Ch 5/2.1.2.5**					
IACS UI Number	**SC 263**	**UI** version	**Oct.,2013**	Date of impleme ntation	**Jul.1,2014**	Means of impleme ntation	**Date of contracted for construction**
Conventions/Codes Requirements							

FSS Code Chapter 5 item 2.1.2.5, as amended by IMO Res. MSC.206(81), reads:
All discharge piping, fittings and nozzles in the protected spaces shall be constructed of materials having a melting temperature which exceeds 925 ℃. The piping and associated equipment shall be adequately supported.

Interpretation

Deleted.

Technical Background

Remarks

IACS decided to delete the UI in light of the comments received at SSE 1.

1.244 Non-combustible material as 'steel or equivalent' for ventilation ducts

Conventions (Amend.), Reg.		SOLAS II-2, Reg. 9.7.1.1					
IACS UI Number	**SC264**	**UI** version	**Dec.,2013**	Date of implementation	**Jul.1,2015**	Means of implementation	**contracted for construction**

Conventions/Codes Requirements

SOLAS II-2, Reg. 9.7.1.1:

Ventilation ducts shall be of steel or equivalent material. However, short ducts, not generally exceeding 2 m in length and with a free cross-sectional area not exceeding 0.02 m^2, need not be steel or equivalent subject to the following conditions:

.1 subject to paragraph 7.1.1.2 the ducts are made of any material which has low flame spread characteristics;

.2 on ships constructed on or after 1 July 2010, the ducts shall be made of heat resisting non-combustible material, which may be faced internally and externally with membranes having low flame-spread characteristics and, in each case, a calorific value† not exceeding 45 MJ/m^2 of their surface area for the thickness used;

.3 the ducts are only used at the end of the ventilation device; and

.4 the ducts are not situated less than 600 mm, measured along the duct, from an opening in an "A" or "B" class division including continuous "B" class ceiling.

Interpretation

With respect only to SOLAS II-2/9.7.1.1, a ventilation duct made of material other than steel may be considered equivalent to a ventilation duct made of steel, provided the material is non-combustible and has passed a standard fire test in accordance with Annex 1: Part 3 of the FTP Code as non-load bearing structure for 30 minutes following the requirements for testing "B" class divisions.

Technical Background

A member of Statutory Panel had been consulted whether to approve a non-combustible material as 'steel or equivalent' in order to be used for ventilation ducts (SOLAS II-2/9.7.1.1). As considering no testing method available to prove steel equivalence, the approach discussed was to perform a standard fire test with steel ducts and ducts made of this non-combustible material according to part 3 of the FTP Code as non-load bearing structure for 30 minutes following the requirements for testing "B" class divisions, and to perform afterwards a strength test in order to check the integrity of the duct made of non-combustible material. Subject to satisfactory tests the material would then be equivalent to steel (used as non-load bearing structure only).

It was recognized that this does not apply to ventilation ducts which are required to be made of solely steel by

other regulations of SOLAS Chapter II-2 (e.g., ventilation ducts provided for the ventilation of machinery spaces of category A, galleys, vehicle spaces, ro-ro spaces or special category spaces as well as ducts which are part of the structure). Consequently e.g. ducts made of the non-combustible material should then not be used for galley exhaust ventilation systems.

Remarks

The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.245 Code of Safe Practice for Cargo Stowage and Securing (CSS Code): Annex 14

Conventions (Amend.), Reg.		**Paragraph 6.2 & 6.4, Code of Safe Practice for Cargo Stowage and Securing (CSS Code): Annex 14**					
IACS UI Number	**SC 265**	**UI** version	**Dec.2013**	Date of implementation	**Jan.1,2015**	Means of implementation	

Conventions/Codes Requirements

MSC.1/Circ.1352 – Annex - Amendments to the Code of Safe Practice for Cargo Stowage and Securing (CSS Code): Annex 14 – Guidance on Providing Safe Working Conditions for Securing of Containers on Deck

6 Design

6.2 Provisions for safe access

6.2.1 General provisions

6.2.1.1 The minimum clearance for transit areas should be at least 2 m high and 600 mm wide.

6.2.2 Lashing position design (platforms, bridges and other lashing positions)

6.2.2.1 Lashing positions should be designed to eliminate the use of three high lashing bars and be positioned in close proximity to lashing equipment stowage areas. Lashing positions should be designed to provide a clear work area which is unencumbered by deck piping and other obstructions and take into consideration:

.1 the need for containers to be stowed within safe reach of the personnel using the lashing position so that the horizontal operating distance from the securing point to the container does not exceed 1,100 mm and not less than 220 mm for lashing bridges and 130 mm for other positions;

6.2.2.2 The width of the lashing positions should preferably be 1,000 mm, but not less than 750 mm.

6.2.2.3 The width of permanent lashing bridges should be:

.1 750 mm between top rails of fencing; and

.2 a clear minimum of 600 mm between storage racks, lashing cleats and any other obstruction.

Interpretation

6.2.1.1. See Table, Dimensions B, J, K1.

6.2.2.1. See Table, Dimensions C1, C2, C3.

6.2.2.2. See Table, Dimensions A, GL, GT, I, K.

6.2.2.3.

.1. See Table, Dimension F.

.2. See Table, Dimension F1.

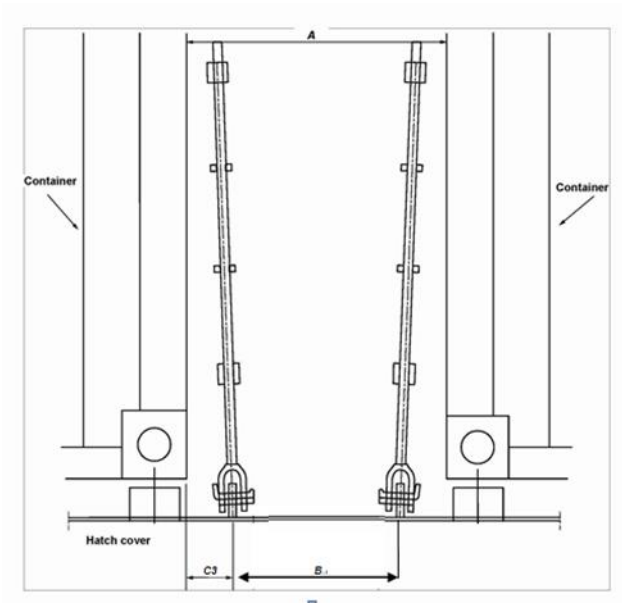


Figure 1

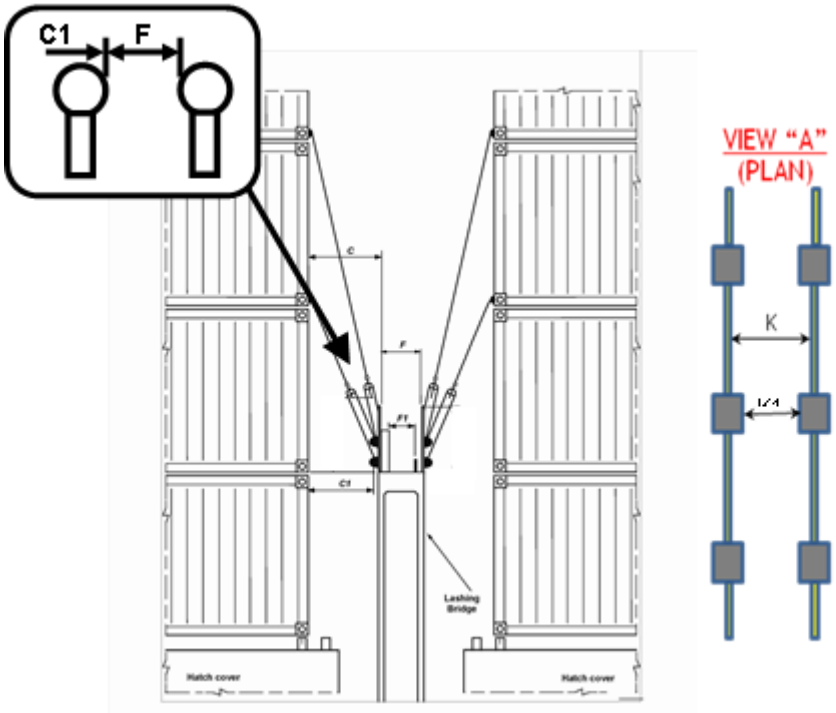


Figure 2

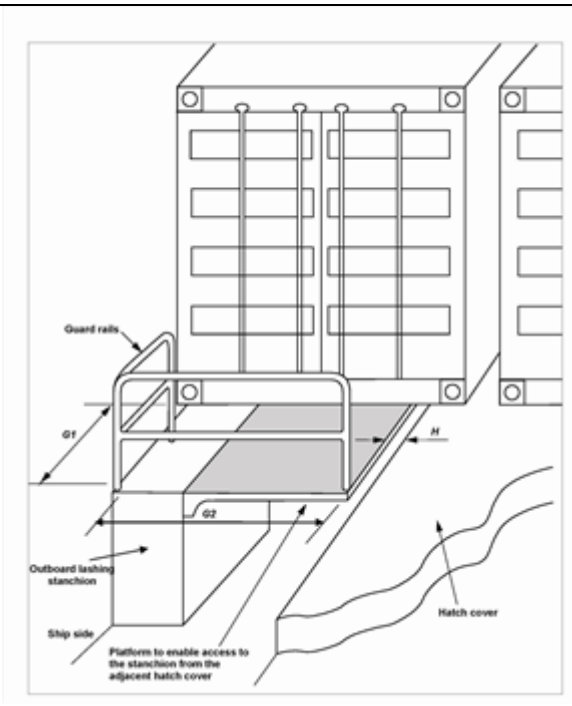


Figure 3

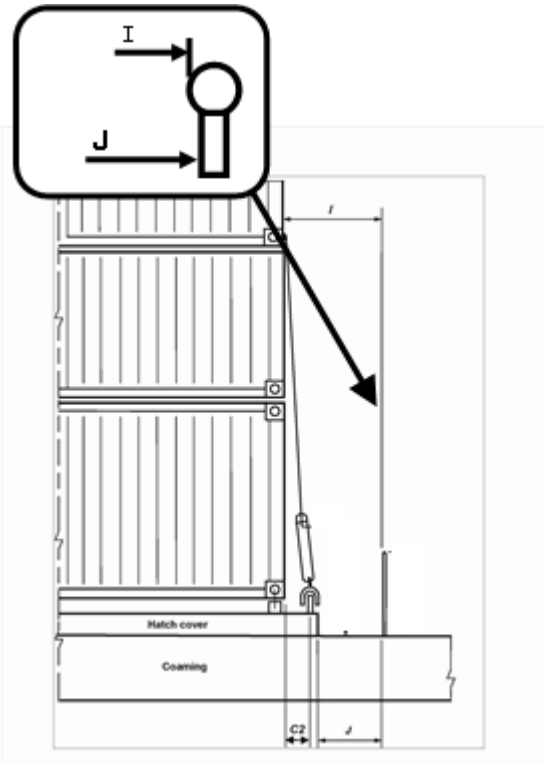


Figure 4

Container securing dimensions

Dimension (*see* Figures)	Description	Requirement (mm)
A	Width of work area between container stacks	750 minimum
B	Distance between lashing plates on deck or on hatch covers	600 minimum
C1	Distance from lashing bridge fencing to container stack	1100 maximum
C2	Distance from lashing plate to container stack (lashing bridge)	220 minimum

C3	Distance from lashing plate to container stack (elsewhere)	130 minimum
F	Width of lashing bridge between top rails of fencing	750 minimum
F1	Width of lashing bridge between storage racks, lashing cleats and any other obstruction	600 minimum
GL	Width of working platform for outboard lashing – fore/aft	750 minimum
GT	Width of working platform for outboard lashing – transverse	750 minimum
I	Width of work platform at end of hatch cover or adjacent to superstructure	750 minimum
J	Distance from edge of hatch cover to fencing	600 minimum
K	Width of lashing bridge between top rails of fencing	750 minimum
K1	Width of lashing bridge between the pillars of the lashing bridge	600 minimum

NOTES
B - Measured between the centres of the lashing plates.
C1 - Measured from inside of fencing.
C2, C3 - Measured from centre of lashing plate to end of container.
F, K - Measured to inside of fencing.
GL - Measured from end of container to inside of fencing.
GT - Measured to inside of fencing.
I - Measured to inside of fencing.
J - Measured to inside of fencing.

Conventions/Codes Requirements

6.4 Lighting design

A lighting plan should be developed to provide for:

.1 the proper illumination of access ways, not less than 10 lux (1 foot candle), taking into account the shadows created by containers that may be stowed in the area to be lit, for example different length

containers in or over the work area;

.4 the illumination intensity should take into consideration the distance to the uppermost reaches where cargo securing equipment is utilized.

Interpretation

6.4 For the upper tier of a lashing bridge, lights at the port and starboard extremities are generally adequate.

Technical Background

IACS drafted a UI to interpret the possible ambiguity of dimension for safety access in the implement of CSS Code Annex 14（MSC.1/Circ.1352）.

Remarks

This Unified Interpretation is to be uniformly implemented by IACS Societies on all ships as defined in Section 2 of Annex 14 of the CSS Code, to which the administration has required the application of MSC.1/Circ.1352.

1.246 Revised guidelines for cargo securing manual and code of safe practice for cargo stowage and securing - scope of application

Conventions (Amend.), Reg.		**Paragraphs 2,MSC.1/Circ.1352; Paragraphs 4,MSC.1/Circ.1353**					
IACS UI Number	**SC 266**	**UI** version	**Dec.,2013**	Date of implementation	**Jan.1,2015**	Means of implementation	

Conventions/Codes Requirements

MSC.1/Circ.1352

2 Member Governments are invited to bring the annexed Amendments to the CSS Code to the attention of shipowners, ship operators, shipmasters and crews and all other parties concerned and, in particular, encourage

shipowners and terminal operators to:

.1 apply the annexed amendments in its entirety for containerships, the keels of which were laid or which are at a similar stage of construction on or after 1 January 2015;

.2 apply sections 4.4 (Training and familiarization), 7.1 (Introduction), 7.3 (Maintenance) and section 8 (Specialized container safety design) to existing containerships, the keels of which were laid or which are at a similar stage of construction before 1 January 2015; and

.3 apply the principles of this guidance contained in sections 6 (Design) and 7.2 (Operational procedures) to existing containerships as far as practical by the flag State Administration with the understanding that existing ships would not be required to be enlarged or undergo other major structural modifications as determined.

MSC.1/Circ.1353

4 Member Governments are invited to bring these Guidelines to the attention of all parties concerned, with the aim of having Cargo Securing Manuals carried on board ships prepared appropriately and in a consistent manner, and to:

.1 apply the revised guidelines in its entirety for containerships, the keels of which were laid or which are at a similar stage of construction on or after 1 January 2015; and

.2 apply chapters 1 to 4 of the revised guidelines to existing containerships, the keels of which were laid or which were at a similar stage of construction before 1 January 2015.

Interpretation

Reference to containerships means dedicated container ships and those parts of other ships for which arrangements are specifically designed and fitted for the purpose of carrying containers on deck.

Technical Background

IACS drafted a UI to interpret the possible ambiguity of the definition for "Containerships" in the implement of CSS Code Annex 14（MSC.1/Circ.1352）and revised guidelines for the preparation of the cargo securing manual（MSC.1/Circ.1353）.

Remarks

This Unified Interpretation is to be uniformly implemented by IACS Societies on or after 1 January 2015 on all ships as defined in Section 2 of Annex 14 of the CSS Code, to which the administration has required the application of MSC.1/Circ.1352 or MSC.1/Circ.1353, as relevant.

1.247 Implementation of the requirements relating to lifeboat release and retrieval systems

Conventions (Amend.), Reg.		**LSA Code, paragraph 4.4.7.6.9, as amended by resolution MSC.320(89)**					
IACS UI Number	**SC267**	**UI** version	**Jan.,2015/ Rev.1, Jan., 2016/Rev.2,Sept., 2016**	Date of implementation	**01.01.2016/ Rev.1,01.07. 2016/ Rev.2,01.01. 2017**	Means of implementation	

Conventions/Codes Requirements

LSA Code, paragraph 4.4.7.6.9, as amended by resolution MSC.320(89):

.9 all components of the hook unit, release handle unit, control cables or mechanical operating links and the fixed structural connections in a lifeboat shall be of material corrosion resistant in the marine environment without the need for coatings or galvanizing. ...

Interpretation

Interpretation

All Interlocks ("mechanical protection" of on load release), which include hydrostatic components in the operating mechanism, shall also be of material corrosion resistant in the marine environment.

1) Where stainless steel having a Pitting Resistance Equivalent Number (PREN = 1 • %Cr + 3.3 (%Mo + 0.5 • %W) + 16 • %N) of 22or more is chosen, such stainless steel do not need to be subjected to ISO 9227:2012 or other equivalent recognized national standard.
2) Where stainless steel having a PREN < 22, or another corrosion resistant material/alloy is chosen, the material is to be qualified by corrosion test according to ISO 9227:2012 or other equivalent recognized national standard. When the test is carried out in accordance with ISO 9227:2012, neutral salt spray (NSS) is to be used, with 1000 hours test duration for components outside the lifeboat, and 160 hours for those inside the lifeboat. The salt spray tests may be conducted by using round specimens (diameter is 14mm) according to IACS UR W2.4.2.
3) After the salt spray test, the release mechanism shall be subjected to load and release test as described in resolution MSC.81(70), as amended by resolution MSC.321(89), part 1, paragraph 6.9.4.1 to demonstrate satisfactory operation. The load and release shall be repeated 10 times. Where specimens are used for the salt spray tests, tensile tests shall be conducted in lieu of the load and release test. The results from the tests shall be in order to verify that the reduction in the ultimate tensile strength and reduction in cross sectional area ratio is less than 5% between corrosion tested and non-corrosion tested specimens.
4) Where austenitic stainless steels (e.g. 316L or 316) are used for welded structures, the risk of sensitisation to intergranular corrosion is to be addressed by the component manufacturer's quality control system.
5) Austenitic stainless steels 201, 304, 321, 347 are susceptible to pitting and crevice corrosion, and therefore unsuitable for these applications.
6) For operating cables covered with sheath and installed inside the lifeboat, inner cables made of austenitic stainless steels 304 are acceptable without the corrosion test above.

Technical Background

1. in MSC 90/9/3 concern that the amended resolution MSC.320 (89) makes no reference to the appropriate corrosion tests to be applied to components identified in paragraph 4.4.7.6.9 of the LSA Code, as amended by resolution MSC.320 (89).
2. Discussions were had over the grade of stainless steels to be used, an appropriate corrosion resistance test standard and the pitting resistance equivalent number (PREN) of the metals which should be used to determine the grades of metal that would be subject to a corrosion test.
3. The Operating cables are inside the lifeboat and usually covered with a sheath (i.e. they are not in a corrosive environment) and thus IACS UI SC267 and the LSA Code would not prohibit the "inner cables" being made of 304 type stainless steel.

Conventions/Codes Requirements

LSA Code, paragraph 4.4.7.6.7.2, as amended by resolution MSC.320(89):

... This release mechanism shall be provided with a hydrostatic interlock unless other means are provided to ensure

that the boat is waterborne before the release mechanism can be activated. In case of failure or when the boat is not waterborne, there shall be a means to override the hydrostatic interlock or similar device to allow emergency release ...

LSA Code, paragraph 4.4.7.6.6, as amended by resolution MSC.320(89):

.6 if a hydrostatic interlock is provided, it shall automatically reset upon lifting the boat from the water.

Interpretation

The reset function as required by paragraph 4.4.7.6.6 is also to apply to the "other means" or "similar device" referred to in paragraph 4.4.7.6.7.2. Where a safety pin is fitted to facilitate compliance with SOLAS regulation III/1.5 then, in line with paragraph 4 of the Annex to MSC.1/Circ.1327, the safety pin arrangement must be acceptable to the hook manufacturer (as defined in paragraph 9.9 of the Annex to MSC.1/Circ.1392).

Conventions/Codes Requirements

LSA Code, paragraph 4.4.7.6.14, as amended by resolution MSC.320(89):

.14 the load-bearing components of the release mechanism and the fixed structural connections in the lifeboat shall be designed with a calculated factor of safety of 6 based on the ultimate strength of the materials used, and the mass of the lifeboat when loaded with its full complement of persons, fuel and equipment, assuming the mass of the lifeboat is equally distributed between the falls, except that the factor of safety for the hanging-off arrangement may be based upon the mass of the lifeboat when loaded with its full complement of fuel and equipment plus 1,000 kg; ...

Interpretation

The hanging off arrangement (including the connections to the lifeboat RRS and davit) shall be designed with a calculated factor of safety of 6 based on the ultimate strength of the materials used, and mass of the lifeboat when loaded with its full complement of fuel and equipment plus 1,000 kg equally distributed between the falls.

Technical Background

1. In MSC 90/9/3 that for many hook designs the Safe Working Load requirement for a Fall Preventer Device (FPD) is the Total Davit Load, i.e. boat + equipment + complement of persons; whereas the maintenance lug on the release hook is designed for the empty boat weight plus 1,000 kg.
2. Although it was noted that MSC.1/Circ.1327 includes a provision for strops and slings to have a factor of safety of six, Resolution MSC.81(70) does not provide any requirements regarding the hanging off/FPD arrangement of the release gear mechanism (e.g. testing procedures to prove the safety factor of the maintenance lug on the release hook), nor does it include any prescriptive text to verify the LSA Factor of Safety of six for the fixed structural connections of the release mechanism in the lifeboat and davit.

Remarks

1.This Unified Interpretation is to be uniformly implemented by IACS Societies for approvals issued in accordance with SOLAS III/34 and the LSA Code on or after 1 January 2016.

2. Revision 1 of this Unified Interpretation is to be uniformly implemented by IACS Societies for approvals issued in accordance with SOLAS III/34 and the LSA Code no later than 1 July 2016.

3.Revision 2 of this Unified Interpretation is to be uniformly implemented by IACS Societies for approvals issued in accordance with SOLAS III/34 and the LSA Code no later than 1 January 2017.

1.248 Arrangements for fixed hydrocarbon gas detection systems in double-hull and double-bottom spaces of oil tankers

Conventions (Amend.), Reg.		**SOLAS Chapter II-2, Regulation 4.5.7.3.1**					
IACS UI Number	**SC268**	**UI** version	**Mar.,2014**	Date of impleme ntation	**Jul.1,2015**	Means of impleme ntation	**contracted for construction**

Conventions/Codes Requirements

SOLAS Chapter II-2, Regulation 4.5.7.3.1

In addition to the requirements in paragraphs 5.7.1 and 5.7.2, oil tankers of 20,000 tonnes deadweight and above, constructed on or after 1 January 2012, shall be provided with a fixed hydrocarbon gas detection system complying with the Fire Safety Systems Code for measuring hydrocarbon gas concentrations in all ballast tanks and void spaces of double-hull and double-bottom spaces adjacent to the cargo tanks, including the forepeak tank and any other tanks and spaces under the bulkhead deck adjacent to cargo tanks.

Interpretation

1. The term "cargo tanks" in the phrase "spaces adjacent to the cargo tanks" includes slop tanks except those arranged for the storage of oily water only.
2. The term "spaces" in the phrase "spaces under the bulkhead deck adjacent to cargo tanks" includes dry compartments such as ballast pump-rooms and bow thruster rooms and any tanks such as freshwater tanks, but excludes fuel oil tanks.
3. The term "adjacent" in the phrase "adjacent to the cargo tanks" includes ballast tanks, void spaces, other tanks or compartments located below the bulkhead deck located adjacent to cargo tanks and includes any spaces or tanks located below the bulkhead deck which form a cruciform (corner to corner) contact with the cargo tanks.

Technical Background

In the discussions concerning SOLAS Ch.II-2 Reg. 4.5.7.3.1, there have been deviating interpretations in terms of which tanks and spaces shall be provided with fixed gas detection as per the regulations. This UI provides interpretations of SOLAS Ch.II-2 Reg. 4.5.7.3.1 with respect to which spaces and tanks the regulation shall apply to.

Remarks

The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details, regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.249 Means of escape from the steering gear space in cargo ships

Conventions (Amend.), Reg.		**SOLAS Chapter II-2, Regulation 13.4.2.2,13.4.2.3**					
IACS UI Number	**SC269**	**UI** version	**Dec., 2014/ Rev.1, Dec., 2016**	Date of impleme ntation	**01.07.2016/ Rev.1,01.0 1.2018**	Means of impleme ntation	**Ships contracted for construction**

Conventions/Codes Requirements

SOLAS Chapter II-2, Regulation 13.4.2.2

….In the steering gear space, a second means of escape shall be provided when the emergency steering position is located in that space unless there is direct access to the open deck.

SOLAS Chapter II-2, Regulation 13.4.2.3

From machinery spaces other than those of category A, two escape routes shall be provided except that a single escape route may be accepted for spaces that are entered only occasionally, and for spaces where the maximum travel distance to the door is 5 m or less.

Interpretation

1. Steering gear spaces which do not contain the emergency steering position need only have one means of escape.
2. Steering gear spaces containing the emergency steering position can have one means of escape provided it leads

directly onto the open deck. Otherwise, two means of escape are to be provided but they do not need to lead directly onto the open deck.

3. Direct access to the open deck

Escape routes that pass only through stairways and/or corridors are considered as providing a "direct access to the open deck", provided that the escape routes from the steering gear spaces have fire integrity protection equivalent to:

- steering gear spaces; or
- stairways / corridors, whichever is more stringent.

Technical Background

A member of the Machinery Panel raised the issue of steering gear space within cargo ships provided with a single means of escape on the basis the aforementioned space is considered as machinery space other than one of category A which is entered occasionally with no particular attention to whether the emergency steering position is located in that space or not. After discussion in Machinery Panel, MP members unanimously supported the proposal of handling this task under the Safety Panel in light of the nature of task。After several rounds of intra-Panel correspondence within Safety Panel it was agreed to draft an IACS UI，To clarify the arrangement of means of escape from the steering gear space in cargo ships, i.e. whether the second means shall be provided.

SOLAS Reg. II-2/13.4.2.1 requires two means of escape from machinery spaces of category A meeting requirements specified in 4.2.1.1 or 4.2.1.2.

Reg. 4.2.2 allows for dispensation from two means of escape from machinery spaces of category A. But, at the same time, Reg. 4.2.2 contains a requirement for a second means of escape from the steering gear space if the emergency steering position is located in that space unless direct access to the open deck is provided. The steering gear space is defined as category 7 (Other Machinery spaces), provided no additional machinery is located in the same space which could change this definition. It is understood that the last sentence in SOLAS Reg.II-2/13.4.2.2 does not allow single means of escape from steering gear spaces containing the emergency steering position, unless there is direct access to the open deck. Notwithstanding the above confusion is possible because ship designers and shipbuilders often consider the steering gear space as machinery space other that one of category A which is entered occasionally with no concern given to whether the emergency steering position is located in that space or not. Consequently they provide a single means of escape only in accordance with requirement 4.2.3.

Revise the UI to ensure that the fire integrity of escape route is at least equivalent to the space(s) through which it travels.

Remarks

1. This Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 July 2016.
2. Rev.1 is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2018.
3. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1. 250 Fire pumps in ships designed to carry five or more tiers of containers on or above the weather deck

Conventions (Amend.), Reg.		**SOLAS II-2/10.2.1.3，II-2/10.2.2.4.1.2, II-2/10.7.3.2.3 ， II-2/19.3.1 and IMO FSS Code Ch. 12.2.2.1.1**					
IACS UI Number	**SC270**	**UI** version	**Jan. 2015/ Corr.1, Mar. 2015/ Corr.2, Sept. 2015/ Rev.1, Dec. 2015**	Date of imple mentati on	**-/ -/ Jan. 1 2016/ Jan. 1 2017**	Means of impleme ntation	**Ships contracte d for constructi on**

Conventions/Codes Requirements

Regulation

SOLAS II-2/10.2.1.3, as per MSC.365(93)

The diameter of the fire main and water service pipes shall be sufficient for the effective distribution of the maximum required discharge from two fire pumps operating simultaneously, except that in the case of cargo ships, other than those included in paragraph 7.3.2, the diameter need only be sufficient for the discharge of 140 m^3/h.

SOLAS II-2/10.2.2.4.1.2, as per MSC.365(93)

pumps in cargo ships, other than any emergency pump, the quantity of water is not less than four thirds of the quantity required under regulation II-1/35-1 to be dealt with by each of the independent bilge pumps in a passenger ship of the same dimension when employed in bilge pumping, provided that in no cargo ship, other than those included in paragraph 7.3.2, need the total required capacity of the fire pumps exceed 180 m^3/h.

SOLAS II-2/10.7.3.2.3, as per MSC.365(93)

The mobile water monitors may be supplied by the fire main, provided the capacity of fire pumps and fire main diameter are adequate to simultaneously operate the mobile water monitors and two jets of water from fire hoses at the required pressure values. If carrying dangerous goods, the capacity of fire pumps and fire main diameter shall also comply with regulation 19.3.1.5, as far as applicable to on-deck cargo areas.

SOLAS II-2/19.3.1, as per MSC.365(93)

3.1.2. The quantity of water delivered shall be capable of supplying four nozzles of a size and at pressures as specified in regulation 10.2, capable of being trained on any part of the cargo space when empty. This amount of water may be applied by equivalent means to the satisfaction of the Administration.

3.1.3. Means shall be provided for effectively cooling the designated underdeck cargo space by at least 5 l/min per square metre of the horizontal area of cargo spaces, either by a fixed arrangement of spraying nozzles or flooding the cargo space with water.

3.1.5. The total required capacity of the water supply shall satisfy paragraphs 3.1.2 and 3.1.3, if applicable, simultaneously calculated for the largest designated cargo space. The capacity requirements of paragraph 3.1.2 shall be met by the total capacity of the main fire pump(s), not including the capacity of the emergency fire pump, if fitted.

IMO FSS Code Ch. 12.2.2.1.1

2.2.1 Emergency fire pumps
2.2.1.1 Capacity of the pump

The capacity of the pump shall not be less than 40% of the total capacity of the fire pumps required by regulation II-2/10.2.2.4.1 of the Convention and in any case not less than the following:

.1 for passenger ships less than 1,000 gross tonnage and for cargo ships of 2,000 gross tonnage and upwards - 25 m^3/h; and

.2 for cargo ships less than 2,000 gross tonnage - 15 m^3/h.

Interpretation

1. On board cargo ships designed to carry five or more tiers of containers on or above the weather deck:
   .1 in cases where the mobile water monitors are supplied by separate pumps and piping system, the total capacity of the main fire pumps need not exceed 180 m^3/h and the diameter of the fire main and water

service pipes (hereinafter referred to "the pipework diameter") need only be sufficient for the discharge of 140 m^3/h.

.2 in cases where the mobile water monitors are supplied by the main fire pumps; the total capacity of required main fire pumps and the pipework diameter shall be sufficient for simultaneously supplying both the required number of fire hoses and mobile water monitors. However, the total capacity shall not be less than the following .1 or .2, whichever is smaller:

.1 four thirds of the quantity required under regulation II-1/35-1 to be dealt with by each of the independent bilge pumps in a passenger ship of the same dimension when employed in bilge pumping; or

.2 180 m^3/h.

.3 in cases where the mobile water monitors and the "water spray system" (fixed arrangement of spraying nozzles or flooding the cargo space with water) required by SOLAS regulation II-2/19.3.1.3 are supplied by the main fire pumps, the total capacity of the main fire pumps and the pipework diameter need only be sufficient to supply whichever of the following is the greater:

.1 the mobile water monitors and the four nozzles required by SOLAS regulation II-2/19.3.1.2; or

.2 the four nozzles required by SOLAS regulation II-2/19.3.1.2 and the water spray system required by SOLAS regulation II-2/19.3.1.3.

The total capacity, however, is not to be less than 1.2.1 or 1.2.2, whichever is smaller.

2. On board cargo ships designed to carry five or more tiers of containers on or above the weather deck, the total capacity of the emergency fire pump need not exceed 72 m^3/h.

Technical Background

The issue was raised within the Safety Panel by a Member. UI should be drafted to clarify requirements to sizing of main and emergency fire pumps on board cargo ships designed to carry five or more tiers of containers on or above the weather deck.

Lastly members agreed that taking into account the size of the emergency fire pump, required by the FSS Code to be not less than 40% of the total capacity required by II-2/10.2.2.4.1.2, should not be required to be calculated based on main fire pump capacity greater than 180 m3/h for ships designed to carry five or more tiers of containers on or above the weather deck because the emergency fire pump is intended to be used to protect the space in which the main fire pumps are located and it is not expected that it would be used to supply water to the mobile fire monitors on deck.

UI SC 270（2015.3 Corr.1)only modify the number error in the terms of reference of SOLAS Regulation II-2/10.2.2.4.1.2.

UI SC 270（2015.9 Corr.2)only correct the text in the UI from SOLAS II-2/10.2.2.4.1.2&10.7.3.2.3 as per MSC.365(93).

UI SC 270（2015.12 Rev.1) Further details the requirements for the fire pumps capacity and the pipework diameter of mobile water monitors under different water supply conditions。

Remarks

1. This Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2016.

2. Rev.1 of the Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2017.

3. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to the IACS Procedural Requirement (PR) No. 29.

1.251 Additional indicating unit in the cargo control room in accordance with amended FSS Code Chapter 9.2.5.1.3

Conventions (Amend.), Reg.		**FSS Code Chapter 9.2.5.1.3**					
IACS UI Number	**SC271**	**UI** version	**Jan., 2015**	Date of impleme ntation	**01 January 2016**	Means of impleme ntation	**Ships contracted for construction**

Conventions/Codes Requirements

IMO FSS Code Ch. 9.2.5.1.3
In passenger ships, an indicating unit that is capable of individually identifying each detector that has been activated or manually operated call point that has operated shall be located on the navigation bridge. In cargo ships, an indicating unit shall be located on the navigation bridge if the control panel is located in the fire control station. In ships constructed on or after 1 July 2014, with a cargo control room, an additional indicating unit shall be located in the cargo control room. In cargo ships and on passenger cabin balconies, indicating units shall, as a minimum, denote the section in which a detector has activated or manually operated call point has operated.

Interpretation

A space in which a cargo control console is installed, but does not serve as a dedicated cargo control room (e.g. ship's office, machinery control room), should be regarded as a cargo control room for the purposes of paragraph 2.5.1.3 of chapter 9 of the FSS Code, as amended by resolution MSC.339(91), and therefore be provided with an additional indicating unit.

Technical Background

With regard to an issue that whether an additional indicating unit is required, in accordance with the amended FSS Code, Ch. 9.2.5.1.3, in such spaces that do not serve as a cargo control room, for example, a ship's office or a machinery control room, but are installed with a cargo control console.
After several rounds of discussions, all members of the Safety Panel agreed with the understanding that it should be regarded as a cargo control room for the purposes of paragraph 2.5.1.3 of chapter 9 of the FSS Code, as amended by resolution MSC.339(91), and therefore be provided with an additional indicating unit.
Based on the above understanding, an IACS common view was drafted and provided to SSE1 in the paper SSE 1/20/2, the Sub-Committee agreed with the understanding of IACS in relation to paragraph 2.5.1.3 of chapter 9 of the International Code for Fire Safety Systems (FSS Code), as amended.
Based on the SSE1 sub-committee's consideration, majority of the Safety Panel agreed to develop a UI draft for this issue based on views mentioned above and submission to SSE2 once again.

Remarks

1. This Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2016.
2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to the IACS Procedural Requirement (PR) No. 29.

1.252 Inert gas supply to double-hull spaces

Conventions (Amend.), Reg.		**SOLAS II-2/4.5.5.1**					
IACS UI Number	**SC272**	**UI** version	**Dec 2015/ Rev.1 July 2016**	Date of impleme ntation	**1 January 2017**	Means of impleme ntation	**contracted for construction**

Conventions/Codes Requirements

SOLAS II-2/4.5.5.1 Application (as amended by Res.MSC.365(93)):
5.5.1.4 Tankers required to be fitted with inert gas systems shall comply with the following provisions:
.1 double-hull spaces shall be fitted with suitable connections for the supply of inert gas;
SOLAS II-2/4.5.7.3 Arrangements for fixed hydrocarbon gas detection systems in double-hull and double-bottom spaces of oil tankers:

5.7.3.1 In addition to the requirements in paragraphs 5.7.1 and 5.7.2, oil tankers of 20,000 tonnes deadweight and above, constructed on or after 1 January 2012, shall be provided with a fixed hydrocarbon gas detection system complying with the Fire Safety Systems Code for measuring hydrocarbon gas concentrations in all ballast tanks and void spaces of double-hull and double-bottom spaces adjacent to the cargo tanks, including the forepeak tank and any other tanks and spaces under the bulkhead deck adjacent to cargo tanks.

Interpretation

Double-hull spaces required to be fitted with suitable connections for the supply of inert gas as per SOLAS II-2/4.5.5.1.4.1 are all ballast tanks and void spaces of double-hull and double-bottom spaces adjacent to the cargo tanks, including the forepeak tank and any other tanks and spaces under the bulkhead deck adjacent to cargo tanks, except cargo pump-rooms and ballast pump-rooms.

Technical Background

To align the text of the UI with the agreed text at SSE 3 contained in Annex 8 of SSE 3/16, which add a interpretation for ballast pump-rooms that need not be fitted with connections for the supply of inert gas.

Remarks

1. This Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2017.
2. Rev.1 of this Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2017.
3. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.253 Inclusion of mediums of the fire-fighting systems in lightweight (SOLAS II-1/2.21, SOLAS II-2/3.28) and lightship condition(IS Code 2008 Paragraph 2.23)

Conventions (Amend.), Reg.		**Chapter II-1, Regulations 2.21 and Chapter II-2, Regulation 3.28 to SOLAS, Paragraph 2.23 to IS Code 2008**					
IACS UI Number	**SC273**	**UI version**	**May 2016, Rev.1**	**Date of implementation**	**1 January 2017**	**Means of implementation**	**contracted for construction**

Conventions/Codes Requirements

SOLAS II-1/2.21 and SOLAS II-2/3.28

"Lightweight is the displacement of a ship in tonnes without cargo, fuel, lubricating oil, ballast water, fresh water and feedwater in tanks, consumable stores, and passengers and crew and their effects."

IS Code 2008 Paragraph 2.23

"Lightship condition is a ship complete in all respects, but without consumables, stores, cargo, crew and effects, and without any liquids on board except that machinery and piping fluids, such as lubricants and hydraulics, are at operating levels."

Interpretation

The weight of mediums on board for the fixed fire-fighting systems (e.g. freshwater, CO_2, dry chemical powder, foam concentrate, etc.) shall be included in the lightweight and lightship condition.

Technical Background
Considering that CO2 and fresh water are not explicitly mentioned in the definitions of lightweight in SOLAS and Intact Stability Code. and a fixed quantity of CO2 - depending on the types and category of the spaces - is to be available on board according to the requirements of the FSS Code (FSS Code, Ch. 5 para. 2.2.1), it is not clear whether the mediums of the fire-fighting system such as freshwater, CO2, dry chemical powder, foam concentrate, etc. are to be considered as: *1. a consumable and counted in the deadweight; or* *2. a weight invariable during normal ship operation (to be constant and in compliance with the FSS Code requirements) and part of the lightweight.* *To develop an interpretation in order to establish if the weight of mediums of the fire-fighting systems are included in the lightweight.*
Remarks
The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.254 Hazardous area classification in respect of selection of electrical equipment, cables and wiring and positioning of openings and air intakes

Conventions (Amend.), Reg.		Regulation **II-1/45.11** of **SOLAS** **Chapter II-1** as amended by IMO resolutions up to MSC.436(99)					
IACS UI Number	**SC274**	**UI** version	**Dec.,2015/ Rev.1,Feb.,2021**	Date of implementation	**Jan. 1,2017/ Rev.1,July 1, 2022**	Means of implementation	**Contracted for construction**

Conventions/Codes Requirements

11 In tankers, electrical equipment, cables and wiring shall not be installed in hazardous locations unless it conforms with standards not inferior to those acceptable to the Organization.* However, for locations not covered by such standards, electrical equipment, cables and wiring which do not conform to the standards may be installed in hazardous locations based on a risk assessment to the satisfaction of the Administration, to ensure that an equivalent level of safety is assured.

_____

* Refer to the standards published by the International Electrotechnical Commission, IEC 60092-502:1999 Electrical installations in ships - Tankers.

Interpretation

Where the prescriptive requirements within SOLAS and related Codes (IBC, IGC) and the standards published by the International Electrotechnical Commission, such as but not limited to I EC 60092-502:1999, are not aligned, the prescriptive requirements in SOLAS and Codes take precedence and are to be applied. The differences revealed between the above mentioned documents are listed in Annex ~~1~~.

ANNEX ~~1~~ - Summary of Discrepancies on the Hazardous Area Classification Issues among SOLAS/IBC/IGC and IEC 60092-502:1999

No.	**Title**	**SOLAS**	**IBC**	**IGC**	**IEC 60092-502:1999**
1	Hazardous area and classification on open deck from the cargo tank	Within 5m radius; Regulation ~~.~~ 11.6.2.2 of SOLAS Chapter II-2 as			Within 4.5m radius; IEC 60092-502:1999, 4.2.2.7 and 4.2.3.1.

	ventilation outlet for small flow by thermal variations	amended by IMO resolutions up to MSC.421(98) (hereinafter the same). Reference is made to UI SC70 "Cargo tank vent systems and selection of electrical equipment".			Zone 1: open areas on deck within a 3m radius. Zone 2: additional 1.5m beyond Zone 1; IEC 60092-502:1999, 4.2.2.7 and 4.2.3.1.	
2	The separation distance of the nearest air intakes for non-hazardous spaces from the tank ventilation outlet for small flow by thermal variations	At least 10m; the openings shall be arranged in accordance with regulation 4.5.3.4.1 of SOLAS Chapter II-2 referred to in regulation 11.6.2 of SOLAS Chapter II-2.	At least 10m; paragraph 8.3.4.2 of the IBC Code as amended by IMO resolutions up to MSC.460(101). At least 15m; paragraph 15.12.1.3 of the IBC Code (although toxicity not flammability).	At least 10m; paragraph 8.2.11.2 of the IGC Code as amended by IMO resolutions up to MSC.441(99) (hereinafter the same). Cargo tank PRV vent exits: at least equal to B or 25m, whichever is less. For ships less than 90m in length, smaller distances may be permitted; paragraph 8.2.11.1 of the IGC Code.	At least 6m; IEC 60092-502:1999, 4.2.2.7, 4.2.3.1 and 8.2.5.	
3	The separation distance of the nearest air intakes for non-hazardous spaces from the tank vent outlets for cargo loading, discharging and ballasting	At least 10m; SOLAS Regulation 5.3.4.1.3 of SOLAS Chapter II-2. At least 10m; Regulation 11.6.2.2 referring back to 4.5.3.4.1 of SOLAS Chapter II-2.	At least 10m; paragraph 12.1.5 of the IBC Code. At least 15m; paragraph 15.12.1.3 of the IBC Code (although toxicity not flammability).	At least 10m; paragraph 12.1.6 of the IGC Code. Cargo tank PRV vent exits: at least equal to B or 25m, whichever is less. For ships less than 90m in length, smaller distances may be	At least 11.5m; IEC 60092-502:1999, 4.2.2.8, 4.2.3.2 and 8.2.5.	

				permitted; paragraph 8.2.11.1 of the IGC Code. All other vent outlets connected to the cargo containment system: at least 10m; paragraph 8.2.11.2 of the IGC Code.		
4	The separation distance of the nearest air intakes for non-hazardous areas from the ventilation exhaust outlet for hazardous areas (i.e. cargo compressor room, cargo pump room, etc.)	MSC.1/Circ.1321 Pt.IV Ch.3 Para.1.2: the position of the cargo pump room vent outlet should be arranged at a distance of at least 3m measured horizontally from any ignition source and from the nearest opening to accommodation, service or machinery spaces.	At least 10m; paragraph 12.1.5 of the IBC Code.	At least 10m; paragraph 12.1.6 of the IGC Code. Ventilation ducts, air intakes and exhaust outlets serving artificial ventilation systems shall be positioned in accordance with recognized standards*; paragraph 12.1.5 of the IGC Code. * IEC60092-502:1999	At least 6m; IEC 60092-502:1999, 4.2.2.7, 4.2.3.1 and 8.2.5.	
5	Hazardous area and classification on open deck from the cargo shore connection or spillage coaming		Within the coaming required by paragraph 3.7.7 of the IBC Code or within a 3m radius beyond the coaming; paragraph 3.7.8 of the IBC Code. It should be noted that paragraph 3.7.8	Within 3m beyond the spillage coaming up to a height of 2.4m above the deck; paragraph 1.2.24.15 of the IGC Code.	Within 4.5m radius; IEC 60092-502:1999, 4.2.2.10 and 4.2.3.1. Zone 1: open areas on deck within a 3m radius, up to a height of 2.4m above the deck. Zone 2: additional 1.5m beyond Zone 1; IEC 60092-502:1999,	

			of the IBC Code only applies to stern or bow loading arrangements.		4.2.2.10 and 4.2.3.1.	
6	Opening to main cargo control stations and service spaces not giving access to accommodations, control stations and similar spaces containing sources of ignition	Subject to Administration; Regulation 4.5.2.2 of SOLAS Chapter II-2. Note: Regulation 4.5.2.2 of SOLAS Chapter II-2 does not categorize the space as hazardous or non-hazardous.	Paragraph 3.2.3 of the IBC Code.		The intent of a minimum distance of 1.5m from the boundaries of any hazardous area is to be followed; IEC 60092-502:1999, 8.2.5.	
7	Openings to accommodation spaces, service spaces, control stations and machinery spaces facing the cargo area	Not less than 4% of L, but not less than 3m from the end of the superstructure or deckhouse. (This distance need not exceed 5m); Regulation ~~.~~ 4.5.2 of SOLAS Chapter II-2.	Not less than 4% of L, but not less than 3m from the end of the superstructure or deckhouse. (This distance need not exceed 5m); paragraph 3.2.3 of the IBC Code.	Not less than 4% of L, but not less than 3m from the end of the superstructure or deckhouse. (This distance need not exceed 5m); paragraph 3.2.4.1 of the IGC Code .	At least 1.5m from the boundaries of any hazardous area; IEC 60092-502:1999, 8.2.5.	
8	Access doors to forecastle spaces containing source of ignition facing the cargo area	Access doors to forecastle spaces containing source of ignition shall not face the cargo area; Regulation 4.5.2.1 of SOLAS Chapter II-2. Access doors to forecastle spaces containing source of ignition shall not face the cargo area and are to be at not less than 3m from the end of the	Access doors to forecastle spaces containing source of ignition shall not face the cargo area; Paragraph 3.2.3 of the IBC Code. Reference is made to UI SC120 “Access to forecastle spaces on tankers;	Access doors to forecastle spaces containing source of ignition shall not face the cargo area; paragraph 3.2.4.1 of the IGC Code. Accesses to forecastle spaces containing sources of ignition may be permitted through a single door facing the cargo area,	The forecastle spaces installed the access doors facing the cargo area shall be designated as the hazardous area of Zone 2; IEC 60092-502:1999, 4.2. See also IEC 60092-502:1999, 4.2.3.6 as commented in item 18 below.	

		superstructure or deckhouse. (This distance need not exceed 5m); Regulation 4.5.2.1 of SOLAS Chapter II-2. Reference is made to UI SC120 "Access to forecastle spaces on tankers; regulations 4.5.2.1 and 4.5.2.2 of SOLAS Chapter II-2, paragraph 3.2.3 of the IBC Code and paragraph 3.2.4 of the IGC Code" .	regulations 4.5.2.1 and 4.5.2.2 of SOLAS Chapter II-2, paragraph 3.2.3 of the IBC Code and paragraph 3.2.4 of the IGC Code".	provided the doors are located outside hazardous areas as defined in chapter 10; paragraph 3.2.4.4 of the IGC Code. Reference is made to UI SC120 "Access to forecastle spaces on tankers; regulations 4.5.2.1 and 4.5.2.2 of SOLAS Chapter II-2, paragraph 3.2.3 of the IBC Code and paragraph 3.2.4 of the IGC Code".		
9	Ventilation of cargo pump rooms (cargo handling spaces on chemical and gas carriers)	20 air changes/hour; Regulation 4.5.4.1 of SOLAS Chapter II-2 and MSC.1/Circ.1321, Pt. IV, Ch. 3, Para. 1.1.	30 air changes/hour; paragraph 12.1.3 of the IBC Code. 45 air changes/hour; IBC Code paragraph 15.17 (toxic) of the IBC Code.	30 air changes/hour; paragraph 12.1.3 of the IGC Code.	Spaces containing sources of release: 30 air changes/hour; IEC 60092-502:1999, 8.1.3. Note: The IEC standard refer to spaces "containing sources of release", while the IBC and IGC Codes refer to spaces for "cargo handling operations".	
10	Ventilation of hazardous spaces not containing source of release		20 air changes/hour; spaces normally entered paragraph 12.2		Spaces not containing sources of release: 6 air changes/hour; IEC 60092-502:1999, 8.1.3.	

			of the IBC Code. 8 air changes/hour; spaces not normally entered paragraph 12.3 of the IBC Code(16 air changes/hour if portable).			
11	Concentration of gas implying that space is non-hazardous (alarm limits)	10% LFL (Lower Flammable Limit) for cargo pump rooms in tankers; Regulation 4.5.10.1.3 of SOLAS Chapter II-2. 30% LFL for all ballast tanks and void spaces of double-hull and double-bottom spaces adjacent to the cargo tanks in oil tankers of 20,000 tonnes deadweight and above; Regulation 4.5.7.3 of SOLAS Chapter II-2 and Paragraph 2.2.3.3 of Chapter 16 of the FSS Code as amended by IMO resolutions up to MSC.410(97).	10% LFL for cargo pump room; paragraph 11.1.1.7 of the IBC Code(Res. MSC.219(82)), clarifying that regulation 4.5.10 of SOLAS Chapter II-2 applies, in which case "hydrocarbon gases" are replaced by "flammable vapours".	Alarms shall be activated for flammable products when the vapour concentration reaches 30% of the lower flammable limit, for the spaces of paragraph 13.6. 2 of the IGC Code; paragraph 13.6. 15.	30% LFL; IEC 60092-502:1999, 8.4.2. Note: The requirement of the standard applies to spaces protected by over-pressure.	
12	Fan monitoring (air lock)			Where spaces are protected by pressurization, the ventilation	Motor running or rotating fan monitoring device is not accepted; IEC	

				shall be designed and installed in accordance with recognized standards*; paragraph 3.6.2 of the IGC Code. * IEC 60092-502:1999. As per the Note to 8.4.3 of the standard, a fan motor or a fan rotation monitoring device will not satisfy this requirement.	60092-502:1999, 8.4.3.	
13	Tanks for heated cargo	Tanker requirements apply to tankers carrying cargo with FP below 60 ℃; Regulation 1.6.1 of SOLAS Chapter II-2. For petroleum cargoes with FP of 60 ℃ and above only deck foam requirements apply; Regulation 1.6.4 of SOLAS Chapter II-2. Hazardous zone classification and electrical installation shall be complied with IEC 60092-502(1999); Regulation 45.11 of SOLAS Chapter II-1 as amended by	Follows SOLAS principle related to flashpoint, however the IBC Code considers non-flammable (NF) products and products with a flashpoint of 60 ℃ and above, in a different way (paragraph 11.1.2 & 11.1.3 of the IBC Code); In the case of a heated cargo, carriage conditions might need to be established and the		When carrying cargoes heated to temperature within 15 ℃ of their flash point, hazardous zone classification for tankers carrying cargoes with FP not exceeding 60 ℃ applies; IEC 60092-502:1999, 4.3.2 referring back to 4.2.	

		IMO resolutions up to MSC.436(99) (hereinafter the same).	requirements for cargoes having a flashpoint not exceeding 60 ℃ applied; paragraph 10.1.6 of the IBC Code.			
14	Classification of cargo pump room	Hazardous zone classification and electrical installation shall be complied with IEC 60092-502:1999; Regulation 45.11 of SOLAS Chapter II-1 .		Paragraph 1.2.24.6 of the IGC Code.	IEC 60092-502:1999, 4.1.4.1 Table 1 and 4.2.2.4 may indicate that cargo pump rooms are Zone 1. However, as ventilation is only running during cargo handling, the requirements may be interpreted that it is Zone 0 (Flag Administration position may be required).	
15	Discontinuation of ventilation for long periods		Spare parts shall be carried for each type of ventilation fan required onboard; paragraph 12.1.9 of the IBC Code.	Where fans are required, full required ventilation capacity for each space shall be available after failure of any single fan, or spare parts shall be provided comprising a motor, starter spares and complete rotating element, including bearings of each type; paragraph 12.1.8 of the IGC Code.	IEC 60092-502:1999, 8.3.1 includes an assumption that ventilation shall not be discontinued for long periods.	

16	Gas carrier ballast tanks			Ballast tanks may be connected to pumps in machinery spaces; paragraph 3.7.5 of the IGC Code.	Ballast tanks on gas carriers, separated from a hold space, where cargo is carried in a cargo tank requiring a secondary barrier, by a single gastight boundary, are hazardous areas Zone 1.	
17	Gas carrier hold space				Hold spaces of gas carriers (except those with C-tanks), where a secondary barrier is required, are considered hazardous areas Zone 0; IEC 60092-502:1999, 4.4.1 and Annex D.	
18	Access to forward spaces below level of main deck	Access openings to service spaces, control stations and machinery spaces are not to face the cargo area; Regulation 4.5.2 of SOLAS Chapter II-2. Reference is made to UI SC120 "Access to forecastle spaces on tankers; regulations 4.5.2.1 and 4.5.2.2 of SOLAS Chapter II-2, paragraph 3.2.3 of the IBC Code and paragraph 3.2.4 of the IGC Code".	Reference is made to UI SC120 "Access to forecastle spaces on tankers; regulations 4.5.2.1 and 4.5.2.2 of SOLAS Chapter II-2, paragraph 3.2.3 of the IBC Code and paragraph 3.2.4 of the IGC Code".	Reference is made to UI SC120 "Access to forecastle spaces on tankers; regulations 4.5.2.1 and 4.5.2.2 of SOLAS Chapter II-2, paragraph 3.2.3 of the IBC Code and paragraph 3.2.4 of the IGC Code".	It is implied that as long as the sill height is above 0.5m then it is exempted from SOLAS and can face the cargo area; IEC 60092-502:1999, 4.2.3.6.	
19	Hazardous zone classification on main deck of tankers with deck girders				The entire deck area up to 2.4m is considered as Zone 1 if deck girders are	

					provided as they are considered to restrict natural ventilation; IEC 60092-502:1999, 4.2.2.11.	
20	Hazardous zone in way of P/V-breaker	Regulation. 4.6.2.2 of SOLAS Chapter II-2: at least 5m. Regulation. 11.6.2.2 of SOLAS Chapter II-2: at least 10m			10m from a cargo gas outlet intended for the passage of large volumes of gas or vapour mixture during cargo loading; IEC 60092-502:1999, 4.2.2.8 & 4.2.3.2 based on UI SC140, otherwise 4.5m from a P/V breaker which does not release large volumes of gas or vapour locally; IEC 60092-502:1999, 4.2.2.7 & 4.2.3.1.	
21	Location of fan motors for cargo pump room and compressor room		To be located outside ducts; paragraph 12.1.8 of the IBC Code.	To be located outside ducts; paragraph 12.1.7 of the IGC Code.	IEC 60092-502:1999; follows zone classification. I.e. if Zone 0, outside ventilation duct (based on 6.5.2). If Zone 1, inside OK, provided certified for Zone 1.	
22	Openings to accommodation spaces, service spaces, control stations and machinery spaces facing the cargo area	Shall not face the cargo area. Can be located at the transverse bulkhead not facing the cargo area, at a distance of at least 4% of the length of the ship but not less than 3m from the end of the superstructure or	Shall not face the cargo area. They shall be located on the end bulkhead not facing the cargo area and/or on the outboard side of the superstructure or deck-house at a distance of	Shall not face the cargo area. They Shall be located on the end bulkhead not facing the cargo area or on the outboard side of the superstructure or deck-house or on both at a distance of at least 4% of	Access doors or other openings shall not be provided between an area intended to be considered as non-hazardous and a hazardous area, or between a space intended to be considered as Zone 2 and a Zone 1 space except where	

		deckhouse facing the cargo area. This distance need not exceed 5m; Regulation ~~.~~ 4.5.2.1 of SOLAS Chapter II-2. Refer to Regulatio 4.5.2.2 of SOLAS Chapter II-2 for permitted access doors to main cargo control stations and service spaces and to wheelhouse doors and windows.	at least 4% of the length (L) of the ship but not less than 3m from the end of the superstructure or deck-house facing the cargo area. This distance, however, need not exceed 5m. Refer to same paragraph for permitted access doors to spaces not having access to accommodation and service spaces and control stations, and wheelhouse doors and windows; paragraph 3.2.3 of the IBC Code.	the length (L) of the ship but not less than 3m from the end of the superstructure or deck-house facing the cargo area. This distance, however, need not exceed 5m. Refer to same paragraph for wheelhouse doors and windows; paragraph 3.2.4.1 of the IGC Code.	required for operational reasons. Where access doors or other openings are provided for operational reasons, 4.1.5.2, 4.1.5.3, 4.1.5.4 or 4.1.5.5 apply; IEC 60092-502:1999, 4.1.5. Where a space has an opening into an adjacent, more hazardous space or area, it may be made into a less hazardous space or non-hazardous space by pressurisation designed and operated in accordance with the requirements given in 8.2 and 8.4; IEC 60092-502:1999, 8.1.4. Note: SOLAS and Codes refer to permitted openings of spaces, while the IEC standard defines hazardous areas.	
23	Protection by over-pressure			Paragraph 12.1.4 of the IGC Code.	Protection by over-pressure where a non-hazardous space has openings into a hazardous space; IEC 60092-502:1999, 8.4.	
24	Air locks			Paragraph 3.6 of the IGC Code.	IEC 60092-502:1999, 4.1.5.3.	
25	Earthed distribution	Earthed			Distribution	

	systems and hull return systems	distribution systems shall not be used in a tanker. The Administration may exceptionally permit in a tanker the earthing of the neutral for alternating current power networks of 3,000 V (line to line) and over, provided that any possible resulting current does not flow directly through any of the dangerous spaces; Regulation. 45.4.1 of SOLAS Chapter II-1. The hull return system of distribution shall not be used for any purpose in a tanker; Regulation. 45.3.1 of SOLAS Chapter II-1. The above regulation does not preclude under conditions approved by the Administration the use of: − impressed current cathodic protective systems; − limited and locally earthed systems; or − insulation level monitoring devices			systems: Distribution systems shall comply with the provisions of IEC 60092-201:2019. Both insulated and earthed distribution systems are permitted; systems with a hull or structure return, other than those noted under 5.2.2, are not permitted; IEC 60092-502:1999, 5.2.1. The following systems are permitted to be of hull or structure return type: − limited and locally earthed systems outside any hazardous area; − intrinsically-safe systems; − impressed current cathodic protective systems; IEC 60092-502:1999, 5.2.2. The neutral and any conductor required for protection against electric shock shall not be connected together or combined in a single conductor in a hazardous area; IEC 60092-502:1999,	

		provided the circulation current does not exceed 30 mA under the most unfavourable conditions. Regulation. 45.3.2 of SOLAS Chapter II-1.			5.2.3.
26	Hazardous zone classification on main deck of tankers	Hazardous zone classification and electrical installation shall be complied with IEC 60092-502:1999; Regulation. 45.11 of SOLAS Chapter II-1.	Chapter 10 of the IBC Code: IEC 60092-502:1999.	Paragraph 1.2.24.9 of the IGC Code.	The cargo tanks, including all ballast tanks with cargo tank area; IEC 60092-502:1999, 4.2.2.11 & 4.2.3.5 (areas on open deck over cargo tanks as per the above IEC paragraphs do not coincide with the definition of the cargo area in SOLAS or the Codes).

Technical Background

Remarks

1.255 Suitable number of spare air cylinders to be provided in connection with drills

Conventions (Amend.), Reg.		**SOLAS II-2/15.2.2.6(as added by Res. MSC.338(91), applicable from 01 July 2014)**					
IACS UI Number	**SC275**	**UI** version	**Jan., 2016/ Rev.1,Jun.2016**	Date of implementation	**Jan. 1, 2017**	Means of implementation	**constructed ships and existing ships**

Conventions/Codes Requirements

SOLAS II-2/15.2.2.6 (as added by Res. MSC.338(91), applicable from 01 July 2014):

"2.2.6 An onboard means of recharging breathing apparatus cylinders used during drills shall be provided or a suitable number of spare cylinders shall be carried on board to replace those used."

Interpretation

"A suitable number of spare cylinders" to be carried on board to replace those used for fire drills shall be at least one 'set of cylinders' for each mandatory breathing apparatus, unless additional spare cylinders are required by the shipboard safety management system (SMS).

'Set of cylinders' means the number of cylinders which are required to operate the breathing apparatus.

No additional cylinders are required for fire drills for breathing apparatus sets required by SOLAS Reg. II-2/19, IMSBC Code, the IBC Code or IGC Code.

Technical Background

At SSE3, the delegation from Marshall Islands stated that the minimum number of spare cylinders to replace those used in the training depends on the safety management system of each ship, and proposed the modification of the UI to reflect this stance. With some editorial improvements by IACS, SSE3 agreed with the revised UI.

Remarks

1. This Unified Interpretation is to be uniformly implemented by IACS Societies for all ships from 1 January 2017.

1. 256 Escape from machinery spaces on passenger ships

Conventions (Amend.), Reg.		**SOLAS Chapter II-2, Regulation 13.4.1**					
IACS UI Number	**SC276**	**UI** version	**Jan., 2016**	Date of implementation	**Feb. 1, 2016**	Means of implementation	**contracted for construction**

Conventions/Codes Requirements

SOLAS Chapter II-2, Regulation 13.4.1:

4.1.1 Escape from spaces below the bulkhead deck

Where the space is below the bulkhead deck, the two means of escape shall consist of either:

.1 two sets of steel ladders, as widely separated as possible, leading to doors in the upper part of the space, similarly separated and from which access is provided to the appropriate lifeboat and liferaft embarkation decks. One of these ladders shall be located within a protected enclosure that satisfies regulation 9.2.2.3, category (2), or regulation 9.2.2.4, category (4), as appropriate, from the lower part of the space it serves to a safe position outside the space. Self-closing fire doors of the same fire integrity standards shall be fitted in the enclosure. The ladder shall be fixed in such a way that heat is not transferred into the enclosure through non-insulated fixing points. The protected enclosure shall have minimum internal dimensions of at least 800 mm x 800 mm, and shall have emergency lighting provisions; or

.2 one steel ladder leading to a door in the upper part of the space from which access is provided to the embarkation deck, and additionally, in the lower part of the space and in a position well separated from the ladder referred to, a steel door capable of being operated from each side and which provides access to a safe escape route from the lower part of the space to the embarkation deck.

4.1.2 Escape from spaces above the bulkhead deck

Where the space is above the bulkhead deck, the two means of escape shall be as widely separated as possible and the doors leading from such means of escape shall be in a position from which access is provided to the appropriate lifeboat and liferaft embarkation decks. Where such means of escape require the use of ladders, these shall be of

steel.

4.1.4 Escape from machinery control rooms

Two means of escape shall be provided from a machinery control room located within a machinery space, at least one of which will provide continuous fire shelter to a safe position outside the machinery space.

Interpretation

1. A "safe position" can be any space, excluding lockers and storerooms irrespective of their area, cargo spaces and spaces where flammable liquids are stowed, but including special category spaces and ro-ro spaces, from which access is provided and maintained clear of obstacles to the embarkation decks (regulation II-2/13.4.1.1.1 and 13.4.1.4).

2. Inclined ladders/stairways in machinery spaces being part of, or providing access to, escape routes but not located within a protected enclosure shall not have an inclination greater than 60 °and shall not be less than 600 mm in clear width. Such requirement need not be applied to ladders/stairways not forming part of an escape route, only provided for access to equipment or components, or similar areas, from one of the main platforms or deck levels within such spaces (regulation II-2/13.4.1).

3. Machinery spaces may include working platforms and passageways, or intermediate decks at more than one deck level. In such case, the lower part of the space shall be regarded as the lowest deck level, platform or passageway within the space. At deck levels, other than the lowest one, where only one means of escape other than the protected enclosure is provided, self-closing fire doors shall be fitted in the protected enclosure at that deck level. Smaller working platforms in-between deck levels, or only for access to equipment or components, need not be provided with two means of escape (regulation II-2/13.4.1.1).

4. A protected enclosure providing escape from machinery spaces to an open deck may be fitted with a hatch as means of egress from the enclosure to the open deck. The hatch shall have minimum internal dimensions of 800 mm x 800 mm (regulation II-2/13.4.1.1.1).

5. Internal dimensions shall be interpreted as clear width, so that a passage having diameter of 800 mm is available throughout the vertical enclosure, as shown in Figure 1, clear of ship's structure, with insulation and equipment, if any. The ladder within the enclosure can be included in the internal dimensions of the enclosure. When protected enclosures include horizontal portions their clear width shall not be less than 600 mm. Figure 1 is given as example of some possible arrangements which may be in line with the above interpretation (regulation II-2/13.4.1.1.1).

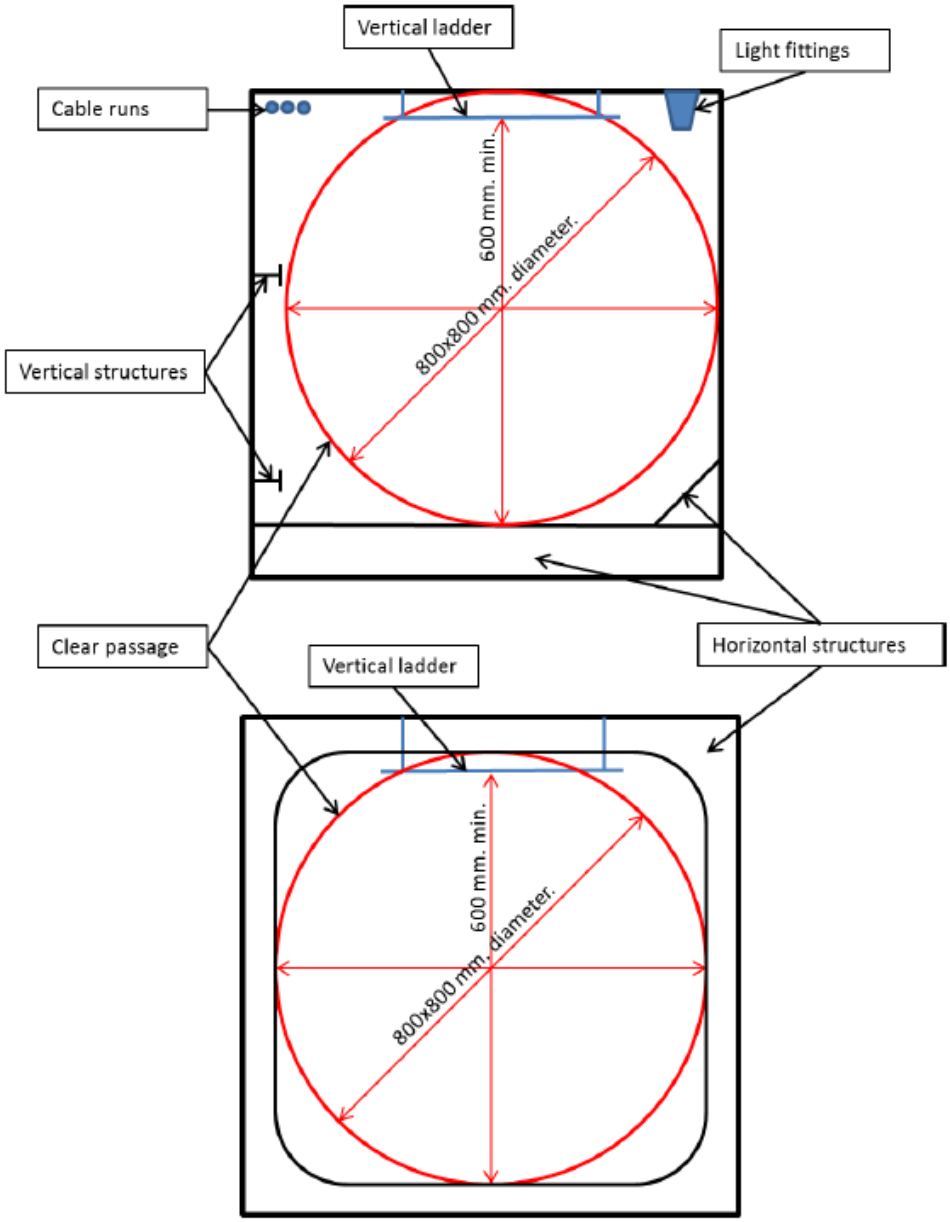


Figure 1

Technical Background
To provide unified interpretation of existing vague requirements for means of escape in machinery spaces on passenger ships as required by SOLAS II-2/13.4.1.
Remarks
1. This Unified Interpretation is to be applied by IACS Societies on ships contracted for construction on or after 1 February 2016. 2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1. 257 Escape from machinery spaces on cargo ships

Conventions (Amend.), Reg.		SOLAS Chapter II-2, Regulation 13.4.2					
IACS UI Number	**SC277**	**UI** version	**Jan., 2016**	Date of implement ation	**Feb. 1, 2016**	Means of impleme ntation	**contracted for construction**

Conventions/Codes Requirements

SOLAS Chapter II-2, Regulation 13.4.2:

4.2.1 Escape from machinery spaces of category A

Except as provided in paragraph 4.2.2, two means of escape shall be provided from each machinery space of category A. In particular, one of the following provisions shall be complied with:

.1 two sets of steel ladders, as widely separated as possible, leading to doors in the upper part of the space, similarly separated and from which access is provided to the open deck. One of these ladders shall be located within a protected enclosure that satisfies regulation 9.2.3.3, category (4), from the lower part of the space it serves to a safe position outside the space. Self-closing fire doors of the same fire integrity standards shall be fitted in the enclosure. The ladder shall be fixed in such a way that heat is not transferred into the enclosure through non-insulated fixing points. The enclosure shall have minimum internal dimensions of at least 800 mm x 800 mm, and shall have emergency lighting provisions; or

.2 one steel ladder leading to a door in the upper part of the space from which access is provided to the open deck and, additionally, in the lower part of the space and in a position well separated from the ladder referred to, a steel door capable of being operated from each side and which provides access to a safe escape route from the lower part of the space to the open deck.

4.2.3 Escape from machinery spaces other than those of category A

From machinery spaces other than those of category A, two escape routes shall be provided except that a single escape route may be accepted for spaces that are entered only occasionally and for spaces where the maximum travel distance to the door is 5 m or less.

Interpretation

1. A "safe position" can be any space, excluding cargo spaces, lockers and storerooms irrespective of their area, cargo pump-rooms and spaces where flammable liquids are stowed, but including vehicle and ro-ro spaces, from which access is provided and maintained clear of obstacles to the open deck (regulation II-2/13.4.2.1.1).

2. Inclined ladders/stairways in machinery spaces being part of, or providing access to, escape routes, but not located within a protected enclosure shall not have an inclination greater than 60 °and shall not be less than 600 mm in clear width. Such requirement need not be applied to ladders/stairways not forming part of an escape route, only provided for access to equipment or components, or similar areas, from one of the main platforms or deck levels within such spaces (regulation II-2/13.4.2.1).

3. Machinery spaces of category A may include working platforms and passageways, or intermediate decks at more than one deck level. In such case, the lower part of the space shall be regarded as the lowest deck level, platform or passageway within the space.

At deck levels, other than the lowest one, where only one means of escape other than the protected enclosure is provided, self-closing fire doors shall be fitted in the protected enclosure at that deck level. Smaller working platforms in-between deck levels, or only for access to equipment or components, need not be provided with two means of escape (regulation II-2/13.4.2.1).

4. A protected enclosure providing escape from machinery spaces of category A to an open deck may be fitted with a hatch as means of egress from the enclosure to the open deck. The hatch shall have minimum internal dimensions of 800 mm x 800 mm (regulation II-2/13.4.2.1.1).

5. Internal dimensions shall be interpreted as clear width, so that a passage having diameter of 800 mm is available throughout the vertical enclosure, as shown in Figure 1, clear of ship's structure, with insulation and equipment, if any. The ladder within the enclosure can be included in the internal dimensions of the enclosure.

When protected enclosures include horizontal portions their clear width shall not be less than 600 mm. Figure 1 is given as example of some possible arrangements which may be in line with the above interpretation (regulation II-2/13.4.2.1.1).

6. In machinery spaces other than those of category A, which are not entered only occasionally, the travel distance shall be measured from any point normally accessible to the crew, taking into account machinery and equipment within the space (regulation II-2/13.4.2.3).

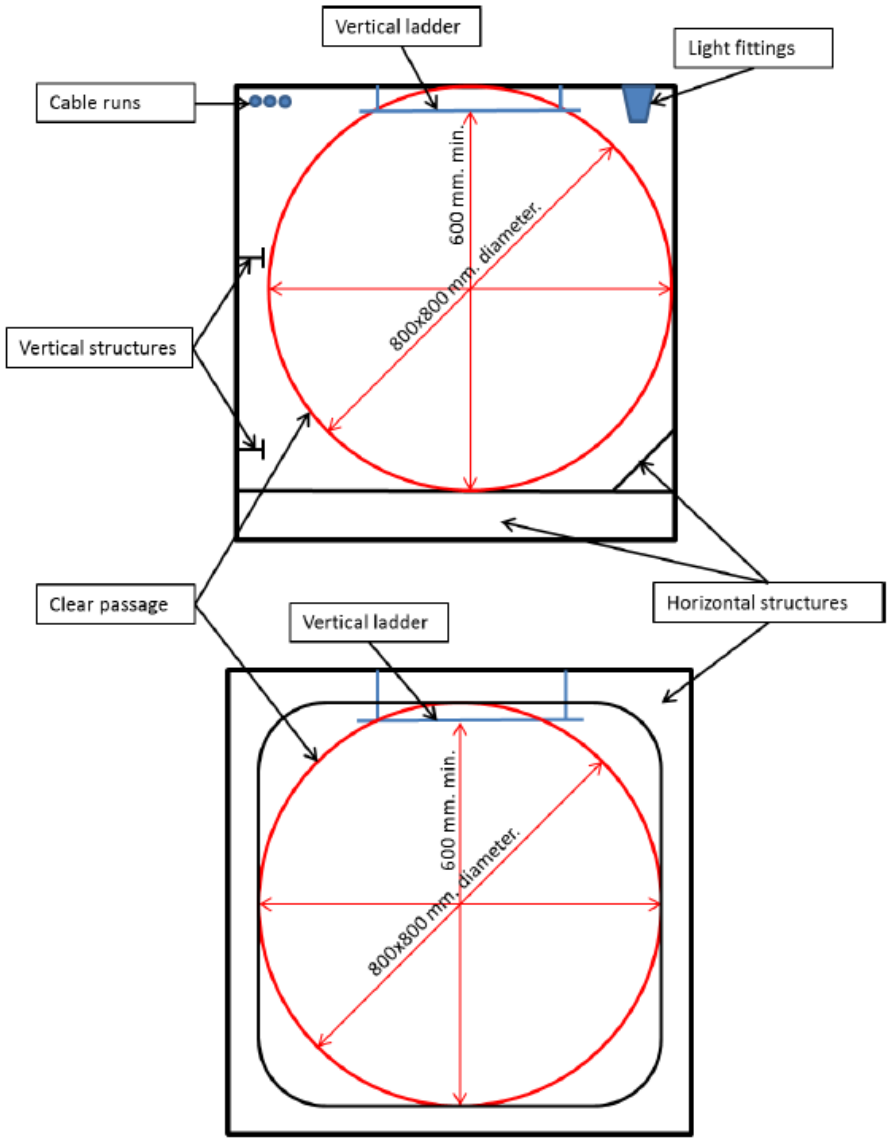


Figure 1

Technical Background

To provide unified interpretation of existing vague requirements for means of escape in machinery spaces on cargo ships as required by SOLAS II-2/13.4.2.

Remarks

1. This Unified Interpretation is to be applied by IACS Societies on ships contracted for construction on or after 1 February 2016.
2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1. 258 Escape from accommodation spaces, service spaces and control stations on cargo ships

Conventions (Amend.), Reg.		**SOLAS Chapter II-2, Regulation 13.3.3.2 and 13.3.3.3**					
IACS UI Number	**SC278**	**UI** version	**Jan., 2016**	Date of implementation	**Feb. 1, 2016**	Means of implementation	**contracted for construction**

Conventions/Codes Requirements

SOLAS Chapter II-2, Regulation 13.3.3.2 and 13.3.3.3

3.3.2 Escape from spaces below the lowest open deck

Below the lowest open deck the main means of escape shall be a stairway and the second escape may be a trunk or a stairway.

3.3.3 Escape from spaces above the lowest open deck

Above the lowest open deck the means of escape shall be stairways or doors to an open deck or a combination thereof.

Interpretation

The "lowest open deck" shall be a category (10) "Open deck" (as defined in SOLAS chapter II-2, regulations 9.2.3.3.2.2 and 9.2.4.2.2.2) at the lowest height from baseline in way of accommodation spaces.

Technical Background

To provide unified interpretation of existing vague requirements for means of escape from accommodation spaces, service spaces and control stations in SOLAS Ch. II-2 Reg.13.3.3.2 and 13.3.3.3.

Remarks

1. This Unified Interpretation is to be applied by IACS Societies on ships contracted for construction on or after 1 February 2016.
2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.259 Annual testing of VDR, S-VDR, AIS and EPIRB

Conventions (Amend.), Reg.		**SOLAS regulation V/18.8; SOLAS regulation V/18.9 SOLAS regulation IV/15.9**					
IACS UI Number	**SC279**	**UI version**	**Jun.,2016**	**Date of implementation**	**Jul.01,2017**	**Means of implementation**	

I. Conventions/Codes Requirements: SOLAS regulation V/18.8 - Annual performance test of Voyage Data Recorder (VDR) and Simplified Voyage Data Recorder (S-VDR)

1. SOLAS regulation V/18.8

The voyage data recorder system, including all sensors, shall be subjected to an annual performance test. The test shall be conducted by an approved testing or servicing facility to verify the accuracy, duration and recoverability of the recorded data. In addition, tests and inspections shall be conducted to determine the serviceability of all protective enclosures and devices fitted to aid location. A copy of the certificate of compliance issued by the testing facility, stating the date of compliance and the applicable performance standards, shall be retained on board the ship.

2. Moreover the annex to MSC.1 Circ./1222 at paragraph 3 expects:

The manufacturer must complete a review, record any changes and issue the completed test report within 45 days. To accommodate performance checks to align with the appropriate survey under the Harmonized System of Survey and Certification (HSSC), the annual performance check may be carried out up to 3 months before the due date for a passenger ship and -/+ 3 months of the due date for a cargo ship. (The maximum period between

subsequent checks is, therefore, 15 months for passenger ships and 18 months for cargo ships, unless either certificate has been extended as permitted by SOLAS regulation I/14, in which case a similar extension may be granted.)

Interpretation

The annual performance test of VDR (or S-VDR) shall be carried out within the "time window" of the annual / periodical / renewal survey under the Harmonized System of Survey and Certification (HSSC), but not later than the date of completion of the survey for endorsement / renewal of the relevant Certificate.

II. Conventions/Codes Requirements: SOLAS regulation V/18.9 - Annual performance test of Automatic Identification System (AIS)

1. SOLAS regulation V/18.9

The automatic identification system (AIS) shall be subjected to an annual test. The test shall be conducted by an approved surveyor or an approved testing or servicing facility. The test shall verify the correct programming of the ship static information, correct data exchange with connected sensors as well as verifying the radio performance by radio frequency measurement and on-air test using, e.g., a Vessel Traffic Service (VTS). A copy of the test report shall be retained on board the ship.

2. Moreover the annex to MSC.1 Circ./1252 at paragraph 3 expects:

To accommodate performance test to align with the appropriate survey under the Harmonized System of Survey and Certification (HSSC), the annual testing may be carried out:

.1 up to 3 months before the due date of the passenger ship renewal survey or the cargo ship safety equipment renewal survey; and

.2 3 months before or after the due date of the cargo ship safety equipment periodical/annual survey (the maximum period between subsequent test is governed by the time window associated to the subsequent surveys, unless either certificate has been extended as permitted by SOLAS regulation I/14, in which case a similar extension may be granted by the Administration).

Interpretation

The annual performance test of the Automatic Identification System (AIS) shall be carried out within the "time window" of the annual / periodical / renewal survey under the Harmonized System of Survey and Certification (HSSC), but not later than the date of completion of the survey for endorsement / renewal of the relevant Certificate.

III. Conventions/Codes Requirements: SOLAS regulation IV/15.9 - Annual test of EPIRB

1. SOLAS regulation IV/15.9

Satellite EPIRBs shall be:

.1 annually tested for all aspects of operational efficiency, with special emphasis on checking the emission on operational frequencies, coding and registration, at intervals as specified below:

.1 on passenger ships, within 3 months before the expiry date of the Passenger Ship Safety Certificate; and

.2 on cargo ships, within 3 months before the expiry date, or 3 months before or after the anniversary date, of the Cargo Ship Safety Radio Certificate.

The test may be conducted on board the ship or at an approved testing station; and

.2 subject to maintenance at intervals not exceeding five years, to be performed at an approved shore-based maintenance facility.

2. Moreover the MSC.1 Circ./955 at paragraph 2 and 4 reads:

……..omission…….

The servicing intervals of the aforementioned life-saving appliances and satellite EPIRBs required by SOLAS regulations III/20.8, III/20.9 and IV/15.9, respectively, shall not exceed 12 months which may be extended to 17 months where in any case this is impracticable in exceptional circumstances. In the meantime, according to regulations I/8 and I/9 of the 1988 SOLAS Protocol, the said appliances shall be subjected to an annual or a periodical survey within 3 months before or after each anniversary of the Cargo Ship Safety Equipment Certificate and of the Cargo Ship Safety Radio Certificate, respectively, or the Cargo Ship Safety Certificate, i.e. maximum 18 months interval.

……..omission…….

The Committee, in pursuance of the HSSC's objectives to "simplify survey requirements, thereby reducing the burden on Administrations, operators of ships and the crews of ships", decided that:

"the servicing intervals of life-saving appliances and radiocommunication equipment for ships, whose flag States implement the HSSC, may be in concert with the terms of the HSSC annual, periodical and renewal survey stipulated in the 1988 SOLAS Protocol notwithstanding regulations III/20.8, III/20.9 and IV/15.9 of the 1974 SOLAS Convention, as amended".

Interpretation

The annual test of the EPIRBs shall be carried out within the "time window" of the prescribed - survey, but not later than the date of completion of the survey for endorsement / renewal of the relevant Certificate.

Technical Background

To unify the interpretation of the "validity" of the annual performance test of the equipment VDR, S-VDR, AIS and EPIRB and establish a common understanding on when these have to be carried out.

1.260 Angle of down-flooding (ϕf) / Angle at which an opening incapable of being closed weathertight (θv)

Conventions (Amend.), Reg.		**2008 IS Code, International Grain Code, SOLAS/Ch.II-1-Reg.7-2**					
IACS UI Number	**SC280**	**UI version**	**06.2016**	**Date of implementation**	**01.01.2017**	**Means of implementation**	**contracted for construction**

Conventions/Codes Requirements

Φf is an angle of heel at which openings in the hull, superstructures or deckhouses which cannot be closed weathertight immerse.
(2008 IS Code & International Grain Code)

θv *is the angle, in any stage of flooding, where the righting lever becomes negative, or the angle at which an opening incapable of being closed weathertight becomes submerged.*
(SOLAS/Ch.II-1-Reg.7-2)

Interpretation

In applying Φf or θv*, openings which cannot be or are incapable of being closed weathertight include ventilators (complying with ILLC 19(4)) that for operational reasons have to remain open to supply air to the engine room or emergency generator room (if the same is considered buoyant in the stability calculation or protecting openings leading below) for the effective operation of the ship.*

Technical Background

The Dutch Safety Board noted that one cause of the capsizing was that the weathertight closing appliances to the main engine room were left open in order to ensure an adequate air supply to achieve the required bollard pull. These openings had been considered as closed in the intact stability calculations.

Remarks

The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.261 Single fall and hook system used for launching a lifeboat or rescue boat

Conventions (Amend.), Reg.		LSA Code 4.4.7.6 and MSC.81(70) 6.9					
IACS UI Number	**SC281**	**UI** version	**Jul., 2016**	Date of implementation	**Jul.1, 2017**	Means of implementation	

Conventions/Codes Requirements

Paragraph 4.4.7.6.17 of the LSA Code states:

"Where a single fall and hook system is used for launching a lifeboat or rescue boat in combination with a suitable painter, the requirements of paragraphs 4.4.7.6.7, 4.4.7.6.8 and 4.4.7.6.15 need not be applicable; in such an arrangement a single capability to release the lifeboat or rescue boat, only when it is fully waterborne, will be adequate."

MSC/Circ.980 Add.2 states the following two exemptions in the rescue boat test section:

(1) "Single fall systems not intended for on-load operation are exempt from this test [MSC.81 (70) Part1/6.9.1-2]."
(2) "This test [MSC.81 (70) Part1/6.9.4] is not applicable to single fall systems not intended for on-load operation."

Interpretation

1.
2. Withdrawn

Technical Background

Remarks

1. IACS Withdrew the UI in Jun., 2017.
2.

1.262 Application of materials other than steel on engine, turbine and gearbox installations

Conventions (Amend.), Reg.		**SOLAS Reg. II-2/4.2.2.5，4.2.3，4.2.4 and MSC.1/Circ. 1321**					
IACS UI Number	**SC282**	**UI** version	**Dec., 2016**	Date of implementation	**1 July 2017**	Means of implementation	**Contracted for construction**

Conventions/Codes Requirements

SOLAS Reg. II-2/4.2.2.5 Oil fuel piping
2.2.5.1 Oil fuel pipes and their valves and fittings shall be of steel or other approved material, ...

SOLAS Reg. II-2/4.2.3 Arrangements for lubricating oil
2.3.1 The arrangements for the storage, distribution and utilization of oil used in pressure lubrication systems shall be such as to ensure the safety of the ship and persons on board. The arrangements made in machinery spaces of category A, and whenever possible in other machinery spaces, shall at least comply with the provisions of paragraphs ..., 2.2.5.1, ...

SOLAS Reg. II-2/4.2.4 Arrangements for other flammable oils
The arrangements for the storage, distribution and utilization of other flammable oils employed under pressure in power transmission systems, control and activating systems and heating systems shall be such as to ensure the safety of the ship and persons on board. ... In locations where means of ignition are present, such arrangements shall at least comply with the provisions of paragraphs ..., 2.2.5.1, ...

MSC.1/Circ. 1321, Guidelines for measures to Prevent Fires in Engine-rooms and Cargo pump-rooms, Part 2, Chapter 2
4.1.1 Housings and bodies of filters and strainers used in oil fuel, lubricating oil or other flammable oil systems should be made of steel or other equivalent material with a melting point above 930℃ and with an elongation above 12%. Other housing and body materials may be utilized provided their use is specially considered on a case-by-case basis in relation to the risk of fire.

Interpretation

Materials other than steel may be assessed in relation to the risk of fire associated with the component and its installation. The use of materials other than steel is considered acceptable for the following applications:

1. internal pipes which cannot cause any release of flammable fluid onto the machinery or into the machinery space in case of failure, or
2. components that are only subject to liquid spray on the inside when the machinery is running, such as machinery covers, rocker box covers, camshaft end covers, inspection plates and sump tanks. It is a condition

that the pressure inside these components and all the elements contained therein is less than 0.18 N/mm2 and that wet sumps have a volume not exceeding 100 litres, or

3. components attached to machinery which satisfy fire test criteria according to standard ISO 19921:2005/19922:2005 or other standards acceptable to the Administration, and which retain mechanical properties adequate for the intended installation.

Technical Background

The fire safety requirements of SOLAS II-2, Reg. 4 require flammable liquid pipes, valves and fittings to be of steel or other approved material (Reg. 4.2.2.5.1, 4.2.3.1and 4.2.4). Notwithstanding this requirement, it is today common practice mainly for 4-stroke medium and high speed engines to use aluminium or aluminium alloys for a number of components such as covers, housings, fuel filter components and valves. This is tolerated/accepted by most class societies in the engine approval process. On different occasions over the last ten years CIMAC requested the former WP Machinery and the Machinery Panel to develop a UI with a view to allowing the use of aluminium or luminium alloys in category 'A' engine rooms. Modern cost effective manufacturing techniques and materials favour the use of aluminium, plastic and other low melting point materials rather than steel. The Panel agreed to examine the CIMAC request and develop a proposal for a UI for the use of materials other than steel on engine and gearbox installations.

Remarks

This Unified Interpretation is to be uniformly implemented by IACS Societies on ships constructed on or after 1 July 2017.

1.263 Fire detection and alarms for boilers in unattended machinery spaces

Conventions (Amend.), Reg.		**SOLAS Reg. II-1/47.1**					
IACS UI Number	**SC283**	**UI** version	**Aug., 2017**	Date of implementation	**01.07.2018**	Means of implementation	**Ships contracted for construction**

Conventions/Codes Requirements

SOLAS Reg. II-1/47.1

Means shall be provided to detect and give alarms at an early stage in case of fires:

.1 in boiler air supply casings and exhausts (uptakes); and

.2 in scavenging air belts of propulsion machinery,

unless the Administration considers this to be unnecessary in a particular case.

Interpretation

Deleted.

Technical Background

IACS withdrew the UI in October 2017 because it had not been confirmed by IMO.

Remarks

1.264 Automatic shutdown of the inert gas system and its components parts

Conventions (Amend.), Reg.		**FSS Code Chapter 15.2.2.2.2**					
IACS UI Number	**SC284**	**UI** version	**06.2018**	Date of implementation	**01.07.2019**	Means of implementation	**contracted for construction**

Conventions/Codes Requirements
FSS Code Chapter 15.2.2.2.2: *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 paragraphs 2.2.4, 2.3.2 and 2.4.2.*
Interpretation
The automatic shut-down of the inert gas system and its components shall involve the following: Shut-down of fans and closing of regulating valve for the following: • High water level in scrubber (not applicable for N2) • Low pressure/flow to scrubber (not applicable for N2) • High-high temperature of inert gas supply Closing of regulating valve in the event of: • High oxygen content (in excess of 5% by volume) • Failure of blowers/fans or N2 compressors Activation of double-block and bleed arrangement upon (for ships with double block and bleed replacing water seal): • Loss of inert gas supply • Loss of power
Technical Background
The UI, as approved by MSC98 by MSC.1/Circ.1582.
Remarks
The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.265 Operational status of valves to cargo tanks

Conventions (Amend.), Reg.		**FSS Code Chapter 15.2.2.3.2.2**					
IACS UI Number	**SC285**	**UI** version	**06.2018**	Date of impleme ntation	**01.07.2019**	Means of impleme ntation	**contracted for construction**
Conventions/Codes Requirements							
FSS Code Chapter 15.2.2.3.2.2: *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 paragraph 2.2.4.*							
Interpretation							
Unambiguous information regarding the operational status of stop valves in branch piping leading from the inert gas main to cargo tanks means position indicators providing open/intermediate/closed status information in the control panel required in the FSS code 15.2.2.4. Limit switches should be used to positively indicate both open and closed position. Intermediate position status shall be indicated when the valve is in neither open nor closed position.							
Technical Background							
The UI, as approved by MSC98 by MSC.1/Circ.1582.							
Remarks							
The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.							

1.266 Operational status of the inert gas system

Conventions (Amend.), Reg.		FSS Code Chapter 15.2.2.4.1					
IACS UI Number	**SC286**	**UI** version	**06.2018**	Date of implementation	**01.07.2019**	Means of implementation	**contracted for construction**

Conventions/Codes Requirements

FSS Code Chapter 15.2.2.4.1:
The operation status of the inert gas system shall be indicated in a control panel.

Interpretation

The operational status of the inert gas system shall be based on indication that inert gas is being supplied downstream of the gas regulating valve and on the pressure or flow of the inert gas mains downstream of the non-return devices. However, the operational status of the IG system as required by FSS Code 15.2.2.4.1 shall not be considered to require additional indicators and alarms other than those specified in the FSS code 15.2.2.4 and 15.2.3.2 or 15.2.4.2, as appropriate.

Technical Background

The UI, as approved by MSC98 by MSC.1/Circ.1582.

Remarks

The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.267 Low pressure audible alarm system

Conventions (Amend.), Reg.		FSS Code Chapter 15.2.2.4.5					
IACS UI Number	**SC287**	**UI** version	**06.2018**	Date of implementation	**01.07.2019**	Means of implementation	**contracted for construction**

Conventions/Codes Requirements

FSS Code Chapter 15.2.2.4.5:

2.2.4.5 Audible and visual alarms

2.2.4.5.1 Audible and visual alarms shall be provided, based on the system designed, to indicate:

.1 oxygen content in excess of 5% by volume;

.2 failure of the power supply to the indicating devices as referred to in paragraph 2.2.4.2;

.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;

.4 high-gas pressure; and

.5 failure of the power supply to the automatic control system.

2.2.4.5.2 The alarms required in paragraphs 2.2.4.5.1.1, 2.2.4.5.1.3 and 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.

2.2.4.5.3 An audible alarm system independent of that required in paragraph 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.

2.2.4.5.4 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.

Interpretation

The term "independent alarm system" as specified in FSS Code 15.2.2.4.5 means that a second pressure sensor, independent of the sensor serving the alarms for low pressure, high pressure and pressure indication/recorder shall be provided. Notwithstanding the above, a common programmable logic controller (PLC) is, however, accepted for the alarms in the control system. The independent sensor is not required if the system is arranged for the shut-down of cargo pumps. If a system for shutdown of cargo pumps is arranged, an automatic system shutting down all cargo pumps shall be provided. The shutdown shall be alarmed at the control station. The shutdown shall not prevent the operation of ballast pumps or pumps used for bilge drainage of a cargo pump room.

Technical Background

The UI, as approved by MSC98 by MSC.1/Circ.1582.

Remarks

The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.268 Carriage of Dangerous Goods – Required Air Changes

Conventions (Amend.), Reg.		**SOLAS Reg. II-2/19.3.4.1, II-2/19.3.5.4, Table 19.1**					
IACS UI Number	**SC288**	**UI** version	**Dec., 2018**	Date of implementation	**01.01.2020**	Means of implementation	**contracted for construction**

Conventions/Codes Requirements

SOLAS Reg. II-2/19.3.4.1 reads:

3.4 Ventilation

3.4.1 Adequate power ventilation shall be provided in enclosed cargo spaces. The arrangement shall be such as to provide for at least six air changes per hour in the cargo space, based on an empty cargo space, and for removal of vapours from the upper or lower parts of the cargo space, as appropriate.

SOLAS Reg. II-2/19.3.5.4 reads:

3.5 Bilge Pumping

3.5.4 Enclosed spaces outside machinery spaces containing bilge pumps serving cargo spaces intended for carriage of flammable or toxic liquids shall be fitted with separate mechanical ventilation giving at least six air changes per hour. If the space has access from another enclosed space, the door shall be self-closing.

SOLAS Table 19.1 reads:

Note 1 for container cargo spaces:

……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……

Interpretation

1. The reduced air changes per hour as per Note 1 of Table 19.1 apply equally to the ventilation air change requirements in SOLAS Reg. II-2/19.3.4.1 and in SOLAS Reg. II-2/19.3.5.4, when the bilge pump is located directly inside a container cargo space.

2. In such a case, where several container cargo spaces are served by the same bilge pump, the bilge pump is to be installed in the container cargo space with the highest ventilation rate, compared to the other container cargo spaces.

Technical Background

To clarify the minimum required air change when transporting dangerous goods of classes 2, 3, 6.1 and 8 in closed freight containers and when the bilge pump is located directly inside a container cargo space.

Remarks

The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.269 Separation arrangements between inert gas piping and cargo tanks

Conventions (Amend.), Reg.		Paragraph 15.2.2.3.2.3 of FSS Code (Amended by Resolution MSC.367(93))					
IACS UI Number	**SC289**	**UI** version	**Dec.,2018**	Date of implementation	**01.01.2020**	Means of implement ation	**contracted for construction**

Conventions/Codes Requirements

FSS Code Chapter 15.2.2.3.2.3:

Each cargo tank not being inerted shall be capable of being separated from the inert gas main by:

.1 removing spool-pieces, valves or other pipe sections, and blanking the pipe ends; or

.2 arrangement of two spectacle flanges in series with provisions for detecting leakage into the pipe between the two spectacle flanges; or

.3 equivalent arrangements to the satisfaction of the Administration, providing at least the same level of protection.

Interpretation

Withdrawn

Technical Background

Remarks

IACS withdrew this UI in July 2019.

1.270 Emergency source of electrical power on Gas Carriers and Chemical Tankers

Conventions (Amend.), Reg.		1974 SOLAS Chapter II-1, Regulation 43.6					
IACS UI Number	**SC290**	**UI** version	**Dec., 2018**	Date of implementation	**01.01.2020**	Means of implementation	

Conventions/Codes Requirements

SOLAS Chapter II-1, Regulation 43.6 reads:

"The emergency generator and its prime mover and any emergency accumulator battery shall be so designed and arranged as to ensure that they will function at full rated power when the ship is upright and when inclined at any angle of list up to 22.5˚ or when inclined up to 10˚ either in the fore or aft direction, or is in any combination of angles within those limits."

Interpretation

The following additional requirements are to be taken into account:

1. IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (Res.MSC.5(48) as amended by Res.MSC.370(93)), clause 2.7.2.2.
2. IMO International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk, clause 2.9.3.2.

Technical background

The New SC290 (corresponding to the Old UI SC6) is applicable to ships for which the new IGC Code (Res. MSC.370(93)) is applicable.

Remarks

This Unified Interpretation is to be uniformly implemented by IACS Societies on ships constructed on or after 1 January 2020.

1.271 Safe Type requirements for two-way portable radiotelephone apparatus for fire-fighter's ommunication(SOLAS Regulation II-2/10.10.4)

Conventions (Amend.), Reg.		**SOLAS Regulation II-2/10.10.4 (Amendments adopted by Resolution MSC. 338(91))**					
IACS UI Number	**SC291**	**UI** version	**Jan., 2020**	Date of implementation	**01.07.2020**	Means of implementation	**Ships constructed on or after 1 July 2020** **Equipment installed on or after 1 July 2020**

Conventions/Codes Requirements

SOLAS Regulation II-2/10.10.4 reads:

"10.4 Fire-fighter's communication

For ships constructed on or after 1 July 2014, a minimum of two two-way portable radiotelephone apparatus for each fire party for fire-fighter's communication shall be carried on board. Those two-way

portable radiotelephone apparatus shall be of an explosion-proof type or intrinsically safe. Ships constructed before 1 July 2014 shall comply with the requirements of this paragraph not later than the first survey after 1 July 2018."

Interpretation

1. Two-way portable radiotelephone apparatus for fire-fighter's communication, required by SOLAS Regulation II-2/10.10.4, should be of certified safe type suitable for use in zone 1 hazardous areas as defined in IEC Publication 60079.

2. The minimum requirements in respect to the apparatus group and temperature class are to be consistent with the most restrictive requirements for the hazardous area zone on board which is accessible to fire party.

Technical Background

IACS Safety panel member think the expression in SOLAS Regulation II-2/10.10.4 with regards to the "intrinsically safe" or "explosion proof" type of two-way portable radiotelephone apparatus for fire-fighter's communication appeared to be vaguely worded, and that should be clarified.

Remarks

1. This UI is to be applied by IACS Members

   i) to ships contracted for construction on or after 1 July 2020.

   ii) to existing ships (contracted for construction before 1 July 2020) when new, additional or replaced equipment is installed on/after 1 July 2020.

2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

3. The "Installed" date means a contractual delivery date of the equipment to the ship on or after 1 July 2020 or, in the absence of a contractual delivery date to the ship, the date that the equipment was actually delivered to the ship on or after 1 July 2020.

1.272 Ships intended to operate in low air temperature in Polar waters - Survival craft and rescue boat communications capabilities

Conventions (Amend.), Reg.		Polar Code (Res. MSC.385(94)), part I-A, paragraphs 10.2.2 and 10.3.2					
IACS UI Number	**SC292**	**UI version**	**Feb.,2020**	**Date of implem-entation**	**01.07.2020**	**Means of impleme-ntation**	**Contracted for con-struction**

Conventions/Codes Requirements

Paragraph 1.2.7 of Part I-A of Polar Code reads:
"1.2.7 Maximum expected time of rescue means the time adopted for the design of equipment and system that provide survival support. It shall never be less than 5 days."

Paragraph 10.2.2 of Part I-A of Polar Code reads:
"10.2.2 Survival craft and rescue boat communications capabilities
10.2.2.1 For ships intended to operate in low air temperature, all rescue boats and lifeboats, whenever released for evacuation, shall maintain capability for distress alerting, locating and on-scene communications.
10.2.2.2 For ships intended to operate in low air temperature, all other survival craft, whenever released, shall maintain capability for transmitting signals for location and for communication.
10.2.2.3 Mandatory communication equipment for use in survival craft, including liferafts, and rescue boats shall be capable of operation during the maximum expected time of rescue."

Paragraph 10.3.2 of Part I-A of Polar Code reads:

"10.3.2 Survival craft and rescue boat communications capabilities

10.3.2.1 For ships intended to operate in low air temperature, in order to comply with the functional requirements of paragraph 10.2.2.1 above, all rescue boats and lifeboats, whenever released for evacuation, shall:

.1 for distress alerting, carry one device for transmitting ship to shore alerts;

.2 in order to be located, carry one device for transmitting signals for location; and

.3 for on-scene communications, carry one device for transmitting and receiving on-scene communications.

10.3.2.2 For ships intended to operate in low air temperature, in order to comply with the functional requirements of paragraph 10.2.2.2 above, all other survival craft shall:

.1 in order to be located, carry one device for transmitting signals for location; and

.2 for on-scene communications, carry one device for transmitting and receiving on-scene communications.

10.3.2.3 In order to comply with the functional requirements of paragraph 10.2.2.3 above, recognizing the limitations arising from battery life, procedures shall be developed and implemented such that mandatory communication equipment for use in survival craft, including liferafts, and rescue boats are available for operation during the maximum expected time of rescue."

Interpretation

1. All rescue boats, all lifeboats and all other survival crafts carried by the ship, notwithstanding the redundancy in aggregate capacity of survival crafts required by SOLAS Regulation III/21 and Regulation III/31, and taking into account the different possible distress scenarios, are considered able to be released for evacuation simultaneously and shall be provided with mandatory communication equipment as required by paragraph 10.3.2 of Part I-A of Polar Code accordingly.

2. The expressions "shall maintain capability for", "shall be capable of operation during the maximum expected time of rescue" and "are available for operation during the maximum expected time of rescue" used in paragraphs 10.2.2.1 and 10.2.2.2, 10.2.2.3, 10.3.2.3 of Part I-A, mean ability of mandatory communication equipment for use in survival craft, including liferafts, and rescue boats to maintain the ready-for-operation state within the maximum expected time of rescue at the Polar Service Temperature (PST) assigned to the vessel, and after that to be capable to perform its functions at the PST assigned to the vessel with the operating time not less than specified in respective existing performance standards*.

Note: For example, it is not required that an EPIRB being used for distress alerting continues distress messaging for maximum expected time of rescue, and two-way VHF radiotelephone apparatus being used for transmitting and receiving on-scene communications does not need to be technically in operation at its highest rated power with a duty cycle of 1:9 for maximum expected time of rescue, as specified in Paragraph 1.2.7 of Part I-A of Polar Code.

3. Procedures referred to in paragraph 10.3.2.3 can include both operational requirements and any other means including technical solutions i.e. thermal insulation, chemical heat sources, additional batteries, rechargeable batteries with respective chargers, etc., and shall be documented in Polar Water Operational Manual (PWOM).

* *EPIRB - Res. A.810(19) and MSC.471(101);*
Radar transponder - Res. A.802(19);
AIS-SART - Res. MSC.246 (83);
Two-way VHF radiotelephone apparatus - Res. MSC.149(77).

Technical Background

Vague expressions in 10.2.2.1 and 10.2.2.2, 10.2.2.3, 10.3.2.3 of part I-A Polar Code with regard to mandatory communication equipment of survival craft and rescue boat on ships intended to operate in low air temperature in Polar waters. Absence of respective performance standards.

Remarks

1. This UI is to be applied by Members on ships contracted for construction on or after 1 July 2020.
2.The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.
This UI SC292 is also an appendix of MSC.1/Circ.1612.

1.273 Lifebuoy Arrangements for Means of Embarkation/Disembarkation

Conventions(Amend),Reg.		SOLAS Reg. II-1/3-9 and III/7					
IACS UI number	**SC293**	**UI version**	**02.2020**	**Date of implementation**	**01.07.2020**	**Means of implementation**	**contracted for construction**

Conventions/Code Requirements

SOLAS Regulations:
Regulation III/7.1.3 reads:
"….lifebuoys with lights and those with lights and smoke signals shall be equally distributed on both sides of the ship and shall not be the lifebuoys provided with lifelines in compliance with the requirements of paragraph 1.2."

Regulation II-1/3-9.2 Means of embarkation on and disembarkation from ships
*"2 The means of embarkation and disembarkation required in paragraph 1 shall be constructed and installed based on the guidelines developed by the Organization.**
** Refer to MSC.1/Circular.1331, Guidelines for construction, installation, maintenance and inspection/survey of means of embarkation and disembarkation."*

MSC.1/Circular.1331 paragraph 3.3
"A lifebuoy equipped with a self-igniting light and a buoyant lifeline should be available for immediate use in the vicinity of the embarkation and disembarkation arrangement when in use."

Interpretation

When considering the minimum number and distribution of lifebuoys as required by regulations 22.1.1 or 32.1.1, as applicable, a lifebuoy, fitted with both a light and a lifeline as per MSC.1/Circular.1331 for compliance with SOLAS regulation II-1/3-9.2, should not be taken into account.

Technical Background

There is a contradiction between the requirement of SOLAS reg. 7.1.3 and MSC.1/Circ.1331 with regard to lifebuoys with lifelines and lights and the number of lifebuoys fitted with a buoyant lifeline that may be carried on board ship. Based on MSC.1/Circ.1618, UI makes a clarification.

Remarks

1. This UI is to be uniformly implemented by IACS Societies for ships contracted for construction on or after 1 July 2020.
2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

1.274 Fire integrity of the division between engine room and urea or sodium hydroxide solution tank installation spaces

Conventions (Amend.), Reg.		SOLAS Regulation II-2/3.30, 9.2.2.3.2.2(10), 9.2.2.4.2.2(7), 9.2.3.3.2.2(7), 9.2.4.2.2.2(7)					
IACS UI Number	**SC294**	**UI** version	**Feb. ,2020**	Date of implementation	**01.07.2020**	Means of implementation	**Ships constructed on or after 1 July 2020**

Conventions/Codes Requirements

SOLAS Chapter II-2, Regulation 3.30 reads:
"30 Machinery spaces are machinery spaces of category A and other spaces containing propulsion machinery, boilers, oil fuel units, steam and internal combustion engines, generators and major electrical machinery, oil filling stations, refrigerating, stabilizing, ventilation and air conditioning machinery, and similar spaces, and trunks to such spaces."

SOLAS Chapter II-2, Regulation 9.2 reads:
Regulation 9.2.2.3.2.2 (Ships carrying more than 36 passengers)
"(10) Tanks, voids and auxiliary machinery spaces having little or no fire risk
Water tanks forming part of the ship's structure.
Voids and cofferdams.
Auxiliary machinery spaces which do not contain machinery having a pressure lubrication system and where storage of combustibles is prohibited, such as:
ventilation and air-conditioning rooms;
windlass room; steering gear room;
stabilizer equipment room;
electrical propulsion motor room;
rooms containing section switchboards and purely electrical equipment other than oil-filled electrical transformers (above 10 kVA);
shaft alleys and pipe tunnels;
spaces for pumps and refrigeration machinery (not handling or using flammable liquids).
Closed trunks serving the spaces listed above.
Other closed trunks such as pipe and cable trunks."
Regulation 9.2.2.4.2.2 (Ships carrying not more than 36 passengers)
"(7) Other machinery spaces
Electrical equipment rooms (auto-telephone exchange, air-conditioning duct spaces).
Spaces as defined in regulation 3.30 excluding machinery spaces of category A."
Regulation 9.2.3.3.2.2 (Cargo Ships except tankers)
"(7) Other machinery spaces
Electrical equipment rooms (auto-telephone exchange, air-conditioning duct spaces).
Spaces as defined in regulation 3.30 excluding machinery spaces of category A."
Regulation 9.2.4.2.2.2 (Tankers)
"(7) Other machinery spaces
Electrical equipment rooms (auto-telephone exchange and air-conditioning duct spaces).
Spaces as defined in regulation 3.30 excluding machinery spaces of category A."

Interpretation

In cases where urea or sodium hydroxide solution tanks for selective catalytic reduction (SCR) systems, exhaust gas recirculation (EGR) systems or exhaust gas cleaning systems (EGCS) are installed in a space separated from engine room, in determining fire integrity of divisions, the solution tank space should be considered as "similar spaces" in the definition of "*Machinery spaces*" in regulation 3.30 and should be categorized as:
"(10) *Tanks, voids and auxiliary machinery spaces having little or no fire risk*" in regulation 9.2.2.3.2.2, for ships carrying more than 36 passengers; or
"(7) *Other machinery spaces*" in regulations 9.2.2.4.2.2, 9.2.3.3.2.2 or 9.2.4.2.2.2 for ships carrying not more than 36 passengers and cargo ships;
The division between the engine room and the solution tank space should have a fire integrity of at least "A-0" class.

Technical Background

IACS Safety panel clarified the required fire integrity of bulkheads and decks between engine room and urea or sodium hydroxide solution tank installation spaces for the application of SOLAS II-2 Reg.9.

Remarks

1. This Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for

construction on or after 1 July 2020.

2. The “contracted for construction” date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of “contract for construction”, refer to IACS Procedural Requirement (PR) No. 29.

1.275 Interpretation of Performance Standards for EPIRBs Operating on 406 MHz (resolution MSC.471(101))

Conventions (Amend.), Reg.		**MSC.471(101)**					
IACS UI Number	**SC295**	**UI version**	**July 2021**	**Date of implem-entation**	**Jul.1,2022**	**Means of impleme-ntation**	

Conventions/Codes Requirements

Operative paragraph 2 of resolution MSC.471(101) reads:

2. RECOMMENDS Governments to ensure that float-free EPIRBs operating on the frequency 406 MHz:

.1 if installed on or after 1 July 2022, conform to performance standards and type-approval standards not inferior to those specified in the annex to the present resolution;

.2 if installed before 1 July 2022, conform to performance standards not inferior to those specified in the annex to resolution A.810(19), as amended by resolutions MSC.56(66) and MSC.120(74), and type-approval standards not inferior to those specified in resolution A.696(17).

Interpretation

For application of resolution MSC.471(101), the phrase “installed on or after 1 July 2022” shall be interpreted as follows:

(a) for ships for which the building contract is placed on or after 1 July 2022, or in the absence of the contract, constructed on or after 1 July 2022, "installed on or after 1 July 2022" means any installation on the ship; and

(b) for ships other than those ships prescribed in (a) above, "installed on or after 1 July 2022" means a contractual delivery date for the equipment or, in the absence of a contractual delivery date, the actual delivery of the equipment to the ship on or after 1 July 2022.

Technical Background

This UI requires further clarification in a similar way to UI SC261 on the interpretation of performance standards for VDR.

Remarks

The “contracted for construction” date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of “contract for construction”, refer to IACS Procedural Requirement (PR) No. 29.

CHAPTER 2 INTERNATIONAL CONVENTION ON LOAD LINES(LL Convention)

2.1 Application

Conventions (Amend.), Reg.		Article **4.4** of **ICLL** Convention **1966**					
IACS UI Number	**LL1**	**UI** version	**1968/ Rev.1,Jul.,2008**	Date of implementation	**1968**	Means of implement ation	

Conventions/Codes Requirements

……; in no case shall such ships be required to increase their freeboards. In order to take advantage of any reduction in freeboard from that previously assigned, existing ships shall comply with all the requirements of the present Convention.

Interpretation

Even where the increase in draught is only of the order of 1 in or 2 in there should be no relaxation from the condition that existing ships comply with all the requirements.

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Footnote: This UI is also applicable to the revised Article 4 of the 1966 Convention as modified by its 1988 Protocol.

Remarks

2. 2 Depth for freeboard

Conventions (Amend.), Reg.		Regulation **3(6)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL2**	**UI** version	**1968/ Rev.1,Jul.,2008**	Date of implementation	**1968**	Means of implementation	

Conventions/Codes Requirements

(a) The depth for freeboard (*D*) is the moulded depth amidships, plus the thickness of the freeboard deck stringer plate, where fitted, plus $T(L - S)/L$ if the exposed freeboard deck is sheathed, where

T is the mean thickness of the exposed sheathing clear of deck openings, and

S is the total length of superstructures as defined in sub-paragraph (10)(d) of this Regulation.

(b) The depth for freeboard (*D*) in a ship having a rounded gunwale with a radius greater than 4% of the breadth (*B*) or having topsides of unusual form is the depth for freeboard of a ship having a midship section with vertical topsides and with the same round of beam and area of topside section equal to that provided by the actual midship section.

Interpretation

The correction for thickness of sheathing on the exposed freeboard deck $T(L-S)/L$ is applicable only when deck is completely sheathed between superstructures. In other cases the correction should be Tl/L, where l = length of sheathed area which extends from side to side. Only wood sheathing should be considered.

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Footnote: This UI is also applicable to Regulation 3(6) of the 1988 Protocol.

Remarks

2.3 Superstructure

Conventions (Amend.), Reg.		Regulation **3(10) (b)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL3**	**UI** version	**1968/ Rev.1,Jul.,2008**	Date of implementation	**1968**	Means of implementation	

Conventions/Codes Requirements

(b) An enclosed superstructure is a superstructure with:

① enclosing bulkheads of efficient construction;

② access openings, if any, in these bulkheads fitted with doors complying with the requirements of Regulation 12;

③ all other openings in sides or ends of the superstructure fitted with efficient weathertight means of closing.

A bridge or poop shall not be regarded as enclosed unless access is provided for the crew to reach machinery and other working spaces inside these superstructures by alternative means which are available at all times when bulkhead openings are closed.

Interpretation

A bridge or poop shall not be regarded as enclosed unless access is provided for the crew starting from any point on the uppermost complete exposed deck or higher to reach machinery and other working spaces inside these superstructures by alternative means which are available at all times when bulkhead openings are closed.

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Footnote: This UI is also applicable to Regulation 3(10)(b) of the 1988 Protocol.

Remarks

2.4 Details of marking

Conventions (Amend.), Reg.		Regulation **8** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL4**	**UI** version	**1968/ Rev.1,Jul.,2008**	Date of implementation	**1968**	Means of implementation	

Conventions/Codes Requirements

The ring, lines and letters shall be painted in white or yellow on a dark ground or in black on a light ground. They shall also be permanently marked on the sides of the ships to the satisfaction of the Administration. The marks shall be plainly visible and, if necessary, special arrangements shall be made for this purpose.

Interpretation

'Permanently marked' is considered to include welding of the marks on the sides of the ship provided the usual precautions as to material, electrodes, etc. are observed.

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Footnote: This UI is also applicable to Regulation 8 of the 1988 Protocol and the revised 1988 Protocol.

Remarks

2.5 Doors

Conventions (Amend.), Reg.		Regulation **12** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL5**	**UI** version	**1968/ Rev.1,Jul.,2008**	Date of implementation	**1968**	Means of implementation	

Conventions/Codes Requirements

(1) All access openings in bulkheads at ends of enclosed superstructures shall be fitted with doors of steel or other equivalent material, permanently and strongly attached to the bulkhead, and framed, stiffened and fitted so that the whole structure is of equivalent strength to the unpierced bulkhead and weathertight when closed. The means for securing these doors weathertight shall consist of gaskets and clamping devices or other equivalent means and shall be permanently attached to the bulkhead or to the doors themselves, and the doors shall be so arranged that they can be operated from both sides of the bulkhead.

(2) Except as otherwise provided in these Regulations, the height of the sills of access openings in bulkheads at ends of enclosed superstructures shall be at least 380 mm above the deck.

Interpretation

(a) Doors should generally open outwards to provide additional security against the impact of the sea. Doors which open inwards are to be especially approved.

(b) Portable sills should be avoided. However, in order to facilitate the loading/unloading of heavy spare parts or similar, portable sills may be fitted on the following conditions:

(i) They must be installed before the ship leaves port.

(ii) Sills are to be gasketed and fastened by closely spaced through bolts.

(iii) Whenever the sills are replaced after removal, the weathertightness of the sills

and the related doors must be verified by hose testing. The dates of removal, replacing and hose testing shall be recorded in the ship's log book.

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Footnotes:

1. This UI is also applicable to Regulation 12 of 1988 Protocol.
2. Paragraph (b)(iii) of this UI is also applicable to Regulation 12 of the revised 1988 Protocol.

Remarks

2.6 Hatchways closed by weathertight covers of steel or other equivalent materials fitted with gaskets and clampings

Conventions (Amend.), Reg.		Regulations **16**, **27(7)(c)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL6**	**UI** version	**Rev.2,Jul.,2004/ Rev.3,Jul,2008**	Date of implementation	**Jul., 2004**	Means of implementation	Contracted for construction

Conventions/Codes Requirements

Regulation **16**: Weathertight covers of steel or other equivalent materials fitted with gaskets and clampings (details omitted)

Regulation **16, 27(7)(c)**: The covers in position 1 and 2 comply with the provisions of regulation 16 and have adequate strength, special care being given to their sealing and securing arrangements;

Interpretation

Regulation 16:

Where hatchways are fitted with coamings of standard height, no extra strengthening (beyond what is required in the Load Line Convention) shall be required for covers loaded with cargo, even if dense cargo, provided the load does not exceed 1,75 ton/m^2 (in position 1)*.

Regulation 27(7)(c):

No extra strengthening is recommended for hatchway covers on vessels* which are assigned freeboards less than those based on Table B, except for flush hatchway covers which are fitted on the freeboard deck forward of the quarter length, in which case the section modulus and the moment of inertia shall be increased 15% over that required by Regulation 16.

*Bulk Carriers:

For the hatch covers on Bulk Carriers, as defined in UR Z11.2.2, contracted for construction on or after 1 July 1998, the hatch cover load and strength requirements are to be in accordance with IACS Unified Requirement S21, "Evaluation of Scantlings of Hatch Covers of Bulk Carrier Cargo Holds".

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Footnote: This UI is also applicable to Regulations 16 and 27(8)(c) of the 1988 Protocol.

Remarks

The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

2.7 Machinery space openings

Conventions (Amend.), Reg.		Regulations **17(1)**, **26(1)**, **27(8)** and **27(9)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL7**	**UI** version	**Rev.1,Jun.,2002/ Rev.2,Jul.,2008**	Date of implementation	**Jan.1,2003**	Means of implementation	

Conventions/Codes Requirements

Regulation **17(1):** Machinery space openings in position 1 or 2 shall be properly framed and efficiently enclosed by steel casings of ample strength, and where the casings are not protected by other structures their strength shall be specially considered. Access openings in such casings shall be fitted with doors complying with the requirements of regulation 12(1), the sills of which shall be at least 600 mm above the deck if in position 1, and at least 380 mm above the deck if in position 2. Other openings in such casings shall be fitted with equivalent covers, permanently attached in their proper positions.

Regulation **26(1):** Machinery casings on type 'A' ships, as defined in Regulation 27, shall be protected by an enclosed poop or bridge of at least standard height, or by a deckhouse of equal height and equivalent strength, provided that machinery casings may be exposed if there are no openings giving direct access from the freeboard

deck to the machinery space. A door complying with the requirements of Regulation 12 may, however, be permitted in the machinery casing, provided that it leads to a space or passageway which is as strongly constructed as the casing and is separated from the stairway to the engine room by a second weathertight door of steel or other equivalent material.
Regulation **27(9):** In calculating the freeboards for type 'B' ships which comply with the requirements of paragraphs (8), (11), (12) and (13), the values from table B of Regulation 28 shall not be reduced by more than 60% of the difference between the B and A tabular values for the appropriate ship lengths.
Regulation **27(10):** (a) The reduction in tabular freeboard allowed under paragraph (9) may be increased up to the total difference between the values in table A and those in table B of Regulation 28 on condition that the ship complies with the requirements of: ……

Interpretation

Where casings are not protected by other structures, double doors should be required for type A or type B ships assigned freeboards less than those based on Table B. An inner sill of 230 mm in conjunction with the outer sill of 600 mm is recommended.

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Footnotes:
1. This UI is also applicable to Regulations 17(1), 26(1), 27(9) and 27(10) of the 1988 Protocol;
2 "Based on Table B" means without any reduction in accordance with Regulation 27(8) or (9) of the 1966 ICLL or Regulation 27(9) or (10) of the 1988 Protocol.

Remarks

2.8 Miscellaneous openings in freeboard and superstructure decks

Conventions (Amend.), Reg.		Regulations **18(2)**, **(3)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL8**	**UI** version	**1968/ Rev.1,Jul.,2008/ Rev.2,Apr.,2021**	Date of implementation	**1968/ -/ Rev.2,Jul.1,2022**	Means of implementation	**Contracted for construction**

Conventions/Codes Requirements

(2) Openings in freeboard decks other than hatchways, machinery space openings, manholes and flush scuttles shall be protected by an enclosed superstructure, or by a deckhouse or companionway of equivalent strength and weathertightness. Any such opening in an exposed superstructure deck or in the top of a deckhouse on the freeboard deck which gives access to a space below the freeboard deck or a space within an enclosed superstructure shall be protected by an efficient deckhouse or companionway. Doorways in such deckhouses or companionways shall be fitted with doors complying with the requirements of Regulation 12(1).
(3) In position 1 the height above the deck of sills to the doorways in companionways shall be at least 600 mm. In position 2 it shall be at least 380 mm.

Interpretation

1. Regulation 18(2):
(a) Only those doorways in companionways or deckhouses leading to or giving access to stairways leading below, need to be fitted with doors in accordance with Regulation 12.
(b) Alternatively, if stairways within a deckhouse are enclosed within properly constructed companionways fitted with doors complying with Regulation 12, the external door need not be weathertight.
(c) Where an opening in a superstructure deck or in the top of a deckhouse on the freeboard deck which gives access to a space below the freeboard deck or to a space within an enclosed superstructure is protected by a deckhouse, then it is considered that only those side scuttles fitted in spaces which give direct access to an open stairway need be fitted with deadlights in accordance with Regulation 23. A cabin is considered to provide adequate protection against the minimal account of water which will enter through a broken side scuttle glass fitted on the second tier.
2. Regulation 18(3):
In the application of Regulation 18 it is understood that:

(i) where access is provided from the deck above as an alternative to access from the freeboard deck in accordance with Regulation 3(10)(b) then the height of sills into a bridge or poop shall be at least 380 mm. The same consideration shall apply to deckhouses on the freeboard deck.
(ii) where access is not provided from above, the height of the sills to doorways in a poop bridge or deckhouse on the freeboard deck shall be at least 600 mm.
(iii) where the closing appliances of access openings in superstructures and deckhouses are not in accordance with Regulation 12, interior deck openings are to be considered exposed, i.e. situated in the open deck.

_____

Footnotes:

1. This UI is applicable to Regulation 18(2) and 18(3) of the International Convention on Load Lines, 1966 .
2. Paragraphs 1 (c) and 2 (ii) of this UI are also applicable to Regulation 18(2) and (6) of the 1988 Protocol as amended by Resolution MSC.143(77) respectively.
3. Rev.2 of this UI is to be applied by all IACS Societies for ships contracted for construction on or after 1 July 2022.
4. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

Remarks

2.9 Air pipes

Conventions (Amend.), Reg.		Regulation **20** of Annex **I** to **ICLL** Convention **1966** and 1988 Protocol					
IACS UI Number	**LL10**	**UI** version	**1968/ Rev.1,Jul.,2008/ Rev.2,Nov.,2020**	Date of implementation	**1968**	Means of implementation	

Conventions/Codes Requirements

Where air pipes to ballast and other tanks extend above the freeboard or superstructure decks, the exposed parts of the pipes shall be of substantial construction; the height from the deck to the point where water may have access below shall be at least 760 mm on the freeboard deck and 450 mm on the superstructure deck. Where these heights may interfere with the working of the ship, a lower height may be approved, provided the Administration is satisfied that the closing arrangements and other circumstances justify a lower height. Satisfactory means permanently attached, shall be provided for closing the openings of the air pipes.

Interpretation

For ships assigned timber freeboards the air pipes should be provided with automatic closing appliances.

_____

Footnote: This UI is applicable to Regulation 20 of the International Convention on Load Lines, 1966 and 1988 Protocol.

Technical Background

In Rev.2, the editorial corrections are made to the footnote of Rev.1.

Remarks

2.10 Scuppers, inlets and discharges

Conventions (Amend.), Reg.		Regulation **22(1)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL11**	**UI** version	**Rev.2,1994/ Rev.3,Jul.,2008**	Date of implementation	**1994**	Means of implementation	

Conventions/Codes Requirements

Discharges led through the shell either from spaces below the freeboard deck or from within superstructures and deckhouses on the freeboard deck fitted with doors complying with the requirements of Regulation 12 shall, except as provided in paragraph (2), be fitted with efficient and accessible means for preventing water from passing inboard.

Normally each separate discharge shall have one automatic non-return valve with a positive means of closing it from a position above the freeboard deck. Where, however, the vertical distance from the summer load waterline to the inboard end of the discharge pipe exceeds 0.01*L*, the discharge may have two automatic non-return valves without positive means of closing, provided that the inboard valve is always accessible for examination under service conditions; where that vertical distance exceeds 0.02*L*, a single automatic non-return valve without positive means of closing may be accepted, subject to the approval of the Administration. The means for operating the positive action valve shall be readily accessible and provided with an indicator showing whether the valve is open or closed.

Interpretation

It is considered that an acceptable equivalent to one automatic non-return valve with a positive means of closing from a position above the freeboard deck would be one automatic non-return valve and one sluice valve controlled from above the freeboard deck.

Where two automatic non-return valves are required, the inboard valve must always be accessible under service condition, i.e., the inboard valve should be above the level of the tropical load water line. If this is not practicable, then, provided a locally controlled sluice valve is interposed between the two automatic non-return valves, the inboard valve need not to be fitted above the LWL.

Where sanitary discharges and scuppers lead overboard through the shell in way of machinery spaces, the fitting to shell of a locally operated positive closing valve, together with non-return valve inboard, is considered to provide protection equivalent to the requirements of Regulation 22(1).

It is considered that the requirements of Regulation 22(1) for non-return valves are applicable only to those discharges which remain open during the normal operation of a vessel. For discharges which must necessarily be closed at sea, such as gravity drains from topside ballast tanks, a single screw down valve operated from the deck is considered to provide efficient protection.

The inboard end of a gravity discharge which leads overboard from an enclosed superstructure or space is to be located above the water line formed by a 5 degree heel, to port or starboard, at a draft corresponding to the assign summer freeboard.

It is considered that the position of the inboard end of discharges should be related to the timber summer load waterline when timber freeboard is assigned.

Refer to the attached Table for the acceptable arrangements of scuppers, inlets, and discharges.

For garbage chutes it is considered that an acceptable equivalent to the non-return valve with a positive means of closing from a position above the freeboard deck would be two gate valves controlled from the working deck of the chute. The lowest gate valve should, in addition, be controlled from a position above the freeboard deck. An interlock system between the two valves should be arranged.

It is recommended that the inboard end be located above the waterline formed by an 8.5 degree heel, to port or starboard, at a draft corresponding to the assigned summer freeboard, but not less than 1000 mm above the summer waterline.

Where the inboard end of the garbage chute exceeds 0.01L above the summer waterline,valve control from the freeboard deck is not required, provided the inboard gate valve is always accessible under service conditions.

The distance between the two gate valves should be adequate to allow the smooth operation of the interlock system.

Alternatively, the upper gate valve may be replaced by a hinged weathertight cover at the inboard end of the chute together with a discharge flap which replaces the lower gate valve. The cover and flap are to be arranged with an interlock so that the discharge flap cannot be operated until the hopper cover is closed.

The chute is to be constructed of material of substantial thickness up to, and including, the cover.

The gate valve(s) controls and/or hinged cover are to be clearly marked: “Keep closed when not in use”.

Where the inboard end of a garbage chute is below the margin line in a passenger ship, or the critical (crucial) waterline of a cargo ship of more than 100 m in length then:

(i) the inboard end hinged cover/valve is to be watertight.

(ii) the valve is to be a screw-down non-return valve fitted in an easily accessible position above the deepest subdivision load line.

(iii) the screw-down non-return valve is to be controlled from a position above the bulkhead deck and provided with open/shut indicators. The valve control is to be clearly marked:

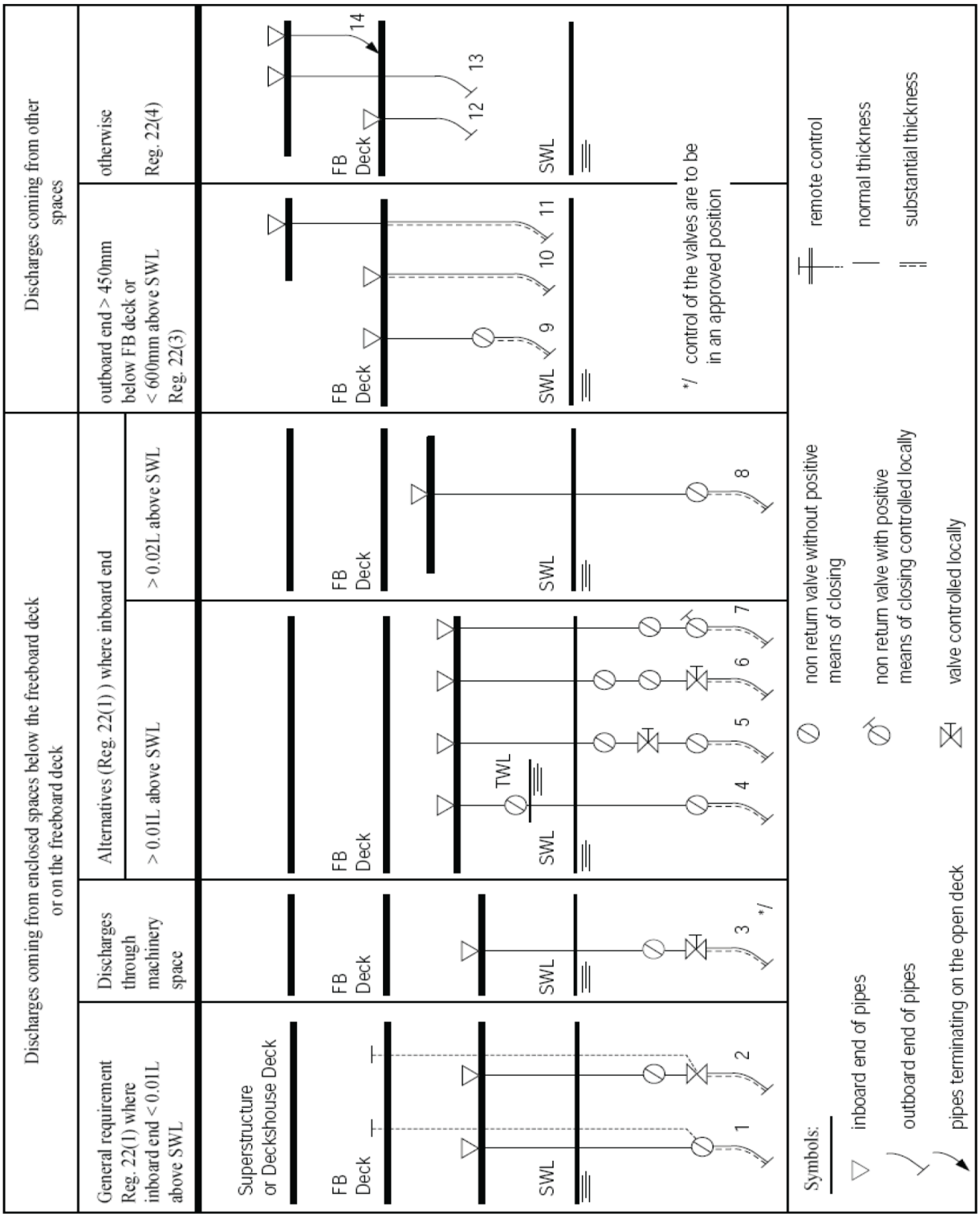
“Keep closed when not in use”.

Where plastic pipes are used for sanity discharges and scuppers, they are also subject to the requirements of the Table, and the valve at the shell is to be operated from outside the space in which the valve is located.

Where such plastic pipes are located below the summer waterline (timber summer load waterline), the valve is to be

operated from a position above the freeboard deck.
The portion of discharge line from the shell to the first valve as well as shell fittings and valves shall be of steel, bronze or other approved ductile material.
The approval of plastic piping in any location will be subject to the consideration of strength and fire hazards involved with special reference to penetrations through bulkheads, decks or other significant compartment boundaries.
Attention must also be paid to valid fire technical regulations.

LL11 – The Table



Footnote: This UI is also applicable to Regulation 22(1) of the 1988 Protocol.

Remarks

2.11 Side scuttles

Conventions (Amend.), Reg.		Regulation **23** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL12**	**UI** version	**1968**	Date of implementation	**1968**	Means of implementation	
Conventions/Codes Requirements							
(1) Side scuttles to spaces below the freeboard deck or to spaces within enclosed superstructures shall be fitted with efficient hinged inside deadlights arranged so that they can be effectively closed and secured watertight. (2) No side scuttle shall be fitted in a position so that its sill is below a line drawn parallel to the freeboard deck at side and having its lowest point 2.5% of the breadth (*B*) above the summer load line (or summer timber load line, if assigned) or 500 mm, whichever is the greater distance. (3) The side scuttles, together with their glasses, if fitted, and deadlights, shall be of substantial and approved construction.							
Interpretation							
Remarks							
Deleted (July 2008) and incorporated into UI LL62.							

2.12 Freeing ports

Conventions (Amend.), Reg.		Regulations **24(1)**, **(5)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL13**	**UI** version	**1968/ Rev.1, Jul., 2008**	Date of implementation	**1968**	Means of implementation	
Conventions/Codes Requirements							
(1) Where bulwarks on the weather portions of freeboard or superstructure decks form wells, ample provision shall be made for rapidly freeing the decks of water and for draining them. Except as provided in paragraphs (2) and (3) of this Regulation, the minimum freeing port area (*A*) on each side of the ship for each well on the freeboard deck shall be that given by the following formulae in cases where the sheer in way of the well is standard or greater than standard. The minimum area for each well on superstructure decks shall be one-half of the area given by the following formulae: Where the length of bulwark (*l*) in the well is 20 m or less: $A = 0.7 + 0.035\ l \quad m^2$; where *l* exceeds 20 m: $A = 0.07\ l \quad m^2$.							

l need in no case be taken as greater than 0.7*L*.

If the bulwark is more than 1.2 m in average height, the required area shall be increased by 0.004 m^2 per metre of length of well for each 0.1 m difference in height. If the bulwark is less than 0.9 m in average height, the required area may be decreased by 0.004 m^2 per m of length of well for each 0.1 m difference in height.

(5) The lower edges of the freeing ports shall be as near the deck as practicable. Two-thirds of the freeing port area required shall be provided in the half of the well nearest the lowest point of the sheer curve.

Interpretation

Regulation 24(1):

On a flush deck ship with a substantial deckhouse amidships it is considered that the deckhouse provides sufficient break to form two wells and that each could be given the required freeing port area based upon the length of the 'well'. It would not then be allowed to base the area upon 0.7L.

In defining a substantial deckhouse it is suggested that the breadth of the deckhouse should be at least 80% of the beam of the vessel, and that the passageways along the side of the ship should not exceed 1.5 m (4.9 ft) in width.

Where a screen bulkhead is fitted completely across the vessel, at the forward end of a midship deck house, this would effectively divide the exposed deck into wells and no limitation on the breadth of the deckhouse is considered necessary in this case.

It is considered that wells on raised quarterdecks should be treated as previously, i.e. as being on freeboard decks.

Regulation 24(5):

With zero or little sheer on the exposed freeboard deck or an exposed superstructure deck it is considered that the freeing port area should be spread along the length of the well.

_____

Footnote: This UI is also applicable to Regulation 24(1) and 24(5) of the 1988 Protocol.

Remarks

2. 13 Protection of the crew

Conventions (Amend.), Reg.		**Reg.25(2) of Annex I of 1966 ICLL**					
IACS UI Number	**LL14**	**UI version**	**1968/ Rev.1, July 2008 Corr.1, Oct 2015**	**Date of implementation**	**1968**	**Means of implementation**	

Conventions/Codes Requirements

Reg.25(2) of Annex I of 1966 ICLL：

(2) Efficient guard rails or bulwarks shall be fitted to all exposed parts of the freeboard and superstructure decks. The height of the bulwarks or guard rails shall be at least 1 metre (39 ½ inches) from the deck, provided that where this height would interfere with the normal operation of the ship, a lesser height may be approved if the Administration is satisfied that adequate protection is provided.

Interpretation
A guard rail should also be required for first tier deckhouses and for superstructures' ends. Note: This UI is also applicable to Regulation 25(2) of the 1988 Protocol
Technical Background
(1) Reg. 25 (2) of the 1966 LL Convention as modified by the 1988 LL Protocol, as amended by resolution MSC.143 (77) requires : "Guard rails or bulwarks shall be fitted around all exposed decks". (2) IACS UI LL14 (Rev.1 July 2008) requires: "A guard rail should also be required for first tier deckhouses and for superstructures ends" IACS safety panel is of the view that "exposed decks" as contained in Reg.25(2) of 1966 ICLL is a vague expression and is not properly addressed in the current revision of IACS UI LL14, and consequently decided to delete the text of "and the revised 1988 Protocol" of the footnote with a view to eliminating inconsistency between the Convention and the UI.
Remarks

2.14 Length of superstructure

Conventions (Amend.), Reg.		Regulations **34(1)**, **34(2)** of Annex **I** to **ICLL** Convention **1966** and 1988 Protocol					
IACS UI Number	**LL15**	**UI** version	**Rev.2,Jul.,2003/ Rev.3,Jul.,2008/ Rev.4,Nov.,2021**	Date of implementation	**Rev.2,Jan.1,2004/ -/ Rev.4,Jan.1,2022**	Means of impleme ntation	

Conventions/Codes Requirements

Regulations 34(1) and 34(2) of the International Convention on Load Lines, 1966 reads as follows:

(1) Except as provided in paragraph (2) of this Regulation, the length of a superstructure (*S*) shall be the mean length of the parts of the superstructure which lie within the length (*L*).

(2) Where the end bulkhead of an enclosed superstructure extends in a fair convex curve beyond its intersection with the superstructure sides, the length of the superstructure may be increased on the basis of an equivalent plane bulkhead. This increase shall be two-thirds of the fore and aft extent of the curvature. The maximum curvature which may be taken into account in determining this increase is one-half the breadth of the superstructure at the point of intersection of the curved end of the superstructure with its side.

Regulations 34(1) and 34(2) of the 1988 Protocol relating to the International Convention on Load Lines 1966 reads as follows:

(1) Except as provided in paragraph (2), the length of a superstructure (S) shall be the mean length of the parts of the superstructure which lie within the length (L).

Where a superstructure bulkhead is recessed, the effective length of the superstructure shall be reduced by an amount equal to the area of the recess in plan view divided by the breadth of the superstructure at the midlength of the recess. Where the recess is unsymmetrical about the centreline, the largest portion of the recess shall be considered as applying to both sides of the ship. A recess need not be decked over.

(2) Where the end bulkhead of an enclosed superstructure extends in a fair convex curve beyond its intersection with the superstructure sides, the length of the superstructure may be increased on the basis of an equivalent plane bulkhead. This increase shall be two-thirds of the fore and aft extent of the curvature. The maximum curvature which may be taken into account in determining this increase is one-half the breadth of the superstructure at the point of intersection of the curved end of the superstructure with its side.

Where there is an extension to a superstructure, which extension has a breadth on each side of the centre line at least 30% of the breadth of the ship, the effective length of the superstructure may be increased by considering an equivalent superstructure bulkhead in the form of a parabola. This parabola shall extend from the extension at the centreline and pass through the junction of the actual superstructure bulkhead with the sides of the extension and extend to the sides of the ship. This parabola shall be completely contained within the boundary of the superstructure and its extensions.

If the superstructure is set-in from the side, up to the limit allowed under regulation 3(10), the equivalent bulkhead should be calculated on the basis of the actual breadth of the superstructure (and not the breadth of the ship).

Interpretation

Regulation 34(1):

1. Where a superstructure bulkhead is recessed, the effective length of the superstructure shall be reduced by an amount equivalent in area to the area of the recess related to the breadth of the ship at the mid-length of the recess.
2. Where the recess is unsymmetrical about the centre line, the largest portion of the recess shall be considered as applying to both sides of the ship.
3. It is considered that such a recess need not be decked over.
4. Where a cargo hatchway, complying with the requirements of regulation 16 and having a coaming height that extends above the level of the superstructure deck, is fitted in the recess and covering the whole area of the recess, the hatchway may be taken into account as forming a part of the superstructure, and the effective length of the superstructure need not be reduced by the amount equivalent in area to the area of the recess.
5. The hatchway coaming height shall be in accordance with Regulation 16(1), measured from the superstructure deck level.

Regulation 34(2):

6. Where there is an extension to a superstructure, which extension has a breadth on each side of the centre line at least 30% of the breadth of the ship, the effective length of the superstructure may be increased by considering an equivalent superstructure bulkhead in the form of a parabola. This parabola should extend from the extension at the centre line and pass through the junction of the actual superstructure bulkhead with the sides of the extension and extend to the sides of the ship. This parabola should be completely contained within the boundary of the superstructure and its extensions.
7. If the superstructure is set-in from the side, up to the limit allowed under Regulation 3(10), the equivalent bulkhead should be calculated on the basis of the actual breadth of the superstructure (not the breadth of the ship).

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Footnotes:

1. All paragraphs of the UI are applicable to Regulation 34 (1) and 34(2) of ICLL 1966 and to ICLL 1966 as amended in 1988
2. Paragraphs 4 and 5 of the UI are also applicable to ICLL 1966 as amended in 1988 and 2003.

Remarks

1. Changes introduced in Rev.2 (July 2003) are to be uniformly implemented by IACS Members and Associates from 1 January 2004.
2. Changes introduced in Rev.4 (Nov 2021) are to be uniformly implemented by IACS Members from 1 January 2022.

2.15 Sheer

Conventions (Amend.), Reg.		Regulation **38** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL16**	**UI** version	**1968/ Rev.1, Jul., 2008**	Date of implementation	**1968**	Means of implementation	

Conventions/Codes Requirements

(12) Where sheer credit is given for a poop or forecastle the following formula shall be used:

$$s = \frac{y}{3} \bullet \frac{L'}{L}$$

where*: s* is the sheer credit, to be deducted from the deficiency, or added to the excess of sheer;

y is the difference between actual and standard height of superstructure at the after or forward perpendicular;

L' is the mean enclosed length of poop or forecastle up to a maximum length of 0.5*L*; and

L is the length of the ship as defined in Regulation 3(1).

The above formula provides a curve in the form of a parabola tangent to the actual sheer curve at the freeboard deck and intersecting the end ordinate at a point below the superstructure deck a distance equal to the standard height of a superstructure. The superstructure deck shall not be less than standard height above this curve at any point. This curve shall be used in determining the sheer profile for forward and after halves of the ship.

Interpretation

Where the height of a superstructure is less than standard, paragraph 12 may be applied except that the superstructure deck shall not be less than the minimum height of the superstructure above the virtual shear curve at any point.

For this purpose y shall be taken as the difference between the actual and minimum height of the superstructure at the end of sheer.

_____

Footnote: This UI is also applicable to Regulation 38 of the 1988 Protocol.

Remarks

2.16 Minimum bow height

Conventions (Amend.), Reg.		Regulations **39(1)**, **39(2)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL17**	**UI** version	**Corr.,1996/ Corr.1,Jun.,2006/ Corr.2,Oct.,2007/ Rev.1,Jul.,2008**	Date of implementation	**1996/ Jun.,2006/ Oct.,2007**	Means of implementation	

Conventions/Codes Requirements

(1) The bow height defined as the vertical distance at the forward perpendicular between the waterline corresponding to the assigned summer freeboard and the designed trim and the top of the exposed deck at side, shall be not less than:

for ships below 250 m in length,

$$56L(1- L/500)(1.36/(C_b + 0.68)) \quad \text{mm}$$

for ships of 250 m and above in length,

$$7000(1.36/(C_b + 0.68)) \quad \text{mm}$$

where: L is the length of the ship in m;

C_b is the block coefficient which is to be taken as not less than 0.68.

(2) Where the bow height required in paragraph (1) of this Regulation is obtained by sheer, the sheer shall extend for at least 15% of the length of the ship measured from the forward perpendicular. Where it is obtained by fitting a

superstructure, such superstructure shall extend from the stem to a point at least 0.07L abaft the forward perpendicular, and it shall comply with the following requirements:

(a) for ships not over 100 m in length, it shall be enclosed as defined in Regulation 3(10), and

(b) for ships over 100 m in length, it need not comply with Regulation 3(10), but shall be fitted with closing appliances to the satisfaction of the Administration.

Interpretation

When a ship built on or after 21 July 1968 is arranged to suit exceptional operational requirements such that the forecastle and/or sheer forward do not meet the provisions of paragraphs (1) and (2) of Regulation 39 of the 1966 ICLL, the increase of calculated summer freeboard may, with the concurrence of the Administration, be determined in the following ways.

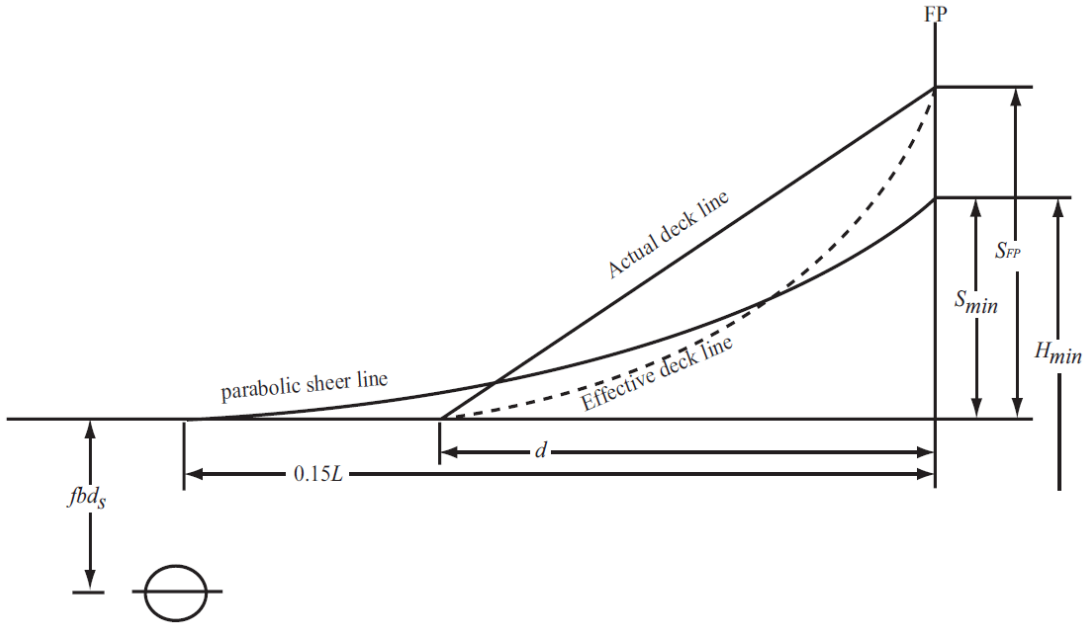
Nomenclature

$\Delta E_0 \geq 0$	Bow height penalty
S_{min} =	H_{min} - fbd_s
H_{min}	Minimum bow height calculated according to paragraph (1) of this Regulation
fbd_s	Summer freeboard
$d \leq 0.15L$	Extent of sheer (measured from FP)
$l_F \leq 0.07L$	Mean covered length of forecastle
h	Height of forecastle measured at FP from zero sheer line
S_{FP}	Actual sheer measured at FP
S_{BHD}	Actual sheer in way of forecastle bulkhead
$S_1 = S_{min}\left(\frac{0.15L - l_F}{0.15L}\right)^2$	Theoretical sheer in way of forecastle bulkhead corresponding to S_{min}
$S_2 = h\left(\frac{0.15L - l_F}{0.15L}\right)^2$	Theoretical sheer in way of forecastle bulkhead corresponding to h

a) Where no forecastle is fitted and the sheer forward extends less than 0.15L from fore perpendicular (FP):

$$\Delta E_0 = S_{min} - S_{FP}\frac{d}{0.15L} \geq 0$$

$0 \leqslant \quad S_{FP} \quad \leqslant 1.5 S_{min}$

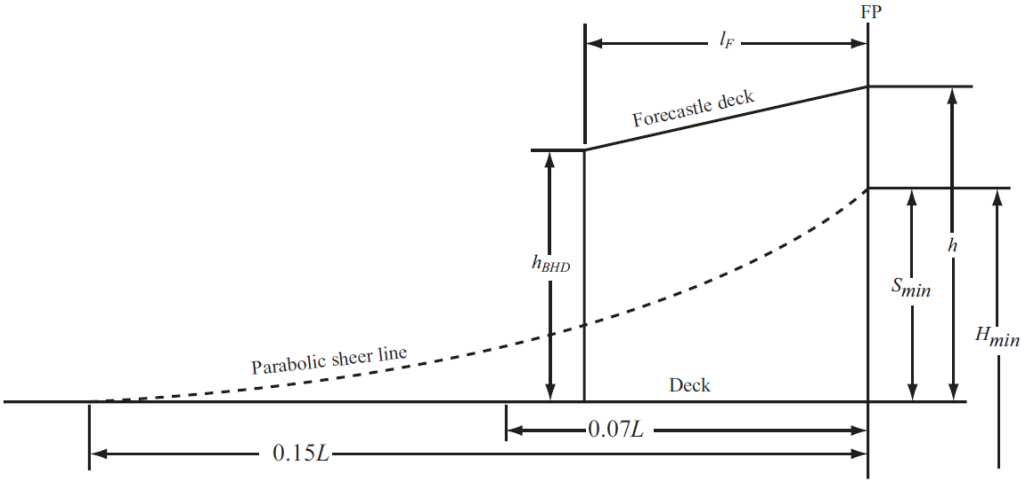


(b) Where there is no sheer on the forward part of the freeboard deck, and the forecastle length is less than 0.07L

from FP:

$$\Delta E_0 = S_{\min} - h\frac{l_F}{0.07L} \geq 0$$

$0 \leq \quad h \quad \leq 1.5S_{\min}$



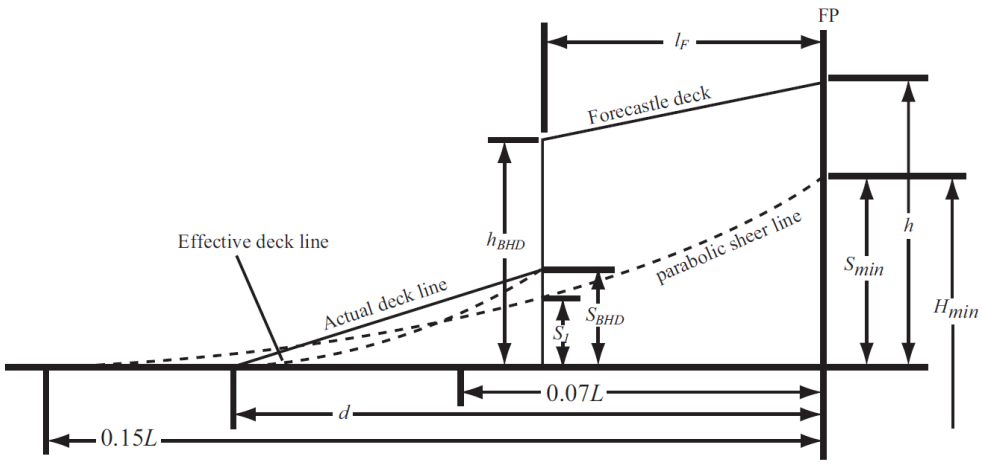
The height of the forecastle at the bulkhead position shall not be less than the ordinate, at that point, of a parabolic sheer curve having an ordinate *S*min at the forward perpendicular and extending aft for a distance of 0.15*L* from the forward perpendicular.

(c) Where the sheer forward extends less than 0.15*L* and the length of forecastle is less than 0.07*L* from FP:

(i) $S_{\min} \leq \quad h \quad \leq 1.5S_{\min}$

$0 \leq \quad S_{BHD} \quad \leq 1.5S_1$

$$\Delta E_0 = S_{\min}\left(1-\frac{h}{S_{\min}}\frac{l_F}{0.07L}\right)\left(1-\frac{S_{BHD}}{S_1}\frac{d-l_F}{0.15L-l_F}\right) \geq 0$$



Conditions:

$$\left(1-\frac{h}{S_{\min}}\frac{l_F}{0.07L}\right)$$

$$\left(1-\frac{S_{BHD}}{S_1}\frac{d-l_F}{0.15L-l_F}\right)$$

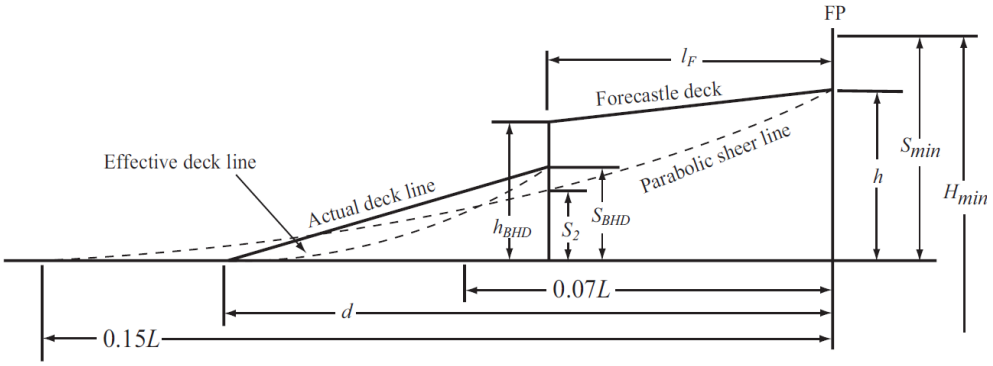
not to be taken negative (less than zero)

The height of the forecastle at bulkhead must satisfy the same conditions as in subparagraph (b) of this paragraph.

(ii) $h \leq S_{\min}$

$0 \leq S_{BHD} \leq 1.5S_2$

$$\Delta E_0 = (S_{\min} - h) + h\left(1-\frac{l_F}{0.07L}\right)\left(1-\frac{S_{BHD}}{S_2}\frac{d-l_F}{0.15L-l_F}\right) \geq 0$$



Conditions:

$$\left(1-\frac{l_F}{0.07L}\right)$$

$$\left(1-\frac{S_{BHD}}{S_2}\frac{d-l_F}{0.15L-l_F}\right)$$

not to be taken negative (less than zero)

The height of the forecastle at the bulkhead position shall not be less than the ordinate, at that point, or a parabolic sheer curve having an ordinate h at the forward perpendicular and extending aft for a distance of $0.15L$ from the forward perpendicular.

In general, this interpretation should be applied to existing ships only. However, to suit exceptional operational requirements, and upon the special consideration by the Administration, the provision of this interpretation may also be applied to new ships.

Note: This UI may also be applied to Regulation 39(1) and 39(2) of the 1988 Protocol and the revised 1988 Protocol upon the special consideration by the Administration.

Technical Background

1.(Corr.1) Correction was made to the interpretation of symbols and Figures in (a).

2.(Corr2.) Editorial correction was made to the original UI.

Remarks

2.17 Freeboard

Conventions (Amend.), Reg.		Regulation **28** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL18**	**UI** version	**1968/ Rev.1,Jul,2008**	Date of implementation	**1968**	Means of implementation	

Conventions/Codes Requirements

Type "A" ships

(1) The tabular freeboard for type "A" ships shall be determined from the following table:

Freeboard table for type "A" ships Table A (details are omitted)

Type "B" ships

(2) The tabular freeboard for type "B" ships shall be determined from the following table:

Freeboard table for type "B" ships Table B (details are omitted)

Interpretation

(a) Type A ships

(i) Freeboards for Type A ships with lengths between 365 m and 400 m shall be determined by the following formula:

$f = 221 + 16{,}10L - 0{,}02L^2$

where f is the freeboard in mm

L is the length as defined in Regulation 3(1).

(ii) Freeboards for Type A ships with lengths of 400 m and above shall be the constant value, 3460 mm.

(**b) Type B ships**

(i) Freeboards for Type B ships with lengths between 365 m and 400 m shall be determined by the following formula:

$f = -587 + 23L - 0{,}0188L^2$

where f is the freeboard in mm

L is the length as defined in Regulation 3(1).

(ii) Freeboards for Type B ships with lengths of 400 m and above shall be the constant value, 5605 mm.

_____

Footnote: This UI is also applicable to Regulation 28 of the 1988 Protocol and the revised 1988 Protocol.

Remarks

2.18 Form of certificates

Conventions (Amend.), Reg.		Article **18** of **ICLL** Convention **1966**					
IACS UI Number	**LL19**	**UI** version	**1972/ Rev.1,Jul,2008**	Date of implementation	**1972**	Means of implementation	

Conventions/Codes Requirements

1. The certificates shall be drawn up in the official language of the issuing State. If the language used is neither English nor French, the text shall include a translation into one of these languages.

2. The form of a certificate is to correspond to an appropriate model given in Annex III. The printed parts in respective model forms are to be exactly duplicated to any copies of respective certificates issued.

Interpretation

It is recommended that the model form of certificates given in Annex III of the Load Line Convention should be strictly adhered to and any deviations from this pattern should be avoided.

_____

Footnote: This UI is also applicable to Article 18 of the 1988 Protocol and the revised 1988 Protocol.

Remarks

2.19 Hatch beams and cover stiffeners of variable cross section

Conventions (Amend.), Reg.		Regulations **15(4)**, **(5), (6), (7) and 16** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL20**	**UI** version	**1972/ Rev.1,Jul,2008**	Date of implementation	**1972**	Means of implementation	

Conventions/Codes Requirements

Regulations 15(4), (5), (6), (7): (details are omitted)
Regulation 16: Weathertight covers of steel or other equivalent materials fitted with gaskets and clampings (details omitted)

Interpretation

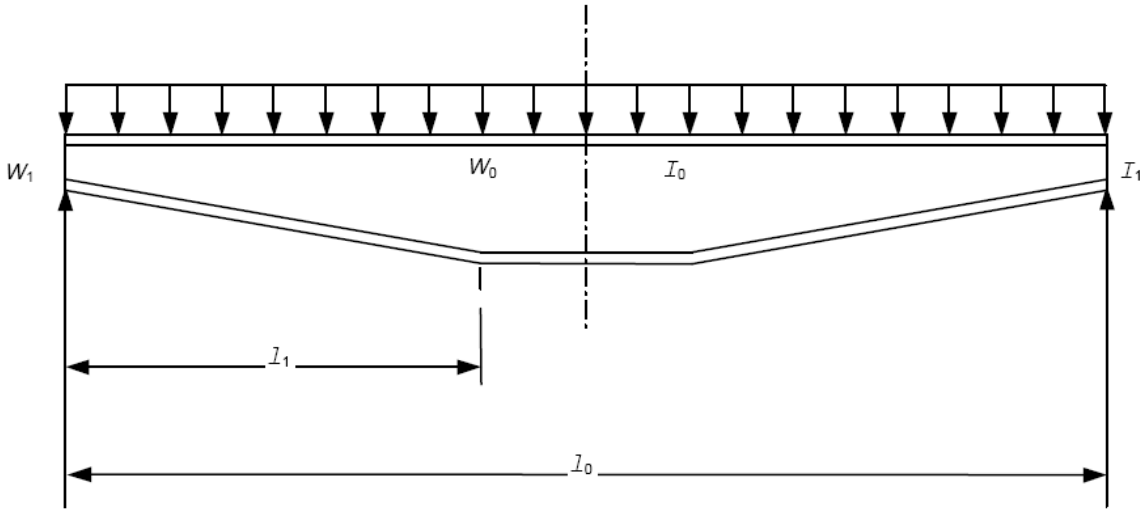
To avoid stresses and deflections exceeding those given in the above Regulations along construction elements of variable cross section, the required section modulus calculated as for constriction elements of constant cross section is to be increased by a factor *K* expressed
by:

$$K = 1 + \frac{3.2\alpha - \gamma - 0.8}{7 + 0.4}$$

where 

The value of factor *K* obtained by the formula is not to be less than unity.

l_1, l_0, W_1 and W_0 are indicated on the sketch below:



The moment of inertia is likewise to be increased by the factor *C* expressed by:

$$C = 1 + 8\alpha^3 \frac{1 - \beta}{0.2 + 3\sqrt{\beta}}$$

where $\alpha = l_1/l_0$, $\beta = I_1/I_0$

The value factor of C obtained by the formula is not to be less than unity.

I_1 and I_0 are indicated on the sketch above.

The use of the above formulae is limited to the determination of the strength of hatch beams and covers in which abrupt changes in the section of the face material do no occur along the length of the beam or cover

_____

Footnote: This UI is also applicable to Regulations 15(4), 15(5), 15(6), 15(7) and 16 of the 1988 Protocol.

Remarks

2.20 Cargo ports or similar openings below the uppermost load line

Conventions (Amend.), Reg.		Regulation **21(2)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL21**	**UI** version	**1972/ Rev.1,Jul,2008**	Date of implementation	**1972**	Means of implementation	

Conventions/Codes Requirements

Unless permitted by the Administration, the lower edge of such openings shall not be below a line drawn parallel to the freeboard deck at side, which has at its lowest point the upper edge of the uppermost load line.

Interpretation

It is recommended that cargo ports or similar openings may be accepted submerged provided the safety of the ship is in no way impaired. It is considered that the fitting of a second door of equivalent strength and watertightness is one acceptable arrangement. In that case leakage detection device should be provided in the compartment between the two doors. Further, drainage of this compartment to the bilges controlled by an easily accessible screw down valve, should be arranged. The outer door should preferably open outwards.

_____

Footnote: This UI is also applicable to Regulation 21(2) of the 1988 Protocol.

Remarks

2.21 Position of the inboard end of discharges when timber freeboard is assigned

Conventions (Amend.), Reg.		Regulation **22(1)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL22**	**UI** version	**1972/ Rev.1,Jul,2008**	Date of implementation	**1972**	Means of implementation	

Conventions/Codes Requirements

Discharges led through the shell either from spaces below the freeboard deck or from within superstructures and deckhouses on the freeboard deck fitted with doors complying with the requirements of Regulation 12 shall, except as provided in paragraph (2), be fitted with efficient and accessible means for preventing water from passing inboard. Normally each separate discharge shall have one automatic non-return valve with a positive means of closing it from a position above the freeboard deck. Where, however, the vertical distance from the summer load waterline to the inboard end of the discharge pipe exceeds 0.01*L*, the discharge may have two automatic non-return valves without positive means of closing, provided that the inboard valve is always accessible for examination under service conditions; where that vertical distance exceeds 0.02*L*, a single automatic non-return valve without positive means of closing may be accepted, subject to the approval of the Administration. The means for operating the positive action valve shall be readily accessible and provided with an indicator showing whether the valve is open or closed.

Interpretation

It is considered that the position of the inboard end of discharges should be related to the timber summer load waterline when timber freeboard is assigned.

_____

Footnotes:

1. This UI is also applicable to Regulation 22(1) of the 1988 Protocol.

2. This UI is also applicable to Regulation 22-1 of the revised 1988 Protocol.
Remarks

2.22 Freeing arrangement

Conventions (Amend.), Reg.		Regulations **26(5), 27(7) and 36(1)(e)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL23**	**UI** version	**1972/ Rev.1,Jul,2008**	Date of implementation	**1972**	Means of implementation	

Conventions/Codes Requirements

Regulation 26(5): Type "A" ships with bulwarks shall have open rails fitted for at least half the length of the exposed parts of the weather deck or other effective freeing arrangements. The upper edge of the sheer strake shall be kept as low as practicable.

Regulation 27(7): Type "B" ships, which in position 1 have hatchways fitted with hatch covers complying with the requirements of Regulation 15(7) or Regulation 16, shall, except as provided in paragraphs (8) to (13) inclusive of this Regulation, be assigned freeboards based on table B of Regulation 28.

Regulation 36(1)(e): open rails are fitted on the weather parts of the freeboard deck in way of the trunk for at least half their length.

Interpretation

1. Regulation 27(7): Freeing arrangements on ships having reduced B freeboard assigned and fitted with bulwarks on the freeboard deck

For Type B ships with freeboards reduced by not more than 60% of the difference between B and A tables there shall be freeing port area in the lower part of the bulwarks equal to at least 25% of the total area of the bulkwarks. The upper edge of the sheer strake shall be kept as low as possible.

2. Regulations 26(5) and 36(1)(e): Freeing arrangements for Type A ships and Type B ships with trunks

It is considered that a freeing port area, in the lower part of the bulwarks, of 33% of the total area of the bulwarks provides the 'other effective freeing arrangements' mentioned in Regulation 26(5), and may be considered equivalent to the 50% open rails in way of trunks required by Regulation 36(1)(e).

_____

Footnotes:

1. This UI is also applicable to Regulations 26(5), 27(8) and 36(1)(e) of the 1988 Protocol.
2. Paragraph 1 of this UI is also applicable to Regulation 27(8) of the revised 1988 Protocol.

Remarks

2.23 Negative depth correction

Conventions (Amend.), Reg.		Regulation **31(3)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL24**	**UI** version	**1972/ Rev.1,Jul,2008**	Date of implementation	**1972**	Means of implementation	

Conventions/Codes Requirements

Where the height of the superstructure or trunk is less than the standard height, the reduction shall be in the ratio of the actual to standard height as defined in regulation 33.

Interpretation

When the height of a superstructure, raised quarterdeck or trunk is less than the corresponding standard height, it is recommended that the calculated reduction be corrected in the ratio of the height of the actual superstructure, raised quarterdeck or trunk to the applicable standard height as defined in Regulation 33.

_____

Footnote: This UI is also applicable to Regulation 31(3) of the 1988 Protocol and the revised 1988 Protocol.

Remarks

2.24 Effective length of raised quarterdeck

Conventions (Amend.), Reg.		Regulation **35(4)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL25**	**UI** version	**1972/ Rev.1,Jul,2008**	Date of implementation	**1972**	Means of implementation	

Conventions/Codes Requirements

The effective length of a raised quarterdeck, if fitted with an intact front bulkhead, shall be its length up to a maximum of 0.6*L*. Where the bulkhead is not intact, the raised quarterdeck shall be treated as a poop of less than standard height.

Interpretation

It is recommended that the maximum effective length of 0.6*L* of a raised quarterdeck which is stipulated by Regulation 35(4), is to be measured from the after perpendicular even where a poop is fitted in conjunction with the raised quarterdeck.

_____

Footnote: This UI is also applicable to Regulation 35(4) of the 1988 Protocol.

Remarks

2.25 Continuous hatchways as trunk

Conventions (Amend.), Reg.		Regulation **36** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL26**	**UI** version	**Rev.1,1983/ Rev.2,Jul,2008**	Date of implementation	**1983**	Means of implementation	

Conventions/Codes Requirements

Regulation 36 (details omitted)

Interpretation

It is recommended that continuous hatchways may be treated as a trunk in the freeboard computation provided Regulation 36 is complied with in all respects.

The trunk deck stringer referred to in Regulation 36(1)(b) may be fitted outboard of the trunk side bulkhead in association with the following:

(i) The stringer so formed is to provide a clear walkway of at least 450 mm in width on each side of the ship.

(ii) The stringer is to be of solid plate efficiently supported and stiffened.

(iii) The stringer is to be as high above the freeboard deck as practicable. In the freeboard calculation, the trunk height is to be reduced by at least 600 mm or by the actual difference between the top of the trunk and the stinger, whichever is greater.

(iv) Hatch cover securing appliances are to be accessible from the stringer or walkway.

(v) The breadth of the trunk is to be measured between the trunk side bulkheads.

(vi) Regulation 36 is to be complied with in all other respects.

_____

Footnote: This UI is also applicable to Regulation 36 of the 1988 Protocol.

Remarks

2.26 Less than standard hatch coamings on trunks of less than standard height

Conventions (Amend.), Reg.		Regulation **36(4)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL27**	**UI** version	**1972/ Rev.1,Jul,2008**	Date of implementation	**1972**	Means of implementation	

Conventions/Codes Requirements

Where the height of a trunk is less than the standard height, its effective length shall be reduced in the ratio of the actual to the standard height. Where the height of hatchway coamings on the trunk deck is less than that required under regulation 15(1), a reduction from the actual height of trunk shall be made which corresponds to the difference between the actual and the required height of coaming.

Interpretation

In the case where the trunk height is less than standard and the trunk hatch coamings are also of less than standard height, or omitted entirely, doubt may arise whether the trunk hatchways are located in position 1 or position 2 and, consequently, about the reduction to be made in the actual trunk height. It is considered that in these cases the reduction from the actual height of trunk on account of insufficient hatch coaming height shall be taken as the difference between 600 mm and the actual height of coaming, or 600 mm if no hatch coamings are fitted. Reduction in the actual height of trunk shall not be required in cases where only small hatches with less than standard height coamings are fitted in the trunk deck for which dispensation from the requirement of standard coaming height may be given.

_____

Footnote: This UI is applicable to Regulation 36(4) of the 1988 Protocol.

Remarks

2.27 Deduction for superstructures and trunks

Conventions (Amend.), Reg.		Regulation **37** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL28**	**UI** version	**1972/ Rev.1,Jul,2008**	Date of implementation	**1972**	Means of implementation	

Conventions/Codes Requirements

(2) Where the total effective length of superstructures and trunks is less than 1.0*L*, the deduction shall be a percentage obtained from one of the following tables:

(tables omitted)

Interpretation

For the purpose of applying the table 'Percentage of Deduction for Type B ships' in Regulation 37(2) it is considered that any detached superstructure abaft midship whose after bulkhead is located 0.05*L* or more forward of the after perpendicular may be treated as a detached bridge.

A superstructure whose after bulkhead is located within 0.05*L* from the after perpendicular shall not qualify as a detached bridge.

Any excess in the height of such a superstructure, which does not extend to the after perpendicular, cannot be regarded as contributing to the sheer allowance contemplated in Regulation 38(12).

_____

Footnote: This UI is applicable to Regulations 37 and 38(12) of the 1988 Protocol.

Remarks

2.28 Sheer credit for superimposed superstructures

Conventions (Amend.), Reg.		Regulations **38(5)**, **(7)** and **(12)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL29**	**UI** version	**Rev.1,1983/ Rev.2,Jul,2008**	Date of implementation	**1983**	Means of implementation	

Conventions/Codes Requirements

(5) In ships with a superstructure of standard height which extends over the whole length of the freeboard deck, the sheer shall be measured at the superstructure deck. Where the height exceeds the standard, the least difference (Z) between the actual and standard heights shall be added to each end ordinate. Similarly, the intermediate ordinates at distances of 1/6*L* and 1/3*L* from each perpendicular shall be increased by 0.444Z and 0.111Z, respectively.

(7) Where an enclosed poop or forecastle is of standard height with greater sheer than that of the freeboard deck, or is of more than standard height, an addition to the sheer of the freeboard deck shall be made as provided in paragraph (12) of this Regulation.

(12) Where sheer credit is given for a poop or forecastle the following formula shall be used:

$$s = \frac{yL'}{3L}$$

where*: s* is the sheer credit, to be deducted from the deficiency, or added to the excess of sheer;

y is the difference between actual and standard height of superstructure at the after or forward perpendicular;

L ′ is the mean enclosed length of poop or forecastle up to a maximum length of 0.5*L*; and

L is the length of the ship as defined in Regulation 3(1) of this Regulation.

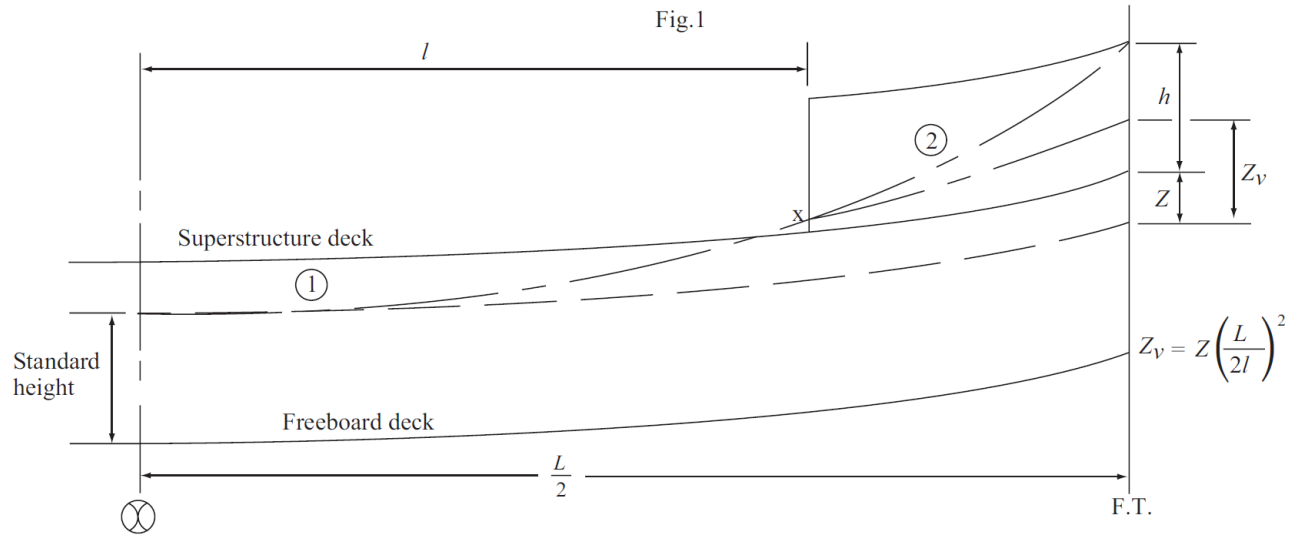
The above formula provides a curve in the form of a parabola tangent to the actual sheer curve at the freeboard deck and intersecting the end ordinate at a point below the superstructure deck a distance equal to the standard height of a superstructure. The superstructure deck shall not be less than standard height above this curve at any point. This curve shall be used in determining the sheer profile for forward and after halves of the ship.

Interpretation

(a) **Regulation 38(5):** Superstructures superimposed on a complete superstructure.

In applying Regulation 38(5) (sheer on a complete superstructure ship) where there is an enclosed poop or forecastle superimposed on a complete superstructure, sheer credit shall be allowed for such a poop or forecastle, according to the method of Regulation 38(12) as shown in Fig 1.

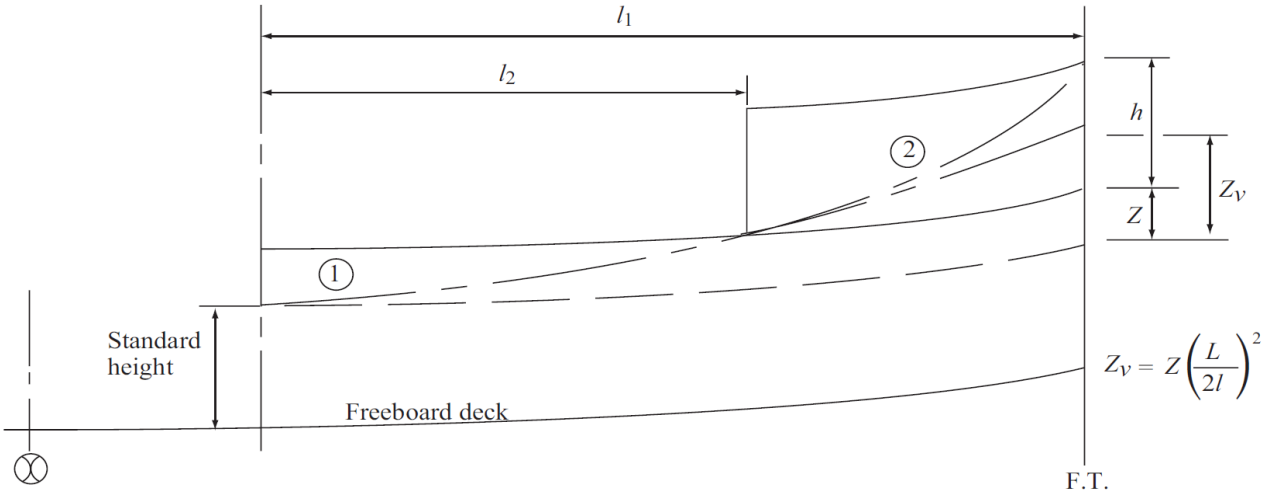
Fig.1



(b) **Regulation 38(7):** Superstructures superimposed on a forecastle or poop (i.e. a stepped forecastle or poop).

In applying Regulation 38(7) and 38(12) where a poop or forecastle consists of two layers, the method shown in Fig 2 shall be used:

Fig.2



In the above the following definitions apply:

Z is as per Regulation 38(5).

Z_v is the end ordinate of a virtual standard parabolic curve taken through the point "X". If Z_v is greater than (Z+h), the end ordinate shall be (Z+h), in which case point "X" shall be disregarded and curve (2) not taken into account. When the length of the first tier superstructure is greater than 0.5L, the virtual standard parabolic curve shall commence at amidships as indicated in Fig 1.

_____

Footnote: This UI is applicable to Regulations 38(5), 38(7) and 38(12) of the 1988 Protocol.

Remarks

2.29 Sheer allowance for excess height of superstructure

Conventions (Amend.), Reg.		Regulations **38(7)**, **(12)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL30**	**UI** version	**1972/ Rev.1,Jul,2008**	Date of implementation	**1972**	Means of implementation	

Conventions/Codes Requirements

(7) Where an enclosed poop or forecastle is of standard height with greater sheer than that of the freeboard deck, or is of more than standard height, an addition to the sheer of the freeboard deck shall be made as provided in paragraph (12) of this Regulation.

(12) Where sheer credit is given for a poop or forecastle the following formula shall be used:

$$s = \frac{yL'}{3L}$$

where: s is the sheer credit, to be deducted from the deficiency, or added to the excess of sheer;

y is the difference between actual and standard height of superstructure at the after or forward perpendicular;

L' is the mean enclosed length of poop or forecastle up to a maximum length of 0.5L; and

L is the length of the ship as defined in Regulation 3(1) of this Regulation.

The above formula provides a curve in the form of a parabola tangent to the actual sheer curve at the freeboard deck and intersecting the end ordinate at a point below the superstructure deck a distance equal to the standard height of a superstructure. The superstructure deck shall not be less than standard height above this curve at any point. This curve shall be used in determining the sheer profile for forward and after halves of the ship.

Interpretation

As Regulation 38(7) and (12) does not refer to a raised quarter deck it is recommended that credit under this paragraph be given for this type of superstructure only when the height of the raised quarterdeck is greater than the standard height of 'other superstructures' as defined in Regulation 33, and only for the amount by which the actual height of the raised quarterdeck exceeds that standard height.

_____ Footnote: This UI is applicable to Regulations 38(7) and 38(12) of the 1988 Protocol.
Remarks

2.30 Deduction for excess sheer

Conventions (Amend.), Reg.		Regulation **38(15)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL31**	**UI** version	**1972/ Rev.1,Jul,2008**	Date of implementation	**1972**	Means of implementation	
Conventions/Codes Requirements							
In ships where an enclosed superstructure covers 0.1*L* before and 0.1*L* abaft amidships, the correction for excess of sheer as calculated under the provisions of paragraph (14) shall be deducted from the freeboard; in ships where no enclosed superstructure covers amidships, no deduction shall be made from the freeboard; where an enclosed superstructure covers less than 0.1*L* before and 0.1*L* abaft amidships, the deduction shall be obtained by linear interpolation. The maximum deduction for excess sheer shall be at the rate of 125 mm per 100 m of length.							
Interpretation							
Since no stipulation is made as to the height of the superstructure referred to in Regulation38(15), it is recommended that the height of this superstructure shall be related to its standard height. When the height of the superstructure or raised quarterdeck is less than standard, the reduction shall be in the ratio of the actual to the standard height thereof. _____ Footnote: This UI is applicable to Regulation 38(15) of the 1988 Protocol.							
Remarks							

2.31 Special requirements for vehicle ferries, ro-ro ships and other ships of similar type

Conventions (Amend.), Reg.		Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL32**	**UI** version	**1972/ Oct.,2007**	Date of implementation	**1972/ Oct.,2007**	Means of implementation	
Conventions/Codes Requirements							
(Details omitted)							
Interpretation							
Technical Background							
Withdrawn Oct 2007, re-categorised as UI SC220 (NEW Oct 2007)							
Remarks							

2.32 Timber freeboards for ships having reduced type "B" freeboards assigned

Conventions (Amend.), Reg.		Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL33**	**UI** version	**1972/ Rev.1,Jul.,2008**	Date of implementation	**1972**	Means of implementation	
Conventions/Codes Requirements							
(Details omitted)							
Interpretation							
It is understood that some Administrations accept that timber freeboards may be assigned to ships with reduced Type B freeboards, provided the timber freeboards are calculated on the basis of the ordinary Type B freeboard. It is recommended that Regulation 45(2) and (3) is interpreted or, if necessary, amended such that the Timber Winter							

mark and/or the Timber Winter North Atlantic mark are placed at the same level as the reduced Type B Winter mark when the computed Timber Winter mark and/or the computed Timber Winter North Atlantic mark fall below the reduced Type B Winter mark.

_____

Footnote: This UI is applicable to Regulations 45(2) and 45(3) of the 1988 Protocol.

Remarks

2.33 Freeboard for lighters and barges

Conventions (Amend.), Reg.		Regulation **27(11)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL34**	**UI** version	**1972/ Corr.1,Jul.,2008**	Date of implementation	**1972**	Means of implementation	

Conventions/Codes Requirements

A lighter, barge or other ship without independent means of propulsion shall be assigned a freeboard in accordance with the provisions of these regulations. However, in the case of barges which are unmanned, the requirements of Regulations 25, 26(2) and (3), and 39 shall not apply. Such unmanned barges which have on the freeboard deck only small access openings closed by watertight gasketed covers of steel or equivalent material may be assigned a freeboard 25% less than those calculated in accordance with these Regulations.

Interpretation

In applying Regulation 27(11) to deck cargo barges it is recommended that only Type B freeboard can be assigned, even if the barges possess the same integrity of exposed decks and equivalent safety against flooding as normal tank barges.

This view is taken as a result of the consideration that Type A freeboard can only be assigned to liquid cargo barges. It is further concluded that deck cargo can only be carried on barges to which Type B freeboard is assigned.

Remarks

2.34 Stowage of timber deck cargo on ships having timber freeboards assigned

Conventions (Amend.), Reg.		Regulations **44**, **45** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL35**	**UI** version	**1972/ Corr.1,Jul.,2008**	Date of implementation	**1972**	Means of implementation	

Conventions/Codes Requirements

Regulations 44: Stowage (details omitted)

Regulations 45: Computation for Freeboard (details omitted)

Interpretation

Deleted

Technical Background

This UI has been made into IACS Recommendation 168.

Remarks
This UI was deleted in June 2021 by IACS.

2.35 Minimum wall thickness of pipes

Conventions (Amend.), Reg.		Regulations **19**, **20**, **22** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL36**	**UI** version	**Rev.1,1978/ Rev.2,Jul.,2008**	Date of implementation	**1978**	Means of implementation	

Conventions/Codes Requirements

Regulation 19: Ventilators (details omitted)
Regulation 20: Air Pipes (details omitted)
Regulation 22: Scuppers, Inlets and Discharges (details omitted)

Interpretation

For pipes covered by the above Regulations the following minimum wall thicknesses are recommended:
(a) (i) For scupper and discharge pipes, where substantial thickness is not required;
and
(ii) For venting pipes other than specified under (c):
- external diameter of pipes equal to or less than 155 mm: thickness not less than 4,5 mm
- external diameter of pipes equal to or more than 230 mm: thickness not less than 6,0 mm intermediate sizes are to be determined by linear interpolation.

(b) For scupper and discharge pipes where substantial thickness is required:
- external diameter of pipes equal to or less than 80 mm: thickness not less than 7,0 mm
- external diameter of pipes 180 mm: thickness not less than 10,0 mm
- external diameter of pipes equal to or more than 220 mm: thickness not less than 12,5 mm intermediate sizes are to be determined by linear interpolation.

(c) For venting pipes in position 1 and 2 leading to spaces below the freeboard deck or to spaces within enclosed superstructures:
- external diameter of pipes equal to or less than 80 mm: thickness not less than 6,0 mm
- external diameter of pipes equal to or more than 165 mm: thickness not less than 8,5 mm intermediate sizes are to be determined by linear interpolation.

_____
Footnotes:
1. This UI is also applicable to Regulations 19, 20 and 22 of the 1988 Protocol.
2. Paragraphs (a)(ii) and (c) are also applicable to Regulations 19 and 20 of the revised 1988 Protocol.

Remarks

2.36 Superstructures with sloping end bulkheads

Conventions (Amend.), Reg.		Regulations **34**, **35**, **38(12)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL37**	**UI** version	**Corr.1996/ Rev.2,Jul.,2008**	Date of implementation	**1996**	Means of implementation	

Conventions/Codes Requirements

Regulation 34: Length of Superstructure (details omitted)
Regulation 35: Effective Length of Superstructure (details omitted)
Regulation 38(12): (details omitted)

Interpretation

When taking account of superstructures which have sloping end bulkheads in the calculations of freeboards, such superstructures shall be dealt with in the following manner:

(a) Regulation 34

(i) When the height of the superstructure, clear of slope, is equal to or smaller than the standard height, length *S* is to be obtained as shown in Fig. 1.

(ii) When the height is greater than the standard, length *S* is to be obtained as shown in Fig2.

(iii) The foregoing will apply only when the slope, related to the base line, is 15 °or greater. Where the slope is less than 15 °, the configuration will be treated as sheer.

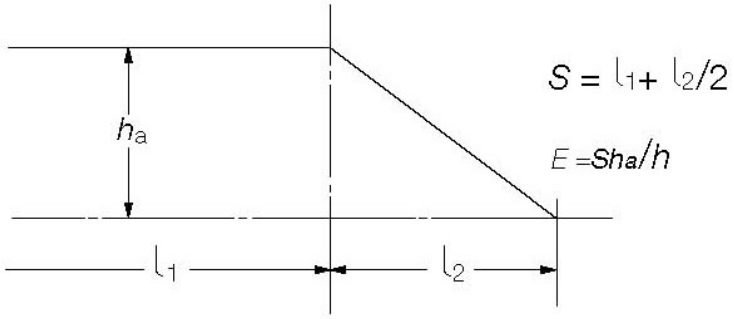


Fig. 1 Height of superstructure equal to or smaller than the standard height *h*

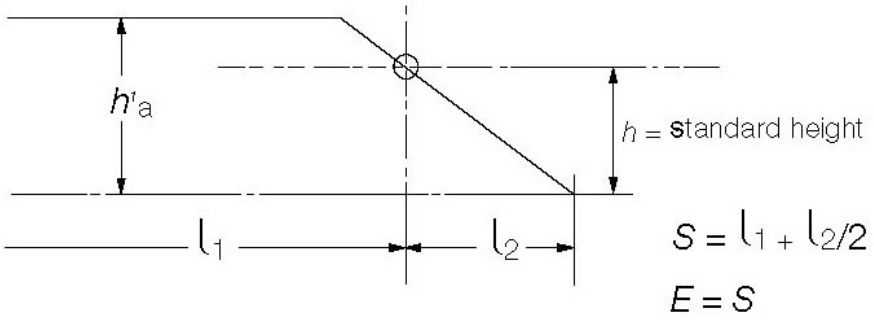


Fig. 2 Height of superstructure greater than the standard height

(b) Regulation 35

When the height of the superstructure, clear of the slope, is less than the standard height, its effective length E shall be its length *S* as obtained from (a)(i), reduced in the ratio of the actual height to the standard height.

(c) Regulation 38(12)

When a poop or a forecastle has sloping end bulkheads, the sheer credit may be allowed on account of excess height, the formula given in Regulation 38(12) shall be used, the values for *y* and *L'* being as shown in Fig 3.

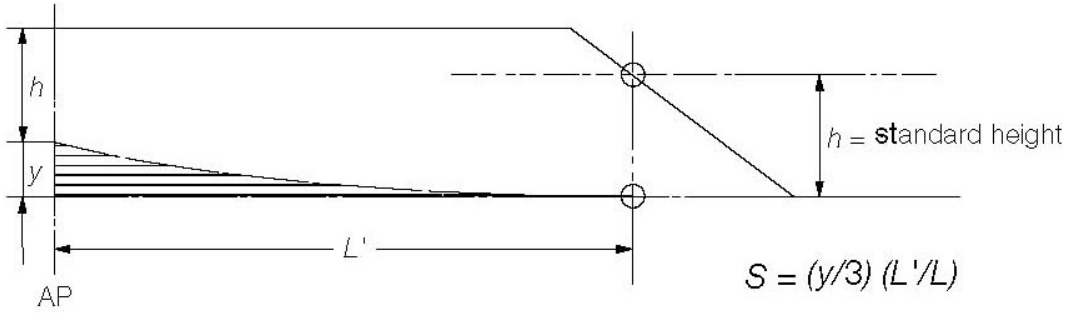


Fig. 3 Sheer credit *s* for excess height

Footnote: This UI is also applicable to Regulations 34, 35 and 38(12) of the 1988 Protocol.

Remarks

2.37 Bow height

Conventions (Amend.), Reg.		Regulation **39(2)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL38**	**UI** version	**Rev.1,1983/ Corr.1,Jun.,2006/ Rev.2, Jul.,2008**	Date of implementation	**1983/Jun., 2006**	Means of implementation	

Conventions/Codes Requirements

Where the bow height required in paragraph (1) of this Regulation is obtained by sheer, the sheer shall extend for at least 15% of the length of the ship measured from the forward perpendicular. Where it is obtained by fitting a superstructure, such superstructure shall extend from the stem to a point at least 0.07*L* abaft the forward perpendicular, and it shall comply with the following requirements:

(a) for ships not over 100 m in length, it shall be enclosed as defined in Regulation 3(10), and

(b) for ships over 100 m in length, it need not comply with Regulation 3(10), but shall be fitted with closing appliances to the satisfaction of the Administration.

Interpretation

1. When calculating bow height, the sheer of the forecastle deck may be taken into account, even if the length of the forecastle is less than 0.15*L*, but greater than 0.07*L*, provided that the forecastle height is not less than one half of standard height of superstructure as defined in Regulation 33 between 0.07*L* and the forward terminal.

2. Where the forecastle height is less than one half of standard height of superstructure, as defined in Regulation 33, the credited bow height may be determined as follows (Figs 1 and 2 illustrate the intention of 2.1 and 2.2 respectively):

2.1 When the freeboard deck has sheer extending from abaft 0.15*L*, by a parabolic curve having its origin at 0.15*L* abaft the forward terminal at a height equal to the midship depth of the ship, extended through the point of intersection of forecastle bulkhead and deck, and up to a point at the forward terminal not higher than the level of the forecastle deck. However, if the value of the height denoted h_t on Fig 1 is smaller than the value of the height denoted h_b, then h_t may be replaced in the available bow height.

2.2 When the freeboard deck has sheer extending for less than 0.15*L* or has no sheer, by a line from the forecastle deck at side at 0.07*L* extended parallel to the base line to the forward terminal.

Fig.1

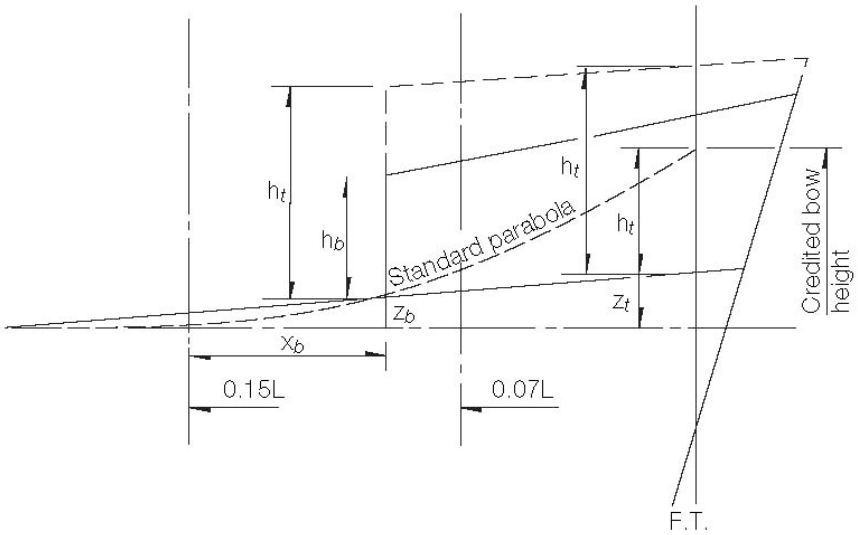
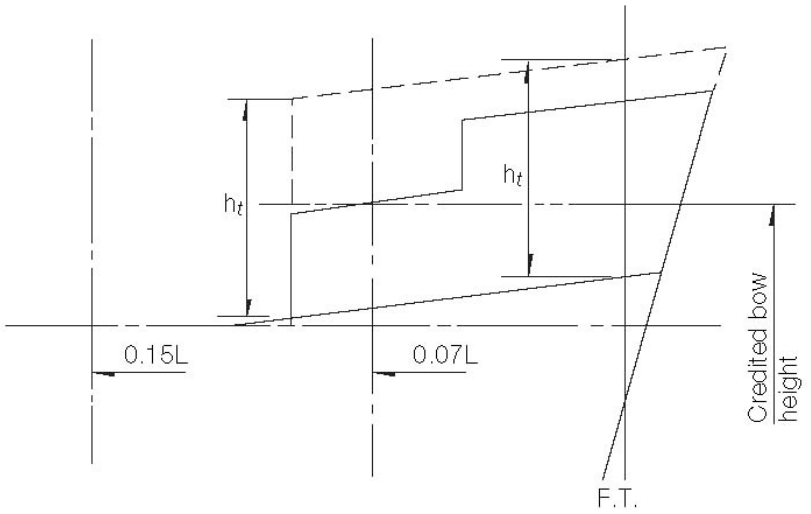


Fig. 2



h_t = Half standard height of superstructure as defined in regulation 33.

$$h_t = Z_b \left(\frac{0.15L}{x_b} \right)^2 - Z_t$$

Footnote: This UI is applicable to Regulation 39(2) of the 1988 Protocol.

Technical Background
Corrections are made to the errors of numbers in paragraph 2.1 and symbols and formulae in Fig.1 of the original UI.
Remarks

2.38 Structure of a lower freeboard deck

Conventions (Amend.), Reg.		Regulation **3(9)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL39**	**UI** version	**1977/ Rev.1,Jul.,2008**	Date of implementation	**1977**	Means of implementation	
Conventions/Codes Requirements							

Freeboard deck. The freeboard deck is normally the uppermost complete deck exposed to weather and sea, which has permanent means of closing all openings in the weather part thereof, and below which all openings in the sides of the ship are fitted with permanent means of watertight closing. In a ship having a discontinuous freeboard deck, the lowest line of the exposed deck and the continuation of that line parallel to the upper part of the deck is taken as the freeboard deck. At the option of the owner and subject to the approval of the Administration, a lower deck may be designated as the freeboard deck provided it is a complete and permanent deck continuous in a fore and aft direction at least between the machinery space and peak bulkheads and continuous athwartships. When this lower deck is stepped the lowest line of the deck and the continuation of that line parallel to the upper part of the deck is taken as the freeboard deck. When a lower deck is designated as the freeboard deck, that part of the hull which extends above the freeboard deck is treated as a superstructure so far as concerns the application of the conditions of assignment and the calculation of freeboard. It is from this deck that the freeboard is calculated.

Interpretation

When a lower deck is designated as the freeboard deck, it shall be continuous in fore and aft direction as well as athwartships. Such a freeboard deck as a minimum shall consist of suitable framed stringers at the ship sides and transversely at each watertight bulkhead which extends to the upper deck, within cargo spaces. The width of these stringers shall not be less than can be conveniently fitted having regard to the structure and the operation of the ship. Any arrangement of stringers shall be such that structural requirements can also be met.

NOTE
Member Societies formulated this Interpretation in order to have a guide when judging whether a structure below the uppermost complete deck can be designated as a freeboard deck in terms of Regulation 3(9) for the application of tonnage regulations. This was done, although it is obvious that such a structure has no significance with regard to the philosophy of the Load Line Convention.
Nevertheless it is felt that it would be preferable if tonnage and load line matters could be clearly separated by deleting from the Load Line Convention the reference to a lower deck being designated as the freeboard deck.

_____
Footnote: This UI is also applicable to to Regulation 3(9) of the 1988 Protocol.

Remarks

2.39 Security of hatch covers

Conventions (Amend.), Reg.		Regulation **15(13)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL40**	**UI** version	**Rev.1,1980/ Rev.2,Jul.,2008**	Date of implementation	**1980**	Means of implementation	

Conventions/Codes Requirements

For all hatchways in position 1 or 2 steel bars or other equivalent means shall be provided in order efficiently and independently to secure each section of hatchway covers after the tarpaulins are battened down. Hatchway covers of more than 1.5 m in length shall be secured by at least two such securing appliances.

Interpretation

Acceptable equivalent means to steel bars shall consist of devices and materials which will provide strength equivalent to, and elasticity not greater than that of, steel.
Steel wire ropes cannot be regarded as satisfactory equivalent means.
Care is to be taken that tarpaulins are adequately protected from the possibility of damage arising from the use of securing devices which do not provide a flat bearing surface.

_____
Footnotes:
1. This UI is also applicable to Regulation 15(13) of the 1988 Protocol.
2. This UI is also applicable to Regulation 15(12) of the revised 1988 Protocol.

Remarks

2.40 Trunks

Conventions (Amend.), Reg.		Regulations **29**, **36**, **38** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL41**	**UI** version	**1978/ Rev.1,Jul.,2008**	Date of implementation	**1978**	Means of implementation	

Conventions/Codes Requirements

Regulation **29:** Correction to the Freeboard for Ships under **100 m** in Length (details omitted)
Regulation **31:** Correction for Depth (details omitted)
Regulation **35:** Effective Length of Superstructure (details omitted)
Regulation **36:** Trunks (details omitted)
Regulation **37:** Deduction for Superstructures and Trunks (details omitted)
Regulation **38:** Sheer (details omitted)

Interpretation

(a) Where the length of a trunk, corrected for breadth and height as may be appropriate, can be included in the effective length used for calculating the correction for superstructures in accordance with Regulation 37, it shall not be taken into account for calculating the total length *S* for the purpose of sheer correction according to Regulation 38(13).
(b) The effective length of superstructures *E* which is used for calculating the freeboard correction according to Regulation 29 shall be determined excluding the length of trunks.
(c) The inclusion of a trunk in the calculation of freeboard need not prohibit the fitting of openings in the bulkheads of adjacent superstructures such as poops, bridges or forecastles provided there is no direct communication between the superstructure and the trunk.
(d) The sides of a trunk included in the calculations of freeboard shall be intact. Side scuttles of the non-opening type and bolted manhole covers may be allowed.

_____
Footnote: This UI is also applicable to Regulations 29, 36 and 38 of the 1988 Protocol.

Remarks

2.41 Access openings on barges

Conventions (Amend.), Reg.		Regulation **27(11)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL42**	**UI** version	**1978/ Rev.1,Jul.,2008**	Date of implementation	**1978**	Means of implementation	

Conventions/Codes Requirements

A lighter, barge or other ship without independent means of propulsion shall be assigned a freeboard in accordance with the provisions of these regulations. However, in the case of barges which are unmanned, the requirements of Regulations 25, 26(2) and (3), and 39 shall not apply. Such unmanned barges which have on the freeboard deck only small access openings closed by watertight gasketed covers of steel or equivalent material may be assigned a freeboard 25% less than those calculated in accordance with these Regulations.

Interpretation

(a) Since Regulation 27(11) does not contain any indication as to what size the term 'small access openings' refers it is recommended that such openings should not be greater than 1.5 m^2 where a freeboard reduction of 25% is granted.
(b) Access plates are considered as being equivalent to an intact deck for unmanned barges, thereby allowing for a 25% reduction in freeboard, provided they are secured by closely spaced bolts, their joining parts are properly gasketed and their arrangements, for all practical purposes, have equivalent structural integrity and tightness as an intact deck.

_____
Footnote: This UI is also applicable to Regulation 27(14)(c) of the 1988 Protocol and the revised 1988 Protocol.

Remarks

2. 42 Minimum bow height

Conventions (Amend.), Reg.		Regulation **39** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL43**	**UI** version	**1978/ Rev.1,Jul.,2008**	Date of implementation	**1978**	Means of implementation	
Conventions/Codes Requirements							
Regulation **39**: Minimum Bow Height (details omitted)							
Interpretation							
On ships to which timber freeboards are assigned Regulation 39 should relate to the summer load waterline and not to the timber summer load waterline. _____ Footnote: This UI is also applicable to Regulation 39 of the 1988 Protocol.							
Remarks							

2.43 Freeing ports

Conventions (Amend.), Reg.		Regulation **24(3)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL44**	**UI** version	**1978/ Rev.1,Jul.,2008**	Date of implementation	**1978**	Means of implementation	
Conventions/Codes Requirements							
Where a ship fitted with a trunk does not comply with the requirements of regulation 36(1)(e) or where continuous or substantially continuous hatchway side coamings are fitted between detached superstructures, the minimum area of the freeing port openings shall be calculated from the following table: (the table omitted)							
Interpretation							
The effectiveness of the freeing area in bulwarks required by Regulation 24(1) and (2) depends on free flow across the deck of a ship. Where there is no free flow due to the presence of a continuous trunk or hatchway coaming, the freeing area in bulwarks is calculated in accordance with Regulation 24(3). The free flow area on deck is the net area of gaps between hatchways, and between hatchways and superstructures and deck houses up to the actual height of the bulwark. The freeing port area in bulwarks should be assessed in relation to the net flow area as follows: i. If the free flow area is not less that the freeing area calculated from Regulation 24(3) as if the hatchway coamings were continuous, then the minimum freeing port area calculated from Regulation 24(1) and (2) should be deemed sufficient. ii. If the free flow area is equal to, or less than the area calculated from Regulations 24(1) and (2), then the minimum freeing area in the bulwarks should be determined from Regulation 24(3). iii. If the free flow area is smaller than that calculated from Regulation 24(3), but greater than that calculated from Regulation 24(1) and (2), the minimum freeing area in the bulwark should be determined from the following formula: $F = F_1 + F_2 - \text{fp}\ (\text{m}^2)$ where F_1 is the minimum freeing area calculated from Regulations 24(1) and (2), F_2 is the minimum freeing area calculated from Regulation 24(3), f_p is the total net area of passages and gaps between hatch ends and superstructures or deckhouses up to the actual height of bulwark. _____ Footnote: This UI is also applicable to Regulation 24(3) of the 1988 Protocol.							
Remarks							

2.44 Presentation of stability data

Conventions (Amend.), Reg.		Regulation **10(2)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL45**	**UI** version	**Rev.1,1984/ Rev.2,Jul.,2008**	Date of implementation	**1984**	Means of implementation	

Conventions/Codes Requirements

The master of every new ship which is not already provided with stability information under an international convention for the safety of life at sea in force shall be supplied with sufficient information in an approved form to give him guidance as to the stability of the ship under varying conditions of service, and a copy shall be furnished to the Administration.

Interpretation

Regulation 10(2) of 1966 Convention and 1988 Protocol requires that:
"The master of every new ship which is not already provided with stability information under an international convention for the safety of life at sea in force shall be supplied with sufficient information in an approved form to give him guidance as to the stability of the ship under varying conditions of service, and a copy shall be furnished to the Administration."

Regulation 10(2) of the revised 1988 Protocol requires that:
"Information shall be provided to the master in a form that is approved by the Administration or a recognised organization. Stability information, and loading information also related to ship strength when required under paragraph (1), shall be carried on board at all times together with evidence that the information has been approved by the Administration."

Interpretation

To ensure that ships are provided with meaningful information which accords with the sense of Regulation 10(2) a document containing such information is to be prepared on the basis of MSC Circular 920.

Additionally full details of the stability criteria appropriate to the ship under all anticipated conditions of service shall be clearly stated in text supplemented as necessary by diagrams using the nomenclature adopted in the document.

Where requirements for wind and/or wave forces and ice accretion are specified by the administration full details are to be given.

_____

Footnotes:

1. Rev.2 of this Unified Interpretation is to be applied by all Members and Associates on ship with a contract for construction on or after 1 September 2008.

2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

Remarks

Regulation **10(2) of** Annex **I** to the Convention revised by the Protocol of **1988** is also applicable.

2.45 Protection of openings in raised quarterdecks

Conventions (Amend.), Reg.		Regulation **18(2)** of Annex **I** to **ICLL** Convention **1966** and **UI LL 8**					
IACS UI Number	**LL46**	**UI** version	**Rev.2,1997/ Rev.3,Jul.,2008**	Date of implementation	**1997**	Means of implementation	

Conventions/Codes Requirements

Regulations **18(2)**: Openings in freeboard decks other than hatchways, machinery space openings, manholes and flush scuttles shall be protected by an enclosed superstructure, or by a deckhouse or companionway of equivalent strength and weathertightness. Any such opening in an exposed superstructure deck, in the top of a deckhouse on the freeboard deck which gives access to a space below the freeboard deck or a space within an enclosed superstructure shall be protected by an efficient deckhouse or companionway. Doorways in such deckhouses or companionways

shall be fitted with doors complying with the requirements of regulation 12(1).
Regulations **23**:
(1) Side scuttles to spaces below the freeboard deck or to spaces within enclosed superstructures shall be fitted with efficient hinged inside deadlights arranged so that they can be effectively closed and secured watertight.
(2) No side scuttle shall be fitted in a position so that its sill is below a line drawn parallel to the freeboard deck at side and having its lowest point 2.5% of the breadth (*B*) above the summer load line (or summer timber load line, if assigned) or 500 mm, whichever is the greater distance.
(3) The side scuttles, together with their glasses, if fitted, and deadlights, shall be of substantial and approved construction.
LL 8: (details omitted)

Interpretation

Regarding the requirement to protect openings in superstructures (Regulation 18(2)) it is considered that openings in the top of a deckhouse on a raised quarterdeck, or on the deck of a superstructure or on the deck of a deckhouse of less than standard height, having a height equal to or greater than the standard quarterdeck height are to be provided with an acceptable means of closing but need not be protected by an efficient deckhouse or companionway as defined in the regulation provided the height of the deckhouse is at least the height of superstructure.

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Footnote: This UI is also applicable to Regulation 18(2) of the 1988 Protocol.

Remarks

2.46 Guard rails

Conventions (Amend.), Reg.		Regulations **25(2)**, **(3)** of Annex **I** to **ICLL** Convention **1966** and **t**he Protocol of **1988** Regulation **25(3)(b)** of the **1988** Protocol to the **ICLL 1966** as amended by resolution **MSC.143(77)**					
IACS UI Number	**LL47**	**UI** version	**Rev.1,1980/ Rev.2,Jun.,2006/ Rev.2.1,Dec.,2006/ Corr.1, Oct.,2007/ Rev.3,Jul.,2008**	Date of implementation	**1980/ Jan.1,2007/ Apr.1,2007**	Means of implementation	

Conventions/Codes Requirements

A. Regulation 25(2) and (3) of 1966 ICLL read:
(2) Efficient guard rails or bulwarks shall be fitted on all exposed parts of the freeboard and superstructure decks. The height of the bulwarks or guard rails shall be at least 1 m from the deck, provided that where this height would interfere with the normal operation of the ship, a lesser height may be approved, if the Administration is satisfied that adequate protection is provided.
(3) The opening below the lowest course of the guard rails shall not exceed 230 mm. The other courses shall be not more than 380 mm apart. In the case of ships with rounded gunwales the guard rail supports shall be placed on the flat of the deck.
B. Regulation 25(3)(b) of the 1988 Protocol to the ICLL 1966 as amended by resolution MSC.143(77) read:
(b) at least every third stanchion shall be supported by a bracket or stay;

Interpretation

A. Guard Rails (Regulation 25(2) and (3) of 1966 ICLL and the 1988 Protocol)

(a) Fixed, removable or hinged stanchions shall be fitted about 1,5 m apart.
(b) At least every third stanchion shall be supported by a bracket or stay. In lieu of this, flat steel stanchions shall be of increased breadth as given in Figure 1, and aligned with member below deck unless the deck plating thickness exceeds 20 mm.
(c) Wire ropes may only be accepted in lieu of guard rails in special circumstances and then only in limited lengths.
(d) Lengths of chain may only be accepted in lieu of guard rails if they are fitted between two fixed stanchions and/or bulwarks.
(e) The openings between courses should be in accordance with Regulation 25(3) of the Convention.
(f) Wires shall be made taut by means of turnbuckles.
(g) Removable or hinged stanchions shall be capable of being locked in the upright position.

B. Guard Rails (Regulation 25(3)(b) of the 1988 Protocol to the ICLL 1966 as amended by resolution MSC.143(77))
As alternate arrangements (required by Regulation 25(3)(b)), flat steel stanchions shall be of increased breadth as given in Figure 1, and aligned with member below deck unless the deck plating thickness exceeds 20 mm.

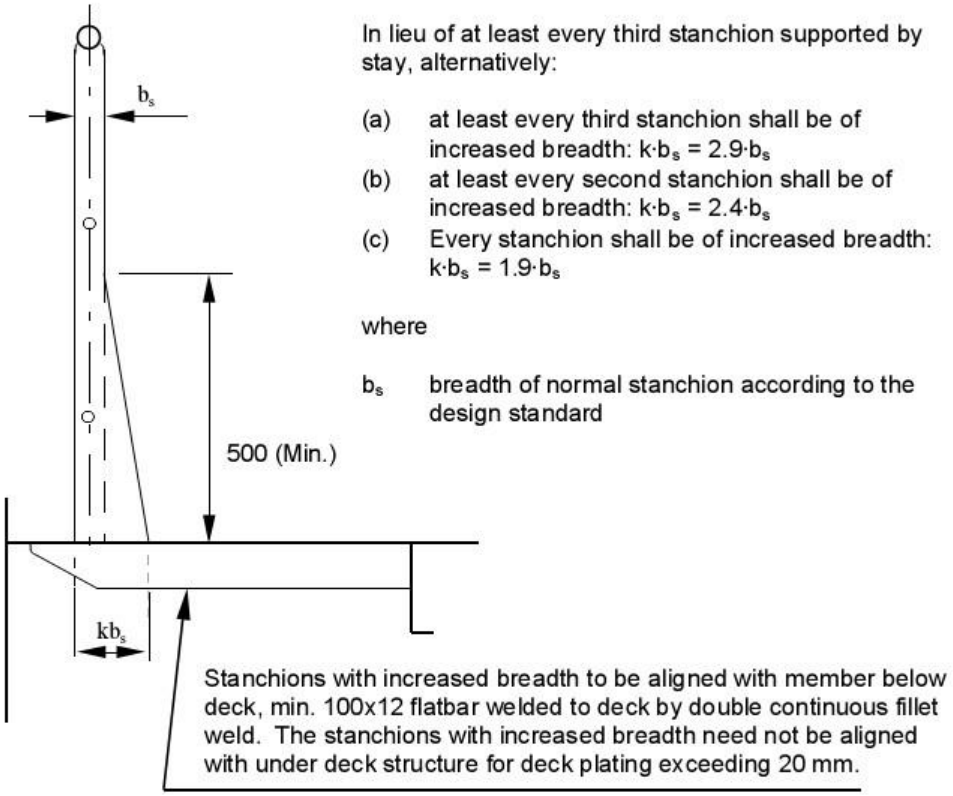


Fig. 1 Guardrail stanchion of increased breadth, welded to deck with double continuous fillet weld with leg size of min. 7 mm or as specified by the design standard.

Technical Background

For the current ship design it is difficult to satisfy the LL47 (b) "At least every third stanchion shall be supported by a bracket or stay.", and alternative solutions are applied. Therefore, UI LL47 is revised to give criteria for acceptable alternative solutions with reference to Japanese and Norwegian industrial standards.

Remarks

1. Corr.1 of this UI contains the interpretation of the "contracted for construction" date. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural

Requirement (PR) No. 29.
2. Regulations **25(2)**, **(3) of** Annex **I** to the Convention revised by the Protocol of **1988** is also applicable.

2.47 Moulded depth

Conventions (Amend.), Reg.		Regulations **3(5)(c)**, **3(9)**, **40(1)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL48**	**UI** version	**Rev.1,1983/ Rev.2,Jul.,2008**	Date of implementation	**1983**	Means of implementation	

Conventions/Codes Requirements

Regulation **3(5)(c)**: Where the freeboard deck is stepped and the raised part of the deck extends over the point at which the moulded depth is to be determined, the moulded depth shall be measured to a line of reference extending from the lower part of the deck along a line parallel with the raised part.
Regulation **3(9)**: Freeboard deck. The freeboard deck is normally the uppermost complete deck exposed to weather and sea, which has permanent means of closing all openings in the weather part thereof, and below which all openings in the sides of the ship are fitted with permanent means of watertight closing. In a ship having a discontinuous freeboard deck, the lowest line of the exposed deck and the continuation of that line parallel to the upper part of the deck is taken as the freeboard deck. At the option of the owner and subject to the approval of the Administration, a lower deck may be designated as the freeboard deck provided it is a complete and permanent deck continuous in a fore and aft direction at least between the machinery space and peak bulkheads and continuous athwartships. When this lower deck is stepped the lowest line of the deck and the continuation of that line parallel to the upper part of the deck is taken as the freeboard deck. When a lower deck is designated as the freeboard deck, that part of the hull which extends above the freeboard deck is treated as a superstructure so far as concerns the application of the conditions of assignment and the calculation of freeboard. It is from this deck that the freeboard is calculated.
Regulation **40(1)**: The minimum freeboard in summer shall be the freeboard derived from the tables in regulation 28, as modified by the corrections in Regulations 27, as applicable, 29, 30, 31, 32, 37, 38 and, if applicable, 39.

Interpretation

Discontinuous Freeboard Deck, Stepped Freeboard Deck.
1. Where a step exists in the freeboard deck, creating a discontinuity extending over the full breadth of the ship, and this step is in excess of one metre in length, Reg 3(9) shall apply. (Fig 1). A step one metre or less in length shall be treated as a recess in accordance with paragraph 2.
2. Where a recess is arranged in the freeboard deck, and this recess does not extend to the side of the ship, the freeboard calculated without regard to the recess is to be corrected for the consequent loss of buoyancy. The correction would be equal to the value obtained by dividing the volume of the recess by the waterplane area of the ship at 85% of the least moulded depth. (Fig 2).
2.1 The correction would be a straight addition to the freeboard obtained after all other corrections have been applied, except bow height correction.
2.2 Where the freeboard, corrected for lost buoyancy as above, is greater than the minimum geometric freeboard determined on the basis of a moulded depth measured to the bottom of the recess, the latter value may be used.
3. Recesses in a second deck, designated as the freeboard deck, may be disregarded in this Interpretation provided all openings in the weather deck are fitted with weathertight closing appliances.
4. Due regard is to be given to the drainage of exposed recesses and to free surface effects on stability.
5. This Interpretation is not intended to apply to dredgers, hopper barges or other similar types of ships with large open holds, where each case would require individual consideration.

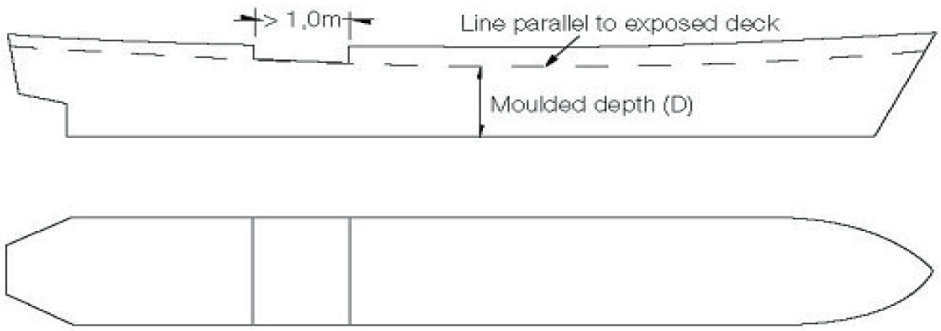


Fig.1 (Para.1)

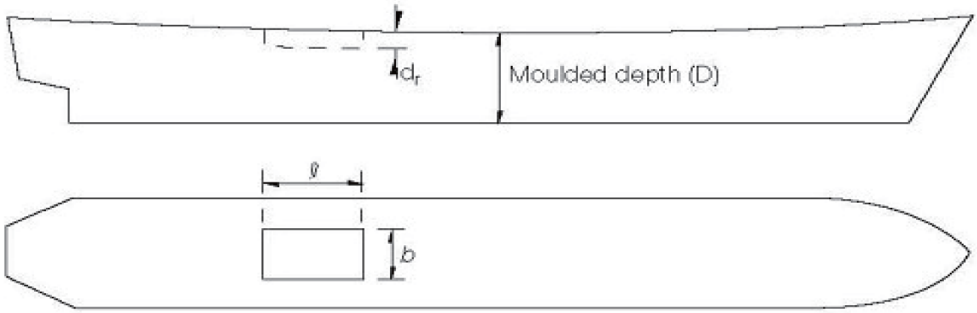


Fig.2 (Para.2)

Correction is addition to freeboard equal to:

$$\frac{l \times b \times d_r}{\text{WP Area at } 0.85D}$$

_____

Footnotes:

1. This UI is also applicable to Regulations 3(5)(c), 3(9) and 40(1) of 1988 Protocol.

2 Paragraph 1 should be replaced with the following sentence: "A step one metre or less in length shall be treated as a recess in accordance with Reg. 32-1." when this UI applies to the revised 1988 Protocol. Paragraphs from 2 to 5 are not applicable to the revised 1988 Protocol.

Remarks

2.48 Air pipe closing devices

Conventions (Amend.), Reg.		Regulation **20** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL49**	**UI** version	**1980/ Rev.1,Jul.,2008**	Date of implementation	**1980**	Means of implementation	

Conventions/Codes Requirements

Where air pipes to ballast and other tanks extend above the freeboard or superstructure decks, the exposed parts of the pipes shall be of substantial construction; the height from the deck to the point where water may have access below shall be at least 760 mm on the freeboard deck and 450 mm on the superstructure deck. Where these heights may interfere with the working of the ship, a lower height may be approved, provided that the Administration is satisfied that the closing arrangements and other circumstances justify a lower height. Satisfactory means permanently attached, shall be provided for closing the openings of the air pipes.

Interpretation

Where required by Regulation 20 air pipe closing devices shall be weathertight. Closing devices shall be automatic if, while the vessel is at its draught corresponding to summer load line, the openings of air pipes to which these

closures are fitted submerge at angles up to 40 ° or up to a lesser angle which may be agreed on the basis of stability requirements. Pressurevacuum valves (PV valves) may, however, be accepted on tankers.
Wooden plugs and trailing canvas hoses shall not be accepted in position 1 and position 2.
NOTE
The Member Societies in formulating this interpretation realise that pressure-vacuum valves (PV valves) presently installed on tankers do not theoretically provide complete watertightness. In view, however, of experience of this type of valve and the position in which they are normally fitted it was considered they could be accepted.

_____

Footnotes:
1. This UI is also applicable to Regulation 20 of 1988 Protocol.
2. The first and last sentences of this UI are also applicable to Reg.20(3) of the revised 1988 Protocol.

Remarks

2.49 Protection of crew

Conventions (Amend.), Reg.		Regulations **25(4)**, **26(2)**, **27(7)** of Annex **I** to **ICLL** Convention **1966** Regulation **25(4), 26(2), 27(8)** of ANNEX **B** ANNEX **I** to the **Protocol 1988,** Regulation **II-1/3-3** of Amendments **1996** to **SOLAS 1974**					
IACS UI Number	**LL50**	**UI** version	**Rev.4,**0ct. **, 1998/ Rev.5,Jul.,2008/ Rev.6,Jun.,2021**	Date of implementation	**Oct.,1998**	Means of implementation	

Conventions/Codes Requirements

Regulation **25(4)** of the **ICLL 1966/Protocol 1988**: Satisfactory means (in the form of guard rails, lifelines, gangways or underdeck passages, etc.) shall be provided for the protection of the crew in getting to and from their quarters, the machinery space and any other spaces used in the necessary work of the ship.

Regulation **26(2)** of the **ICLL 1966/Protocol 1988**: An efficiently constructed fore and aft permanent gangway of sufficient strength shall be fitted on type "A" ships at the level of the superstructure deck between the poop and the midship bridge or deckhouse where fitted, or equivalent means of access shall be provided to carry out the purpose of the gangway, such as passages below deck. Elsewhere, and on type "A" ships without a midship bridge, arrangements to the satisfaction of the Administration shall be provided to safeguard the crew in reaching all parts used in the necessary work of the ship.

Regulation **27(7)** of the **ICLL 1966**: Any type "B" ship of over 100 m in length may be assigned freeboards less than those required under paragraph (6), provided that, in relation to the amount of reduction granted, the Administration is satisfied that:

(a) the measures provided for the protection of the crew are adequate;

……

Regulation **27(8)** of the **Protocol 1988**: Any type 'B' ship of over 100 m in length may be assigned free boards less than those required under paragraph (7), provided that, in relation to the amount of reduction granted, the Administration is satisfied that:

(a) the measures provided for the protection of the crew are adequate;

……

SOLAS Regulation II-1/3-3 (details omitted)

Interpretation

When applying Regulation 25(4), 26(2) and 27(7) of the ICLL 1966, 1966, Regulation 25(4), 26(2) and 27(8) of the Protocol 1988, as well as Regulation II-1/3-3 of SOLAS the protection of crew should be provided at least one of the means denoted in the table given below:

Type of Ship	**Locations of access in Ship**	**Assigned Summer**	**Acceptable arrangements according to type of freeboard assigned:**

		Freeboard	Type A	Type B-100	Type B-60	Type B&B+
All Ships other than Oil Tankers*, Chemical Tankers* and Gas Carriers*	**1.1. Access to Midship Quarters** 1.1.1. Between poop and bridge, or 1.1.2. Between poop and deckhouse containing living accommodation or navigating equipment, or both.	≤ 3000 mm	a b e	a b e	a b c(1) e f(1)	a b c(1) c(2) c(4) d(1) d(2) d(3) e f(1) f(2) f(4)
		> 3000 mm	a b e	a b e	a b c(1) c(2) e f(1) f(2)	
	1.2 Access to Ends 1.2.1. Between poop and bow(if there is no bridge), 1.2.2. Between bridge and bow, or 1.2.3. Between a deckhouse containing living accommodation or navigating equipment, or both, and bow, or 1.2.4. In the case of a flush deck vessel, between crew accommodation and the forward and after ends of ship.	≤ 3000 mm	a b c(1) e f(1)	a b c(1) c(2) e f(1) f(2)	a b c(1) c(2) e f(1) f(2)	
		> 3000 mm	a b c(1) d(1) e f(1)	a b c(1) c(2) d(1) d(2) e f(1) f(2)	a b c(1) c(2) c(4) d(1) d(2) d(3) e f(1) f(2) f(4)	
Oil Tankers*, Chemical Tankers* and Gas Carriers*	**2.1 Access to Bow** 2.1.1. Between poop and bow, or 2.1.2. Between a deckhouse containing living accommodation or navigating equipment, or both, and bow, or 2.1.3. In the case of a flush deck vessel, between crew accommodation and the forward ends of ship.	≤ (A_f + H_s)**	a e f(1) f(5)			
		> (A_f + H_s)**	a e f(1) f(2)			
	2.2 Access to After End In the case of a flush deck vessel, between crew accommodation and the after end of ship	as required in 1.2.4 for other types of ships				

* Oil Tankers, Chemical Tanker and Gas Carrier as defined in SOLAS II-1/2.12, VII/8.2 and VII/11.2 respectively, of the International Convention for the Safety of Life at Sea, 1974, as amended.

** A_f: the minimum summer freeboard calculated as type A ship regardless of the type freeboard actually assigned.

H_s: the standard height of superstructure as defined in ICLL Regulation 33.

Note: Deviations from some or all of these requirements or alternative arrangements for such cases as ships with very high gangways (i.e. certain gas carriers) may be allowed subject to agreement case-by-case with the relevant flag Administration.

For oil tanker, as defined in SOLAS II-1/2.12, chemical tankers as defined in SOLAS VII/8.2 or gas carriers as defined in SOLAS VII/11.2, constructed before 1st July 1998, existing arrangements which complied with (b) or (c)

may be accepted in lieu of (e) or (f) provided such existing arrangements are fitted with shelters and means of access to and from the deck as required for the arrangements (e) or (f) as defined below.

For tankers less than 100 m in length, the minimum width of the gangway platform or deck level walkway fitted in accordance with arrangement (e) or (f), respectively, may be reduced to 0.6 m.

Acceptable arrangements referred to in the table are defined as follows:

(a) A well lighted and ventilated under-deck passageway (clear opening 0.8 m wide, 2.0 m high) as close as practicable to the freeboard deck, connecting and providing access to the locations in question.

(b) A permanent and efficiently constructed gangway fitted at or above the level of the superstructure deck on or as near as practicable to the centre line of the ship, providing a continuous platform at least 0.6 m in width and a non-slip surface, with guard rails extending on each side throughout its length. Guard rails shall be at least 1 m high with courses as required in Load Line Regulation 25(3), a foot-stop shall be provided.

(c) A permanent walkway at least 0.6 m in width fitted at freeboard deck level consisting of two rows of guard rails with stanchions spaced not more than 3 m. The number of courses of rails and their spacing are to be as required by Regulation 25(3). On Type B ships, hatchway coamings not less than 0.6 m in height may be regarded as forming one side of the walkway, provided that between the hatchways two rows of guard rails are fitted.

(d) A wire rope lifeline not less than 10 mm in diameter, supported by stanchions not more than 10 m apart, or a single hand rail or wire rope attached to hatch coamings, continued and supported between hatchways.

(e) A permanent and efficiently constructed gangway fitted at or above the level of the superstructure deck on or as near as practicable to the centre line of the ship:

- located so as not to hinder easy access across the working areas of the deck;
- providing a continuous platform at least 1.0 m in width;
- constructed of fire resistant and non-slip material;
- fitted with guard rails extending on each side throughout its length; guard rails should be at least 1.0 m high with courses as required by Regulation 25(3) and supported by stanchions spaced not more than 1.5 m;
- provided with a foot stop on each side;
- having openings, with ladders where appropriate, to and from the deck. Openings should not be more than 40 m apart;
- having shelters of substantial construction set in way of the gangway at intervals not exceeding 45 m if the length of the exposed deck to be traversed exceeds 70 m. Every such shelter should be capable of accommodating at least one person and be so constructed as to afford weather protection on the forward, port and starboard sides.

(f) A permanent and efficiently constructed walkway fitted at freeboard deck level on or as near as practicable to the centre line of the ship having the same specifications as those for a permanent gangway listed in (e) except for foot-stops. On Type B ships (certified for the carriage of liquids in bulk), with a combined height of hatch coaming and fitted hatch cover of together not less than 1m in height the hatchway coamings may be regarded as forming one side of the walkway, provided that between the hatchways two rows of guard rails are fitted.

Alternative transverse locations for (c),(d) and (f) above, where appropriate:

(1) At or near centre line of ship; or Fitted on hatchways at or near centre line of ship.

(2) Fitted on each side of the ship.

(3) Fitted on one side of the ship, provision being made for fitting on either side.

(4) Fitted on one side only.

(5) Fitted on each side of the hatchways as near to the centre line as practicable.

Notes:

1. In all cases where wire ropes are fitted, adequate devices (for example turnbuckles) are to be provided to ensure their tautness.

2. Wire ropes may only be accepted in lieu of guard rails in special circumstances and then only in limited lengths.

3. Lengths of chain may only be accepted in lieu of guard rails if fitted between two fixed stanchions.
4. Where stanchions are fitted, every 3rd stanchion is to be supported by a bracket or stay.
5. Removable or hinged stanchions shall be capable of being locked in the upright position.
6. A means of passage over obstructions, if any, such as pipes or other fittings of a permanent nature, should be provided.
7. Generally, the width of the gangway or deck-level walkway should not exceed 1.5 m.

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Footnotes:
1. This UI will be applied by all Members and Associates for ships that are subject to the referenced ICLL and SOLAS Regulations.
2. This UI is applicable to Regulations 25(4), 26(2) and 27(7) of the 1966 ICLL and Regulations 25(4), 26(2) and 27(8) of 1988 Protocol.

Remarks

2.50 Freeboards greater than minimum

Conventions (Amend.), Reg.		Regulation **2(5)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL51**	**UI** version	**Rev.1,1986/ Rev.2,Jul.,2008**	Date of implementation	**1986**	Means of implementation	

Conventions/Codes Requirements

Regulations 10 to 26 inclusive of this Annex shall apply to every ship to which a minimum freeboard is assigned. Relaxations from these requirements may be granted to a ship to which a greater than minimum freeboard is assigned, on condition that the Administration is satisfied with the safety conditions provided.

Interpretation

Where freeboards are required to be increased, because of such consideration as strength (Regulation 1), location of shell doors (Regulation 21) or side scuttles (Regulation 23) or other reasons then:
(a) the height of
- door sills Regulation 12
- hatchway coamings Regulation 15(1)
- sills of machinery space openings Regulation 17
- miscellaneous openings Regulation 18
- ventilators Regulation 19
- air pipes Regulation 20

(b) the scantlings of hatch covers Regulation 15 and 16,
(c) freeing arrangements Regulation 24 and means for protection of crew Regulation 25,
(d) windows and side scuttles
on the actual freeboard deck may be as required for a superstructure deck, provided the summer freeboard is such that the resulting draught will not be greater than that corresponding to the minimum freeboard calculated from an assumed freeboard deck situated at a distance equal to a standard superstructure height below the actual freeboard deck. Similar considerations may be given in cases of draught limitation on account of bow height (Regulation 39).

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Footnote: This UI is also applicable to Regulation 2(5) of 1988 Protocol.

Remarks

2.51 Weathertight closing appliances for ventilators

Conventions (Amend.), Reg.		Regulation **19(4)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL52**	**UI** version	**1983/ Rev.1,Jul.,2008**	Date of implementation	**1983**	Means of implementation	

Conventions/Codes Requirements

Except as provided in paragraph (3) of this Regulation, ventilator openings shall be provided with efficient weathertight closing appliances. In ships of not more than 100 m in length the closing appliances shall be permanently attached; where not so provided in other ships, they shall be conveniently stowed near the ventilators to which they are to be fitted. Ventilators in position 1 shall have coamings of a height of at least 900 mm above the deck; in position 2 the coamings shall be of a height at least 760 mm above the deck.
Interpretation
Where required by Regulation 19, weathertight closing appliances for all ventilators in positions 1 and 2 are to be of steel or other equivalent materials. Wood plugs and canvas covers are not acceptable in these positions. _____ Footnote: This UI is also applicable to Regulation 19(4) of 1988 Protocol.
Remarks

2.52 Treatment of moon pools

Conventions (Amend.), Reg.		Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL53**	**UI** version	**1987/ Rev.1,Jul.,2008**	Date of implementation	**1987**	Means of implementation	
Conventions/Codes Requirements							
(Details omitted)							
Interpretation							
Where moonpools are arranged within the hull in open communication with the sea, the volume of the moonpool should not be included in calculation of any hydrostatic properties. An addition should be made to the geometric freeboard, if the moonpool has a larger crosssectional area above the waterline at 0,85*D* than below, corresponding to the lost buoyancy. This addition for the excess portion above 0,85*D* should be made as prescribed for recesses in LL 48/rev 1. If an enclosed superstructure contains part of the moonpool, deduction should be made from the effective length of the superstructure. _____ Footnotes: 1. This UI is also applicable to 1988 Protocol. 2. The reference "LL 48/rev 1" should be replaced with "Reg.32-1" when this UI applies to the revised 1988 Protocol.							
Remarks							

2.53 Effective length of superstructures

Conventions (Amend.), Reg.		Regulation **35(3)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL54**	**UI** version	**1989/ Rev.1,Jul.,2008**	Date of implementation	**1989**	Means of implementation	
Conventions/Codes Requirements							
Where the height of an enclosed superstructure is less than the standard height, the effective length shall be its length reduced in the ratio of the actual height to the standard height. Where the height exceeds the standard, no increase shall be made to the effective length of the superstructure							
Interpretation							
When calculating the freeboard for a ship with excessive sheer but without any superstructure at 0,2*L* amidships, the deduction for sheer per Regulation 38(15) is not to be granted. However, where a poop or forecastle of less than standard height is fitted, when applying Regulation 35(3), credit may be given to the height of the poop or forecastle							

by increasing it by the difference between the actual and the standard sheer profiles.

When the height of the superstructure, clear of the slope, is less than the standard height, its effective length E shall be its length *S* as obtained from (a)(i), reduced in the ratio of the actual height to the standard height.

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Footnote: This UI is also applicable to Regulation 35(3) of the 1988 Protocol.

Remarks

2.54 Least moulded depth for a ship with a rake of keel

Conventions (Amend.), Reg.		Regulation **3(1)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL55**	**UI** version	**1993/ Rev.1,Jul.,2008/ Corr.1,Dec.,2021**	Date of implementation	**1993**	Means of implementation	

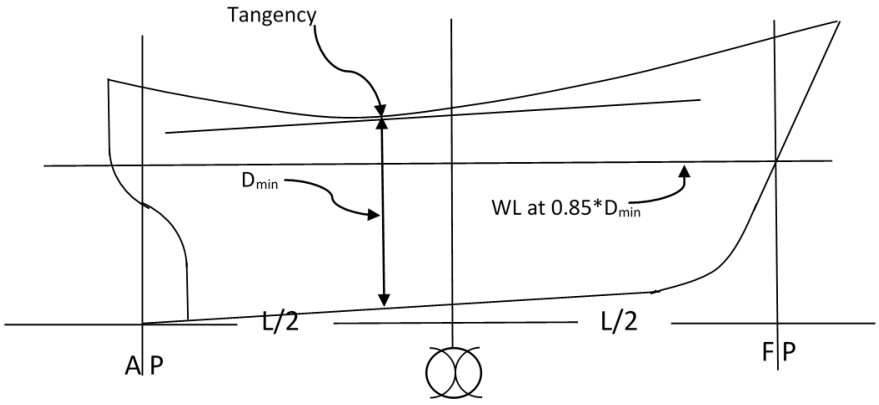
Conventions/Codes Requirements

Length. The length (*L*) shall be taken as 96% of the total length on a waterline at 85% of the least moulded depth measured from the top of the keel, or as the length from the fore side of the stem to the axis of the rudder stock on that waterline, if that be greater.-In ships designed with a rake of keel the waterline on which this length is measured shall be parallel to designed waterline.

Interpretation

For a ship with a rake of keel, least moulded depth, $\boldsymbol{D_{min}}$, is found by drawing a line parallel to the keel line of the vessel (including skeg) tangent to the moulded sheer line of the freeboard deck, as illustrated in the above sketch. The least moulded depth is the vertical distance measured from the top of the keel to the top of the freeboard deck beam at side at the point of tangency.

Depth for freeboard, ***D***, may then be found.



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Remarks

2.55 Block coefficient of a pontoon

Conventions (Amend.), Reg.		Regulation **3(7)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL56**	**UI** version	**1993/ Rev.1,Jul.,2008**	Date of implementation	**1993**	Means of implementation	

Conventions/Codes Requirements

Block coefficient. The block coefficient (C_b) is given by:

$$C_b = \frac{\nabla}{L \cdot B \cdot d_1}$$

where:

∇ is the volume of the moulded displacement of the ship, excluding bossing, in a ship with a metal shell, and is the volume of displacement to the outer surface of the hull in a ship with a shell of any other material, both taken at a moulded draught of d_1; and where

d_1 is 85% of the least moulded depth.

Interpretation

When calculating the block coefficient of a pontoon, according to the definition of Regulation 3(7), the 96%-length, if applicable, shall be used disregarding the fact that this might lead to a coefficient greater than 1,0.

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Footnote: This UI is also applicable to Regulation 3(7) of the 1988 Protocol.

Remarks

2.56 Block coefficient of a multi-hull craft

Conventions (Amend.), Reg.		Regulation **3(7)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL57**	**UI** version	**1996/ Rev.1,Jul.,2008**	Date of implementation	**1996**	Means of implementation	

Conventions/Codes Requirements

Block coefficient. The block coefficient (C_b) is given by:

$$C_b = \frac{\nabla}{L \cdot B \cdot d_1}$$

where:

∇ is the volume of the moulded displacement of the ship, excluding bossing, in a ship with a metal shell, and is the volume of displacement to the outer surface of the hull in a ship with a shell of any other material, both taken at a moulded draught of d_1; and where

d_1 is 85% of the least moulded depth.

Interpretation

When calculating the block coefficient (C_b) of a multi-hull craft according to the definition of Regulation 3(7), the full breadth (B) as defined in regulation 3(4) is to be used and not the breadth of a single hull.

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Footnote: This UI is also applicable to Regulation 3(7) of the 1988 Protocol.

Remarks

2.57 Machinery space and emergency generator room ventilator coaming heights

Conventions (Amend.), Reg.		Regulations **17(2)**, **19(3)**, **19 (4)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL58**	**UI** version	**1997/ Rev.1,Jul.,2008**	Date of implementation	**1997**	Means of implementation	

Conventions/Codes Requirements

Regulation **17(2)**: Coamings of any fiddley, funnel or machinery space ventilator in an exposed position on the freeboard or superstructure deck shall be as high above the deck as is reasonable and practicable. Fiddley openings shall be fitted with strong covers of steel or other equivalent material permanently attached in their proper positions and capable of being secured weathertight.

Regulation **19(3)**: Ventilators in position 1 the coamings of which extend to more than 4.5 m above the deck, and in position 2 the coamings of which extend to more than 2.3 m above the deck, need not be fitted with closing

arrangements unless specifically required by the Administration.

Regulation **19(4)**: Except as provided in paragraph (3) of this Regulation, ventilator openings shall be provided with efficient weathertight closing appliances. In ships of not more than 100 m in length the closing appliances shall be permanently attached; where not so provided in other ships, they shall be conveniently stowed near the ventilators to which they are to be fitted. Ventilators in position 1 shall have coamings of a height of at least 900 mm above the deck; in position 2 the coamings shall be of a height at least 760 mm above the deck.

Interpretation

Regulation 17(2) requires that the coamings of machinery space ventilators situated in exposed positions on the freeboard and superstructure decks be as high above the deck as is reasonable and practicable.

In general, ventilators necessary to continuously supply the machinery space and, on demand, immediately supply the emergency generator room should have coamings which comply with regulation 19(3), without having to fit weathertight closing appliances.

However, where due to vessel size and arrangement this is not practicable, lesser heights for machinery space and emergency generator room ventilator coamings may be accepted with provision of weathertight closing appliances in accordance with regulation 19(4) in combination with other suitable arrangements to ensure an uninterrupted, adequate supply of ventilation to these spaces.

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Footnote: This UI is also applicable to Regulations 17(2), 19(3) and 19(4) of the 1988 Protocol.

Remarks

2.58 Cargo manifold gutter bars – freeing arrangements and intact stability

Conventions (Amend.), Reg.		Regulations **24(1)(g)**, **26** of Annex **I** to **ICLL** Convention (including Regulation **24** of Annex **I** to **1988** Protocol -Freeing ports, as amended by Resolution **MSC.143(77)** and Regulation **26** of Annex **I** to **ICLL** Convention **1966** and **1988** Protocol-Special conditions of assignment for type 'A' ships)					
IACS UI Number	**LL59**	**UI** version	**1997/ Rev.1,Dec.,2007**	Date of implementation	**1997/ Jul.1,2008**	Means of implementation	

Conventions/Codes Requirements

ICLL 1988, as amended by res. MSC.143(77), Regulation 24 Freeing Ports

(1)(g) Gutter bars greater than 300 mm in height fitted around the weather decks of tankers in way of cargo manifolds and cargo piping shall be treated as bulwarks. Freeing ports shall be arranged in accordance with this regulation. Closures attached to the freeing ports for use during loading and discharge operations are to be arranged in such a way that jamming cannot occur while at sea.

ICLL 1966, Regulation 26 Special Conditions of Assignment for Type "A" Ships

Machinery Casings

(1) Machinery casings on Type "A" ships as defined in Regulation 27 shall be protected by an enclosed poop or bridge of at least standard height, or by a deckhouse of equal height and equivalent strength, provided that machinery casings may be exposed if there are no openings giving direct access from the freeboard deck to the machinery space. A door complying with the requirements of Regulation 12 may, however, be permitted in the machinery casing, provided that it leads to a space or passageway which is as strongly constructed as the casing and is separated from the stairway to the engine room by a second weathertight door of steel or other equivalent material.

Gangway and Access

(2) An efficiently constructed fore and aft permanent gangway of sufficient strength shall be fitted on Type "A" ships at the level of the superstructure deck between the poop and the midship bridge or deckhouse where fitted, or equivalent means of access shall be provided to carry out the purpose of the gangway, such as passages below deck.

Elsewhere, and on Type "A" ships without a midship bridge, arrangements to the satisfaction of the Administration shall be provided to safeguard the crew in reaching all parts used in the necessary work of the ship.
(3) Safe and satisfactory access from the gangway level shall be available between separate crew accommodations and also between crew accommodations and the machinery space.

Hatchways
(4) Exposed hatchways on the freeboard and forecastle decks or on the tops of expansion trunks on Type "A" ships shall be provided with efficient watertight covers of steel or other equivalent material.

Freeing Arrangements
(5) Type "A" ships with bulwarks shall have open rails fitted for at least half the length of the exposed parts of the weather deck or other effective freeing arrangements. The upper edge of the sheer strake shall be kept as low as practicable.
(6) Where superstructures are connected by trunks, open rails shall be fitted for the whole length of the exposed parts of the freeboard deck.

ICLL 1988, Regulation 26 Special conditions of assignment for type 'A' ships
Machinery casings
(1) Machinery casings on type 'A' ships, as defined in regulation 27, shall be protected by one of the following arrangements:
(a) an enclosed poop or bridge of at least standard height; or
(b) a deckhouse of equal height and equivalent strength.

(2) Machinery casings may, however, be exposed if there are no openings giving direct access from the freeboard deck to the machinery space. A door complying with the requirements of regulation 12 is acceptable in the machinery casing, provided that it leads to a space or passageway which is as strongly constructed as the casing and is separated from the stairway to the engine-room by a second weathertight door of steel or other equivalent material.

Gangway and access
(3) A fore-and-aft permanent gangway, constructed in accordance with the provisions of regulation 25-1(2)(e), shall be fitted on type 'A' ships at the level of the superstructure deck between the poop and the midship bridge or deckhouse where fitted. The arrangement contained in regulation 25-1(2)(a) is considered an equivalent means of access to carry out the purpose of the gangway.
(4) Safe access from the gangway level shall be available between separate crew accommodations and also between crew accommodations and the machinery space.

Hatchways
(5) Exposed hatchways on the freeboard and forecastle decks or on the tops of expansion trunks on type 'A' ships shall be provided with efficient watertight covers of steel or other equivalent material.

Freeing arrangements
(6) Type 'A' ships with bulwarks shall have open rails fitted for at least half the length of the weather deck or other equivalent freeing arrangements. A freeing port area, in the lower part of the bulwarks, of 33% of the total area of the bulwarks, is an acceptable equivalent freeing arrangement. The upper edge of the sheer strake shall be kept as low as practicable.
(7) Where superstructures are connected by trunks, open rails shall be fitted for the whole length of the exposed parts of the freeboard deck.

Interpretation

Where gutter bars are installed on the weather decks of tankers in way of cargo manifolds and are extended aft as far as the after house front for the purpose of containing cargo spills on deck during loading and discharge operations, the free surface effects caused by containment of a cargo spill during liquid transfer operations or of boarding seas while underway require consideration with respect to the vessel’s available margin of positive initial stability (GMo).

Where the gutter bars installed are greater than 300 mm in height, they are to be treated as bulwarks according to the Load Line Convention with freeing ports arranged in accordance with Regulation 24 and effective closures provided for use during loading and discharge operations. Attached closures are to be arranged in such a way that jamming cannot occur while at sea, ensuring that the freeing ports will remain fully effective.

On ships without deck camber, or where the height of the installed gutter bars exceeds the camber, and for tankers

having cargo tanks exceeding 60% of the vessel's maximum beam at midships regardless of gutter bar height, gutter bars should not be accepted without an assessment of the initial stability (GMo) for compliance with the relevant intact stability requirement taking into account the free surface effect caused by liquids contained by the gutter bars.

Remarks

2.59 Freeing ports in way of wells in combination with open superstructures

Conventions (Amend.), Reg.		Regulations **24(1)**, **(4)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL60**	**UI** version	**Corr.1,1998.04/ Rev.1,Jul.,2008**	Date of implementation	**Apr.,1998**	Means of implementation	

Conventions/Codes Requirements

(1) Where bulwarks on the weather portions of freeboard or superstructure decks form wells, ample provision shall be made for rapidly freeing the decks of water and for draining them. Except as provided in paragraphs (2) and (3) of this Regulation, the minimum freeing port area (A) on each side of the ship for each well on the freeboard deck shall be that given by the following formulae in cases where the sheer in way of the well is standard or greater than standard. The minimum area for each well on superstructure decks shall be one-half of the area given by the following formulae:

Where the length of bulwark (l) in the well is 20 m or less:

$$A = 0.7 + 0.035l \quad m^2;$$

where l exceeds 20 m:

$$A = 0.07l \quad m^2.$$

l need in no case be taken as greater than $0.7L$.

If the bulwark is more than 1.2 m in average height, the required area shall be increased by 0.004 m^2 per metre of length of well for each 0.1 m difference in height. If the bulwark is less than 0.9 m in average height, the required area may be decreased by 0.004 m^2 per m of length of well for each 0.1 m difference in height.

(2) In ships with no sheer, the area calculated according to paragraph (1) shall be increased by 50%. Where the sheer is less than the standard, the percentage shall be obtained by linear interpolation.

Interpretation

In the case of vessels having open superstructures on the freeboard or superstructure decks, which open to wells formed by bulwarks on the peripheries of the open decks, the convention leaves to the satisfaction of the Administration how the freeing port areas for the open spaces within the superstructures are to be calculated.

Since water can enter only through the end bulkhead openings, the freeing port areas for the open spaces within the superstructures should be a function of the breadth of the end openings and the extent to which wells formed by the open decks and common spaces within the open superstructures are covered by the open superstructures.

To determine the minimum freeing port area on each side of the ship for the open superstructure (A_S) and for the open well (A_W), the following procedure is recommended:

1. Determine the total well length (l_t) equal to the sum of the length of the open deck enclosed by bulwarks (l_W) and the length of the common space within the open superstructure (l_S).

2. To determine (A_S):

2.1 Calculate the freeing port area (A) required for an open well of length l_t in accordance with regulation 24(1) with standard height bulwark assumed.

2.2 Multiply by the factor of 1.5 to correct for the absence of sheer, if applicable, in accordance with regulation 24(2).

2.3 Multiply by the factor (b_O/l_t) to adjust the freeing port area for the breadth (b_O) of the openings in the end bulkhead of the enclosed superstructure. (Note: this cancels the l_t terms from the calculation.)

2.4 To adjust the freeing port area for that part of the entire length of the well which is enclosed by the open superstructure, multiply by the factor:

$$1-(l_W/l_t)^2$$

where l_W and l_t are defined in 1 above.

2.5 To adjust the freeing port area for the distance of the well deck above the freeboard deck, multiply by the factor:

$$0.5\ (h_S/h_W)$$

where h_W is the distance of the well deck above the freeboard deck and h_s is one standard superstructure height.

3. To determine (A_W):

3.1 The freeing port area for the open well (A_W) is to be calculated in accordance with step 2.1 above, using l_W to calculate (A'), and then adjusted for the actual height of the bulwark (h_b) by the application of one of the following area corrections, whichever is applicable:

For bulwarks greater than 1.2 m in height:

$$A_C = l_W\ ((h_b\text{-}1.2)/(0.10))\ (0.004)\ m^2$$

For bulwarks less than 0.9 m in height:

$$A_C = l_W\ ((h_b\text{-}0.9)/(0.10))\ (0.004)\ m^2$$

For bulwarks between 1.2 m and 0.9 m in height:

$$A_C = 0.00\ m^2$$

3.2 The corrected freeing port area, ($A_W = A' + A_C$), is then adjusted for absence of sheer, if applicable, and height above freeboard deck as in steps 2.2 and 2.5 above, using h_S and h_W.

4. The resulting freeing port areas for the open superstructure (A_S) and for the open well (A_W) are to be provided along each side of the open space covered by the open superstructure and each side of the open well respectively.

5. The above relationships are summarised by the following equations, assuming l_t, the sum of l_W and l_S , is greater than 20 m*:

Freeing port area A_W for the open well:

$$A_W = (0.07\ l_W + A_C)\ (\text{sheer correction})\ (0.5h_S/h_W)$$

Freeing port area A_S for the open superstructure:

$$A_S = (0.07l_t)\ (\text{sheer correction})\ (b_O/l_t)\ (1 - (l_W/l_t)^2)\ (0.5h_S/h_W)$$

* Where l_t is 20 m or less, the basic freeing port area is $A = 0.7 + 0.035l_t$ in accordance with Regulation 24(1). Units are to be consistent with those in the Convention.

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Footnote: This UI is also applicable to Regulation 24(1) and 24(4) of the 1988 Protocol.

Remarks

2.60 Method of correction for the effect of free surface of liquids in tanks

Conventions (Amend.), Reg.		Regulation **10(2)** of Annex **I** to **ICLL** Convention **1966**, **UR L3**, **UI LL45**					
IACS UI Number	**LL61**	**UI** version	**1997/ Rev.1,Jul.,2008**	Date of implementation	**1997**	Means of implementation	

Conventions/Codes Requirements

Regulation **10(2)**: The master of every new ship which is not already provided with stability information under an international convention for the safety of life at sea in force shall be supplied with sufficient information in an approved form to give him guidance as to the stability of the ship under varying conditions of service, and a copy shall be furnished to the Administration.
UR L3: deleted.
UI LL45: (details omitted)

Interpretation

1 For all loading conditions, the initial metacentric height and the righting lever curve should be corrected for the effect of free surfaces of liquids in tanks.

2 Free surface effects will exist whenever the filling level in a tank is less than 100% and greater than 0%. Where the total free surface effects of nominally full (i.e. 98% or above) tanks is small in relation to the metacentric height of the vessel, with the agreement of the administration the effects for such tanks may be ignored. Free surface effects should be considered whenever the filling level in a tank is less than 98%.

3 Tanks which are taken into consideration when determining the free surface correction may be in one of two categories:

3.1 Tanks with filling levels fixed (e.g. liquid cargo, water ballast). The free surface correction should be determined for the actual filling level to be used in each tank.

3.2 Tanks with filling levels variable (e.g. consumable liquids such as fuel oil, diesel oil,
and fresh water, and also liquid cargo and water ballast during liquid transfer operations). Except as permitted in 5 and 6, the free surface correction should be the maximum value attainable between the filling limits envisaged for each tank, consistent with any operating instructions.

4 In calculating the free surface effects in tanks containing consumable liquids, it should be assumed that for each type of liquid at least one transverse pair or a single centreline tank has a free surface and the tank or combination of tanks taken into account should be those where the effect of free surfaces is the greatest.

5 Where water ballast tanks, including anti-rolling tanks and anti-heeling tanks, are to be filled or discharged during the course of a voyage, the free surface effects should be calculated to take account of the most onerous transitory stage relating to such operations.

6 For vessels engaged in liquid transfer operations, the free surface corrections at any stage of the liquid transfer operations may be determined in accordance with the filling level in each tank at that stage of the transfer operation.

7 The corrections to the initial metacentric height and to the righting lever curve should be addressed separately as follows:

7.1 In determining the correction to initial metacentric height, the transverse moments of inertia of the tanks should be calculated at 0 degrees angle of heel according to the categories indicated in 3.
7.2 The righting lever curve may be corrected by any of the following methods subject to the agreement of the Administration:

.1 Correction based on the actual moment of fluid transfer for each angle of heel calculated.

.2 Correction based on the moment of inertia, calculated at 0 degrees angle of heel, modified at each angle of heel calculated, (i.e.: $GG_1 \sin\theta$).

.3 Correction based on the summation of M_{fs} values for all tanks taken into consideration, see 8.

With the exception of item 7.2.3 above, corrections may be calculated according to the categories indicated in 3.

Whichever method is selected for correcting the righting lever curve, only that method should be presented in the vessel's stability booklet. However, where an alternative method is described for use in manually calculating loading conditions, an explanation of the differences which may be found in the results, as well as an example correction for each alternative, should be included.

8 The values of M_{fs} for each tank may be derived from the formula:

$$M_{fs} = vb\rho k\sqrt{\delta}$$

where:
M_{fs} is the free surface moment at any inclination in metre-tonnes
v is the tank total capacity in cubic metres
b is the tank maximum breadth in metres
ρ is the mass density of liquid in the tank in tonnes/cubic metre
δ is equal to v/blh (the tank block coefficient)
h is the tank maximum height in metres
l is the tank maximum length in metres
k is the dimensionless coefficient to be determined from the following table according to the ratio b/h. The intermediate values are determined by interpolation.

Table of Values for Coefficient "k" for Calculating Free Surface Corrections

$k = \frac{\sin\theta}{12}\left(1+\frac{\tan^2\theta}{2}\right) * \frac{b}{h}$ where $\cot\theta \geq b/h$								$k = \frac{\cos\theta}{8}\left(1+\frac{\tan\theta}{b/h}\right) - \frac{\cos\theta}{12(b/h)^2}\left(1+\frac{\cot^2\theta}{2}\right)$ where $\cot\theta \leq b/h$						
θ / b/h	5°	10°	15°	20°	30°	40°	45°	50°	60°	70°	75°	80°	85°	θ / b/h
20	0.11	0.12	0.12	0.12	0.11	0.10	0.09	0.09	0.07	0.05	0.04	0.03	0.02	20
10	0.07	0.11	0.12	0.12	0.11	0.10	0.10	0.09	0.07	0.05	0.04	0.03	0.02	10
5	0.04	0.07	0.10	0.11	0.11	0.11	0.10	0.10	0.08	0.07	0.06	0.05	0.04	5
3	0.02	0.04	0.07	0.09	0.11	0.11	0.11	0.10	0.09	0.08	0.07	0.06	0.05	3
2	0.01	0.03	0.04	0.06	0.09	0.11	0.11	0.11	0.10	0.09	0.09	0.08	0.07	2
1.5	0.01	0.02	0.03	0.05	0.07	0.10	0.11	0.11	0.11	0.11	0.10	0.10	0.09	1.5
1	0.01	0.01	0.02	0.03	0.05	0.07	0.09	0.10	0.12	0.13	0.13	0.13	0.13	1
0.75	0.01	0.01	0.02	0.02	0.04	0.05	0.07	0.08	0.12	0.15	0.15	0.16	0.16	0.75
0.5	0.00	0.01	0.01	0.02	0.02	0.04	0.04	0.05	0.09	0.16	0.18	0.21	0.23	0.5
0.3	0.00	0.00	0.01	0.01	0.01	0.02	0.03	0.03	0.05	0.11	0.19	0.27	0.34	0.3
0.2	0.00	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.04	0.07	0.13	0.27	0.45	0.2
0.1	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.02	0.04	0.06	0.14	0.53	0.1

9 Small tanks which satisfy the following condition using the values of "k" corresponding to an angle of inclination of 30 degrees, need not be included in the correction:

$$vb\rho k\sqrt{\delta} \,/\, \Delta_{min} < 0.01 \text{ m}$$

where Δ_{min} = the minimum ship displacement in tonnes.

10 The usual remainder of liquids in empty tanks need not be taken into account in calculating the corrections providing the total of such residual liquids does not constitute a significant free surface effect.

Footnote: This UI is also applicable to Regulation 10(2) of the 1988 Protocol and the revised 1988 Protocol.

Remarks

2.61 Side scuttles, windows and skylights

Conventions (Amend.), Reg.		Regulation **23** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL62**	**UI** version	**1997/ Rev.1,Jul.,2008/ Corr.1,Aug.,2010**	Date of implementation	**1997**	Means of implementation	

Conventions/Codes Requirements

(1) Side scuttles to spaces below freeboard deck or to spaces within enclosed superstructures shall be fitted with efficient hinged inside deadlights arranged so that they can be effectively closed and secured watertight
(2) No side scuttle shall be fitted in a position so that its sills are below a line drawn parallel to the freeboard deck at side and having its lowest point 2.5% of the breadth (*B*) above the Summer Load Line (or Summer Timber Load Line if assigned), or 500 mm, whichever is the greater distance.
(3) The side scuttles, together with their glasses, if fitted, and deadlights, shall be of substantial and approved construction.

Interpretation

(1) Side scuttles and windows together with their glasses, deadlights[1] and storm covers, if fitted, shall be of approved design and substantial construction in accordance with, or equivalent to, recognised national or international standards. Non-metallic frames are not acceptable.

(2) Side scuttles are defined as being round, or oval, openings with an area not exceeding 0.16 square metres. Round or oval openings having areas exceeding 0.16 square metres shall be treated as windows.

(3) Windows are defined as being rectangular openings generally, having a radius at each corner relative to the window size in accordance with recognised national or international standards, and round, or oval, openings with an area exceeding 0.16 square metres.

(4) Side scuttles to the following spaces shall be fitted with efficient hinged inside deadlights:

(a) spaces below freeboard deck
(b) spaces within the first tier of enclosed superstructures
(c) first tier deckhouses on the freeboard deck protecting openings leading below or considered buoyant in stability calculations.

The deadlights shall be capable of being effectively closed and secured watertight if fitted below freeboard deck and weathertight if fitted above.

(5) Side scuttles shall not be fitted in such a position that their sills are below a line drawn parallel to the freeboard deck at side and having its lowest point 2.5 percent of the breadth B, or 500 mm, whichever is the greatest distance, above the summer load line (or timber summer load line if assigned).

(6) Side scuttles shall be of the non-opening type in ships subject to damage stability regulations, if calculations indicate that they would become immersed by any intermediate stage of flooding or the final equilibrium waterplane in any required damage case.

(7) Windows shall not be fitted below the freeboard deck, in the first tier end bulkheads or sides of enclosed superstructures and in first tier deckhouses[2] considered buoyant in the stability calculations or protecting openings leading below.

(8) Side scuttles and windows at the side shell in the second tier, protecting direct access below or considered buoyant in the stability calculations, shall be provided with efficient hinged inside deadlights capable of being effectively closed and secured weathertight.

(9) Side scuttles and windows set inboard from the side shell in the second tier, protecting direct access below to spaces listed in paragraph (4), shall be provided with either efficient hinged inside deadlights or, where they are accessible, permanently attached external storm covers of approved design and of substantial construction and capable of being effectively closed and secured weathertight.

(10) Cabin bulkheads and doors in the second tier separating side scuttles and windows from a direct access leading below may be accepted in place of deadlights or storm covers fitted to the side scuttles and windows.

(11) Deckhouses situated on a raised quarter deck or on the deck of a superstructure of less than standard height or on the deck of a deckhouse of less than standard height, may be regarded as being in the second tier as far as the provision of deadlights is concerned, provided the height of the raised quarter deck, superstructure or deckhouse is equal to, or greater than, the standard quarter deck height.

(12) Fixed or opening skylights shall have glass thickness appropriate to their size and position as required for side scuttles and windows. Skylight glasses in any position shall be protected from mechanical damage and where fitted in positions 1 or 2, shall be provided with robust deadlights or storm covers permanently attached.

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1 'Deadlights', in accordance with recognised standards, are fitted to the inside of windows and side scuttles while 'storm covers', of comparable specifications to deadlights, are fitted to the outside of windows, where accessible, and may be hinged or portable.
2 Two members reserved their position for those cases where this first tier is not considered buoyant, provided efficient deadlights are fitted.

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Footnotes:
1.This UI is also applicable to Regulation 23 of the 1988 Protocol.
2.Paragraph 7 of this UI is applicable to Reg. 23(7)(c) of the revised 1988 Protocol.
3.Paragraph 11 of this UI is applicable to Reg. 23(11) of the revised 1988 Protocol.

Remarks

2.62 Treatment of steps and recesses in transverse subdivision bulkheads

Conventions (Amend.), Reg.		Paragraphs **12(d)**, **(e)** of **IMO** Res. **A.320**, Regulations **27(12)(d)**, **(e)** of the revised **1988** Protocol (**MSC.143(77)**)					
IACS UI Number	**LL63**	**UI** version	**Rev.1,Jul.,2004/ Rev.2,Jul.,2008**	Date of implementation	**Jan.1,1999**	Means of implementation	**Contracted for construction**

Conventions/Codes Requirements

(d) Except where otherwise required by paragraph (10)(a), the flooding shall be confined to a single compartment between adjacent transverse bulkheads, provided that the inner longitudinal boundary of the compartment is not in a position within the transverse extent of assumed damage. Transverse boundary bulkheads of wing tanks, which do not extend over the full breadth of the ship shall be assumed not to be damaged, provided that they extend beyond the transverse extent of assumed damage prescribed in subparagraph (b).
If in a transverse bulkhead there are steps or recesses of not more than 3 m in length, located within the transverse extent of assumed damage as defined in subparagraph (b), such transverse bulkhead may be considered intact and the adjacent compartment may be floodable singly. If, however, within the transverse extent of assumed damage there is a step or recess of more than 3 m in length in a transverse bulkhead, the two compartments adjacent to this bulkhead shall be considered as flooded. The step formed by the afterpeak bulkhead and the afterpeak tank top shall not be

regarded as a step for the purpose of this Regulation.
(e) Where a main transverse bulkhead is located within the transverse extent of assumed damage and is stepped in way of a double bottom or side tank by more than 3 m, the double bottom or side tanks adjacent to the stepped portion of the main transverse bulkhead shall be considered as flooded simultaneously. If this side tank has openings into one or several holds, such as grain feeding holes, such hold or holds shall be considered as flooded simultaneously. Similarly, in a ship designed for the carriage of fluid cargoes, if a side tank has openings into adjacent compartments, such adjacent compartments shall be considered as empty and as being flooded simultaneously. This provision is applicable even where such openings are fitted with closing appliances, except in the case of sluice valves fitted in bulkheads between tanks and where the valves are controlled from the deck. Manhole covers with closely spaced bolts are considered equivalent to the unpierced bulkhead, except in the case of openings in topside tanks making the topside tanks common to the holds.

Interpretation

Where a transverse bulkhead forming the forward or aft limit of a wing tank or double bottom tank is not in line with the main transverse bulkhead of the adjacent in board compartment, it is considered to form a step or recess in the main transverse bulkhead.

Such a step or recess should be assumed not to be damaged provided that, either:

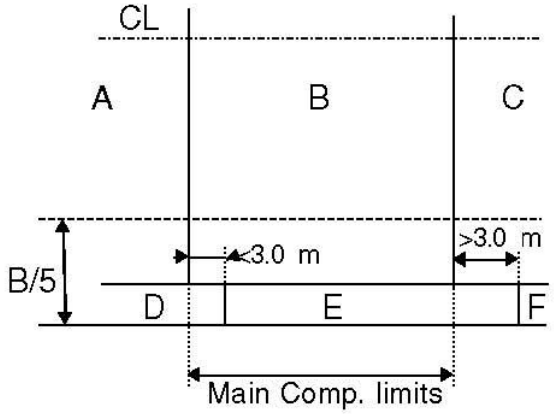
(a) the longitudinal extent of the step or recess, measured from the plane of the main transverse bulkhead, is not more than 3.0 metres, or:

(b) any longitudinal surface forming the step or recess is located inboard of the assumed damage.

Where, otherwise, the transverse and longitudinal bulkheads bounding a main inboard compartment are entirely in board of the assumed damage position, damage is assumed to occur between the transverse bulkheads of the adjacent wing compartment. Any step or recess in such wing tank shall be treated as indicated above.

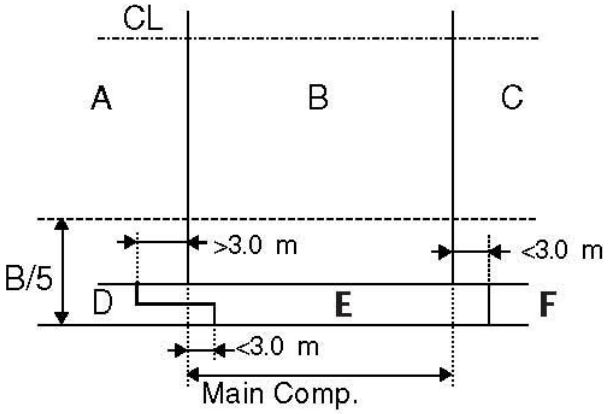
Representative examples to clarify treatment of steps within the transverse extent of damage

Fig. 1 (12(e))



Compartments to be considered damaged simultaneously:
A + D
B + E
C + E + F

Fig. 2 (12 (e))



A + D + E
B + E
C + F

Fig. 3 (12 (d) and 12 (e))

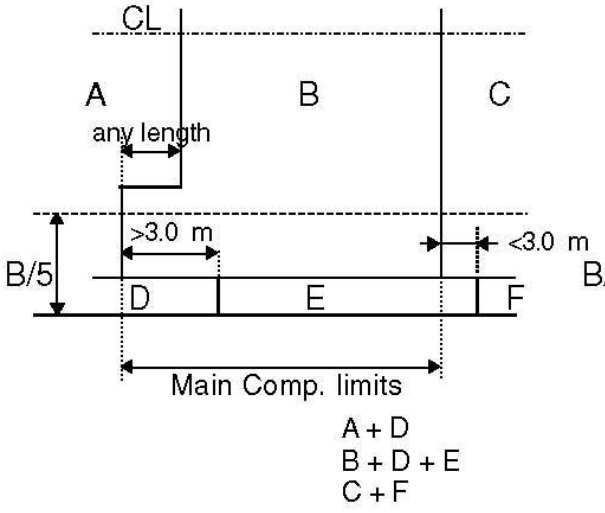
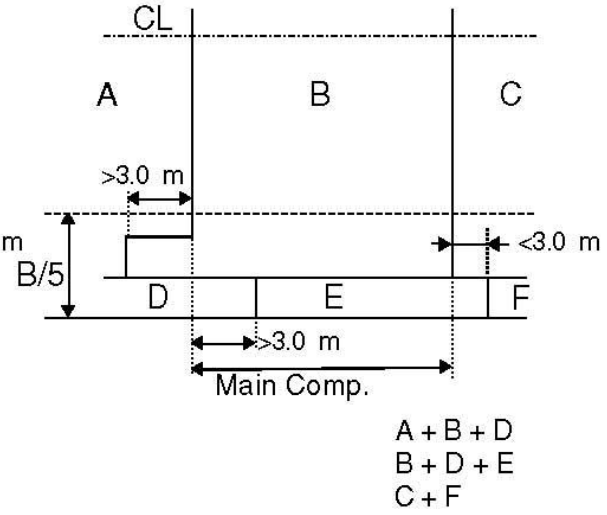


Fig. 4 (12 (d) and 12 (e))



Footnote: This UI is also applicable to Regulation 27(12)(d) and (e) of the 1988 Protocol.

Remarks

The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

2.63 Non-weathertight hatch covers above superstructure deck

Conventions (Amend.), Reg.		Regulations **2(5)**, **14(2)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL64**	**UI** version	**Rev.4,Jul.,2005/ Rev.5,Jul.,2008**	Date of implementation	**Jan.1,2006**	Means of implementation	

Conventions/Codes Requirements

Regulation **2(5)**: Regulations 10 to 26 inclusive, of this Annex, shall apply to every ship to which a minimum freeboard is assigned. Relaxations from these requirements may be granted to a ship to which a greater than minimum freeboard is assigned, on condition that the Administration is satisfied with the safety conditions provided.

Regulation **14(2)**: Coamings and hatchway covers to exposed hatchways on decks above the superstructure deck shall comply with the requirements of the Administration.

Interpretation

The requirements for coaming height and weathertightness of hatch covers located above the superstructure deck are left to the satisfaction of the flag Administration by Regulations 2(5) and 14(2) of the Load Line Convention. Exposed coamings and hatch covers situated above the second tier of the superstructure, or equivalent, or above the third tier, or equivalent, in the forward quarter of the ship's length, may be regarded to be above the superstructure deck in the application of 14(2). Non-weathertight covers in these locations may be accepted subject to the approval of the flag Administration and conditional upon the following:

1. Their acceptance should be limited to use on container ships.
2. They may be fitted to hatchways located on weatherdecks which are at least two standard superstructure heights above an actual freeboard deck or an assumed freeboard deck from which a freeboard can be calculated which will result in a draught not less than that corresponding to the freeboard actually assigned. Where any part of a hatchway is forward of a point located one quarter of the ship's length (0.25L) from the forward perpendicular, that hatchway is to be located on a weatherdeck at least three standard superstructure heights above the actual or assumed freeboard deck. It is to be noted that the assumed freeboard deck is used only for the purpose of measuring the height of the deck on which the hatchways are situated and may be an imaginary, or virtual deck and in this case is not to be used for the actual

assignment of freeboard. The vessels freeboard is to be assigned from an actual deck, designated as the freeboard deck, which is to be determined in accordance with the Convention and LL39.

3. The hatchway coamings should be not less than 600 mm in height.

4. The non-weathertight gaps between hatch cover panels should be considered as unprotected openings with respect to the requirements of intact and damage stability calculations. They should be as small as possible commensurate with the capacity of the bilge system and expected water ingress, and the capacity and operational effectiveness of the fire-fighting system and, generally, should not exceed 50 mm.

5. Labyrinths, gutter bars, or equivalents should be fitted proximate to the edges of each panel in way of the gaps to minimise the amount of water that can enter the container hold from the top surface of each panel.

6. Scantlings of the hatch cover panels are to be equivalent to those for weathertight covers and in accordance with the applicable requirements of UR S21 and UI LL70. The details on the securing arrangements to the vessel's support structure and coamings are provided in IACS Recommendation No. 14.

7. Bilge alarms should be provided in each hold fitted with non-weathertight covers.

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Footnote: This UI is also applicable to Regulations 2(5) and 14(2) of the 1988 Protocol and the revised 1988 Protocol.

Remarks

Circular No. 032/Total No.152 (2005) "Notice on the implementation of UI LL 64(Rev.4)" issued by CCS' Technical Department

2.64 Ships with assigned reduced freeboards intended to carry deck cargo

Conventions (Amend.), Reg.		**Regulation 27 of Annex I to ICLL Convention 1966 or the 1988 Protocol and its Amendments Regulation 4.2.1.2.4&4.2.1.2.5 of SOLAS Chapter II-1 as amended by IMO resolutions up to MSC.421(98)**					
IACS UI Number	**LL65**	**UI** version	**Jun.,2000/ Rev.1, Jun.,2007/ Rev.2,Jul.,2008/ Rev.3,Feb.,2021**	Date of implementation	**Jul.1,2001/ Rev.1,Jan.1,2009/ -/ Rev.3,Jul.1,2021**	Means of implement ation	

Conventions/Codes Requirements

Regulation 27 of ICLL (details omitted)
SOLAS II-1/4,
"For cargo ships, the requirements in parts B-1 to B-4 shall apply as follows:
2.1 In part B-1:
.2 Regulation 6 to regulation 7-3 shall apply to cargo ships having a length (L) of 80 m and upwards, but may exclude those ships subject to the following instruments and shown to comply with the subdivision and damage stability requirements of that instrument:
.4 the damage stability requirements of regulation 27 of the 1966 Load Lines Convention as applied in compliance with resolutions A.320(IX) and A.514(13), provided that in the case of cargo ships to which regulation 27(9) applies, main transverse watertight bulkheads, to be considered effective, are spaced according to paragraph (12)(f) of resolution A.320(IX), except that ships intended for the carriage of deck cargo shall be in compliance with regulation 6 to regulation 7-3; or
.5 the damage stability requirements of regulation 27 of the 1988 Load Lines Protocol, except that ships intended for the carriage of deck cargo shall be in compliance with regulation 6 to regulation 7-3;"

Interpretation

General:

1. This UI pertains to ships intended to carry deck cargo and assigned or reassigned reduced freeboards in accordance with Regulation 27 of the International Convention on Load Lines, 1966 (ICLL 1966) or the ICLL 1966 as amended by the 1988 Protocol.
2. As per SOLAS II-1/4.2.1.2.4 & 4.2.1.2.5,ships shown to comply with ICLL 1966 Regulation 27 as applied in compliance with IMO Res. A.320 and A.514, may be excluded from the application of SOLAS Chapter II-1 Part B-1 Regulation 6 to regulation 7-3, except if they carry deck cargo.
3. Therefore ships identified in item 1), above, shall:

   a) according to the assigned reduced freeboards, comply with damage stability requirements of Regulation 27 of ICLL 1966 and the 1988 Protocol to the ICLL 1966; and

   b) according to the intended deck cargo capacity, be provided with the limiting GM or KG curve required by SOLAS Chapter II-1, Regulation 5-1.4 in compliance with the probabilistic damage stability analysis of SOLAS Chapter II-1 Part B-1.

4. The KG used for demonstrating compliance with the criteria in 3 a) shall be the same as that used for the criteria in 3 b) at the deepest subdivision load line.

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Footnote: This UI is also applicable to the revised 1988 Protocol.

Technical Background

1. Rev.1: It is explicit in SOLAS regulation II-1/4.1, footnote that ships with assigned reduced freeboards and intended to carry deck cargo cannot be excluded from the damage stability requirements based on probabilistic principle, but without detailed specifications. Meanwhile, this interpretation also applies to ships with reassigned reduced freeboards. Therefore, the title and the text of this UI are editorially revised.
2. Rev.3: It is explicit in SOLAS 2017 Amendments regulation II-1/4.2.1.2.4&4.2.1.2.5 that ships with assigned reduced freeboards and intended to carry deck cargo cannot be excluded from the damage stability requirements based on probabilistic principle. Meanwhile, this interpretation also applies to ships with reassigned reduced freeboards.

Remarks

1. This UI LL 65 (prior to Revision 1) is to be uniformly implemented by IACS Members and Associates from 1 July 2001.
2. Rev.1 is to be uniformly implemented by IACS Members and Associates from 1 January 2009.
3. Rev.3 is to be uniformly implemented by IACS Societies on ships constructed on or after 1 July 2021.

2.65 Hatch cover stress/deflection calculation

Conventions (Amend.), Reg.		Regulations **16(5)(a), (b)** of Amendments to Annex **I** to the Convention revised by the Protocol of **1988**					
IACS UI Number	**LL66**	**UI** version	**Oct. 2003**	Date of implementation	**01.01.2005**	Means of implementation	

Conventions/Codes Requirements

Regulation **16** Hatchways closed by weathertight covers of steel or other equivalent materials
Hatch cover minimum design loads
(5) All hatch covers shall be designed such that:
(a) the product of the maximum stress determined in accordance with the above loads and the factor of 1.25 does not exceed the minimum upper yield point strength of the material in tension and the critical buckling strength in compression;
(b) the deflection is limited to not more than 0.0056 times the span;

Interpretation

In the calculation of stress and deflection from the prescribed mass per unit area, the design pressure is to be determined by using a vertical acceleration equal to 1.0 g.

Remarks

2.66 Endorsement of certificates with the date of completion of the survey on which they are based

Conventions (Amend.), Reg.		MSC/Circ. 1012, MEPC/Circ. 384					
IACS UI Number	**LL67**	**UI** version	**Nov. 2003 Rev. 1, Nov. 2005**	Date of implementation	**01.03.2004 / 01.07.2006 (Rev.1)**	Means of implementation	

Conventions/Codes Requirements

1 The Maritime Safety Committee, at its seventy-fourth session (30 May to 8 June 2001) and the Marine Environment Protection Committee, at its forty-sixth session (23 to 27 April 2001), acknowledging that, in the process of transition to the Harmonized System of Survey and Certification (HSSC) under the SOLAS, MARPOL and Load Line Conventions, it has become evident that it is sometimes difficult on the pre-HSSC certificates, and in certain cases not possible on certificates issued under the HSSC, to find information on the date of completion of the survey on which the certificate in question and its validity is based, agreed that when the date of issue of a certificate does not correspond with the associated survey, all certificates should clearly indicate when the associated survey was completed. The primary purpose of this indication is to provide port State control officers and other parties with clear and unambiguous information.

2 Conscious of the time needed to effect the appropriate amendments to the form of the certificates issued under the HSSC; realizing that any amendments to the form of pre-HSSC certificates are no longer possible; and recognizing that it would be advantageous for all the parties involved to provide in the certificates, as soon as possible, all the information that port State control officers may need, the Committees invited flag Administrations, in the interim and when appropriate, to endorse, or authorize their recognized organizations to endorse, the relevant certificates with the following words:

"Completion date of the survey on which this certificate is based: dd/mm/yy".

Interpretation

For application of the above resolutions, the following IACS Unified Interpretation applies:

The "Completion date of the survey on which this certificate is based", is the date of the last initial/renewal survey visit on which all statutory and class items, required to be surveyed, have been surveyed (regardless if they were found satisfactory or with minor deficiency).

Remarks

2.67 Position of freeboard deck on float on/float off barge carriers

Conventions (Amend.), Reg.		Regulation **3(9)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL68**	**UI** version	**May,2004/ Rev.1,Jul.,2008**	Date of implementation	**Apr.1,2005**	Means of implementation	

Conventions/Codes Requirements

"Freeboard Deck. The freeboard deck is normally the uppermost complete deck exposed to weather and sea, which has permanent means of closing all openings in the weather part thereof, and below which all openings in the sides of the ship are fitted with permanent means of watertight closing. In a ship having a discontinuous freeboard deck, the lowest line of the exposed deck and the continuation of that line parallel to the upper part of the deck is taken as the freeboard deck. At the option of the owner and subject to the approval of the Administration, a lower deck may be designated as the freeboard deck provided it is a complete and permanent deck continuous in fore and aft direction at least between the machinery space and peak bulkheads and continuous athwartships. When this lower deck is stepped the lowest line of the deck and the continuation of that line parallel to the upper part of the deck is taken as the freeboard deck. When a lower deck is designated as the freeboard deck, that part of the hull which extends above the freeboard deck is treated as a superstructure so far as concerns the application of the conditions of assignment and the calculation of freeboard. It is from this deck that the freeboard is calculated."

Interpretation

1. Float On/Float Off Barge Carriers are designed to be ballasted such that the bottom of their cargo space(s) (well deck) submerges below the waterline to allow barges being floated in and out.
2. If such a ship is fitted with weathertight closures for the cargo space(s) and a watertight enclosure at the stern, the uppermost complete deck may be taken as the freeboard deck.
3. If such a ship is not fitted with weathertight closures for the cargo space(s) or a watertight enclosure at the stern, the well deck shall be taken as the freeboard deck, while buoyant spaces above may be considered as superstructures in accordance with UI LL 15 or 88 Prot. Reg. 34(1).
4. If such a ship is not fitted with weathertight closures for the cargo space(s) but has a watertight enclosure at the stern, the uppermost complete deck may be taken as the freeboard deck provided that:

- the structure of the freeboard deck complies with the requirements of LL39;
- the calculated freeboard is corrected for any missing buoyancy above the well deck in accordance with LL48, and
- a satisfactory safety level at the resulting draught is demonstrated according to alternative concepts.

_____

Footnote: This UI is also applicable to Regulations 3(9) of the 1988 Protocol and the revised 1988 Protocol.

Remarks

Note: This UI is to be uniformly implemented by IACS Members and Associates from 1 April 2005.
Footnote: This UI is also applicable to to Regulation 3(9) of the 1988 Protocol and the revised 1988 Protocol.

2.68 Interpretation to 1966 ICLL Reg. 27

Conventions (Amend.), Reg.		Regulation **27** of Annex **I** to **ICLL** Convention **1966** (**IMO** Res.**A.320** paragraph **12**)					
IACS UI Number	**LL69**	**UI** version	**Sep.,2004/ Rev.1,Jul.,2008**	Date of implementation	**Apr.1,2005**	Means of implementation	

Conventions/Codes Requirements

(12) The following principles regarding the character of the assumed damage apply:

(a) The vertical extent of damage in all cases is assumed to be from the base line upwards without limit.

(b) The transverse extent of damage is equal to B/5 or 11.5 metres (37.7 feet), which ever is the lesser, measured inboard from the side of the ship perpendicularly to the centre line at the level of the summer load water line.

(c) If damage of a lesser extent than specified in sub paragraphs (a) and (b) of this paragraph results in a more severe condition, such lesser extent shall be assumed.

(d) Except where otherwise required by paragraph (10)(a) the flooding shall be confined to a single compartment between adjacent transverse bulkheads provided the inner longitudinal boundary of the compartment is not in a position within the transverse extent of assumed damage. Transverse boundary bulkheads of wing tanks, which do not extend over the full breadth of the ship shall be assumed not to be damaged, provided they extend beyond the transverse extent of assumed damage prescribed in sub paragraph(b) of this paragraph. If in a transverse bulkhead there are steps or recesses of not more than 3.05 metres (10 feet) in length located within the transverse extent of assumed damage as defined in sub-paragraph (b) of this paragraph, such transverse bulkhead may be considered intact and the adjacent compartment may be floodable singly. If, however, within the transverse extent of assumed damage there is a step or recess of more than 3.05 metres (10 feet) in length in a transverse bulkhead, the two compartments adjacent to this bulkhead shall be considered as flooded. The step formed by the after peak bulkhead and the after peak tank top shall not be regarded as a step for the purpose of this Regulation.

(e) Where a main transverse bulkhead is located within the transverse extent of assumed damage and is stepped in way of a double bottom or side tank by more than 3.05 metres (10 feet), the double bottom or side tanks adjacent to the stepped portion of the main transverse bulkhead shall be considered as flooded simultaneously. If this side tank has openings into one or several holds, such as grain feeding holes, such hold or holds shall be considered as flooded simultaneously. Similarly in a ship designed for the carriage of fluid cargoes, if a side tank has openings into adjacent compartments, such adjacent compartments shall be considered as empty and flooded simultaneously. This provision is applicable even where such openings are fitted with closing appliances, except in the case of sluice valves fitted in bulkheads between tanks and where the valves are controlled from the deck. Manhole covers with closely spaced belts are considered equivalent to the unpierced bulkhead except in the case of openings in topside tanks making the topside tanks common to the holds.

(f) Where the flooding of any two adjacent fore and aft compartments is envisaged main transverse watertight

bulkheads shall be spaced at least $1/3L^{2/3}$ or 14.5 metres ($0.495L^{2/3}$ or 47.6 feet), whichever is the lesser, in order to be considered effective. Where transverse bulkheads are spaced at a lesser distance, one or more of these bulkheads shall be assumed as non-existent in order to achieve the minimum spacing between bulkheads."

Interpretation

Treatment of the volume of the forecastle, which is located over the foremost cargo hold for damage stability calculation in accordance with Reg.27 of ICLL 1966: IMO Res. A.320 paragraph 12.
In the case where the forecastle overlaps foremost cargo hold, provided the forecastle bulkhead is not more than 3.05 m aft of the forward bulkhead of the hold and the deck forming the step in way is watertight, then the bulkhead will be considered as continuous and not subject to damage.

Remarks

1. The distance of 3.05 m referred in this UI should be replaced with 3.00 m, when this interpretation applies to the 1988 Protocol and the revised 1988 Protocol.
2. Regulation **27(12)** of Annex **I** to the Convention revised by the Protocol of **1988** as amended is also applicable.

2.69 Corrosion margin for hatch cover design

Conventions (Amend.), Reg.		Regulation **16(5)(d)** of Amendments to Annex **I** to the Convention revised by the Protocol of **1988**					
IACS UI Number	**LL70**	**UI** version	**Jan. 2005**	Date of implementation	**01.01.2005**	Means of implementation	Ships constructed on or after 01.01.2005

Conventions/Codes Requirements

All hatch covers shall be designed such that:
(a) the product of the maximum stress determined in accordance with the above loads and the factor of 1.25 does not exceed the minimum upper yield point strength of the material in tension and the critical buckling strength in compression;
(b) the deflection is limited to not more than 0.0056 times the span;
(c) steel plating forming the tops of covers is not less in thickness than 1% of the spacing of stiffeners or 6 mm if that be greater; and
(d) an appropriate corrosion margin is incorporated.

Interpretation

The "appropriate corrosion margin" for hatch covers of cargo holds in positions 1 and 2 and above, defined as the corrosion addition t_s which is to be added to the net thickness t_{net} required by (a), (b) and (c) is:

1. for Bulk Carriers, Ore Carriers and Combination Carriers, as defined in UR Z11.2:
   - single skin hatch covers, a corrosion addition t_s = 2.0 mm for all plating and stiffeners;
   - double skin hatch covers, a corrosion addition t_s = 2.0 mm for top and bottom plating and t_s = 1.5 mm for the internal structure.
2. for other vessels:
   - single skin hatch covers, a corrosion addition $t_s = 2.0^{i)}$ mm for all plating and stiffeners;
   - double skin hatch covers, a corrosion addition $t_s = 1.5^{i)}$ mm for top and bottom plating and t_s = 1.0 mm for the internal structure.

   i) Corrosion addition t_s = 1.0 mm for the hatch covers in way of cellular cargo holds intended for containers.

The above corrosion margins have been defined based on the assumption that corrosion protection and renewals as given in UR S21.6.1 is complied with for all ship types subject to Regulation 16(5)(d) of the 1988 Load Line Protocol.
For corrosion addition t_s = 1.0 mm it is assumed that the thickness for steel renewal is t_{net} and the thickness for coating or annual gauging is t_{net} + 0.5 mm.

"FAQ"
(Note: This text is prepared by IACS for external use. 16 August 2005).
Hatch Cover Design for General Cargo Ships and Container Ships

Question 1:
Bulk Carriers
IACS S21 Rev.3 (April 2003) entered into force on 1 January 2004, and applies to ships contracted for construction on or after 1 January 2004.
When the bulk carrier hatch covers are designed according to IACS S21 Rev.3 (April 2003), do they also fulfil the MSC.143 (77) Annex 3 – Regulation 16 requirements?
Answer:
It is confirmed that when bulk carrier hatch covers are designed according to IACS UR S21 Rev.3 (April 2003), they also fulfil the MSC.143 (77) Annex 3 – Regulation 16 requirements.

Question 2:
Container Carriers and General Cargo Ships
In Resolution MSC.143(77) Annex 3 (Adopted on 5 June 2003) – Regulation 16(5)(d), it is stated that "an appropriate corrosion margin is incorporated".
Can the same corrosion margin as for the conventional 1.75 t/m^2 weather load (as per the current Classification Rules) be used for this purpose?
Answer:
The current version of S21, applicable to bulk carriers, ore carriers and combination carriers, considers only the sea pressures but a new version is presently under development for application to all types of ships and at this purpose also loads other than sea loads will be taken into account.
The unified requirements that will be developed by IACS for the design of hatch covers will be based on a net scantling approach.
The corrosion additions in UR S21 to be used also for other types of ships will be the same as the ones presently adopted for bulk carriers.
Until the new version of UR S21 is adopted by IACS, hatch covers for ships different from bulk carriers, ore carriers and combination carriers are to be designed in accordance with:
– the requirements of ILLC, as far as sea loads are concerned;
– the current Classification Societies Rules.

Question 3:
Container Carriers – special features
Interpretation of Resolution MSC.143(77) Annex 3 (Adopted on 5 June 2003) – Regulation 16 – Table 16.2 for Container Carriers with L > 100 m:
Can the following interpretation be applied?

	Longitudinal position		
	FP	0.25L	Aft of 0.25L
L > 100m			
Freeboard Deck	Equation in 16(2)(a)	3.5 t/m^2	3.5 t/m^2
1st superstructure deck	3.5 t/m^2	3.5 t/m^2	2.6 t/m^2
2nd superstructure deck	2.6 t/m^2	2.6 t/m^2	2.1 t/m^2
3rd superstructure deck	2.1 t/m^2	2.1 t/m^2	2.1 t/m^2

Answer:
The design loads can be reduced from 2.6 t/m^2 to 2.1 t/m^2, as proposed above, for locations other than positions 1 and 2, as defined in ILLC.
The following considerations have been given for accepting a load reduction:
– Position 2 is defined in the Amendments to the Protocol of 1988 with respect to the exposed superstructure decks.
– The meaning of "located at least one (or two, when forward of 0.25L from forward perpendicular) standard height of superstructure above the freeboard deck", relevant to the "position 2" definition, should be interpreted as: decks of superstructures having height less than one (two) standard height(s) of superstructure are to be considered as being in "position 1".
In conclusion, locations more than two (or three, when forward of 0.25L from forward perpendicular) standard height of superstructure above the freeboard deck are not position 2 and the design loads in these locations may be reduced with respect to those specified in ILLC.

Question 4:
To determine the hatch cover location, can we use the "assumed freeboard deck" as defined in IACS UI LL64?
Answer:

It is confirmed that LL 64 is to be used to determine the hatch cover location.
Remarks

2.70 Similar stage of construction

Conventions (Amend.), Reg.		Article **2(6)** of **ICLL** Convention **1966** Regulations **2(7), (8)** of Amendments to Annex **I** to the Convention revised by the Protocol of **1988**					
IACS UI Number	**LL71**	**UI** version	**Apr.,2005/ Rev.1,Jul.,2008**	Date of implementation	**Jul.1,2005**	Means of implementation	Ships contracted on or after Jan.1,2005
Conventions/Codes Requirements							
1966 ILLC, Article 2(6): New ship means a ship the keel of which is laid, or which is at a similar stage of construction, on or after the date of coming into force of the present Convention for each Contracting Government. Amended 1988 LL Protocol, regulation 2, paragraphs (7) and (8): (7) Unless expressly provided otherwise, the regulations of this Annex shall apply to ships the keels of which are laid or which are at a similar stage of construction on or after 1 January 2005. (8) For ships the keels of which are laid or which are at a similar stage of construction before 1 January 2005, the Administration shall ensure that the requirements which are applicable under the International Convention on Load Lines, 1966, as modified by the Protocol of 1988 relating thereto, adopted by the International Conference on Harmonized System of Survey and Certification, 1988, are complied with.							
Interpretation							
The term "similar stage of construction" means the stage at which: - construction identifiable with a specific ship begins; and - assembly of that ship has commenced comprising at least 50 tonnes or one per cent of the estimated mass of all structural material, whichever is less. Footnote: This UI is also applicable to Article 2(6) of the 1988 Protocol and the revised 1988 Protocol.							
Remarks							
Circular No. 019/Total No. 139 (2005) "Notice on the Issuance of IACS Unified Interpretations for ILCC (UI LL 71)" issued by CCS' Technical Department.							

2.71 Interpretation to ICLL Regulation 27

Conventions (Amend.), Reg.		Regulation **27(3)** of Annex **I** to **ICLL** Convention **1966**					
IACS UI Number	**LL72**	**UI** version	**Sept. 2005**	Date of implementation	**01.01.2006**	Means of implementation	Ships under construction
Conventions/Codes Requirements							
Regulation **27(3)** reads: A type "A" ship, if over 150 m in length, to which a freeboard less than type "B" has been assigned, when loaded in accordance with the requirements of paragraph (11), shall be able to withstand the flooding of any compartment or compartments, with an assumed permeability of 0.95, consequent upon the damage assumptions specified in paragraph (12), and shall remain afloat in a satisfactory condition of equilibrium, as specified in paragraph (13). In such a ship, the machinery space shall be treated as a floodable compartment, but with a permeability of 0.85.							
Interpretation							
Members apply resolution A.320(IX) when certifying ships of non 1988 Protocol Parties under Regulation 27(3) of the 1966 ICLL.							
Remarks							
Circular No.038/Total No.158 (2005) "Notice on the Implementation of IACS UI LL72" issued by CCS' Technical Department.							

2.72 Measurement of Distances

Conventions (Amend.), Reg.		IMO instruments (e.g., ICLL, SOLAS and MARPOL Conventions, the IBC Code and the IGC Code, etc.)					
IACS UI Number	**LL74**	**UI** version	**Aug.,2008**	Date of implementation	**Apr.1,2009**	Means of implementation	**Contracted for construction**

Conventions/Codes Requirements

Several IMO instruments (e.g., ICLL, SOLAS and MARPOL Conventions, the IBC Code and the IGC Code, etc.) require distances to be measured such as tank length, height, width, ship (or subdivision or waterline) length, etc..

Interpretation

Unless explicitly stipulated otherwise in the text of the regulations in SOLAS, Load Line and MARPOL Conventions and any of their mandatory Codes, distances are to be measured by using moulded dimensions.

Remarks

2.73 Permeability of Store Space in the Damage Stability Calculation (Regulation 27(3) & (8.d))

Conventions (Amend.), Reg.		Regulation 27(3) & (8.d) of 1988 protocol of 1966 ICLL					
IACS UI Number	**LL75**	**UI** version	**Sep., 2008/ Rev.1, Mar., 2009**	Date of implementation	**Apr.1,2009/ Jul.1,2009**	Means of implementation	Date of Contracted for construction

Conventions/Codes Requirements

1. Reg.27(3) of 1988 protocol of 1966 ICLL and its amendment MSC.143(77) reads:

"(3) A type 'A' ship, if over 150 m in length, to which a freeboard less than type 'B' has been assigned, when loaded in accordance with the requirements of paragraph (11), shall be able to withstand the flooding of any compartment or compartments, with an assumed permeability of 0.95, consequent upon the damage assumptions specified in paragraph (12), and shall remain afloat in a satisfactory condition of equilibrium, as specified in paragraph (13). In such a ship, the machinery space shall be treated as a floodable compartment, but with a permeability of 0.85."

2. Reg.27(8.d) of 1988 protocol of 1966 ICLL and its amendment MSC.143(77) reads:

"the ship, when loaded in accordance with the requirements of paragraph (11), shall be able to withstand the flooding of any compartment or compartments, with an assumed permeability of 0.95, consequent upon the damage assumptions specified in paragraph (12), and shall remain afloat in a satisfactory condition of equilibrium, as specified in paragraph (13). In such a ship, if over 150 m in length, the machinery space shall be treated as a floodable compartment, but with a permeability of 0.85."

Interpretation

The permeability assumed in the damage stability calculation for the flooding of any store space shall be 0.95 under 1988 Protocol of 1966 ICLL.

Remarks

The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

2.74 Initial Statutory Surveys at New Construction

Conventions (Amend.), Reg.		ICLL Convention					
IACS UI Number	**LL76**	**UI** version	**Apr.,2009/ Corr.1,Jul., 2010/ Rev.1,Feb., 2014/ Rev.2,Dec., 2014**	Date of implementation	**Jul.1,2010/ Rev.1,Jul.1,2014/ Rev.2,Jul.1, 2015**	Means of implementation	Contracted for construction

Conventions/Codes Requirements and Interpretations

Deleted
Remarks
IACS deleted the UI in June 2016.

2.75 Application of load line requirements to conversions of single-hull oil tankers to double-hull oil tankers or bulk carriers

Conventions (Amend.), Reg.		**Regulation 10 of Amendments to Annex I to the Convention revised by the Protocol of 1988**					
IACS UI Number	**LL77**	**UI version**	**Dec.2011/ Corr.1,Dec.,2021**	**Date of implementation**	**Jan.1,2013**	**Means of implementation**	

Conventions/Codes Requirements

Regulations

Article 10 - Repairs, alterations and modifications

(1) A ship which undergoes repairs, alterations, modifications and outfitting related thereto shall continue to comply with at least the requirements previously applicable to the ship. An existing ship in such a case shall not, as a rule, comply to a lesser extent with the requirements for a new ship than it did before.

(2) Repairs, alterations and modifications of a major character and outfitting related thereto should meet the requirements for a new ship in so far as the administration deems reasonable and practicable.

Interpretation

1 For single-hull oil tankers converted to double-hull oil tankers:

1.1 The ship should meet the requirements of the regulations contained in chapter III (Freeboards) of Annex I of the Load Line Convention in effect at the date of conversion. In cases where there are no changes to the parameters which result in a change of the minimum freeboard[*1], and where there is no decrease in magnitude of freeboard assigned after conversion, using the Convention previously applicable to the ship in determining any change or decrease as mentioned above, the converted ship should continue to comply with at least the requirements previously applicable to the ship.

1.2 Any structure and/or equipment such as doors, hatches, and cable lockers, etc., which is newly added, replaced, or modified is to comply with the requirements of the regulations contained in chapter II (Conditions of assignment of freeboard) of Annex I of the Convention in effect at the date of conversion.

2 For single-hull oil tankers converted to bulk carriers:

2.1 Any such conversion should be regarded as a modification of a major character and the ship should meet all the requirements of the regulations annexed to the Convention (including regulation 39) in effect at the date of conversion; and

2.2 Notwithstanding the above, the requirements of the regulations contained in chapter II (Conditions of assignment of freeboard) of Annex I of the Convention in effect at the date of conversion, should be applied only to the structure and/or equipment, which is newly added, replaced, or modified.

3 The date on which a conversion occurs for the purposes of determining the applicability of requirements for ships constructed on or after the date on which any relevant amendments enters into force should be:

3.1 the date on which the contract is placed for the conversion; or

3.2 in the absence of a contract, the date on which the work identifiable with the specific conversion begins; or

3.3 the completion date of the conversion[*2], if that occurs more than 3 years after the date specified in subparagraph 3.1 above or 30 months after the date specified in subparagraph 3.2 above, either as applicable.

Footnote:

*1 "which result in a change of the minimum freeboard" should be understood as "which are used in determining the minimum freeboard even though the minimum freeboard has no change in fact".

*2 Where the completion date of the conversion has been subject to delay beyond the period referred to in paragraph 3.3 above due to unforeseen circumstances beyond the control of the builder and the owner, the other dates referred to in paragraph 3.1 or 3.2 above, if applicable, may be accepted by the Administration in lieu of the completion date of the conversion in accordance with MSC.1/Circ.1247.

Technical Background

It is a common concern among ship owners, shipyards and classification societies how to apply the ICLL when a Single Hull Tanker is converted into a Double Hull Tanker or Bulk Carrier/Ore Carrier. This UI is developed to address the standards/regulations in effect prior to or at "the date of conversion" that shall apply to such a conversion.

Remarks

2.76 Continuous hatchways

Conventions (Amend.), Reg.		**Regulations 36(6) of Annex I to Annex B to the Convention revised by the Protocol of 1988**					
IACS UI Number	**LL79**	**UI version**	**Jul.2014**	**Date of implementation**	**Jul.1,2015**	**Means of implementation**	

Conventions/Codes Requirements

Regulation 36 Trunks

(6) Continuous hatchways may be treated as a trunk in the freeboard computation, provided the provisions of this paragraph are complied with in all respects.

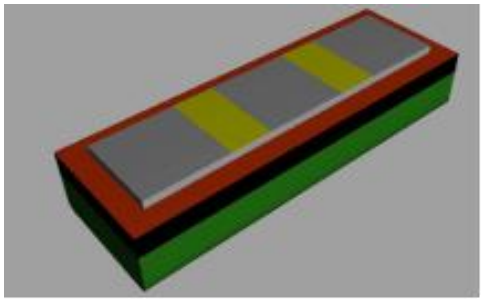
Interpretation

1 Generally two types of 'continuous hatchways' can be distinguished:

1.1 In case of a single hatchway the hatchway may be regarded as a 'continuous hatchway'.

1.2 In case more than one hatchway is fitted, the following arrangement may be considered as 'continuous hatchway', too:

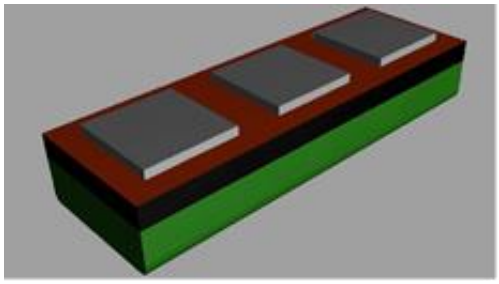
Detached hatchways linked by weathertight decked steel structures in between;
The hatchways are connected by longitudinal coamings connected transversally by decked steel structures. In this case, the equivalent 'continuous hatchway' is the entire enclosed volume of the single hatchways and the weathertight spaces between them.



1.3 In case more than one hatchway is fitted the following arrangements shall not be regarded as 'continuous hatchways':

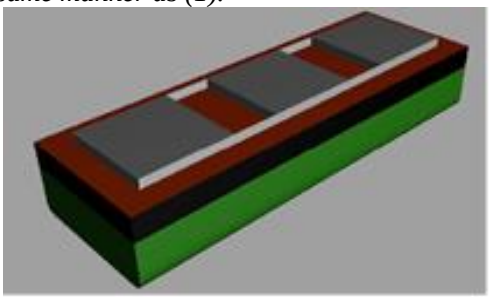
(1) Detached hatchways;

Each hatchway is to be considered as a "separated detached trunk", thus each hatchway may be treated separately as a trunk in the freeboard computation.



(2) Detached hatchways connected by longitudinal coamings;

All hatchways may be treated in the same manner as (1).



Technical Background

There was no common understanding as to the exact meaning of the term ´continuous hatchway treated as a trunk`. This UI is developed to clarify the term。

Remarks

2.77 Unprotected openings

Conventions (Amend.), Reg.		**ICLL Regulation 27(13)(e)**					
IACS UI Number	**LL80**	**UI version**	**2016.06**	**Date of implementation**	**2017.01.01**	**Means of implementation**	**contracted for construction**

Conventions/Codes Requirements

When any part of the deck outside the compartment assumed flooded in a particular case of damage is immersed, or in any case where the margin of stability in the flooded condition may be considered doubtful, the residual stability is to be investigated. It may be regarded as sufficient if the righting lever curve has a minimum range of 20 °beyond the position of equilibrium with a maximum righting lever of at least 0.1 m within this range. The area under the righting lever curve within this range shall be not less than 0.0175 m.rad. The Administration shall give consideration to the potential hazard presented by protected or unprotected openings which may become temporarily immersed within the range of residual stability.

Interpretation

Unprotected openings include ventilators (complying with ILLC 19(4)) that for operational reasons have to remain open to supply air to the engine room or emergency generator room (if the same is considered buoyant in the stability calculation or protecting openings leading below) for the effective operation of the ship.

Technical Background
The Dutch Safety Board noted that one cause of the capsizing was that the weathertight closing appliances to the main engine room were left open in order to ensure an adequate air supply to achieve the required bollard pull. These openings had been considered as closed in the intact stability calculations.
Remarks
The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

CHAPTER 3 INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS (MARPOL CONVENTION)

3.1 Periodical surveys of oil content meters

Conventions (Amend.), Reg.		**MARPOL 73/78** Annex **I** ,Regulation **15(3)**					
IACS UI Number	**MPC1**	**UI** version	**1988**	Date of implementation	**1988**	Means of implementation	
Conventions/Codes Requirements							
An oil discharge monitoring and control system approved by the Administration shall be fitted							
Interpretation							
Deleted.							
Remarks							
Deleted in Aug.2015							

3.2 Operational manuals for oil discharge monitoring and control systems

Conventions (Amend.), Reg.		**MARPOL 73/78** Annex **I** ,Regulation **31.4**					
IACS UI Number	**MPC2**	**UI** version	**1988/ Rev.1, Aug 2015**	Date of implementation	**1988/ 1 July 2016**	Means of implementation	
Conventions/Codes Requirements							
Annex I, 31.4 31.4 Instructions as to the operation of the system shall be in accordance with an operational manual approved by the Administration. They shall cover manual as well as automatic operations and shall be intended to ensure that at no time shall oil be discharged except in compliance with the conditions specified in regulation 34 of this Annex.							
Interpretation							
For compliance with Regulation 31.4 of MARPOL Annex I and Resolution MEPC.108(49) as amended by Resolution MEPC.240(65), the Oil Discharge Monitoring and Control System Operational Manual is to contain all the details necessary to operate and maintain the system and should include at least the following information. The information may be grouped as indicated, or in an equivalent manner. Introduction : Particulars of the ship, together with the date on which the system was/is to be installed and index to remainder of manual. Text of Regulations 31 and 34 to be quoted in full. Section 1: Manufacturer's equipment manuals for major components of the system. These may include installation, commissioning, operating and fault finding procedures for the oil content monitor. Section 2: Operations manual comprising a description of the ship's cargo ballast systems, designated overboard discharges with sampling points, normal operational procedures, automatic inputs, manual inputs (as applicable), starting interlock and discharge valve control (as applicable), override system, audible and visual alarms, outputs recorded and, where required for manual input, flow rate when discharging by gravity and when pumping ballast							

overboard. It should also include instructions for the discharge of oily water following malfunction of the equipment.

The above information is to be supported by copies of relevant approved diagrams.

Reference may be made to Section 1, where applicable.

Section 3: Technical manual comprising fault finding schedules, maintenance record and electrical, pneumatic and hydraulic schematic diagrams and descriptions of the complete system.

Reference may be made to Section 1, where applicable.

Section 4: Test and check-out procedures to include a functional test at installation and guidance notes for the Surveyors carrying out initial and in-service surveys.

Reference may be made to Section 1, where applicable.

Appendix I: Technical installation specification including location and mounting of components, arrangements for maintaining integrity of "safe" zones, safety requirements for electrical equipment installed in hazardous zones supported by copies of approved drawings, sample piping layout and sample delay calculations, design and arrangements of sampling probes, flushing arrangements and zero setting.

Reference may be made to Section 1, where applicable.
Appendix II: Copy of Type Approval Certificate and Workshop Certificates for major components.

Remarks

Notes:
1. Revision 1 of this Unified Interpretation is to be uniformly implemented by IACS Societies for ships contracted for construction on or after 1 July 2016.
2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

3.3 Machinery space oil discharge monitoring and control systems

Conventions (Amend.), Reg.		**MARPOL 73/78** Annex **I,** Regulation **16(5)**					
IACS UI Number	**MPC3**	**UI** version	**1988**	Date of implementation	**1988**	Means of implementation	

Conventions/Codes Requirements

Oil filtering equipment shall be of a design approved by the Administration and shall be such as will ensure that any oily mixture discharged into the sea after passing through the system has an oil content not exceeding 15 parts per million. In addition, it shall be provided with alarm arrangement and automatic stopping arrangement

Interpretation

Deleted.

Remarks

Deleted in August 2015

3.4 Discharge of segregated ballast

Conventions (Amend.), Reg.		**MARPOL 73/78** Annex **I** ,Regulation **18(6)**					
IACS UI Number	**MPC4**	**UI** version	**1988**	Date of implementation	**1988**	Means of implementation	
Conventions/Codes Requirements							
On every oil tanker the discharge of ballast water or oil contaminated water from cargo tank areas shall take place above the waterline, except as follows: …….							
Interpretation							
Deleted.							
Remarks							
Deleted in August 2015							

3.5 Minimum vertical depth of each double bottom tank or space

Conventions (Amend.), Reg.		**MARPOL 73/78** Annex **I** ,Regulation **18.15.2**					
IACS UI Number	**MPC5**	**UI** version	**1990/ Rev.1, Aug 2015**	Date of implementation	**1990/ 1 July 2016**	Means of implementation	
Conventions/Codes Requirements							
Annex **I, 18.15.2** 18.15.2 the minimum vertical depth of each double bottom tank or space shall be B/15 or 2m, whichever is the lesser. Where a lesser depth is provided, the bottom tank or space shall not be taken into account when calculating the protecting area PAs.							
Interpretation							
For the purpose of determining the minimum vertical depth of each double bottom tank or space to be taken into account when calculating the protecting area *PAs*, suction wells may be neglected, provided such wells are not excessive in area and extend below the cargo tank for a minimum distance and in no case more than half the height of the double bottom tank or space.							
Remarks							
Notes: 1. Revision 1 of this Unified Interpretation is to be uniformly implemented by IACS Societies for ships contracted for construction on or after 1 July 2016. 2. The “contracted for construction” date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of “contract for construction”, refer to IACS Procedural Requirement (PR) No. 29.							

3.6 Calculation of the aggregate capacity of SBT

Conventions (Amend.), Reg.		**MARPOL73/78** Annex **I,** Regulation **19.3.4**					
IACS UI Number	**MPC6**	**UI** version	**1997/ Rev.1, Aug 2015**	Date of implementation	**1997 / 1 July 2016**	Means of implementation	

Conventions/Codes Requirements

Annex **I, 19.3.4**

19.3.4 The aggregate capacity of ballast tanks

On crude oil tankers of 20,000 tonnes deadweight and above and product carriers of 30,000 tonnes deadweight and above, the aggregate capacity of wing tanks, double bottom tanks, forepeak tanks and after peak tanks shall not be less than the capacity of segregated ballast tanks necessary to meet the requirements of regulation 18 of this Annex. Wing tanks or spaces and double bottom tanks used to meet the requirements of regulation 18 shall be located as uniformly as practicable along the cargo tank length. Additional segregated ballast capacity provided for reducing longitudinal hull girder bending stress, trim, etc. may be located anywhere within the ship.

Interpretation

1. Any ballast carried in localized inboard extensions, indentations or recesses of the double hull, such as bulkhead stools, should be excess ballast above the minimum requirement for segregated ballast capacity according to regulation 18.

2. In calculating the aggregate capacity under Regulation 19.3.4, the following should be taken into account:

2.1 the capacity of engine-room ballast tanks should be excluded from the aggregate capacity of ballast tanks;

2.2 the capacity of ballast tank located inboard of double hull should be excluded from the aggregate capacity of ballast tanks (see figure 1).

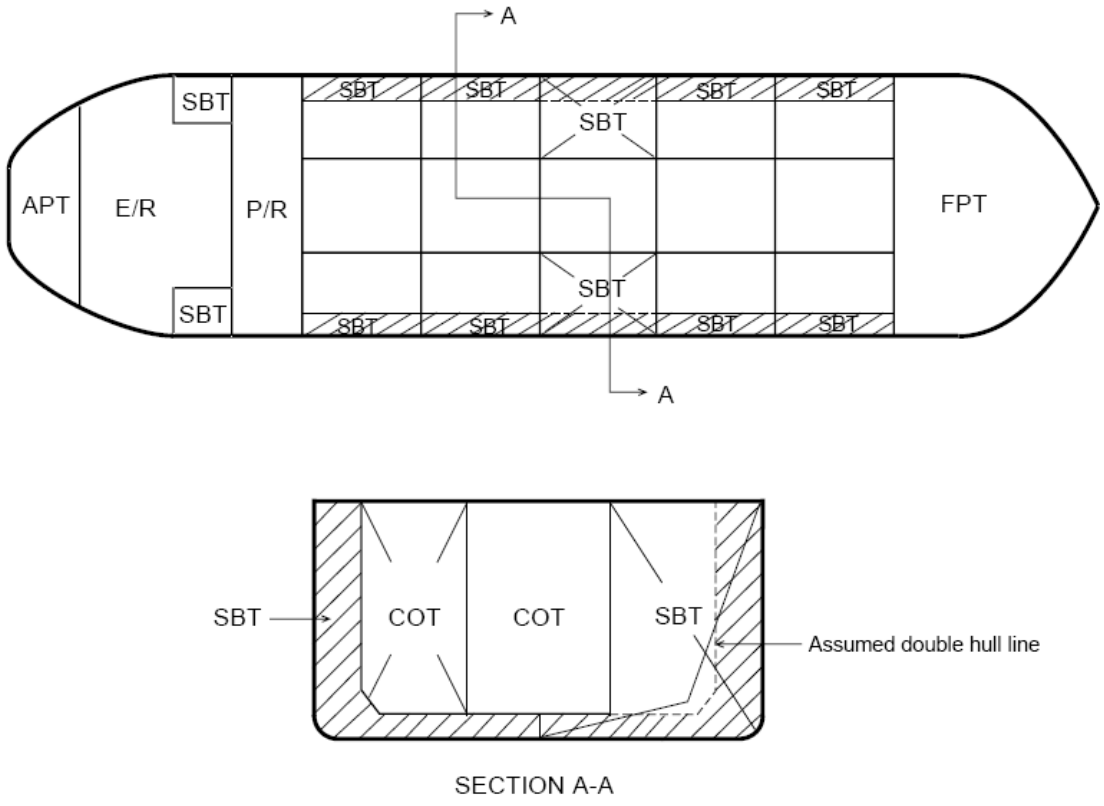
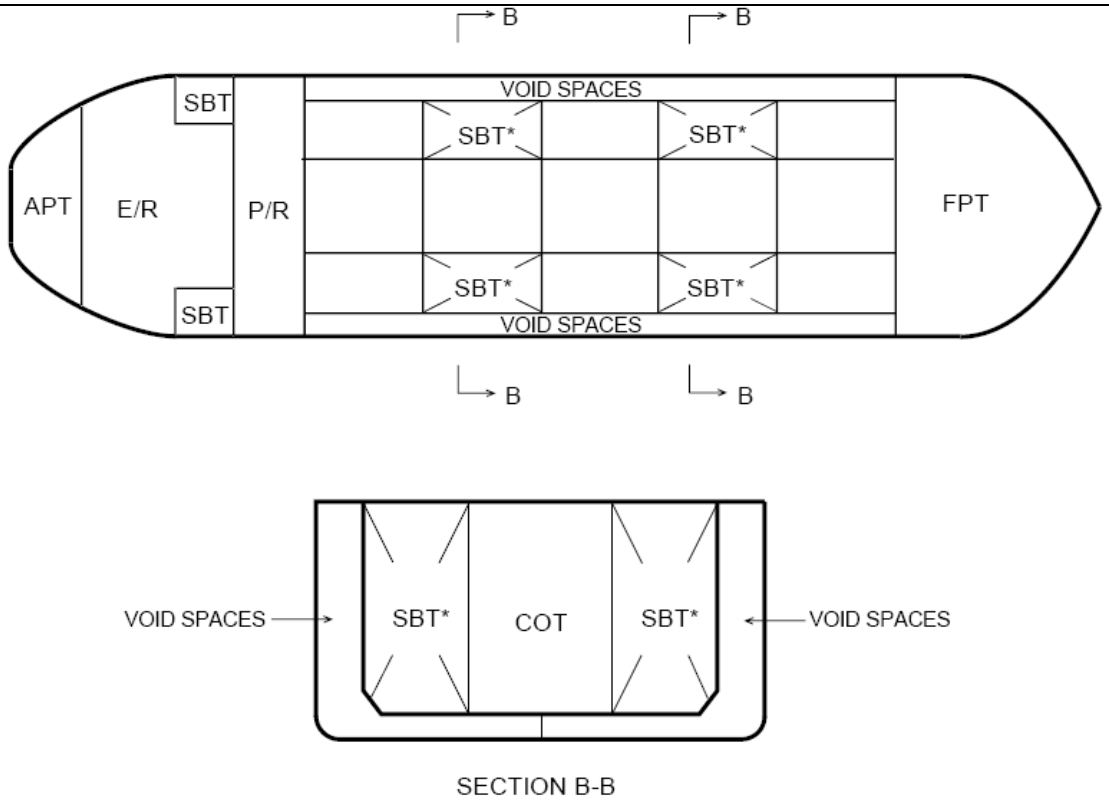


Fig. 1

2.3 spaces such as void spaces located in the double hull within the cargo tank length should be included in the aggregate capacity of ballast tanks (see Figure 2).



SECTION B-B

Fig. 2

Remarks

Notes:

1. This IACS Unified Interpretation was submitted to IMO and is contained in MEPC/Circ.316 of 25th July 1996.
2. Revision 1 of this Unified Interpretation is to be uniformly implemented by IACS Societies for ships contracted for construction on or after 1 July 2016.
3. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

3.7 Hydrostatic Balance Loading

Conventions (Amend.), Reg.		Regulation **13(G)7** of Annex **I** to **MARPOL 73/78**－Guidelines for Approval of Alternative Structural or Operational Arrangements (MEPC.64(36))					
IACS UI Number	**MPC7**	**UI** version	**1998/ Corr.1999**	Date of implementation	**1998**	Means of implementation	

Conventions/Codes Requirements

Other structural or operational arrangements such as hydrostatically balanced loading may be accepted as alternatives to the requirements prescribed in paragraph (4), provided that such alternatives ensure at least the same level of protection against oil pollution in the event of collision or stranding and are approved by the Administration based on guidelines developed by the Organization.

Interpretation

Deleted.

Technical Background

Deleted since Hydrostatic Balance Loading is no longer acceptable under MARPOL Annex I.

Remarks

3.8 Interpretation of "installed on board"

Conventions (Amend.), Reg.		Regulation **16(2)(a)** of Annex **VI** to **MARPOL 73/78**					
IACS UI Number	**MPC8**	**UI** version	**Oct. 1999**	Date of implementation	**Oct. 1999**	Means of implementation	

Conventions/Codes Requirements

Except as provided in subparagraph (b) of this paragraph, each incinerator installed on board on or after 1 January 2000 shall meet the requirements contained in appendix IV to this Annex. Each incinerator shall be approved by the Administration taking into account the standard specifications for shipboard incinerators developed by the Organization.

Interpretation

For application of this Regulation the term "installed on board a ship on or after 1 January 2000" may be interpreted as follows:

(a) For new ships, incinerators installed on board ships the keels of which are laid or which are at a similar stage of construction on or after 1 January 2000.

(b) For existing ships, new incinerators with a contractual delivery date to the ship of on or after 1 January 2000 or, in the absence of a contractual delivery date, the actual delivery of the incinerator to the ship on or after 1 January 2000.

Remarks

3.9 Interpretation of width of wing tanks and height of double bottom tanks at turn of the bilge area

Conventions (Amend.), Reg.		**MARPOL Annex I, Regulation 19.3.3**					
IACS UI Number	**MPC9**	**UI** version	**June 2002/ Rev.1, Aug 2015**	Date of implementation	**1 Jan 2003/ 1 July 2016**	Means of implementation	

Conventions/Codes Requirements

Annex **I, 19.3.3**

19.3.3 Turn of the bilge area or at locations without a clearly defined turn of the bilge

When the distances h and w are different, the distance w shall have preference at levels exceeding 1.5h above the baseline as shown in figure 1.

Interpretation

The requirements of Reg. 19.3.3 at turn of the bilge areas are applicable throughout the entire tank length.

Remarks

Notes:

1. This UI MPC 9 is to be uniformly implemented by IACS Members and Associates from 1 January 2003.
2. Revision 1 of this Unified Interpretation is to be uniformly implemented by IACS Societies for ships contracted for construction on or after 1 July 2016.
3. The "contracted for construction" date means the date on which the contract to build the vessel is signed

between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

3.10 Endorsement of certificates with the date of completion of the survey on which they are based

Conventions (Amend.), Reg.		**MSC**/Circ.**1012** and **MEPC**/Circ.**384**					
IACS UI Number	**MPC10**	**UI** version	**Nov. 2003/ Rev. 1 Nov. 2005**	Date of implementation	**01.03.2004/ 01.07.2006(Rev.1)**	Means of implementation	

Conventions/Codes Requirements

Resolutions MSC.170(79), MSC.171(79), MSC.172(79), MSC.174(79) through MSC.179(79) and MSC.181(79) through MSC.187(79) require that the identified certificates include the statement:

"Completion date of the survey on which this certificate is based: dd/mm/yyyy".

Interpretation

For application of the above resolutions, the following IACS Unified Interpretation applies:

The "Completion date of the survey on which this certificate is based", is the date of the last initial/renewal survey visit on which all statutory and class items, required to be surveyed, have been surveyed (regardless if they were found satisfactory or with minor deficiency).

Remarks

3.11 Intact stability

Conventions (Amend.), Reg.		**MARPOL I/27**					
IACS UI Number	**MPC11**	**UI version**	**May,2004/ Rev.1,Nov.,2012/ Rev.2,Jun.,2016/ Corr.1,Jun.,2021**	**Date of implementation**	**Apr.1,2005/ Rev.1,Jul.1,2013/ Rev.2,Jan.1,2017**	**Means of implementation**	**Contracted for construction**

Conventions/Codes Requirements

Regulation 27 Intact stability

1 Every oil tanker of 5,000 tonnes deadweight and above delivered on or after 1 February 2002, as defined in regulation 1.28.7, shall comply with the intact stability criteria specified in paragraphs 1.1 and 1.2 of this regulation, as appropriate, for any operating draught under the worst possible conditions of cargo and ballast loading, consistent with good operational practice, including intermediate stages of liquid transfer operations. Under all conditions the ballast tanks shall be assumed slack.

.1 In port, the initial metacentric height GM_o, corrected for the free surface measured at 0° heel, shall be not less than 0.15 m;

.2 At sea, the following criteria shall be applicable:

.2.1 the area under the righting lever curve (GZ curve) shall be not less than 0.055 m.rad up to θ = 30° angle of heel and not less than 0.09 m.rad up to θ = 40° or other angle of flooding θ_f * if this angle is less than 40°. Additionally, the area under the righting lever curve (GZ curve) between the angles of heel of 30° and 40° or between 30° and θ_f, if this angle is less than 40°, shall be not less than 0.03 m.rad;

.2.2 the righting lever GZ shall be at least 0.20 m at an angle of heel equal to or greater than 30°;

. 2.3 the maximum righting arm shall occur at an angle of heel preferably exceeding 30° but not less than 25°; and

.2.4 the initial metacentric height GM_o, corrected for free surface measured at 0° heel, shall be not less than 0.15 m.

* θ_f is the angle of heel at which openings in the hull superstructures or deckhouses which cannot be closed weathertight immerse. In applying this criterion, small openings through which progressive flooding cannot take place need not be considered as open.

2 The requirements of paragraph 1 of this regulation shall be met through design measures. For combination carriers simple supplementary operational procedures may be allowed.

3 Simple supplementary operational procedures for liquid transfer operations referred to in paragraph 2 of this regulation shall mean written procedures made available to the master which:

.1 are approved by the Administration;

.2 indicate those cargo and ballast tanks which may, under any specific condition of liquid transfer and possible range of cargo densities, be slack and still allow the stability criteria to be met. The slack tanks may vary during the liquid transfer operations and be of any combination provided they satisfy the criteria;

.3 will be readily understandable to the officer-in-charge of liquid transfer operations;

.4 provide for planned sequences of cargo/ballast transfer operations;

.5 allow comparisons of attained and required stability using stability performance criteria in graphical or tabular form;

.6 require no extensive mathematical calculations by the officer-in-charge;

.7 provide for corrective actions to be taken by the officer-in-charge in case of departure from recommended values and in case of emergency situations; and

.8 are prominently displayed in the approved trim and stability booklet and at the cargo/ballast transfer control station and in any computer software by which stability calculations are performed.

Interpretation

For proving compliance with Reg. I/27, either paragraph 1 or 2, below, shall be applied.

1. The vessel shall be loaded with all cargo tanks filled to a level corresponding to the maximum combined total of vertical moment of volume plus free surface inertia moment at 0° heel, for each individual tank. Cargo density shall correspond to the available cargo deadweight at the displacement at which transverse KM reaches a minimum value, assuming full departure consumables and 1% of the total water ballast capacity. The maximum free surface moment shall be assumed in all ballast conditions. For the purpose of calculating GM_o, liquid free surface corrections shall be based on the appropriate upright free surface inertia moment. The righting lever curve may be corrected on the basis of liquid transfer moments.

2. An extensive analysis covering all possible combinations of cargo and ballast tank loading is to be carried out. For such extensive analysis conditions it is considered that:

(a) Weight, centre of gravity co-ordinates and free surface moment for all tanks are to be according to the actual content considered in the calculations; and

(b) The extensive calculations are to be carried out in accordance with the following:

1. The draughts are to be varied between light ballast and scantling draught.

2. Consumables including but not restricted to fuel oil, diesel oil and fresh water corresponding to 97%, 50% and 10% content are to be considered.

3. For each draught and variation of consumables, the available deadweight is to comprise ballast water and cargo, such that combinations between maximum ballast and minimum cargo and vice-versa, are covered. In all cases the number of ballast and cargo tanks loaded is to be chosen to reflect the worst combination of VCG and free surface effects. Operational limits on the number of tanks considered to be simultaneously slack and exclusion of specific tanks are not permitted. All ballast tanks are to have at least 1% content.

4. Cargo densities between the lowest and highest intended to be carried are to be considered.

5. Sufficient steps between all limits are to be examined to ensure that the worst conditions are

identified. A minimum of 20 steps for the range of cargo and ballast content, between 1% and 99% of total capacity, are to be examined. More closely spaced steps near critical parts of the range may be necessary.

At every stage the criteria described in regulations 27.1.1 and 27.1.2 of MARPOL Annex I are to be met.

3. In applying θ_f, openings which "cannot be closed weathertight" include ventilators (complying with regulation 19(4)) of the International Convention on Load Lines, 1966) that for operational reasons have to remain open to supply air to the engine room or emergency generator room (if the same is considered buoyant in the stability calculation or protecting openings leading below) for the effective operation of the ship.

Technical Background

Remarks

1. This UI is to be uniformly implemented by IACS Members and Associates from 1 April 2005.
2. The damage stability requirements in MARPOL I/28 shall not apply for the purpose of demonstrating compliance with MARPOL Reg. I/27.
3. Rev.1 of this UI is to be uniformly implemented by IACS Societies from 1 July 2013.
4. Rev.2 of this UI is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2017.
5. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

3.12 Annex VI of MARPOL 73/78

Conventions (Amend.), Reg.		**MARPOL Annex VI，Reg 1**					
IACS UI Number	**MPC12**	**UI version**	**Rev.3 Aug 2018**	**Date of implementation**	**Jan.1,2020**	**Means of implementation**	

Conventions/Codes Requirements

MARPOL Annex VI

Regulation 1 Application

The provisions of this Annex shall apply to all ships, except where expressly provided otherwise in regulations 3, 5, 6, 13, 15, 16, 18, 19, 20, 21, 22 and 22A of this Annex.

Interpretation

For application of this regulation the term "all ships" shall be interpreted as applicable to all ships as defined by MARPOL 73 Article 2 (4).

Remarks

3.13 Annex VI to MARPOL 73/78

Conventions (Amend.), Reg.		Regulation **2(4)** of Annex **VI** to **MARPOL 73/78**					
IACS UI Number	**MPC13**	**UI** version	**July 2004/ Rev. 1, 29.03.2006**	Date of implementation	**19.05.2005/ 01.07.2006 (Rev.1)**	Means of implementation	

Conventions/Codes Requirements
New installations, in relation to Regulation 12 of this Annex, means the installation of systems, equipment, including new portable fire extinguishing units, insulation, or other material on a ship after the date on which this Annex enters into force, but excludes repair or recharge of previously installed systems, equipment, insulation, or other material, or recharge of portable fire extinguishing units.
Interpretation
Deleted
Remarks
Deleted by IACS in Nov.,2013.

3.14 Annex VI of MARPOL 73/78

Conventions (Amend.), Reg.		**MARPOL Annex VI，Reg 1、Reg 5.2**					
IACS UI Number	**MPC14**	**UI version**	**Rev.2,Aug 2018**	**Date of implementation**	**Jan.1,2020**	**Means of implementation**	

Conventions/Codes Requirements
MARPOL Annex VI **Regulation 1 / Regulation 5.2** ***Application /Surveys and Inspections*** Regulation 1 reads as follows: The provisions of this Annex shall apply to all ships, except where expressly provided otherwise in regulations 3, 5, 6, 13, 15, 16, 18, 19, 20, 21,22 and 22Aof this Annex. Regulation 5.2 reads as follows: In the case of ships of less than 400 gross tonnage, the Administration may establish appropriate measures in order to ensure that the applicable provisions of chapter 3 are complied with.
Interpretation
It shall be interpreted that all marine diesel engines over 130 kW except those exempted by Regulation 3 or Regulation 13 are to comply with the Regulation 13 limit regardless of the gross tonnage of the ship onto which the engine is installed. In this context such engines must have an approved Technical File and must be issued with an EIAPP certificate in accordance with the NOx Technical Code in all cases. However the application of the ship surveys as given in Regulation 5.2 to ships under 400 GT would be at the discretion of the relevant Administration.
Remarks

3.15 Annex VI to MARPOL 73/78

Conventions (Amend.), Reg.		Regulation **9(4)(b)** of Annex **VI** to **MARPOL 73/78**					
IACS UI Number	**MPC15**	**UI** version	**2004**	Date of implementation	**19.05.2005**	Means of implementation	

Conventions/Codes Requirements

Duration and validity of Certificate Regulation 9(4)(b): An International Air Pollution Prevention Certificate shall cease to be valid if significant alterations have taken place to the equipment, systems, fittings, arrangements or material to which this Annex applies without the express approval of the Administration, except the direct replacement of such equipment or fittings with equipment or fittings that conform with the requirements of this Annex. For the purpose of Regulation 13, significant alteration shall include any change or adjustment to the system, fittings, or arrangement of a diesel engine which results in the nitrogen oxide limits applied to that engine no longer being complied with.
Interpretation
Deleted
Remarks
Deleted by IACS in Nov.,2013.

3.16 Annex VI of MARPOL 73/78

Conventions (Amend.), Reg.		**MARPOL Annex VI，Reg 13(1)(a)(i)**					
IACS UI Number	**MPC16**	**UI version**	**July 2004**	**Date of implementation**	**19 May 2005**	**Means of implementation**	
Conventions/Codes Requirements							
Reg 13(1)(a)(i) This regulation shall apply to each diesel engine with a power output of more than 130kW which is installed on a ship constructed on or after 1 January 2000.							
Interpretation							
Deleted on 1 November 2015.							
Remarks							
Amendments to Annex VI adopted with Resolution MEPC.176(58) now give a definition of "installed" in Regulation 2.1, so the UI is deleted.							

3.17 Annex VI to MARPOL 73/78

Conventions (Amend.), Reg.		Regulation **13(1)(a)(ii)** of Annex **VI** to **MARPOL 73/78**					
IACS UI Number	**MPC17**	**UI** version	**July 2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
Regulation 13(1)(a)(ii): This regulation shall apply to each diesel engine with a power output of more than 130 kW which undergoes a major conversion on or after 1 January 2000.							
Interpretation							
Deleted							
Remarks							
Deleted by IACS in Nov.,2013.							

3.18 Annex VI to MARPOL 73/78

Conventions (Amend.), Reg.		Regulation **13(1)(b)(i)** of Annex **VI** to **MARPOL 73/78**					
IACS UI Number	**MPC18**	**UI** version	**July 2004 Rev. 1 29.03.2006**	Date of implementation	**19.05.2005 01.07.2006 (Rev.1)**	Means of implementation	
Conventions/Codes Requirements							
Regulation 13(1)(b)(i): This Regulation does not apply to emergency diesel engines, engines installed in lifeboats and any device or equipment intended to be used solely in case of emergency.							
Interpretation							
Deleted							
Remarks							
Deleted by IACS in Nov.,2013.							

3.19 Annex VI to MARPOL 73/78

Conventions (Amend.), Reg.		Regulation **13(1)(c)** of Annex **VI** to **MARPOL 73/78**					
IACS UI Number	**MPC19**	**UI** version	**July 2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
Regulation 13(1)(c): Notwithstanding the provisions of sub-paragraph (a) of this paragraph, the Administration may allow exclusion from the application of this regulation to any diesel engine which is installed on a ship constructed, or on a ship which undergoes a major conversion, before the entry into force of the present Protocol, provided that the ship is solely engaged in voyages to ports or offshore terminals within the State of the flag of which the ship is entitled to fly.							
Interpretation							
Deleted							
Remarks							
Deleted by IACS in Nov.,2013.							

3.20 Annex VI to MARPOL 73/78

Conventions (Amend.), Reg.		**MARPOL Annex VI，Reg13.2.1.1、Reg13.2.2**					
IACS UI Number	**MPC20**	**UI version**	**Jul. 2004/ Rev.1,Apr.,2014/ Corr.1, July, 2020**	**Date of implementation**	**May 19, 2005/ Rev.1, Jan.1, 2015**	**Means of implementation**	
Conventions/Codes Requirements							
Regulation 13.2.1.1 and 13.2.2 *Application* **Regulation 13.2.1.1 reads as follows:** For the purpose of this regulation, major conversion means a modification on or after 1 January 2000 of a marine diesel engine that has not already been certified to the standards set forth in paragraph 3, 4, or 5.1.1 of this regulation where: .1 the engine is replaced by a marine diesel engine or an additional marine diesel engine is installed, or …. **Regulation 13.2.2 reads as follows:** For a major conversion involving the replacement of a marine diesel engine with a non-identical marine diesel engine or the installation of an additional marine diesel engine, the standards in force at the time of the replacement or addition shall apply.							
Interpretation							
This section shall be interpreted, in respect of engines installed on or after 1 January 2000 but before 1 July 2010, on the basis of regulation 13(2)(a)(i) which applied at that time in which it was given that "For the purpose of this regulation, major conversion*, means a modification of an engine where the engine is replaced by a new engine built on or after 1 January 2000." as follows:							

(a) For application of regulation 13(2)(a)(i) the term "replaced" shall be interpreted as being applicable to an engine installed either as a direct replacement for an existing engine or one installed as an addition to the original engine complement as at 1 January 2000 to meet revised ship requirements; and, (b) For application of regulation 13(2)(a)(i) the term "new" shall be interpreted as applying to engines that left the manufacturer's works for the first time on or after 1 January 2000. * For IACS interpretation of "time of the replacement or addition" with respect to major conversion, see MPC 98
Remarks

3.21 Annex VI to MARPOL 73/78

Conventions (Amend.), Reg.		Regulation **13(2)(a)(iii)** of Annex **VI** to **MARPOL 73/78**					
IACS UI Number	**MPC21**	**UI version**	**July 2004/ Rev. 1, 29.03.2006**	**Date of implementation**	**19.05.2005/ 01.07.2006 (Rev.1)**	**Means of implementation**	
Conventions/Codes Requirements							
Regulation 13(2)(a)(iii): For the purpose of this regulation, major conversion means a modification of an engine where the maximum continuous rating of the engine is increased by more than 10%.							
Interpretation							
Deleted							
Remarks							
Deleted by IACS in Nov.,2013.							

3.22 Annex VI to MARPOL 73/78

Conventions (Amend.), Reg.		Regulation **13(3)(a)** of Annex **VI** to **MARPOL 73/78**					
IACS UI Number	**MPC22**	**UI version**	**July 2004**	**Date of implementation**	**19.05.2005**	**Means of implementation**	
Conventions/Codes Requirements							
Regulation 13(3)(a): Subject to the provision of regulation 3 of this Annex, the operation of each diesel engine to which this Regulation applies is prohibited, except when the emission of nitrogen oxides (calculated as the total weighted emission of NO_2) from the engine is within the following limits: (i) 17.0 g/kWh when *n* is less than 130 rpm (ii) 45.0 x *n*(-0.2) g/kWh when *n* is 130 or more but less than 2000 rpm (iii) 9.8 g/kWh when *n* is 2000 rpm or more where *n* = rated engine speed (crankshaft revolutions per minute). When using fuel composed of blends from hydrocarbons derived from petroleum refining, test procedure and measurement methods shall be in accordance with the NO_x Technical Code, taking into consideration the test cycles and weighting factors outlined in appendix II to this Annex.							
Interpretation							
Deleted							
Remarks							
Deleted by IACS in Nov.,2013.							

3.23 Annex VI to MARPOL 73/78

Conventions (Amend.), Reg.		Regulation **13(3)(b)** of Annex **VI** to **MARPOL 73/78**					
IACS UI Number	**MPC23**	**UI** version	**July 2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							

Regulation 13(3)(b): Notwithstanding the provisions of sub-paragraph (a) of this paragraph, the operation of a diesel engine is permitted when: (i) an exhaust gas cleaning system, approved by the Administration in accordance with the NO_x Technical Code, is applied to the engine to reduce onboard NO_x emissions at least to the limits specified in sub-paragraph (a), or (ii) any other equivalent method, approved by the Administration taking into account relevant guidelines to be developed by the Organization, is applied to reduce onboard NO_x emissions at least to the limit specified in sub-paragraph (a) of this paragraph.
Interpretation
Deleted
Remarks
Deleted by IACS in Nov.,2013.

3.24 Annex VI to MARPOL 73/78

Conventions (Amend.), Reg.		Regulation **14(6)** of Annex **VI** to **MARPOL 73/78**					
IACS UI Number	**MPC24**	**UI** version	**July 2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
Regulation 14(6): Those ships using separate fuel oils to comply with paragraph (4) (a) of this regulation shall allow sufficient time for the fuel oil service system to be fully flushed of all fuels exceeding 1.5% m/m sulphur content prior to entry into a SO_x emission control area. The volume of the low sulphur fuel oils (less than or equal to 1.5% sulphur content) in each tank as well as the date, time, and position of the ship when any fuel-changeover operation is completed, shall be recorded in such log-book as prescribed by the Administration.							
Interpretation							
Deleted							
Remarks							
Deleted by IACS in Nov.,2013.							

3.25 Annex VI to MARPOL 73/78

Conventions (Amend.), Reg.		Regulation **16(2)(a)** of Annex **VI** to **MARPOL 73/78**					
IACS UI Number	**MPC25**	**UI** version	**July 2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
Regulation 16(2)(a): Except as provided in sub-paragraph (b) of this paragraph, each incinerator installed on board a ship on or after 1 January 2000 shall meet the requirements contained in appendix IV to this Annex. Each incinerator shall be approved by the Administration taking into account the standard specifications for shipboard incinerators developed by the Organisation							
Interpretation							
Deleted							
Remarks							
Deleted by IACS in Nov.,2013.							

3.26 Annex VI to MARPOL 73/78

Conventions (Amend.), Reg.		Regulation **16(6)** of Annex **VI** to **MARPOL 73/78**					
IACS UI Number	**MPC26**	**UI** version	**July 2004**	Date of implementation	**19.05.2005**	Means of implementation	

Conventions/Codes Requirements
Regulation 16(6): Shipboard incineration of polyvinyl chlorides (PVCs) shall be prohibited, except in shipboard incinerators for which IMO Type Approval Certificates have been issued.
Interpretation
Deleted
Remarks
Deleted by IACS in Nov.,2013.

3.27 Annex VI to MARPOL 73/78

Conventions (Amend.), Reg.		Regulation **16(7)** of Annex **VI** to **MARPOL 73/78**					
IACS UI Number	**MPC27**	**UI** version	**July 2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
Regulation 16(7): All ships with incinerators subject to this Regulation shall possess a manufacturer's operating manual which shall specify how to operate the incinerator within the limits described in paragraph 2 of appendix IV to this Annex.							
Interpretation							
Deleted							
Remarks							
Deleted by IACS in Nov.,2013.							

3.28 Annex VI to MARPOL 73/78

Conventions (Amend.), Reg.		Regulation **16(8)** of Annex **VI** to **MARPOL 73/78**					
IACS UI Number	**MPC28**	**UI** version	**July 2004/ 02.12.2005**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
Regulation 16(8): Personnel responsible for operation of any incinerator shall be trained and capable of implementing the guidance provided in the manufacturer's operating manual.							
Interpretation							
For application of this Regulation it shall be interpreted as applicable to all incinerators, not only those specified in Regulation 16(2).							
Remarks							
This Regulation was deleted on 02.12.2005							

3.29 Annex VI to MARPOL 73/78

Conventions (Amend.), Reg.		**MARPOL Annex VI，Reg18.5、Reg18.6**					
IACS UI Number	**MPC29**	**UI version**	**Jul.,2004/ Rev.1,Apr.,2014**	**Date of impleme**	**May 19,2005/ Rev.1,Jan.1,2015**	**Means of implemen**	

				ntation		**tation**	

Conventions/Codes Requirements

Regulations 18.5 and 18.6

Application

Regulation 18.5 reads as follows:

For each ship subject to regulations 5 and 6 of this Annex, details of fuel oil for combustion purposes delivered to and used on board shall be recorded by means of a bunker delivery note that shall contain at least the information specified in appendix V to this Annex.

Regulation 18.6 reads as follows:

The bunker delivery note shall be kept on board the ship in such a place as to be readily available for inspection at all reasonable times. It shall be retained for a period of three years after the fuel oil has been delivered on board.

Interpretation

For application of these regulations it shall be interpreted as applicable to all ships of 400 gross tonnage or above and, at the Administration's discretion, for ships of less than 400 gross tonnage.

Remarks

3.30 Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		NOx Technical Code 2008, Table 3 – Symbols and subscripts for terms and variables					
IACS UI Number	**MPC30**	**UI** version	**July ,2004/ Rev.1,Nov., 2019**	Date of implementation	**19.05.2005/ Rev.1,July 1,2020**	Means of implementation	

Conventions/Codes Requirements

Table 3 gives:

Symbol	Term	Unit
T_a	Intake air temperature determined at the engine intake	K

Interpretation

For application of the term "T_a" it shall be interpreted that the intake air temperature determined at the engine intake is that determined at the engine/turbocharger intake suction filter.

Remarks

3.31 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **1.2.1** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC31**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	

Conventions/Codes Requirements
Chapter 1.2.1: This Code applies to all diesel engines with a power output of more than 130 kW which are installed, or are designed and intended for installation, on board any ship subject to Annex VI, with the exception of those engines described in paragraph 1(b) of regulation 13. Regarding the requirements for survey and certification under regulation 5 of Annex VI, this Code addresses only those requirements applicable to an engine's compliance with the NO_x emission limits.
Interpretation
Deleted
Remarks
IACS deleted the UI in Nov. 2019.

3.32 Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		NOx Technical Code 2008, Chapter 1, Paragraph 1.3.2.2					
IACS UI Number	**MPC32**	**UI** version	**July ,2004/ Rev.1 Jan. ,2020**	Date of implementation	**19.05.2005/ Rev.1,July 1,2020**	Means of implementation	

Conventions/Codes Requirements
Paragraph 1.3.2.2, Chapter 1 of the NOx Technical Code (NTC) 2008 reads: For engines installed on ships constructed before 1 January 2000, substantial modification means any modification made to an engine which increases its existing emission characteristics established by the simplified measurement method as described in 6.3 in excess of the allowances set out in 6.3.11. These changes include, but are not limited to, changes in its operations or in its technical parameters (e.g., changing camshafts, fuel injection systems, air systems, combustion chamber configuration, or timing calibration of the engine). The installation of a certified Approved Method pursuant to regulation 13.7.1.1 or certification pursuant to regulation 13.7.1.2 is not considered to be a substantial modification for the purpose of the application of regulation 13.2 of the Annex.
Interpretation
For application of this section it shall be interpreted that an increase in "emission characteristics" relates to an increase in the application average cycle weighted NO_x emission value. Furthermore it shall also be interpreted that any modification made on or after 1 January 2000 to such an engine involving alternative duty cycle, rating, components or settings that were available, but not necessarily utilised, prior to 1 January 2000 shall not be considered as representing a "substantial modification" to that engine.
Remarks

3.33 Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		NOx Technical Code 2008, Chapter 2, Paragraph 2.2.4.1					
IACS UI Number	**MPC33**	**UI** version	**July ,2004/ Rev.1,29.03.2006/ Rev.2,Nov. ,2019**	Date of implementation	**19.05.2005/ Rev.1,01.07.2006/ Rev.2,July 1,2020**	Means of implementation	

Conventions/Codes Requirements
Paragraph 2.2.4.1, Chapter 2 of the NOx Technical Code (NTC) 2008 reads: There are engines which, due to their size, construction and delivery schedule, cannot be precertified on a test-bed. In such cases, the engine manufacturer, shipowner or ship builder shall make application to the Administration requesting an on-board test (see 2.1.2.2). The applicant must demonstrate to the Administration that the on-board test fully meets all of the requirements of a test-bed procedure as specified in chapter 5 of this Code. In no case shall an allowance be granted for possible deviations of measurements if an initial survey is carried on board a ship without any valid pre-certification test. For engines undergoing an on-board certification test, in order to be issued with an EIAPP Certificate, the same procedures apply as if the engine had been pre-certified on a test-bed, subject to the limitations given in paragraph 2.2.4.2.
Interpretation
Engines undergoing an on-board certification test, shall have a preliminary approved Technical File, pending the results of the emission test.. If the result of the emission test does not comply with the applicable NOx regulation, the engines are to be re-adjusted to the compliance condition originally approved, if any, or the applicant is to apply to the Flag Administration for acceptance of further testing.
Remarks

3.34 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **2.2.5** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC34**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	

Conventions/Codes Requirements
Chapter 2.2.5: If the pre-certification test results show that an engine fails to meet the NO_x emission limits as required by Regulation 13 of Annex VI, a NO_x–reducing device may be installed. This device, when installed on the engine, must be recognised as an essential component of the engine and its presence will be recorded in the engine's technical file. To receive an EIAPP Certificate for this assembly, the engine, including the reducing device, as installed, must be re-tested to show compliance with the NOx emission limits. However, in this case, the assembly may be retested in accordance with the simplified measurement method addressed in 6.3. The NO_x–reducing device shall be included on the EIAPP Certificate together with all other records requested by the Administration. The engine's technical file shall also contain on-board NO_x verification procedures for the device to ensure it is operating correctly.
Interpretation
Deleted
Remarks
IACS deleted the UI in Nov. 2019.

3.35 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **2.2.8** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC35**	**UI** version	**July ,2004/ Rev.1,29.03.2006**	Date of implem entation	**19.05.2005/ Rev.1,01.07.2006**	Means of implementat ion	
Conventions/Codes Requirements							
Chapter 2.2.8: A flow chart providing guidance for compliance with the requirements of a pre-certification survey for marine diesel engines intended for installation on board of ships is provided in Figure 1 of Appendix 2 of this Code.							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.36 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **2.2.9** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC36**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
Chapter 2.2.9: A model form of an EIAPP Certificate is attached as appendix 1 to this Code.							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.37 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **2.3.4** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC37**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
Chapter 2.3.4: The shipowner shall have the option of direct measurement of NO_x emissions during engine operation. Such data may take the form of spot checks logged with other engine operating data on a regular basis and over the full range of engine operation or may result from continuous monitoring and data storage. Data must be current (taken within the last 30 days) and must have been acquired using the test procedures cited in this NO_x Technical Code. These monitoring records shall be kept on board for three months for verification purposes by the Parties to the Protocol of 1997. Data shall also be corrected for ambient conditions and fuel specification, and measuring equipment must be checked for correct calibration and operation, in accordance with the procedures specified by the measurement equipment manufacturer in the engine's technical file. Where exhaust gas after-treatment devices are fitted which influence the NO_x emissions, the measuring point(s) must be located downstream of such devices.							

Interpretation
Deleted
Remarks
IACS deleted the UI in Nov. 2019.

3.38 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **2.3.5** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC38**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
Chapter 2.3.5: To demonstrate compliance by the direct measurement method, sufficient data shall be collected to calculate the weighted average NO_x emissions in accordance with this Code.							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.39 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **2.3.6** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC39**	**UI** version	**July ,2004/ Rev.1,29.03.2006**	Date of implementation	**19.05.2005/ Rev.1,01.07.2006**	Means of implementation	
Conventions/Codes Requirements							
Chapter 2.3.6: Every marine diesel engine installed on board a ship shall be provided with a technical file. The technical file shall be prepared by the engine manufacturer and approved by the Administration, and required to accompany an engine throughout its life on board ships. The technical file shall contain information as specified in 2.4.1.							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.40 Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		NOx Technical Code 2008, Chapter 2, Paragraph 2.3.9					
IACS UI Number	**MPC40**	**UI** version	**July ,2004/ Rev.1,Nov. , 2019**	Date of implementation	**19.05.2005/ Rev.1,July 1,2020**	Means of implementation	
Conventions/Codes Requirements							
Paragraph 2.3.9, Chapter 2 of the NOx Technical Code (NTC) 2008 reads: 2.3.9 If any adjustment or modification is made which is outside the approved limits documented in the Technical File, the IAPP Certificate may be issued only if the overall NOx emission performance is verified to be within the required limits by: onboard Simplified Measurement in accordance with 6.3; or, reference to the test-bed testing for the relevant Engine Group approval showing that the adjustments or modifications do not exceed the applicable NOx emission limit. At surveys after the initial engine survey, the Direct Measurement and Monitoring method in accordance with							

6.4, as approved by the Administration, may alternatively be used.

Interpretation

The demonstration of compliance in accordance with either direct measurement and monitoring method or on-board simplified NO_x measurement does not establish a new Engine Group but does define the on-board verification procedure to be used thereafter to verify continuing compliance for that particular engine.
In these instances it shall be understood that the Parent Engine emission value, as given in the EIAPP Certificate, thereafter only relates to the condition of that engine at the Precertification Survey stage.

Remarks

3.41 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **2.3.12** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC41**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	

Conventions/Codes Requirements

Chapter 2.3.12:
The Administration may, at its own discretion, abbreviate or reduce all parts of the survey on board, in accordance with this Code, to an engine which has been issued an EIAPP Certificate. However, the entire survey on board must be completed for at least one cylinder and/or one engine in an engine family or engine group, or spare part, if applicable, and the abbreviation may be made only if all the other cylinders and/or engines or spare parts are expected to perform in the same manner as the surveyed engine and/or cylinder or spare part.

Interpretation

Deleted

Remarks

IACS deleted the UI in Nov. 2019.

3.42 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **2.3.13** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC42**	**UI** version	**July ,2004/ Rev.1,29.03.2006**	Date of implementation	**19.05.2005/ Rev.1,01.07.2006**	Means of implementation	

Conventions/Codes Requirements

Chapter 2.3.13:
Flow charts providing guidance for compliance with the requirements of initial, periodical and intermediate surveys for certification of marine diesel engines installed on board ships are provided in figures 2 and 3 of Appendix 2 of this Code.

Interpretation

Deleted

Remarks

IACS deleted the UI in Nov. 2019.

3.43 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **2.4.1.1** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC43**	**UI** version	**July ,2004/ Rev.1,29.03.2006**	Date of implementation	**19.05.2005/ Rev.1,01.07.2006**	Means of implementation	
Conventions/Codes Requirements							
Chapter 2.4.1.1: To enable an Administration to perform the engine surveys described in 2.1, the technical file required by 2.3.6 shall, at a minimum, contain the identification of those components, settings and operating values of the engine which influences its NO_x emissions.							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.44 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **2.4.1.5** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC44**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
Chapter 2.4.1.5: To enable an Administration to perform the engine surveys described in 2.1, the technical file required by 2.3.6 shall, at a minimum, contain a copy of the test report required in 5.10.							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.45 Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		NOx Technical Code 2008, Chapter 2, Paragraph 2.4.1.7					
IACS UI Number	**MPC45**	**UI** version	**July ,2004/ Rev.1,Nov. ,2019**	Date of implementation	**19.05.2005/ Rev.1,July 1,2020**	Means of implementation	
Conventions/Codes Requirements							
Paragraph 2.4.1.7, Chapter 2 of the NO_x Technical Code (NTC) 2008 reads: 2.4.1 To enable an Administration to perform the engine surveys described in 2.1, the Technical File required by 2.3.4 shall, at a minimum, contain the following information: .7 specifications of those spare parts/components which, when used in the engine, according to those specifications,							

will result in continued compliance of the engine with the applicable NOx emission limit;
Interpretation
(a) It is considered that in this context "specification" may be read as identification marking and as such the identification of a NO_x influencing component by a manufacturer's part number or specific marking scheme would be sufficient. In such instances the identification marking would be tied to a particular drawing or other data defining the features of that component with regard to its influence on NO_x formation in the combustion process. Those drawings or other data shall form part of the conformity of production procedures as required under Chapter 4. (b) The "specification" need only address those aspects of the design of the component which directly affect its function as a NO_x critical component. For some components it may be possible to define these components by means of an outline dimensioned drawing within the conformity of production procedures or as a drawing directly included within the Technical File.
Remarks

3.46 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **2.4.2** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC46**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
Chapter 2.4.2: To ensure that engines are in compliance with regulation 13 of Annex VI after installation, each engine with an EIAPP Certificate shall be checked at least once prior to issuance of the IAPP Certificate. Such check can be done using the on-board NO_x verification procedures specified in the engine's technical file or one of the other methods if the owner's representative does not wish to check using the on-board NO_x verification procedures.							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.47 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **2.4.4.3** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC47**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
Chapter 2.4.4.3: On-board NO_x verification procedures shall be determined by using the direct measurement and monitoring method in accordance with 2.3.4, 2.3.5, 2.3.7, 2.3.8, 2.3.11, and 5.5.							
Interpretation							
Deleted							

Remarks
IACS deleted the UI in Nov. 2019.

3.48 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **2.4.5** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC48**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
Chapter 2.4.5: When a NO_x monitoring and recording device is specified as on-board NO_x verification procedures, such device shall be approved by the Administration based on guidelines to be developed by the Organization. These guidelines shall include, but are not limited to, the following items: .1 a definition of continuous NO_x monitoring, taking into account both steady-state and transitional operations of the engine; .2 data recording, processing and retention; .3 a specification for the equipment to ensure that its reliability is maintained during service; .4 a specification for environmental testing of the device; .5 a specification for the testing of the equipment to demonstrate that it has a suitable accuracy, repeatability and cross sensitivity compared with the applicable sections of this Code; and .6 the form of the approval certificate to be issued by the Administration.							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.49 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **3.1.1** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC49**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
Chapter 3.1.1: The graph in figure 1 represents the maximum allowable NO_x emission limit values based on the formulae included in paragraph 3(a) of regulation 13 of Annex VI. The total weighted NO_x emissions, as measured and calculated in accordance with the procedures in this Code, shall be equal to or less than the applicable value from the graph corresponding to the rated speed of the engine.							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.50 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **3.1.3** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC50**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
Chapter 3.1.3: An engine's applicable exhaust emissions limit value from Figure 1 and the actual calculated exhaust emissions value for the engine shall be stated on the engine's EIAPP Certificate.							

Interpretation
Deleted
Remarks
IACS deleted the UI in Nov. 2019.

3.51 Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		NOx Technical Code 2008, Chapter 3, Paragraph 3.2.1					
IACS UI Number	**MPC51**	**UI** version	**July ,2004/ Rev.1 Jan., 2017 Withdrawn/ Rev.2,Nov., 2019 Withdrawn**	Date of implementation	**19.05.2005**	Means of implementation	

Conventions/Codes Requirements

Paragraph 3.2.1, Chapter 3 of the NOx Technical Code (NTC) 2008 reads:

3.2.1 For every individual Engine or Parent Engine of an Engine Family or Engine Group, one or more of the relevant test cycles specified in 3.2.2 to 3.2.6 shall be applied for verification of compliance with the applicable NO_x emission limits contained in regulation 13.

Interpretation

For application of this section it shall be interpreted that:

(a) One of the test cycles specified in Chapters 3.2.2 to 3.2.6, applicable to the application, shall be applied.

(b) Where more than one test cycle is to be applied the average cycle weighted NOx emission value (in g/kWh) for each cycle is to be stated on the EIAPP Certificate 1.15, together with the corresponding limit value, 1.14.

(c) A Parent Engine test for a particular duty cycle is to follow the appropriate test cycle. A Parent Engine emission value shall not be 'constructed' by, for example, adding data from one test to emission values taken from another test.

(d) In those instances where a constant speed engine as installed can be used either solely for main propulsion or auxiliary purposes, then that engine should be certified to both the E2 and D2 cycles.

(e) Where a generator is also permanently fitted or coupled to main engine propulsion shafting then certification of that main engine using only the E2 or E3 cycle, as appropriate, is required.

Remarks

1. UI MPC51 (Rev.1 Jan 2017) approved on 18 January 2017 was withdrawn on 08 June 2018 prior to coming into force on 1 July 2018.
2. UI MPC51 (Rev.2 Nov 2019) approved on 9 November 2019 was withdrawn on 5 May 2020 prior to coming into force on 1 July 2020.

3.52 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **3.2.3** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC52**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	

Conventions/Codes Requirements

Chapter 3.2.3:

For variable-pitch propeller sets, test cycle E2 shall be applied in accordance with Table 1.

Table 1 – Test cycle for "Constant-speed main propulsion" application
(including diesel-electric drive and variable-pitch propeller installations)

Test cycle type E2	Speed	100%	100%	100%	100%
	Power	100%	75%	50%	25%
	Weighting factor	0.2	0.5	0.15	0.15

Interpretation
Deleted
Remarks
IACS deleted the UI in Nov. 2019.

3.53 Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		NOx Technical Code 2008, Chapter 4, Paragraphs 4.1.1 to 4.1.4					
IACS UI Number	**MPC53**	**UI** version	**July ,2004/ Rev.1,Nov., 2019**	Date of implementation	**19.05.2005/ Rev.1,July 1,2020**	Means of implement ation	

Conventions/Codes Requirements

NOx Technical Code 2008, Chapter 4, Paragraphs 4.1.1 to 4.1.4:

Section 4.1 General

4.1.1 To avoid certification testing of every engine for compliance with the NO_x emission limits, one of two approval concepts may be adopted, namely the engine family or the engine group concept.

4.1.2 The engine family concept may be applied to any series-produced engines which, through their design, are proven to have similar NO_x emission characteristics, are used as produced, and, during installation on board, require no adjustments or modifications which could adversely affect the NO_x emissions.

4.1.3 The engine group concept may be applied to a smaller series of engines produced for similar engine application and which require minor adjustments and modifications during installation or in service on board.

4.1.4 Initially the engine manufacturer may, at its discretion, determine whether engines should be covered by the engine family or engine group concept. In general, the type of application shall be based on whether the engines will be modified, and to what extent, after testing on a test bed.

Interpretation

The Engine Family concept shall be interpreted as applicable to mass produced small bore engines (generally high speed) that, for design purposes, include adjustable features but are generally dispatched with the intent that no "installation" or "in service" setting modifications are undertaken.

For marine engine applications the Engine Group concept shall be interpreted as applicable to any engine intended for main propulsion or auxiliary duties, where adjustment and modification following installation (and through the service life of the engine) is considered routine.

For application of the Engine Family or Engine Group concepts it shall be interpreted that engines within an Engine Family may have different cylinder bore and stroke dimensions (within the defined limits - see paragraph 4.3.8.2.3) and that engines within an Engine Group concept effectively have identical bore and stroke dimensions as a result of only one of the parameters defined under paragraph 4.4.6.2 being permitted to vary within the defined engine group.

An Onboard NO_x Verification Procedure shall be included within the Technical Files of all engines irrespective of whether they are included within an Engine Family or Engine Group.

Remarks

Rev.1 of this UI is to be uniformly implemented by IACS Societies when an application for certification of an engine is dated on or after 1 July 2020

3.54 Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		NOx Technical Code 2008, Chapter 4, Paragraphs 4.3.1 and 4.4.1					
IACS UI Number	**MPC54**	**UI** version	**July ,2004/ Rev.1,Nov., 2019**	Date of implemen tation	**19.05.2005/ Rev.1,July 1,2020**	Means of implement ation	

Conventions/Codes Requirements

NOx Technical Code 2008, Chapter 4, Paragraphs 4.3.1 and 4.4.1:

4.3.1: The Engine Family concept provides the possibility of reducing the number of engines which must be submitted for approval testing, while providing safeguards that all engines within the Engine Family comply with the approval requirements. In the Engine Family concept, engines with similar emission characteristics and design are represented by a Parent Family.

4.4.1 Engine Group engines:

normally require adjustment or modification to suit the on-board operating conditions but these adjustments or modifications shall not result in NO_x emissions exceeding the limits in regulation 13.

Interpretation

For application of these sections it shall be interpreted that where the measured performance of a Member Engine to

an Engine Family or Engine Group is fundamental to the verification that that member engine is operating within the parameters defined by the approved engine family or group, then that performance data (emissions, engine performance, ambient conditions) and other necessary data shall have been obtained in accordance with NO_x Technical Code Chapter 5.
Remarks

3.55 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraphs **4.3.7, 4.3.10, 4.4.8** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC55**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	

Conventions/Codes Requirements

Chapter 4.3.7:
Before granting an engine family approval, the Administration shall take the necessary measures to verify that adequate arrangements have been made to ensure effective control of the conformity of production.
Chapter 4.3.10.6:
Before granting an engine family approval for new, serially produced engines, the Administration shall take the necessary measures to verify that adequate arrangements have been made to ensure effective control of the conformity of production. This requirement may not be necessary for families established for the purpose of engine modifications on board after an EIAPP Certificate has been issued.
Chapter 4.4.8:
The requirements of 4.3.10 apply mutatis mutandis to this section.

Interpretation

Deleted

Remarks

IACS deleted the UI in Nov. 2019.

3.56 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraphs **4.3.9.1, 4.4.7** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC56**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	

Conventions/Codes Requirements

Chapter 4.3.9.1:
The method of selection of the parent engine for NO_x measurement shall be agreed to and approved by the Administration. The method shall be based upon selecting an engine which incorporates engine features and characteristics which, from experience, are known to produce the highest NOx emissions expressed in grams per kilowatt hour (g/kW h). This requires detailed knowledge of the engines within the family. Under certain circumstances, the Administration may conclude that the worst case NO_x emission rate of the family can best be characterised by testing a second engine. Thus, the Administration may select an additional engine for test based upon features which indicate that it may have the highest NO_x emission levels of the engines within that family. If engines within the family incorporate other variable features which could be considered to affect NO_x emissions, these features must also be identified and taken into account in the selection of the parent engine.
Chapter 4.4.7:
The selection of the parent engine shall be in accordance with the criteria in 4.3.9, as applicable. It is not always possible to select a parent engine from small-volume production engines in the same way as the mass-produced engines (engine family). The first engine ordered may be registered as the parent engine. The method used to select the parent

engine to represent the engine group shall be agreed to and approved by the Administration.
Interpretation
Deleted
Remarks
IACS deleted the UI in Nov. 2019.

3.57 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **4.3.9.2** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC57**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
Chapter 4.3.9.2: The following criteria for selecting the parent engine for NOx emission control shall be considered, but the selection process must take into account the combination of basic characteristics in the engine specification: .1 main selection criteria – higher fuel delivery rate .2 supplementary selection criteria – higher mean effective pressure – higher maximum cylinder peak pressure – higher charge air/ignition pressure ratio – d_p/d_α, the lower slope of the combustion curve – higher charge air pressure – higher charge air temperature							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.58 Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		NOx Technical Code 2008, Chapter 4, Paragraphs 4.3.10.2 and 4.3.10.3					
IACS UI Number	**MPC58**	**UI** version	**July ,2004/ Rev.1,Nov., 2019**	Date of implementation	**19.05.2005/ Rev.1,July 1,2020**	Means of implementation	
Conventions/Codes Requirements							
NOx Technical Code 2008, Chapter 4, Paragraphs 4.3.10.2 and 4.3.10.3： 4.3.10.2: A pre-certificate, or EIAPP Certificate, should be issued for a Member Engine of an Engine Family in accordance with this Code which certifies that the Parent Engine meets the applicable NOx limit specified in regulation 13. Where Member Engine pre-certification requires the measurement of some performance values, the calibration of the equipment used for those measurements shall be in accordance with the requirements of 1.3 of appendix 4 of this Code. 4.3.10.3: When the Parent Engine of an Engine Family is tested and gaseous emissions measured under the most adverse conditions specified within this Code and confirmed as complying with the applicable maximum allowable emission limits as given in 3.1, the results of the test and NOx measurement shall be recorded in the EIAPP Certificate issued for the particular Parent Engine and for all Member Engines of the Engine Family.							
Interpretation							
For application of these sections it shall be interpreted that the determined Parent Engine NO_x emission value shall be							

given under 1.9.6 of the Supplement to EIAPP Certificate for Parent Engine(s) and all subsequent Member Engines within the Engine Family or Engine Group as established from that Parent Engine test.
Remarks

3.59 Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		NOx Technical Code 2008, Chapter 4, Paragraphs 4.4.6.2 and 4.4.6.3					
IACS UI Number	**MPC59**	**UI** version	**July ,2004/ Rev.1,Nov., 2019**	Date of implementation	**19.05.2005/ Rev.1,July 1,2020**	Means of implementation	

Conventions/Codes Requirements

NO_X Technical Code 2008, Chapter 4, Paragraphs 4.4.6.2 and 4.4.6.3：

4.4.6.2

The following parameters and specifications shall be common to engines within an Engine Group:

.1 bore and stroke dimensions,

.2 method and design features of pressure charging and exhaust gas system,

- constant pressure
- pulsating system,

.3 method of charge air cooling system,

- with/without charge air cooler,

.4 design features of the combustion chamber that effect NO_x emission,

.5 design features of the fuel injection system, plunger and injection cam or gas valve which may profile basic characteristics that effect NO_x emission, and

.6 rated power at rated speed. The permitted range of engine power (kW/cylinder) and/or rated speed are to be declared by the manufacturer and approved by the Administration.

4.4.6.3

Generally, if the criteria required by 4.4.6.2 are not common to all engines within a prospective Engine Group, then those engines may not be considered as an Engine Group. However, an Engine Group may be accepted if only one of those criteria is not common for all of the engines within a prospective Engine Group.

Interpretation

For application of these sections it shall be interpreted that rated power at rated speed is one parameter. Derating and uprating, in terms of power per cylinder and rated speed, outside the approved power or speed ranges shall be interpreted as deviations according to chapter 4.4.6.3.

Remarks

3.60 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **5.2.2.2** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC60**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	

Conventions/Codes Requirements

Chapter 5.2.2.2:

All engines when equipped as intended for installation on board ships must be capable of operating within the allowable NO_x emission levels of regulation 13 (3) of Annex VI at an ambient seawater temperature of 25℃.

Interpretation

Deleted

Remarks

IACS deleted the UI in Nov. 2019.

3.61 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **5.2.5** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC61**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
The test engine shall be equipped with an exhaust system which provides an exhaust backpressure as specified by the manufacturer at the engine operating conditions and which results in the maximum declared power in the respective engine application.							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.62 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **5.4.2** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC62**	**UI** version	**July ,2004/ Rev. 1,29.03.2006**	Date of implementation	**19.05.2005/ Rev.1,01.07.2006**	Means of implementation	
Conventions/Codes Requirements							
Chapter 5.4.2: Other systems or analysers may, subject to the approval of the Administration, be accepted if they yield equivalent results to that of the equipment referenced in 5.4.1.							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.63 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **5.5.3** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC63**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
Chapter 5.5.3: This method involves exhaust gas mass flow calculation from fuel consumption and exhaust gas concentrations using the carbon and oxygen balance method as specified in Appendix 6 of this Code.							
Interpretation							
Deleted							

Remarks
IACS deleted the UI in Nov. 2019.

3.64 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **5.6** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC64**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
Chapter 5.6: The calibration of all measuring instruments shall be traceable to recognised international standards and shall comply with the requirements as set out in 1.3.1 of Appendix 4 of this Code.							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.65 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **5.9.1.2** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC65**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
Chapter 5.9.1.2: The settings of inlet restriction and exhaust backpressure shall be adjusted to the upper limits as specified by the manufacturer in accordance with 5.2.4 and 5.2.5, respectively.							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.66 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **5.9.2.1** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC66**	**UI** version	**July ,2004/ Rev. 1,29.03.2006**	Date of implementation	**19.05.2005/ Rev.1,01.07.2006**	Means of implementation	
Conventions/Codes Requirements							
Chapter 5.9.2.1: An analytical system for the determination of the gaseous emissions (CO, CO_2, HC, NO_x, O_2) in the raw exhaust gas shall be based on the use of the following analysers: .1 HFID analyser for the measurement of hydrocarbons; .2 NDIR analyser for the measurement of carbon monoxide and carbon dioxide; .3 HCLD or equivalent analyser for the measurement of nitrogen oxides; and .4 PMD, ECS or ZRDO for the measurement of oxygen.							
Interpretation							

Deleted
Remarks
IACS deleted the UI in Nov. 2019.

3.67 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **5.9.2.3** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC67**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
Chapter 5.9.2.3: Specifications and calibration of these analysers shall be as set out in Appendices 3 and 4 of this Code, respectively.							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.68 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **5.9.3.1** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC68**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
Chapter 5.9.3.1: The sampling probes for the gaseous emissions shall be fitted at least 0.5 m or 3 times the diameter of the exhaust pipe – whichever is the larger – upstream of the exit of the exhaust gas system, as far as practicable, but sufficiently close to the engine so as to ensure an exhaust gas temperature of at least 343 K (70℃) at the probe.							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.69 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **5.9.3.2** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC69**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
Chapter 5.9.3.2: In the case of a multi-cylinder engine with a branched exhaust manifold, the inlet of the probe shall be located sufficiently far downstream so as to ensure that the sample is representative of the average exhaust emission from all cylinders. In multi-cylinder engines having distinct groups of manifolds, such as in a "Vee" engine configuration, it is permissible to acquire a sample from each group individually and calculate an average exhaust emission. Other methods which have been shown to correlate with the above methods may be used. For exhaust emission calculation, the total exhaust mass flow must be used.							
Interpretation							
Deleted							

Remarks
IACS deleted the UI in Nov. 2019.

3.70 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **5.9.6.1** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC70**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
Chapter 5.9 Test Run 5.9.6 Test sequence 5.9.6.1 After the procedures in 5.9.1 to 5.9.5 have been completed, the test sequence shall be started. The engine shall be operated in each mode in accordance with the appropriate test cycles defined in 3.2.							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.71 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **5.9.6.2** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC71**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
Chapter 5.9 Test Run 5.9.6 Test sequence 5.9.6.2 During each mode of the test cycle after the initial transition period, the specified speed shall be held within ± 1% of rated speed or 3 min^{-1}, whichever is greater, except for low idle, which shall be within the tolerances declared by the manufacturer. The specific torque shall be held so that the average, over the period during which the measurements are to be taken, is within 2% of the maximum torque at the test speed.							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.72 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **5.9.7** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC72**	**UI** version	**July ,2004/ Rev.1,29.03.2006**	Date of implement ation	**19.05.2005/ Rev.1,01.07.2006**	Means of implement ation	
Conventions/Codes Requirements							
Chapter 5.9.7 Analyser response The output of the analysers shall be recorded, both during the test and during all response checks (zero and span), on a strip chart recorder or measured with an equivalent data acquisition system with the exhaust gas flowing through							

the analysers at least during the last ten minutes of each mode.
Interpretation
Deleted
Remarks
IACS deleted the UI in Nov. 2019.

3.73 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **5.9.9** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC73**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	
Conventions/Codes Requirements							
Chapter 5.9.9 Re-checking the analysers After the emission test, the calibration of the analysers shall be re-checked, using a zero gas and the same span gas as used prior to the measurements. The test shall be considered acceptable if the difference between the two calibration results is less than 2%.							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.74 Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		NOx Technical Code 2008, Chapter 5, Paragraph 5.10.1					
IACS UI Number	**MPC74**	**UI** version	**July ,2004/ Rev.1, Nov., 2019**	Date of implementation	**19.05.2005/ Rev.1,July 1,2020**	Means of implementation	
Conventions/Codes Requirements							
Paragraph 5.10.1, Chapter 5 of the NOx Technical Code (NTC) 2008 reads: 5.10.1 For every Individual Engine or Parent Engine tested to establish an Engine Family or Engine Group, the engine manufacturer shall prepare a test report which shall contain the necessary data to fully define the engine performance and enable calculation of the gaseous emissions including the data as set out in section 1 of appendix 5 of this Code. The original of the test report shall be maintained on file with the engine manufacturer and a certified true copy shall be maintained on file by the Administration.							
Interpretation							
The" necessary data to fully define the engine performance and enable calculation of the gaseous emissions" shall be incorporated, in accordance with 5.12, from the raw data units to the cycle weighed NO_x emission value in g/kWh. The data set given under Appendix 5 should not be considered definitive and any other test data (i.e. engine performance or setting data, description of control devices, etc.) relevant to the approval of a specific engine design and/or on-board NO_x verification procedures must also be given. For the engine fitted with SCR, under scheme A, the parameters listed in sub-paragraphs of paragraph 5.2.2 of IMO Resolution MEPC. 291(71) shall be measured and recorded in the engine test report. Under scheme B, the exhaust gas temperature at the intended inlet of the SCR chamber shall be determined and recorded in the test report. For Dual fuel engines, the ratio of liquid-to-gas, Gas fuel temperature and its							

measurement point position shall be recorded during the testing.
With reference to Appendix 5 of the Code it shall be further interpreted that:
(a) The term "Deviation" as given under "Sheet 3/5, Measurement equipment, Calibration" refers to the deviation of the analyser calibration and not the deviation of the span gas concentration.
(b) The Fuel properties as given under "Sheet 3/5, Fuel characteristics, Fuel properties" shall, include sufficient data to justify the ISO 8217:2017 grade (i.e. DMA, DMB etc.) as given on EIAPP Certificate Supplement1.9.4 by considering other additional analysis results for the fuel oil characteristics, i.e. Cetane index (ISO 4264:2018), carbon residue (ISO 10370:2014).

Remarks

3.75 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **5.11** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC75**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	

Conventions/Codes Requirements

For the evaluation of the gaseous emissions, the chart reading of the last 60 seconds of each mode shall be averaged, and the average concentrations (conc) of CO, CO_2, HC, NO_x, and O_2 during each mode shall be determined from the average chart readings and the corresponding calibration data.

Interpretation

Deleted

Remarks

IACS deleted the UI in Nov. 2019.

3.76 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **5.12.4.1** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC76**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	

Conventions/Codes Requirements

Chapter 5.12.4 Calculation of the emission mass flow rates

5.12.4.1 The emission mass flow rates for each mode shall be calculated as follows (for the raw exhaust gas):

Gas mass = u • conc • G_{EXHW} (15)

or

Gas mass = v • conc • V_{EXHD} (16)

or

Gas mass = w • conc • V_{EXHW} (17)

Interpretation

Deleted

Remarks
IACS deleted the UI in Nov. 2019.

3.77 Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		NOx Technical Code 2008, Chapter 6, Paragraph 6.2.1.2					
IACS UI Number	**MPC77**	**UI** version	**July ,2004/ Rev.1, Nov., 2019**	Date of implementation	**19.05.2005/ Rev.1,July 1,2020**	Means of implementation	

Conventions/Codes Requirements

Paragraph 6.2.1.2, Chapter 6 of the NO_x Technical Code (NTC) 2008 reads:

6.2.1.2

When a marine diesel engine is designed to run within the applicable NOx emission limit, it is most likely that within the marine life of the engine, the NOx emission limit may be adhered to. The applicable NOx emission limit may, however, be contravened by adjustments or modification to the engine. Therefore, an Engine Parameter Check method shall be used to verify whether the engine is still within the applicable NOx emission limit.

Interpretation

It shall be interpreted that a survey would additionally be required where the component or adjustable feature change was outside that already approved for the Engine Group or Engine Family and as given in the engine's Technical File. In such cases the change would need to be documented in accordance with 6.2.2.7

It shall be further interpreted that, in the case of the Engine Parameter Check Method, the change is to be such that the Engine Group/Family Parent Engine emission value was not exceeded.

Remarks

3.78 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **6.2.3.4.2** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC78**	**UI** version	**July ,2004/ Rev.1,29.03.2006**	Date of implementation	**19.05.2005/ Rev.1,01.07.2006**	Means of implementation	

Conventions/Codes Requirements

Chapter 6.2.3.4 List of NO_x–influencing parameters sometimes modified on board

6.2.3.4.2 The actual technical file of an engine may, based on the recommendations of the engine manufacturer and the approval of the Administration, include less components and/or parameters than discussed above depending on the particular engine and the specific design.

Interpretation

Deleted

Remarks

IACS deleted the UI in Nov. 2019.

3.79 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **6.2.3.5** of Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines					
IACS UI Number	**MPC79**	**UI** version	**July ,2004/ Rev.1,29.03.2006**	Date of implement	**19.05.2005/ Rev.1,01.07.2006**	Means of implement	

				ation		ation	

Conventions/Codes Requirements

Chapter 6.2.3.5 Checklist for the engine parameter check method

6.2.3.5 For some parameters, different survey possibilities exist. Approved by the Administration, the ship operator, supported by the engine manufacturer, may choose what method is applicable. Any one of, or a combination of, the methods listed in Appendix 7 of this Code may be sufficient to show compliance.

Interpretation

Deleted

Remarks

IACS deleted the UI in Nov. 2019.

3.80 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Appendix **4** "Calibration of the analytical instruments" – Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines (Refer to Chapter **5** of the Code)					
IACS UI Number	**MPC80**	**UI** version	**July ,2004/ Rev.1,29.03.2006**	Date of implement ation	**19.05.2005/ Rev.1,01.07.2006**	Means of implement ation	

Conventions/Codes Requirements

1 Introduction

1.1 Each analyser used for the measurement of an engine's parameters shall be calibrated as often as necessary in accordance with the requirements of this Appendix.

Tables 1, 2 3 & 4 right hand column headers:

Calibration intervals (month).

Interpretation

Deleted

Remarks

IACS deleted the UI in Nov. 2019.

3.81 Resolution 2 of the 1997 MARPOL Conference: Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		Paragraph **8.1** of Appendix **4** "Calibration of the analytical instruments" – Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines (Refer to Chapter **5** of the Code)					
IACS UI Number	**MPC81**	**UI** version	**July ,2004**	Date of implementation	**19.05.2005**	Means of implementation	

Conventions/Codes Requirements

8.1 CO analyser interference check:

Water and CO_2 may interfere with the CO analyser performance. Therefore, a CO_2 span gas having a concentration of 80 to 100% of full scale of the maximum operating range used during testing shall be bubbled through water at room temperature and the analyser response recorded.

The analyser shall not be more than 1% of full scale for ranges greater than or equal to 300 ppm or more than 3 ppm for ranges below 300 ppm.

Interpretation

Deleted

Remarks
IACS deleted the UI in Nov. 2019.

3.82 Annex VI to MARPOL 73/78

Conventions (Amend.), Reg.		Regulation **14** of Annex **VI** to **MARPOL 73/78**					
IACS UI Number	**MPC82**	**UI** version	**Sept.,2005**	Date of implementation	**Sept.,2005**	Means of implementation	

Conventions/Codes Requirements
Regulation 14 Sulphur Oxides (SO_x) Regulation 14(1) (entered into force on 19 May 2005) reads: The sulphur content of any fuel oil used on board ships shall not exceed 4.5 % m/m. Regulation 14(4)(a) (which enters into force on 19 May 2006) reads: The sulphur content of fuel oil used on board ships in a SO_x emission control area does not exceed 1.5 % m/m.
Interpretation
Deleted
Remarks
Deleted by IACS in Nov.,2013.

3. 83 Annex VI to MARPOL 73/78

Conventions (Amend.), Reg.		Regulation **18** of Annex **VI** to **MARPOL 73/78**					
IACS UI Number	**MPC83**	**UI** version	**Sept.,2005**	Date of implementation	**Sept.,2005**	Means of implementation	

Conventions/Codes Requirements
For each ship subject to Regulations 5 and 6 of this Annex, details of fuel oil for combustion purposes delivered to and used on board shall be recorded by means of a bunker delivery note which shall contain at least the information specified in Appendix V to this Annex.
Interpretation
Deleted
Remarks
Deleted by IACS in Nov.,2013.

3. 84 Annex VI to MARPOL 73/78

Conventions (Amend.), Reg.		Regulation **16(9)** of Annex **VI** to **MARPOL 73/78**					
IACS UI Number	**MPC84**	**UI** version	**Nov., 2005**	Date of implementation	**03.02.2006**	Means of implementation	

Conventions/Codes Requirements
Monitoring of combustion flue gas outlet temperature shall be required at all times and waste shall not be fed into a continuous-feed shipboard incinerator when the temperature is below the minimum allowed temperature of 850 ℃. For batch-loaded shipboard incinerators, the unit shall be designed so that the temperature in the combustion chamber shall reach 600 ℃ within five minutes after start-up.
Interpretation
Deleted

Remarks
Deleted by IACS in Nov.,2013.

3.85 Annex I of MARPOL 73/78

Conventions (Amend.), Reg.		Regulation **22(5)** of Annex **I** to **MARPOL 73/78**, as amended by **Resolution MEPC.117(52)**					
IACS UI Number	**MPC 85**	**UI** version	**Jan.,2006/ Rev.1,Jul.,2006/ Rev.2,Jan.,2007/ Rev.3,Jan.,2008/ Rev.4,Sep.9,2008**	Date of implementation	**Jan.1,2007(Rev.1) Jan.1,2007 (Rev.2) Jan.,2008(Rev.3) Implemented as from the adoption date, but not later than Sep.9,2009(Rev.4)**	Means of implementation	

Conventions/Codes Requirements

Regulation 22 (entering into force on 1 January 2007) reads:

" 1. This regulation applies to oil tankers of 5,000 tonnes deadweight and above constructed on or after 1 January 2007.

2. The pump-room shall be provided with a double bottom such that at any cross-section the depth of each double bottom tank or space shall be such that the distance h between the bottom of the pump-room and the ship's base line measured at right angles to the ship's base line is not less than specified below:

$h = B/15$(m) or $h = 2$ m, whichever is the lesser.

The minimum value of $h = 1$ m.

3. In case of pump rooms whose bottom plate is located above the base line by at least the minimum height required in paragraph 2 above (e.g. gondola stern designs), there will be no need for a double bottom construction in way of the pump-room.

4. Ballast pumps shall be provided with suitable arrangements to ensure efficient suction from double bottom tanks.

5. Notwithstanding the provisions of paragraphs 2 and 3 above, where the flooding of the pump room would not render the ballast or cargo pumping system inoperative, a double bottom need not be fitted.".

Interpretation

1. The term "pump-room" means a cargo pump room. Ballast piping is permitted to be located within the pump-room double bottom provided any damage to that piping does not render the ship's pumps located in the "pump room" ineffective.

2. The double bottom protecting the "pump-room" can be a void tank, a ballast tank or, unless prohibited by other regulations, a fuel oil tank.

3. Bilge wells may be accepted within the double bottom provided that such wells are as small as practicable and the distance between the well bottom and the ship's base line measured at right angles to the ship's base line is not less than 0.5h.

4. Where a portion of the pump-room is located below the minimum height required in regulation 22.2, then only that portion of the pump room is required to be a double bottom.

Technical Background

Rev. 3:

In accordance with the Regulation I/22, in particular I/22(3), paragraph 3 of the UI Rev.2 is revised to provide for measurement of the double bottom height below a well from the ship's baseline rather than from its bottom shell plating.

Additionally, a new paragraph 4 is developed with consideration of the arrangement where only a portion of the pump bottom is not only above the required height but above the base line under the Regulation I/22(3) so as to apply gondola sterns and transverse deadrise of the ship's bottom plating.

Rev.4: Subsequently, taking into account the outcome of MEPC 57 (MEPC57/21/Corr.2), the UI MPC85 is further revised by deleting the words "*protected by*" in paragraph 4.
Remarks
This UI is to be uniformly implemented by IACS Members and Associates for ships subject to this regulation.

3.86 Annex IV of MARPOL 73/78

Conventions (Amend.), Reg.		Regulation **10.1** of Annex **IV** to **MARPOL 73/78**, as amended by **Resolution MEPC.115(51)**					
IACS UI Number	**MPC86**	**UI** version	**Jun.,2006/ Corr.1, Oct.,2007**	Date of implementation	**Jan.1,2007**	Means of implementation	
Conventions/Codes Requirements							
Regulation 10.1 as amended by Resolution MEPC.115(51) reads as follows: "To enable pipes of reception facilities to be connected with the ship's discharge pipeline, both lines shall be fitted with a standard discharge connection in accordance with the following table……"							
Interpretation							
All ships subject to Annex IV, irrespective of their size and of the presence of a sewage treatment plant or sewage holding tank, shall be provided with a pipeline and the relevant shore connection flange for discharging sewage to port sewage treatment facility.							
Technical Background							
A standard discharge connection is required to be provided to ensure there is a capability to discharge sewage ashore in cases when - a sewage treatment plant is not available due to malfunction or maintenance and discharge of sewage into the sea is not possible or it is forbidden by local law, or - a holding tank needs to be emptied for tank cleaning and/or inspection purposes, or - in the event of a prolonged stay in port where the capacity of the holding tank is exceeded.							
Remarks							
Note: 1 This UI is to be uniformly implemented by IACS Societies for ships contracted for construction on or after 1 January 2007. 2 The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.							

3.87 Annex I to MARPOL 73/78

Conventions (Amend.), Reg.		Regulation **12A** of Annex **I** to **MARPOL 73/78** as amended by **Resolution MEPC.141 (54)**					
IACS UI Number	**MPC87**	**UI** version	**Jan. 2007**	Date of implementation	**01.08.2010**	Means of implementation	Delivery date as defined in Annex I to MARPOL
Conventions/Codes Requirements							

Regulation 12A.9 reads:

"Lines of oil fuel piping located at a distance from the ship's bottom of less than *h*, as defined in paragraph 6, or from the ship's side less than *w*, as defined in paragraphs 7 and 8 shall be fitted with valves or similar closing devices within or immediately adjacent to the oil fuel tank. These valves shall be capable of being brought into operation from a readily accessible enclosed space the location of which is accessible from the navigation bridge or propulsion machinery control position without traversing exposed freeboard or superstructure decks.

The valves shall close in case of remote control system failure (fail in a closed position) and shall be kept closed at sea at any time when the tank contains oil fuel except that they may be opened during oil fuel transfer operations."

Regulation 12A.10 reads:

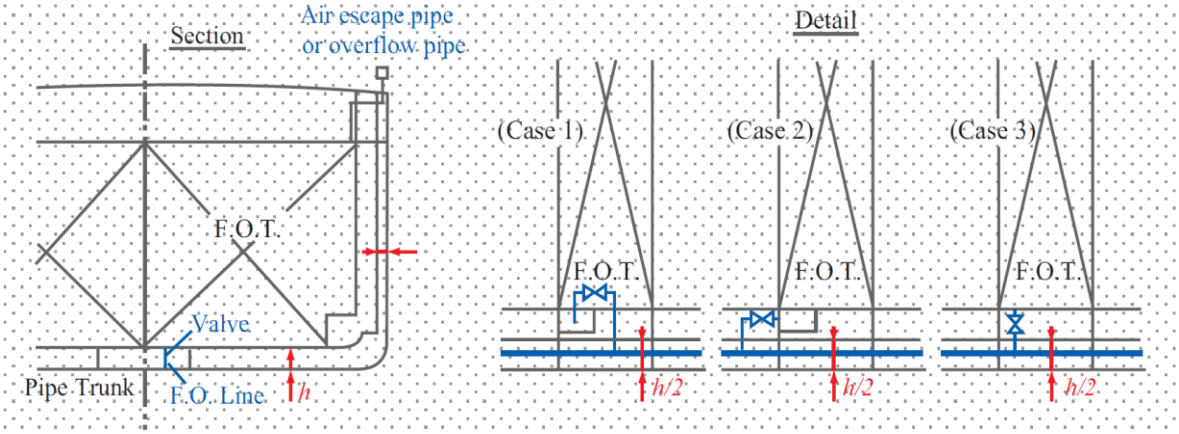
"Suction wells in oil fuel tanks may protrude into the double bottom below the boundary line defined by the distance *h* provided that such wells are as small as practicable and the distance between the well bottom and the bottom shell plating is not less than 0.5 *h*."

Interpretation

1. Valves for oil fuel tanks located in accordance with the provisions of paragraphs 6, 7 and 8 of MARPOL regulation I/12A may be treated in a manner similar to the treatment of suction wells as per MARPOL regulation I/12A.10 and therefore arranged at a distance from the ship's bottom of not less than *h/2* (see the figure below).

2. Valves for tanks which are permitted to be located at a distance from the ship's bottom or side at a distance less than *h* or *w*, respectively, in accordance with the accidental oil fuel outflow performance standard of MARPOL regulation I/12A.11 may be arranged at the distance less than *h* or *w*, respectively.

3. Fuel tank air escape pipes and overflow pipes are not considered as part of *"lines of fuel oil piping"* and therefore may be located at a distance from the ship's side of less than *w*.



Technical Background

MARPOL regulation I/12A.9 specifies that valves or similar closing devices shall be fitted within or immediately adjacent to the oil fuel tank. Where valves are not fitted within the oil fuel tank, they may be treated in a manner similar to the treatment of suction wells as per MARPOL regulation I/12A.10 and therefore arranged at a distance from the ship's bottom of not less than h/2.

In accordance with the accidental oil fuel outflow performance standard of MARPOL regulation I/12A.11, valves for tanks which are permitted to be located at a distance from the ship's bottom or side at a distance less than h or w, respectively, may be arranged at the distance less than h or w, respectively.

Experience shows that fuel tank air escape pipes and overflow pipes are not considered as part of 'lines of fuel oil piping" and therefore excluded from these requirements.

Remarks

3.88 Annex IV to MARPOL 73/78

Conventions (Amend.), Reg.		Regulation **9.1.1** of Annex **IV** to **MARPOL 73/78** -Sewage systems					
IACS UI Number	**MPC 88**	**UI** version	**Feb. 2007/ Rev. 1, Dec. 2015**	Date of implementation	**Jul.01, 2007/Jan. 1,2017**	Means of implementation	

Conventions/Codes Requirements

Regulation 9.1.1 reads:

1 Every ship which, in accordance with regulation 2, is required to comply with the provisions of this Annex shall be equipped with one of the following sewage systems:

.1 a sewage treatment plant which shall be of a type approved by the Administration, in compliance with the standards and test methods developed by the Organization*"…...

Operative paragraph 2.1 of resolution MEPC.227(64), which supersedes resolution MEPC.159(55), and paragraph 1.2.2 in the Annex thereto read:

2. INVITES governments to:

.1 implement the 2012 Guidelines and apply them on or after 1 January 2016;

1.2.2 The requirements of these Guidelines, with the exception of the requirements in section 4.2, will apply to sewage treatment plants installed on or after 1 January 2016 on:

.1 ships, other than passenger ships, in all areas; and

.2 passenger ships outside MARPOL Annex IV special areas.

Interpretation

Deleted

Technical Background

Remarks

This UI was deleted by IACS in Aug.,2018.

3.89 Annex I of MARPOL 73/78 Regulation 1 as amended by Resolution MEPC.117(52)

Conventions (Amend.), Reg.		Regulation **1** of Annex **I** to **MARPOL 73/78**, as amended by **Resolution MEPC.117(52)**					
IACS UI Number	**MPC90**	**UI** version	**Sep.,2007**	Date of implementation	**Oct.1,2007**	Means of implementation	

Conventions/Codes Requirements

Regulation 1.28.1 to 1.28.8, as amended by Resolution MEPC.117(52), reads:

"ship delivered on or before" dd/mm/yyyy "means a ship:

…….

in the absence of a building contract, the keel of which is laid or which is at a similar stage of construction on or before dd/mm/yyyy: or

…….”

Regulation 1.30, as amended by Resolution MEPC.117(52), reads:

“Constructed means a ship the keel of which is laid or which is at a similar stage of construction.”

Interpretation

"A similar stage of construction" means the stage at which:

(a) construction identifiable with a specific ship begins; and

(b) assembly of that ship has commenced comprising at least 50 tonnes or one per cent of the estimated mass of all structural material, whichever is less.

Technical Background

MARPOL Annex I and Annex IV contain the phrase "*similar stage of construction*" in the numerous definitions of "ship delivered" which is used to determine the application of regulations in these Annexes. The phrase "*similar stage of construction*" is not defined in Annex I and Annex IV, as it is defined in in MARPOL Annex II and Annex VI. To provide for consistency of MARPOL Annexes I and IV with MARPOL Annexes II and VI, the definition of "*similar stage of construction*" in MARPOL Annexes II and VI is extended to apply to MARPOL Annexes I and IV.

Remarks

3.90 Annex IV of MARPOL 73/78

Conventions (Amend.), Reg.		Regulation **1.1** of Annex **IV** to **MARPOL**					
IACS UI Number	**MPC91**	**UI** version	**Sep.,2007**	Date of implementation	**Oct.1,2007**	Means of implementation	

Conventions/Codes Requirements

Regulation 1.1 reads:

“For the purposes of the present Annex:

(1) New ship means a ship:

(a) for which the building contract is placed, or in the absence of a building contract, the keel of which is laid, or which is at a similar stage of construction, on or after the date of entry into force of this Annex;

…….”

Interpretation

"A similar stage of construction" means the stage at which:

(a) construction identifiable with a specific ship begins; and

(b) assembly of that ship has commenced comprising at least 50 tonnes or one per cent of the estimated mass of all structural material, whichever is less.
Technical Background
MARPOL Annex I and Annex IV contain the phrase "*similar stage of construction*" in the numerous definitions of "ship delivered" which is used to determine the application of regulations in these Annexes. The phrase "*similar stage of construction*" is not defined in Annex I and Annex IV, as it is defined in in MARPOL Annex II and Annex VI. To provide for consistency of MARPOL Annexes I and IV with MARPOL Annexes II and VI, the definition of "*similar stage of construction*" in MARPOL Annexes II and VI is extended to apply to MARPOL Annexes I and IV.
Remarks

3.91 Tonnage to be used when applying MARPOL Annex VI

Conventions (Amend.), Reg.		Annex **VI** to **MARPOL**					
IACS UI Number	**MPC92**	**UI** version	**Oct.,2007**	Date of implementation	**Jan.1,2008**	Means of implementation	Keel laying
Conventions/Codes Requirements							
Regulation 5 Surveys and Inspections *(1) Every ship of 400 gross tonnage and above and every fixed and floating drilling rig and other platforms shall be subject to the surveys specified below.* *(2) In the case of ships of less than 400 gross tonnage, the Administration may establish appropriate measures in order to ensure that the applicable provisions of this Annex are complied with.* ***Regulation 6 Issue of International Air Pollution Prevention Certificate*** *(1) An International Air Pollution Prevention Certificate shall be issued, after survey in accordance with the provisions of regulation 5 of this Annex, to:* *(a) any ship of 400 gross tonnage or above engaged in voyages to ports or offshore terminals under the jurisdiction of other Parties; and*							
Interpretation							
Deleted							
Technical Background							
Remarks							
This UI was deleted by IACS in Aug.,2018.							

3.92 MARPOL73/78 Annex I

Conventions (Amend.), Reg.		**Annex I of MARPOL 73/78 Regulation 23 Accidental oil outflow performance, as amended by Resolution MEPC.117(52)**					
IACS UI Number	**MPC93**	**UI** version	**2008.07/2016.4**	Date of implementation	**2009.04.01/2017.7.1**	Means of implementation	**Contracted for construction**
Conventions/Codes Requirements							
Regulation 23.7.3.2, as amended by Resolution MEPC.117(52) reads: *"The cargo level after damage shall be calculated as follows:*							

$h_c = \{(d_s + t_c - Z_1)(\rho_s) - (1000p)/g\}/\rho_n$"

where the overpressure *p* is defined as:

"p = if an inert gas system is fitted, the normal overpressure, in kilopascals, to be taken as not less than 5 kPa; if an inert gas system is not fitted, the overpressure may be taken as 0."

Interpretation

If an inert gas system is fitted, the normal overpressure, in KPa, is to be taken as 5 KPa

Technical Background

The "normal overpressure" is a vague expression which may be subject to interpretation.
The initial view on the definition was:
a) The pressure *p* is to be taken as the maximum static inert gas pressure that can be obtained by the inert gas fans or 5 kPa, whichever is the greatest. However, *p* need not to be higher than the maximum tank pressure corresponding to the P/V valve set-point.
b) It was noted that appendix 8 of the previous revision of Marpol Annex I says "normally 0.05 bar" (5 kPa) and that the new text specifies that the 5 kPa limit is a minimum.

The figure to be used is clear and it is not possible for the yard to choose a low (in-operable) operational pressure in order to reduce the number of bulkheads. Therefore a UI was developed based on the proposal. The text of the draft UI was editorially changed and subsequently further revised by consideration of the inert gas generator system having no inert gas blowers/fans on the discharge side of the scrubber.

The application statement of the draft UI is revised so that the UI is not retroactive to oil tankers that may have already been certified under a different interpretation of normal overpressure.

Remarks

1. This Unified Interpretation is to be applied by IACS Societies all Members and Associates on ships which are contracted for construction on or after 1 April 2009.
2. Revision 1 of this Unified Interpretation is to be applied by IACS Societies on ships which are contracted for construction on or after 1 July 2017.
3. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

3.93 Annex I of MARPOL 73/78

Conventions (Amend.), Reg.		Regulations **12A.6-8 & 11.8** of Annex **I** to **MARPOL** as amended by **Resolution MEPC.141 (54)** – Oil fuel tank protection					
IACS UI Number	**MPC94**	**UI** version	**Jul.,2008**	Date of implementation	**Apr.1,2009**	Means of implementation	

Conventions/Codes Requirements

Regulation 12A.6-8 and 11.8 as Amended by Resolution MEPC.141(54) reads:

6 For ships, other than self-elevating drilling units, having an aggregate oil fuel capacity of 600m3 and above, oil fuel tanks shall be located above the moulded line of the bottom shell plating nowhere less than the distance h as specified below:

h = *B*/20 m or,

h = 2.0 m, whichever is the lesser.

The minimum value of h = 0.76 m

In the turn of the bilge area and at locations without a clearly defined turn of the bilge, the oil fuel tank boundary line shall run parallel to the line of the midship flat bottom as shown in Figure 1.

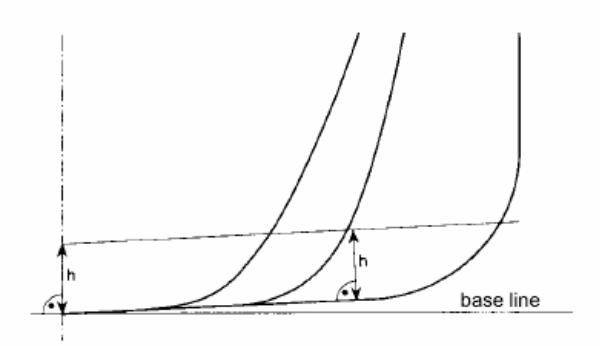


Figure 1 – Oil fuel tank boundary lines for the purpose of paragraph 6

7 For ships having an aggregate oil fuel capacity of 600 m^3 or more but less than 5,000 m^3, oil fuel tanks shall be located inboard of the moulded line of the side shell plating, nowhere less than the distance w which, as shown in Figure 2, is measured at any cross-section at right angles to the side shell, as specified below:

$w = 0.4 + 2.4\ C/20{,}000$ m or

The minimum value of $w = 1.0$ m, however for individual tanks with an oil fuel capacity of less than 500 m^3 the minimum value is 0.76 m.

8 For ships having an aggregate oil fuel capacity of 5,000 m^3 and over, oil fuel tanks shall be located inboard of the moulded line of the side shell plating, nowhere less than the distance w which, as shown in Figure 2, is measured at any cross-section at right angles to the side shell, as specified below:

$w = 0.5 + C/20{,}000$ m or

$w = 2.0$ m, whichever is the lesser.

The minimum value of $w = 1.0$ m

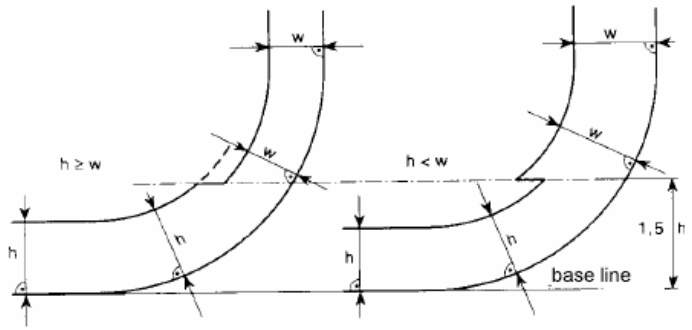


Figure 2 – Oil fuel tank boundary lines for the purpose of paragraphs 7 and 8

11、Alternatively to paragraphs 6 and either 7 or 8, ships shall comply with the accidental oil fuel outflow performance standard specified below:

….

.8 For the purpose of maintenance and inspection, any oil fuel tanks that do not border the outer shell plating shall be located no closer to the bottom shell plating than the minimum value of h in paragraph 6 and no closer to the side shell plating than the applicable minimum value of w in paragraph 7 or 8."

Interpretation

1. The distance "*h*" should be measured from the moulded line of the bottom shell plating at right angle to it (Reg.12A, Fig.1).

1.1 For vessels designed with a skeg, the skeg should not be considered as offering protection for the FO tanks. For the area within skeg's width the distance "*h*" should be measured perpendicular to a line parallel to the baseline at the intersection of the skeg and the moulded line of the bottom shell plating as indicated in Figure A.

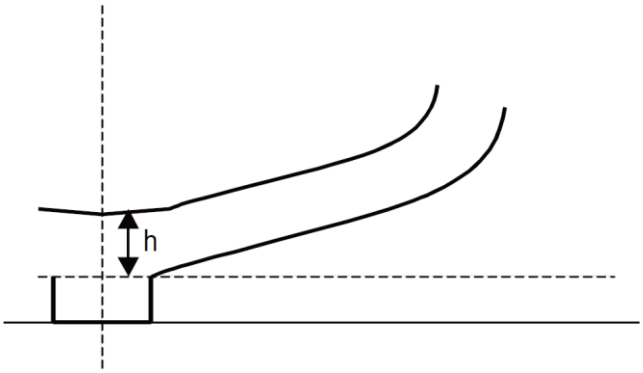


Figure A

1.2 For vessels designed with a permanent trim, the baseline should not be used as a reference point. The distance "*h*" should be measured perpendicular to the moulded line of the bottom shell plating at the relevant frames where fuel tanks are to be protected.

2. For vessels designed with deadrising bottom, the distance "1.5*h*" should be measured from the moulded line of the bottom shell plating but at right angle to the baseline, as indicated in Figure B.

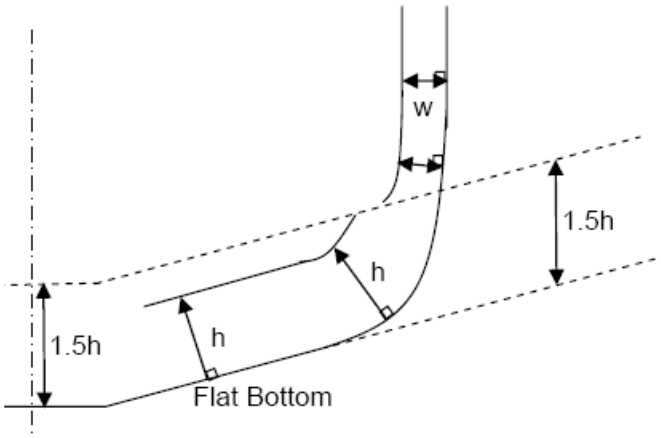


Figure B

3. Paragraphs 1 and 2, above also apply to the reference to the distance "h" in Regulation 12A-11.8.

Technical Background

1. Scope and objective

A class society has received questions from ship designers on how to apply the *h* measured from the baseline shown in Fig. 2 of MARPOL Annex I Reg. 12A, when the vessel has skeg or when the vessel is designed with permanent trim. It became apparent that this definition is directly decisive for the design of the ship and a unified interpretation needs to be developed.

2. Points of discussion

1) Enclosed is a drawing of a vessel where the baseline is partly below, partly inside the vessel. This designer has shown two different interpretations, one including the skeg (stb), one not including the skeg (port). After a panel discussion, it was agreed that the skeg should not be included.

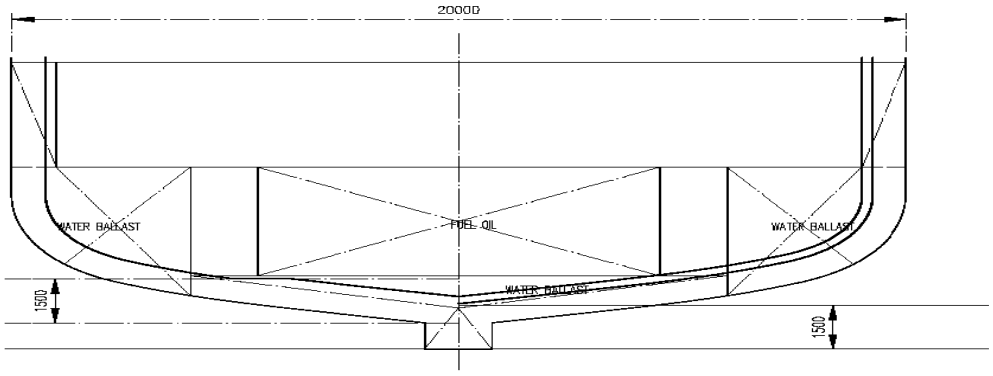


Fig. 1

2) The second matter is the term "baseline" used on Figure 1 and Figure 2 of MARPOL I. For vessels designed e.g. for a permanent aft trim, see enclosed fig.2 (vessel w aft trim.pdf). the baseline does not follow the moulded line, and is found not to be correct as a reference point. It was agreed that "*h*" should be measured from the bottom of the shell plating and not from the baseline.

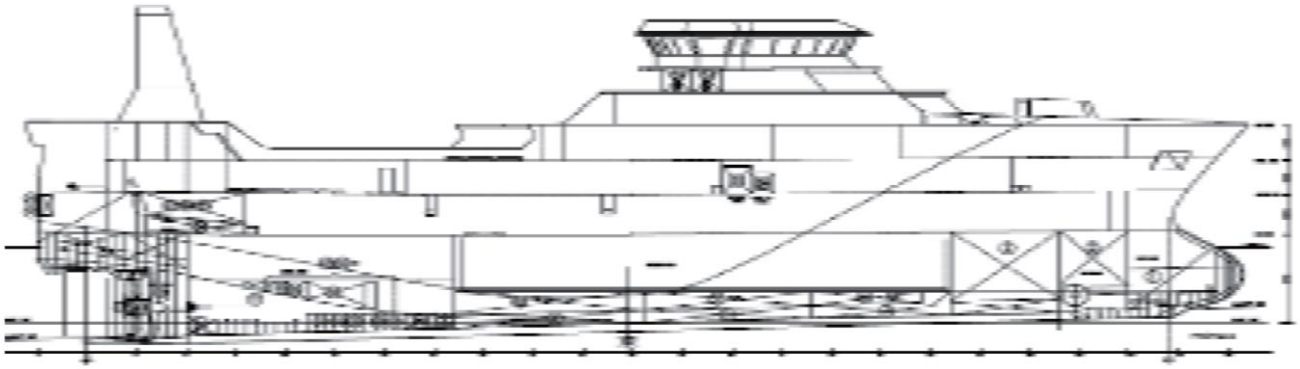


Fig.2

Remarks

Note:
This Unified Interpretation is to be applied by all Members and Associates on ships subject to MARPOL I, regulation 12A, as amended by Resolution MEPC.141(54), for which the building contract is placed on or after 1 April 2009.

3.94 Measurement of Distances

Conventions (Amend.), Reg.		**IMO instruments (e.g., ICLL, SOLAS and MARPOL Conventions, the IBC Code and the IGC Code, etc.)**					
IACS UI Number	**MPC95**	**UI** version	**Aug.,2008**	Date of implementation	**Apr.1,2009**	Means of implementation	

Conventions/Codes Requirements

Several IMO instruments (e.g., ICLL, SOLAS and MARPOL Conventions, the IBC Code and the IGC Code, etc.) require distances to be measured such as tank length, height, width, ship (or subdivision or waterline) length, etc..

Interpretation

Unless explicitly stipulated otherwise in the text of the regulations in SOLAS, Load Line and MARPOL Conventions and any of their mandatory Codes, distances are to be measured by using moulded dimensions.

Technical Background

Remarks

3.95 Initial Statutory Surveys at New Construction

Conventions (Amend.), Reg.		MARPOL Convention					
IACS UI Number	**MPC96**	**UI** version	**Apr.,2009/ Corr.1,Jul.,2010/ Rev.1,Feb., 2014/ Rev.2,Dec., 2014**	Date of implementation	**Jul.1,2010/ Rev.1,Jul.1, 2014/ Rev.2,Jul.1, 2015**	Means of implementation	Contracted for construction
Conventions/Codes Requirements and Interpretations							
Deleted							
Technical Background							
Remarks							
IACS deleted the UI in June 2016.							

3.96 Volatile Organic Compounds (VOCs) Management Plan

Conventions (Amend.), Reg.		Regulations 15.6 & 15.7 of **Annex VI to MARPOL**					
IACS UI Number	**MPC97**	**UI** version	**Jul. 2010**	Date of implementation	**Aug.1, 2010**	Means of implementation	**All applicable tankers carrying crude oil**
Conventions/Codes Requirements							

MARPOL VI, Regulation 15.6 and 15.7

6 A tanker carrying crude oil shall have on board and implement a VOC Management Plan approved by the Administration. Such a plan shall be prepared taking into account the guidelines developed by the Organization. The plan shall be specific to each ship and shall at least:

.1 provide written procedures for minimizing VOC emissions during the loading, sea passage and discharge of cargo;

.2 give consideration to the additional VOC generated by crude oil washing;

.3 identify a person responsible for implementing the plan; and

.4 for ships on international voyages, be written in the working language of the master and officers and, if the working language of the master and officers is not English, French, or Spanish, include a translation into one of these languages.

7 This regulation shall also apply to gas carriers only if the type of loading and containment systems allow safe retention of non-methane VOCs on board or their safe return ashore.

Interpretation
The requirement for a VOC Management Plan applies only to a tanker carrying crude oil.

Technical Background
There were mixed views from Statutory Panel Members with regard to MARPOL VI, regulations 15.6 and 15.7. Some members thought the requirement for a VOC Management Plan applies only to a tanker carrying crude oil while others thought it may also apply to gas carriers based on reading of 15.7. Having considered the clarification of the regulation above at IMO MEPC 58 (paragraphs 15 and 16 of MEPC 58/WP.9): the requirement for a VOC Management Plan applies only to a tanker carrying crude oil, the Panel concluded that it would advantageous to reflect the decision contained in MEPC 58/WP.9 in a formal IACS Unified Interpretation.
Remarks
1. Formalizes the clarification contained in MEPC 58/WP.9 as stated in paragraphs 15 and 16 on the scope of application of MARPOL Annex VI, regulations 15.6 and 15.7 concerning the VOC Management Plan. The requirement for a VOC Management Plan applies only to a tanker carrying crude oil, not to gas carriers. 2. This interpretation was circulated by IMO in 26 October 2010 by MEPC.1/Circ.735.

3.97 "Time of the Replacement or Addition" for the Applicable Tier Standard For the Supplement to the IAPP Certificate

Conventions (Amend.), Reg.		**MARPOL Annex VI，Reg 13.2.2**					
IACS UI Number	**MPC98**	**UI version**	**Rev.1 Aug 2018**	**Date of implementation**	**Jan.1,2020**	**Means of implementation**	
Conventions/Codes Requirements							
MARPOL Annex VI *Regulation 13 Nitrogen Oxides* *2.2 For a major conversion involving the replacement of a marine diesel engine with a non-identical marine diesel engine or the installation of an additional marine diesel engine, the standards in this regulation in force at the time of the replacement or addition of the engine shall apply.*							
Interpretation							
The "time of the replacement or addition" of the engine is to be taken as the date of: *a. the contractual delivery date of the engine to the ship*; or* *b. in the absence of a contractual delivery date, the actual delivery date of the engine to the ship*, provided that the date is confirmed by a delivery receipt; or* *c. in the event the engine is fitted onboard and tested for its intended purpose on or after six(6) months from the date specified in sub-paragraphs of regulation 13.5.1.2, as appropriate, the actual date that the engine is tested onboard for its intended purpose applies in determining the standards in this regulation in force at the time of the replacement or addition of the engine.* *Entry of the date in a), b) or c), provided the conditions associated with those dates apply, is to be made in the item 8.a "Major conversion – According to Reg. 13.2.1.1 &13.2.2" of the IAPPC Supplement.* *If the engine is not tested within six(6) months after the date specified in sub-paragraphs of regulation 13.5.1.2, as appropriate due to unforeseen circumstances beyond the control of the ship owner, then the provisions of "unforeseen delay in delivery" may be considered by the Administration in a manner similar to MARPOL Annex I UI4.* _____ *Footnote:* **) The engine is to be fitted onboard and tested for its intended purpose within six(6) months after the date specified in sub-paragraphs of regulation 13.5.1.2, as appropriate.*							
Technical Background							
The Supplement to the IAPP Certificate does not refer to the "time of replacement or addition" in item 2.2.1 instead							

it refers to "Date of major conversion – According to Reg. 13.2.2". Furthermore, MARPOL Annex VI does not define "time of the replacement or addition" .To avoid different interpretations as to what date represented the "time of replacement or addition", the UI is developed by IACS.
Remarks

3.98 Oil residue (sludge) tank discharge connections to the bilge system, oily bilge water holding tank(s), tank top or oily water separators

Conventions (Amend.), Reg.		**MARPOL 73/78 Annex I Regulation 12.2**					
IACS UI Number	**MPC99**	**UI version**	**Dec.,2011**	**Date of implementation**	**Jul.1,2012**	**Means of implementation**	
Conventions/Codes Requirements							
MARPOL 73/78 Annex I (as amended by MEPC.187(59)) Regulation 12.2 *2. Oil residue (sludge) may be disposed of directly from the oil residue (sludge) tank(s) through the standard discharge connection referred to in regulation 13, or any other approved means of disposal. The oil residue (sludge) tank(s):* *.2.* ***shall have no discharge connections to the bilge system, oily bilge water holding tank(s), tank top or oily water separators*** *except that the tank(s) may be fitted with drains, with manually operated self-closing valves and arrangements for subsequent visual monitoring of the settled water, that lead to an oily bilge water holding tank or bilge well, or an alternative arrangement, provided such arrangement does not connect directly to the bilge piping system.* **MARPOL 73/78 Annex I Unified Interpretation to regulation 12.2.2 introduced by MEPC.1/Circ.753** *2* ***There should be no interconnections between the sludge tank discharge piping and bilge-water piping*** *other than possible common piping leading to the standard discharge connection referred to in regulation 13.*							
Interpretation							
Deleted							
Technical Background							
Remarks							
IACS deleted the UI in July 2020							

3.99 Supplement to the International Air Pollution Prevention (IAPP) Certificate – Section 2.3

Conventions (Amend.), Reg.		**MARPOL** Annex **VI**, Regulation **8**					
IACS UI Number	**MPC101**	**UI** version	**Jul.,2012/ Rev.1,July, 2020/ Corr.1,Sep. 2020**	Date of implementation	**Jan.1,2013/ Rev.1, Mar.1,2020**	Means of implementation	
Conventions/Codes Requirements							
MARPOL Annex VI, Regulation 8 "The International Air Pollution Prevention Certificate shall be drawn up in a form corresponding to the model given in appendix I to this Annex and shall be at least in English, French or Spanish. If an official language of the issuing							

country is also used, this shall prevail in case of a dispute or discrepancy."

Revised form of Supplement to the IAPP Certificate as per MEPC.305(73)

"2.3.1 When the ship operates outside of an emission control area specified in regulation 14.3, the ship uses:

.1 fuel oil with a sulphur content as documented by bunker delivery notes that does not exceed the limit value of 0.50% m/m, and/or

.....☐

.2 an equivalent arrangement approved in accordance with regulation 4.1 as listed in paragraph 2.6 that is at least as effective in terms of SO_x emission reductions as compared to using a fuel oil with a sulphur content limit value of 0.50% m/m

.....☐

2.3.2 When the ship operates inside an emission control area specified in regulation 14.3, the ship uses:

.1 fuel oil with a sulphur content as documented by bunker delivery notes that does not exceed the limit value of 0.10% m/m, and/or

.....☐

.2 an equivalent arrangement approved in accordance with regulation 4.1 as listed in paragraph 2.6 that is at least as effective in terms of SO_x emission reductions as compared to using a fuel oil with a sulphur content limit value of 0.10% m/m

.....☐

2.3.3 For a ship without an equivalent arrangement approved in accordance with regulation 4.1 as listed in paragraph 2.6, the sulphur content of fuel oil carried for use on board the ship shall not exceed 0.50% m/m as documented by bunker delivery notes

.....☐"

Interpretation

Section 2.3 of the Supplement ("as documented by bunker delivery notes") allows for an "x" to be entered in all of the relevant check boxes recognizing that the bunker delivery notes, required to be retained on board for a minimum period of three years, provide the subsequent means to check that a ship is actually operating in a manner consistent with the intent as given in section 2.3.

Technical Background

Remarks

1. July 2012 version of this UI is to be uniformly implemented by IACS Societies not later than the first IAPP renewal survey carried on/after 1 January 2013.

2. Corr.1 of this UI is to be uniformly implemented by IACS Societies at the opportunity of the IAPP survey occurring after 1 March 2020 unless otherwise instructed by a flag state.

3.100 Surveys and certification relating to the Ship Energy Efficiency Management Plan (SEEMP) (MARPOL Annex VI Regulation 5.4.4)

Conventions (Amend.), Reg.	**MARPOL** Annex **VI** Regulation **5.4.4**

IACS UI Number	MPC102	UI version	Jul.,2012	Date of implementation	Jan.1,2013	Means of implementation	

Conventions/Codes Requirements

Regulation 5.4 as amended by Resolution MEPC.203(62) reads:

4 Ships to which Chapter 4 applies shall also be subject to the surveys specified below, taking into account Guidelines adopted by the Organization:

.4 For existing ships, the verification of the requirement to have a SEEMP on board according to regulation 22 shall take place at the first intermediate or renewal survey identified in paragraph 1 of this regulation, whichever is the first, on or after 1 January 2013

Regulation 6.4 as amended by Resolution MEPC.203(62) reads:

4 An International Energy Efficiency Certificate for the ship shall be issued after a survey in accordance with the provisions of regulation 5.4 to any ship of 400 gross tonnage and above before that ship may engage in voyages to ports or offshore terminals under the jurisdiction of other Parties.

Interpretation

Deleted

Technical Background

Remarks

This UI was deleted by IACS in Aug.,2018.

3.101 Identical Replacement Engines (MARPOL Annex VI Regulation 13)

Conventions (Amend.), Reg.		MARPOL Annex VI，Reg 13.1.1.2，Reg 13.2.2					
IACS UI Number	MPC103	UI version	Jan, 2013	Date of implementation	Jan.1,2014	Means of implementation	

Conventions/Codes Requirements

MARPOL Annex VI

Regulation 13 Nitrogen Oxides

1.1.2 each marine diesel engine with a power output of more than 130 kW which undergoes a major conversion on or after 1 January 2000 except when demonstrated to the satisfaction of the Administration that such engine is an identical replacement to the engine which it is replacing and is otherwise not covered under paragraph 1.1.1 of this regulation.

2.2 For a major conversion involving the replacement of a marine diesel engine with a non-identical marine diesel engine or the installation of an additional marine diesel engine, the standards in this regulation in force at the time of the replacement or addition of the engine shall apply.

Interpretation

In regulation 13.1.1.2 the term "identical" (and hence, by application of the converse, in regulation 13.2.2 the term "non-identical") as applied to engines under Regulation 13 is to be taken as:

An 'identical engine' is, as compared to the engine being replaced, an engine which is of the same:*

- *design and model;*
- *rated power;*
- *rated speed;*
- *use;*

number of cylinders;

fuel system type (including, if applicable, injection control software); and

*(a) for engines without EIAPP certification, have the same NOx critical components and settings**; or*

(b) for engines with EIAPP certification, belonging to the same Engine Group /Engine Family.

_____

NOTE:

** In those instances where the replaced engine will not be available to be directly compared with the replacing engine at the time of updating the Supplement to the IAPP Certificate reflecting that engine change it is to be ensured that the necessary records in respect of the replaced engine are available in order that it can be confirmed that the replacing engine represents "an identical engine".*

*** For engines without EIAPP Certification there will not be the defining NOx critical component markings or setting values as usually given in the approved Technical File. Consequently in these instances the assessment of '... same NOx critical components and settings...' shall be established on the basis that the following components and settings are the same:*

Fuel system

(a) Fuel pump model and injection timing

(b) Injection nozzle model

Charge air

(a) Configuration and, if applicable, turbocharger model and auxiliary blower specification

(b) Cooling medium (seawater / freshwater)

Technical Background

The term "identical" in regulation 13.1.1.2 and 13.2.2 is not defined in either MARPOL annex VI or the NOx Technical Code 2008. To avoid different interpretations as to the term "identical" and"non-identical", the UI is developed by IACS.

Remarks

This Unified Interpretation is to be implemented by CCS for "... a time of the replacement ..." of an engine, as interpreted by UI MPC 98, occurring on or after 1 January 2014.

3.102 Gaseous Emissions Calculation of Marine Diesel Engines Fitted with Selective Catalytic Reduction (SCR) Systems

Conventions (Amend.), Reg.		**MEPC.198(62), 5.2.1**					
IACS UI Number	**MPC105**	**UI** version	**Nov., 2013**	Date of implementation	**Jan.1,2015**	Means of implementation	

Conventions/Codes Requirements

Resolution MEPC.198(62)

5.2.1 The calculation method in section 5.12 of the NTC 2008 is also applied to engine systems fitted with SCR. No allowance is made for the reductant solution injected into the exhaust gas stream in respect of its effect on exhaust gas mass flow rate calculation(appendix VI) or dry/wet correction factor (equation (11), paragraph 5.12.3.2.2 of the NTC 2008). The NOx correction factor for humidity and temperature (equations (16) or (17), paragraphs 5.12.4.5 and 5.12.4.6, respectively, of the NTC 2008) should not be applied.

Interpretation

Deleted
Technical Background
Deleted
Remarks
IACS deleted the UI in Nov. 2019.

3.103 Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		**Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines(NOx Technical Code 2008)**					
IACS UI Number	**MPC106**	**UI version**	**July ,2015**	**Date of implementation**	**July 1,2016**	**Means of implementation**	
Conventions/Codes Requirements							
4.3 Application of the engine family concept 4.3.7. Before granting an engine family approval, the Administration shall take the necessary measures to verify that adequate arrangements have been made to ensure effective control of the conformity of production. **4.4 Application of the engine group concept** 4.4.5. Before granting an initial engine group approval for serially produced engines, the Administration shall take the necessary measures to verify that adequate arrangements have been made to ensure effective control of the conformity of production.							
Interpretation							
An Engine Family / Group approval, as applicable, is granted to the entity requesting to apply the Engine Family or Engine Group concept to serially produced marine diesel engines. The conformity of production arrangements as required by 4.3.7 as proposed by the entity seeking Engine Family / Group approval and as accepted by the Administration are to cover those marine diesel engines within that particular Engine Family / Group as manufactured by that entity. Additionally, where that entity has in place arrangements which extend, under their oversight and control, the accepted conformity of production arrangements to other engine manufacturers (i.e. licensees), then candidate marine diesel engines produced by those other parties may be included in the Engine Family / Group as established. In this circumstance the marine diesel engine selected, and accepted by the Administration as the Parent Engine, may be manufactured either by the entity which requested the Engine Family / Group certification or by one of the other parties as covered by the agreed conformity of production arrangements. In those instances where serially produced marine diesel engines are manufactured outside an accepted conformity of production arrangement then it is the responsibility of the manufacturer of those marine diesel engines themselves to request certification in accordance with the requirements of the NOx Technical Code 2008 from the relevant Administration including the establishment of the relevant Engine Family / Group, selection and testing of the Parent							

Engine and the development of the particular conformity of production arrangements which are to cover those marine diesel engines.
Remarks
This UI is to be uniformly applied by IACS Societies when an application for first EIAPP certification for a marine diesel engine is dated on or after 1 July 2016.

3.104 2011 Guidelines Addressing Additional Aspects to the NOx Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems

Conventions (Amend.), Reg.		**Resolution MEPC.198(62), Section 3.1.1**					
IACS UI Number	**MPC107**	**UI version**	**Nov., 2015**	**Date of implementation**	**July. 1, 2016**	**Means of implementation**	
Conventions/Codes Requirements							
MEPC.198(62), Section 3.1.1: 3.1.1 Engine systems fitted with SCR should be certified in accordance with chapter 2 of the NTC 2008. In cases where combined engine/SCR systems can neither be tested on a test bed due to their size, construction and other restrictions nor an on board test can be performed fully complying with the requirements of chapter 5 of the NTC 2008 the procedures provided by Scheme B of these guidelines should be applied.							
Interpretation							
Withdrawn							
Remarks							
IACS Withdrew the UI in May 2016.							

3.105 2011 Guidelines Addressing Additional Aspects to the NOx Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems

Conventions (Amend.), Reg.		**Resolution MEPC.198(62), Section 3.2.1.3**					
IACS UI Number	**MPC108**	**UI version**	**Nov., 2015**	**Date of implementation**	**July 1, 2016**	**Means of implementation**	
Conventions/Codes Requirements							
MEPC.198(62), Section 3.2.1.3: 3.2.1 In addition to the information supplied in paragraph 3.1.3 of these guidelines and items in section 2.4 of the NTC 2008, engine systems fitted with SCR should include the following information in its Technical File: .3 design features of SCR specific components in the exhaust duct from the engine exhaust manifold to the SCR chamber;							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.106 2011 Guidelines Addressing Additional Aspects to the NOx Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems

Conventions (Amend.), Reg.		Resolution MEPC.198(62), Section 3.2.1.4					
IACS UI Number	MPC109	UI version	Nov., 2015	Date of implementation	July 1, 2016	Means of implementation	
Conventions/Codes Requirements							
MEPC.198(62), Section 3.2.1.4: 3.2.1 In addition to the information supplied in paragraph 3.1.3 of these guidelines and items in section 2.4 of the NTC 2008, engine systems fitted with SCR should include the following information in its Technical File: .4 catalyst block specification and arrangement in the SCR chamber;							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.107 2011 Guidelines Addressing Additional Aspects to the NOx Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems

Conventions (Amend.), Reg.		Resolution MEPC.198(62), Section 3.2.1.6					
IACS UI Number	MPC110	UI version	Nov., 2015	Date of implementation	July 1, 2016	Means of implementation	
Conventions/Codes Requirements							
MEPC.198(62), Section 3.2.1.6: 3.2.1 In addition to the information supplied in paragraph 3.1.3 of these guidelines and items in section 2.4 of the NTC 2008, engine systems fitted with SCR should include the following information in its Technical File: .6 cross-unit parameters: allowable pressure loss (Δp) between inlet and outlet of SCR chamber and in the exhaust duct caused by SCR components;							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.108 2011 Guidelines Addressing Additional Aspects to the NOx Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems

Conventions (Amend.), Reg.		Resolution MEPC.198(62), Section 3.2.1.7					
IACS UI Number	MPC111	UI version	Nov., 2015	Date of implementation	July 1, 2016	Means of implementation	
Conventions/Codes Requirements							
MEPC.198(62), Section 3.2.1.7: 3.2.1 In addition to the information supplied in paragraph 3.1.3 of these guidelines and items in section 2.4 of the NTC 2008, engine systems fitted with SCR should include the following information in its Technical File: .7 aspects related to the fuel oil quality resulting in continued compliance of the engine with the applicable NOx emission limit;							

Interpretation
Deleted
Remarks
IACS deleted the UI in Nov. 2019.

3.109 2017 Guidelines Addressing Additional Aspects of the NOx Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems

Conventions (Amend.), Reg.		Resolution MEPC.291(71), Paragraph 3.2.8					
IACS UI Number	**MPC112**	**UI version**	**Nov., 2015/ Rev.1, Nov., 2019**	**Date of implementation**	**July 1, 2016/ Rev.1,July 1,2020**	**Means of implementation**	

Conventions/Codes Requirements

MEPC.291(71), Paragraph 3.2.8 reads:

3.2 Technical File and on board NOx verification procedures

In addition to the information supplied in paragraph 3.1.3 of these Guidelines and items in section 2.4 of the NTC 2008, engine systems fitted with SCR should include the following information in Technical File:

.8 factors related to the deterioration rate of SCR performance, e.g., exchange condition for SCR blocks and recommended exchange time of SCR blocks;

.1 where a feedback or a feed forward reductant control strategy is incorporated with a NOx measurement device, this is acceptable as a means of monitoring catalyst condition/degradation. The exchange criteria of catalyst blocks against the reading of the NOx measurement device is to be specified by the applicant as well as the maintenance, service, and calibration requirements for the NOx measurement device;

.2 where a feed forward reductant control strategy is adopted without a NOx measurement device, the application is to provide the details of:

.1 the expected deterioration curve under expected operating conditions or the life of catalyst under expected operating conditions;

.2 factors which can influence catalyst NOx reduction efficiency; and

.3 guidance on how to assess catalyst NOx reduction efficiency based on periodical spot checks or monitoring as specified by the applicant, if applicable; records are to be kept for inspection during annual, intermediate and renewal surveys. The frequency of periodical spot checks is to be defined by the applicant considering the expected deterioration of the catalyst. The frequency for spot-checks should be at least after installation and once every 12 months; and

.3 other strategies on monitoring the catalyst condition/degradation are subject to the approval of the Administration;

Interpretation

For application of 3.2.8.1:

1. A NOx measurement device, incorporated in a SCR feedback or feed forward reductant control system, is not required to be in compliance with appendix III of NOx Technical Code if the suitability of this NOx measurement device had been proven by the corresponding Parent Engine test.

   The suitability shall be verified by comparing the emission data of the NOx measurement device with the results of an analyzer complying with 3.4, Appendix III of NTC2008. The values obtained by the NOx measurement device

shall not differ by more than ± 5 % from the readings of the analyzer during the parent engine test.

The applicant shall specify the accuracy of the NOx measurement device based on a defined calibration procedure and/or exchange requirements for the device.

2. Irrespective of the reductant control strategy, the criteria for catalyst block exchange are to be specified by the applicant. The criteria shall ensure permanent compliance with the applicable NOx emission limit for the relevant Engine type, Engine Group or Engine Family, as applicable.

   Depending on the proposed onboard verification procedure for assessment of catalyst NOx reduction efficiency, allowances may be given according to NTC2008, 6.3.11.1 or Resolution MEPC.291(71) Section 7.5.

3. In case where feedback system is applied as a means of monitoring catalyst condition degradation, generating alarms or failure codes in case of non-compliance is to be provided and to be specified in the Technical File.

   For systems generating alarms or failure codes in case of non-compliance without access to the measured NOx values, the applicant is to provide details, not necessarily in the Technical File but at least in supportive documentation for approval, about the alarm strategy, failure codes and calculation algorithm. From the view point of the purpose of achieving NOx compliance, application of the feedback system with the alarms or failure codes is considered as fulfilling the requirements of NTC2008 2.3.6 (a means of monitoring the consumption of substances).

For application of 3.2.8.2.3:

The spot checks after installation shall be performed on board the vessel after installation of the complete Engine+SCR system in cases where they are specified as a method of assess catalyst NOx reduction efficiency by the applicant. In this case the record of this test including information on compliance of NOx measurement device and its calibration record shall be available for the initial survey. The spot checks do not need to be witnessed by the Administration.

In cases where spot checks are required, the checks are to be performed at least at 75% of the rated power.

The guidance on how to assess catalyst NOx reduction efficiency shall include, but not be limited to, the following items:

a) Procedure for spot checks

- Preparation of calibration gas, if applicable
- Details of NOx measurement device including calibration requirements.
- Test condition (e.g. power and speed setting ranges as well as other applicable engine and SCR settings)
- Data to be recorded. It is recommended to include a test report template in the Technical File.
- Sampling probe position(s) for NOx measurement.
- Time duration for engine+SCR stabilisation and the NOx emission measurement

b) Criteria to assess catalyst NOx reduction efficiency

   In case where the spot checks are conducted following the procedure specified in resolution MEPC.291(71) Section 7, the criteria specified in 7.5 of the resolution MEPC.291(71) shall be applied.

   Otherwise, the criteria shall be determined based on applicable NOx emission limits corresponding to the rated engine speed of the subject engine rather than the parent engine emission value. Also, allowance of the criteria may be given according NTC2008, 6.3.11.1 or Resolution MEPC.291 (71) Section 7.5.

For application of 3.2.8.3:

Other monitoring strategies may only be accepted if the entire SCR chamber with all catalyst blocks installed is covered. Testing of single catalyst blocks after removing them from the SCR chamber is not considered as representative for the entire SCR system.

Remarks
1. This Unified Interpretation is to be uniformly implemented by IACS Societies not later than 1 July 2016.
2. Rev.1 of this Unified Interpretation is to be uniformly implemented by IACS Societies from 1 July 2020.

3.110 2011 Guidelines Addressing Additional Aspects to the NOx Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems

Conventions (Amend.), Reg.		Resolution MEPC.198(62), Section 3.2.1.9					
IACS UI Number	MPC113	UI version	Nov., 2015	Date of implementation	July 1, 2016	Means of implementation	
Conventions/Codes Requirements							
MEPC.198(62), Section 3.2.1.9: 3.2.1 In addition to the information supplied in paragraph 3.1.3 of these guidelines and items in section 2.4 of the NTC 2008, engine systems fitted with SCR should include the following information in its Technical File: .9 controlling arrangements and settings of the SCR, e.g., model, specification of control device;							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.111 2011 Guidelines Addressing Additional Aspects to the NOx Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems

Conventions (Amend.), Reg.		Resolution MEPC.198(62), Section 3.2.1.10					
IACS UI Number	MPC114	UI version	Nov., 2015	Date of implementation	July 1, 2016	Means of implementation	
Conventions/Codes Requirements							
MEPC.198(62), Section 3.2.1.10: 3.2.1 In addition to the information supplied in paragraph 3.1.3 of these guidelines and items in section 2.4 of the NTC 2008, engine systems fitted with SCR should include the following information in its Technical File: .10 measures to minimize reductant slip;							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.112 2017 Guidelines Addressing Additional Aspects of the NOx Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems

Conventions (Amend.), Reg.		Resolution MEPC.291(71), Paragraph 3.2.11					
IACS UI Number	**MPC115**	**UI version**	**Nov., 2015/ Rev.1, Nov.,,2019/ Corr.1,May,2020**	**Date of implementation**	**July 1, 2016/ Rev.1,July 1,2020**	**Means of implementation**	

Conventions/Codes Requirements

MEPC.291(71), Paragraph 3.2.11 reads：

3.2 In addition to the information supplied in paragraph 3.1.3 of these Guidelines and items in section 2.4 of the NTC 2008, engine systems fitted with SCR should include the following information in Technical File:

.11 parameter check method as the verification procedure: with regard to the application of the parameter check method, requirements given in paragraph 2.3.6 and guidance given in paragraph 2 of appendix VII of the NTC 2008 should be taken into account in assessing the adequacy of a proposed procedure with analysers meeting or exceeding the requirements of appendix III of the NTC 2008; and

Interpretation

The engine technical file is to include details of the application of the parameter check method, requirements given in paragraph 2.3.6 of the NTC 2008 and guidance given in appendix VII, paragraph 2 of the NTC 2008 should be taken into account in assessing the adequacy of a proposed procedure with analysers meeting or exceeding the requirements of appendix III of the NTC 2008. Other systems or analysers may be accepted if they yield equivalent results, see paragraph 5.4.2 of the NTC 2008.

Where NOx monitoring is used to demonstrate compliance then measurement of the NOx reduction rate in accordance with chapter 7 of the guidelines is accepted as demonstrating compliance, analysers are to meet the requirements of appendix III of the NTC 2008.

Spot check may be taken as an on-board measurement of the NOx reduction rate in accordance with chapter 7 of the guidelines, alternatively, systems using a feed forward reductant control strategy may be fitted with NOx monitoring devices for the purposes of monitoring catalyst condition and SCR performance. Instrumentation used for spot checks, or alternatively monitoring, is to meet the requirements of Appendix III of the NOx Technical Code 2008 or are to be demonstrated as equivalent as permitted by 5.4.2 of the NTC 2008. Other systems or analysers may be accepted according to MPC112.

For systems using feed forward reductant controls without NOx monitoring the applicant is to provide details of the relationship between engine load and reductant consumption and the means of checking that reductant flow is appropriate. The Technical File is to include proposals for maintaining records of reductant consumption and also reductant composition and quality. Records of reductant composition and quality may be based on delivery notes where these delivery notes include reductant concentration and quality parameters.

Reductant delivery notes may also be accepted for the purposes of verifying that the system has been operated using reductant. In such cases the reductant delivery notes are to be made available at annual, intermediate and renewal surveys. Where it is proposed to produce aqueous reductant on-board then the recording system is to consider records of feedstock deliveries and quality.

Remarks

1.This Unified Interpretation is to be uniformly implemented by IACS Societies not later than 1 July 2016.

2. Rev.1 of this UI is to be uniformly implemented by IACS Societies from 1 July 2020.

3.113 2017 Guidelines Addressing Additional Aspects of the NOx Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems

Conventions (Amend.), Reg.		Resolution MEPC.291(71), Paragraph 3.2.12					
IACS UI Number	MPC116	UI version	Nov., 2015/ Rev.1,Nov., 2019	Date of implementation	July 1, 2016/ Rev.1,July 1,2020	Means of implement ation	

Conventions/Codes Requirements

MEPC.291(71), Paragraph 3.2.12 reads:

3.2 In addition to the information supplied in paragraph 3.1.3 of these Guidelines and items in section 2.4 of the NTC 2008, engine systems fitted with SCR should include the following information in Technical File:

.12 any other parameter(s) specified by applicant.

Interpretation

The applicant is responsible for ensuring any parameters which affect NOx emissions and which are not included within the scope of 3.2.1.1 - 3.2.1.11 are included within the Technical File.

Remarks

1.This Unified Interpretation is to be uniformly implemented by IACS Societies not later than 1 July 2016.

2. Rev.1 of this UI is to be uniformly implemented by IACS Societies from 1 July 2020.

3.114 2011 Guidelines Addressing Additional Aspects to the NOx Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems

Conventions (Amend.), Reg.		Resolution MEPC.198(62), Section 3.5.2					
IACS UI Number	MPC117	UI version	Nov., 2015	Date of implementation	July 1, 2016	Means of implementation	

Conventions/Codes Requirements

MEPC.198(62), Section 3.5.2:

3.5.2 When an applicant chooses the Scheme B for pre-certification, the IAPP initial survey should not be completed until the on board initial confirmation test provides compliant results. The applicant remains the responsible entity until final acceptance of the system.

Interpretation

Deleted

Remarks

IACS deleted the UI in Nov. 2019.

3.115 2011 Guidelines Addressing Additional Aspects to the NOx Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems

Conventions (Amend.), Reg.		Resolution MEPC.198(62), Section 4.1					
IACS UI	MPC118	UI	Nov., 2015	Date of	July 1, 2016	Means of	

Number		version		implementation		implementation	
Conventions/Codes Requirements							
MEPC.198(62), Section 4.1: 4.1 Requirements in chapter 4 of the NTC 2008 apply equally to engine systems fitted with SCR.							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.116 2011 Guidelines Addressing Additional Aspects to the NOx Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems

Conventions (Amend.), Reg.		Resolution MEPC.198(62), Section 5.1.1					
IACS UI Number	**MPC119**	**UI version**	**Nov., 2015**	**Date of implementation**	**July 1, 2016**	**Means of implementation**	
Conventions/Codes Requirements							
MEPC.198(62), Section 5.1.1: 5.1.1 A test for a combined system of an engine fitted with an SCR in Scheme A is to ensure compliance with the applicable NOx emission limits of MARPOL Annex VI, as required. The test bed measurement procedures of chapter 5 of the NTC 2008 should apply.							
Interpretation							
Withdrawn							
Remarks							
IACS Withdrew the UI in May 2016.							

3.117 2011 Guidelines Addressing Additional Aspects to the NOx Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems

Conventions (Amend.), Reg.		Resolution MEPC.198(62), Section 5.2.2					
IACS UI Number	**MPC120**	**UI version**	**Nov., 2015**	**Date of implementation**	**July 1, 2016**	**Means of implementation**	
Conventions/Codes Requirements							
MEPC.198(62), Section 5.2.2: 5.2.2 For an engine system fitted with SCR, the following parameters should be measured and recorded in the engine test report in accordance with section 5.10 of the NTC 2008: .1 injection rate of reductant at each load point (kg/h); .2 exhaust gas temperature at the inlet and outlet of the SCR chamber (℃); .3 pressure loss (kPa): it is necessary to measure the pressure at inlet and at outlet of the SCR chamber and to calculate pressure loss Δp. If the manufacturer sets an allowable limit of Δp, it should be confirmed; and .4 other parameter(s) as specified by the Administration.							
Interpretation							

Deleted
Remarks
IACS deleted the UI in Nov. 2019.

3.118 2011 Guidelines Addressing Additional Aspects to the NOx Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems

Conventions (Amend.), Reg.		**Resolution MEPC.198(62), Section 6.3.1.1**					
IACS UI Number	**MPC121**	**UI version**	**Nov., 2015**	**Date of implementation**	**July 1, 2016**	**Means of implementation**	
Conventions/Codes Requirements							
MEPC.198(62), Section 6.3.1.1: 6.3.1.1 The SCR chamber for validation testing may be either a full scale SCR chamber or a scaled version. A SCR chamber should demonstrate the reduction in NOx concentrations (ppm) expected in exhaust gas measured in section 6.2 of these guidelines. Therefore, NOx reduction rate of the SCR chamber should be determined for each individual mode point. Where undertaken on a scaled version of the SCR chamber the scaling process should be validated to the satisfaction of the Administration.							
Interpretation							
Withdrawn							
Remarks							
IACS Withdrew the UI in May 2016.							

3.119 2011 Guidelines Addressing Additional Aspects to the NOx Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems

Conventions (Amend.), Reg.		**Resolution MEPC.198(62), Section 6.3.2.1.2**					
IACS UI Number	**MPC122**	**UI version**	**Nov., 2015**	**Date of implementation**	**July 1, 2016**	**Means of implementation**	
Conventions/Codes Requirements							
MEPC.198(62), Section 6.3.2.1.2: 6.3.2.1 Exhaust gas, catalyst, reductant and an injection system should satisfy the following conditions at each mode point: .2 Exhaust gas component Exhaust gas for the test should either be diesel engine exhaust gas or simulated gas. Where diesel exhaust gas is used it should correspond, in terms of concentrations, to the exhaust gas in section 6.2 of these guidelines, in terms of NOx, O2, CO2, H2O, and SO2 (±5% of the required concentration for each emission species). Where simulated gas is used it should correspond, in terms of concentrations, to the exhaust gas in section 6.2 of these guidelines, in terms of NO, NO2, O2, CO2, H2O, and SO2 (±5% of the required concentration for each emission species) balance N2.							
Interpretation							

Deleted
Remarks
IACS deleted the UI in Nov. 2019.

3.120 2011 Guidelines Addressing Additional Aspects to the NOx Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems

Conventions (Amend.), Reg.		**Resolution MEPC.198(62), Section 6.3.2.1.5**					
IACS UI Number	**MPC123**	**UI version**	**Nov., 2015**	**Date of implementation**	**July 1, 2016**	**Means of implementation**	
Conventions/Codes Requirements							
MEPC.198(62), Section 6.3.2.1.5: 6.3.2.1 Exhaust gas, catalyst, reductant and an injection system should satisfy the following conditions at each mode point: .5 Reductant The reductant concentration should be representative of the reductant concentration in the exhaust gas during actual operation.							
Interpretation							
Deleted							
Remarks							
IACS deleted the UI in Nov. 2019.							

3.121 2011 Guidelines Addressing Additional Aspects to the NOx Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems

Conventions (Amend.), Reg.		**Resolution MEPC.198(62), Section 7.5**					
IACS UI Number	**MPC124**	**UI version**	**Nov., 2015**	**Date of implementation**	**July 1, 2016**	**Means of implementation**	
Conventions/Codes Requirements							
MEPC.198(62), Section 7.5: 7.5 NOx emission concentrations should be measured at the inlet and outlet of the SCR chamber. The NOx reduction rate should be calculated. Both values should either be dry or wet. The value obtained for NOx reduction rate should be compared to the initial confirmation test required value at each mode point as given in the Technical File. Reduction efficiency values obtained at each of the test points should not be less than the corresponding values as given in the Technical File by more than 5%.							
Interpretation							
Withdrawn							
Remarks							
IACS Withdrew the UI in May 2016.							

3.122 Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		NTC 2008, chapter 4, Paragraph 4.4.6.1					
IACS UI Number	**MPC125**	**UI version**	**Nov., 2015**	**Date of implementation**	**July 1, 2016**	**Means of implementation**	

Conventions/Codes Requirements

Paragraph 4.4.6.1, Chapter 4 of NO_x Technical Code (NTC) 2008:

4.4.6.1 The engine group may be defined by basic characteristics and specifications in addition to the parameters defined in 4.3.8 for an engine family.

Interpretation

Paragraph 4.4.6.1 cross references 4.3.8 which provides guidance for selection of an engine family. For engines fitted with SCR system to reduce NOx emissions it is recognised that some of the parameters provided may not be common to all engines within a group, in particular 4.3.8.2.3 and 4.3.8.2.4 state that:

.3 individual cylinder displacement:

- to be within a total spread of 15%

.4 number of cylinders and cylinder configuration:

- applicable in certain cases only, e.g., in combination with exhaust gas cleaning devices

For engines fitted with SCR system to reduce NOx emissions the number and arrangement of cylinders may not be common to all members of the engine group. These parameters may be replaced with new parameters derived from the SCR chamber and catalyst blocks, such as the SCR space velocity (SV), catalyst block geometry and catalyst material.

Remarks

This Unified Interpretation is to be uniformly implemented by IACS Societies not later than 1 July 2016.

3.123 Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		NTC 2008, chapter 4, Paragraph 4.4.6.2					
IACS UI Number	**MPC126**	**UI version**	**Nov., 2015**	**Date of implementation**	**July 1, 2016**	**Means of implementation**	

Conventions/Codes Requirements

Paragraph 4.4.6.2, Chapter 4 of NO_x Technical Code (NTC) 2008:

4.4.6.2 The following parameters and specifications shall be common to engines within an engine group:

.1 bore and stroke dimensions;

.2 method and design features of pressure charging and exhaust gas system:

- constant pressure;
- pulsating system;

.3 method of charge air cooling system:

- with/without charge air cooler;

.4 design features of the combustion chamber that effect NOx emission;

.5 design features of the fuel injection system, plunger and injection cam which may profile basic characteristics that effect NOx emission; and

.6 rated power at rated speed. The permitted ranges of engine power (kW/cylinder) and/or rated speed are to be declared by the manufacturer and approved by the Administration.

Interpretation

Deleted
Remarks
IACS deleted the UI in Nov. 2019.

3.124 Annex I to MARPOL 73/78

Conventions (Amend.), Reg.		**Regulation 14 *Oil filtering equipment***					
IACS UI Number	**MPC 127**	**UI** version	**Feb., 2016**	Date of implementation	**Jan. 1, 2017**	Means of implementation	

Conventions/Codes Requirements

Regulation 14.7 reads:

7 Oil filtering equipment referred to in paragraph 2 of this regulation shall comply with paragraph 6 of this regulation. In addition, it shall be provided with alarm arrangement to indicate when this level cannot be maintained. The system shall also be provided with arrangements to ensure that any discharge of oily mixtures is automatically stopped when the oil content of the effluent exceeds 15 parts per million. In considering the design of such equipment and approvals, the Administration shall have regard to the specification recommended by the Organization.*

The footnote to regulation 14.7 reads:

* Refer to the Recommendation on International Performance and Test Specification for Oily-Water Separating Equipment and Oil Content Meters, adopted by the Organization by Assembly resolution A.393(X), or the Guidelines and specifications for Pollution Prevention equipment for Machinery space Bilges of Ships, adopted by the Marine Environment Protection Committee by resolution MEPC.60(33), or the 2011 Guidelines and specifications for add-on equipment for upgrading resolution MEPC.60(33) - compliant oil filtering equipment, adopted by resolution MEPC.205(62), or the revised guidelines and specification for pollution prevention equipment for machinery space bilges of ships, adopted by the Marine Environment Protection Committee by resolution MEPC.107(49).

Operative paragraph 4.2.11 in the Annex of resolution MEPC.107(49) reads:

4.2.11 The accuracy of the 15 ppm Bilge Alarms should be checked at IOPP Certificate renewal surveys according to the manufacturer's instructions. Alternatively the unit may be replaced by a calibrated 15 ppm Bilge Alarm. The calibration certificate for the 15 ppm Bilge Alarm, certifying date of last calibration check, should be retained onboard for inspection purposes. The accuracy checks can only be done by the manufacturer or persons authorized by the manufacturer.

Operative paragraphs (OA) 1.2.1.18, (OIn) 1.3.1.1 and (OR) 1.4.1.2 in the Annex 3 of resolution A.1104(29) read:

(OA) 1.2.1.18 verifying, if applicable, that the 15 ppm bilge alarm has been calibrated by the manufacturer or a person authorized by the manufacturer and that a valid calibration certificate is available on board.
(OIn) 1.3.1.1 the provisions of (OA) 1.2.1.
(OR) 1.4.1.2 verifying that, if applicable, the 15 ppm bilge alarm has been calibrated by the manufacturer or a person authorized by the manufacturer and that a valid calibration certificate is available on board.

Interpretation

Deleted

Technical Background
Remarks
This UI was deleted by IACS in Aug.,2018.

3.125 Inclusion of mediums of the fire-fighting systems in lightweight(MARPOL Annex I/Regulation 1.24)

Conventions (Amend.), Reg.		MARPOL Annex I/Regulation 1.24					
IACS UI Number	MPC 128	UI version	May,2016	Date of implementation	Jan. 1,2017	Means of implementation	contracted for construction

Conventions/Codes Requirements
MARPOL Annex I/Regulation 1.24 "Lightweight means the displacement of a ship in tonnes without cargo, fuel, lubricating oil, ballast water, fresh water and feed water in tanks, consumable stores, and passengers and crew and their effects."
Interpretation
The weight of mediums on board for the fixed fire-fighting systems (e.g. freshwater, CO_2, dry chemical powder, foam concentrate, etc.) shall be included in the lightweight and lightship condition.
Technical Background
There was no common understanding as to the exact meaning of the term ćontinuous hatchway treated as a trunk`. This UI is developed to clarify the term。
Remarks
The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

3.126 Unprotected openings

Conventions (Amend.), Reg.		MARPOL Annex I / Regulation 28.3.3					
IACS UI Number	MPC129	UI version	06.2016	Date of implementation	01.01.2017	Means of implementation	contracted for construction

Conventions/Codes Requirements
The stability in the final stage of flooding shall be investigated and may be regarded as sufficient if the righting lever curve has at least a range of 20 degree beyond the position of equilibrium in association with a maximum residual righting lever of at least 0.1 m within the 20 degree range; the area under the curve within this range shall not be less than 0.0175 metre radian. Unprotected openings shall not be immersed within this range unless the space concerned is assumed to be flooded. Within this range, the immersion of any of the openings listed in subparagraph 3.1 of this paragraph and other openings capable of being closed weathertight may be permitted.
Interpretation
Other openings capable of being closed weathertight do not include ventilators (complying with ILLC 19(4)) that for operational reasons have to remain open to supply air to the engine room or emergency generator room (if the same is considered buoyant in the stability calculation or protecting openings leading below) for the effective operation of the ship.

Technical Background
The Dutch Safety Board noted that one cause of the capsizing was that the weathertight closing appliances to the main engine room were left open in order to ensure an adequate air supply to achieve the required bollard pull. These openings had been considered as closed in the intact stability calculations.
Remarks
The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

3.127 Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

Conventions (Amend.), Reg.		**NOx Technical Code 2008, Chapter 2, Paragraph 2.2.5.1**					
IACS UI Number	**MPC130**	**UI version**	**Nov., 2019 Withdrawn**	**Date of implementation**	–	**Means of implementation**	
Conventions/Codes Requirements							
Paragraph 2.2.5.1, Chapter 2 of the NOx Technical Code (NTC) 2008 reads: 2.2.5.1 Where a NOx-reducing device is to be included within the EIAPP certification, it must be recognized as a component of the engine, and its presence shall be recorded in the engine's Technical File							
Interpretation							
Withdrawn							
Remarks							
UI MPC130 approved on 9 November 2019 was withdrawn on 5 May 2020 prior to coming into force on 1 July 2020							

CHAPTER 4 INTERNATIONAL CONVENTION ON TONNAGE MEASUREMENT OF SHIPS (TM CONVENTION)

4.1 Determination of moulded depth (D) for ships with an open mooring deck aft or stepped upper deck

Conventions (Amend.), Reg.		Regulation **2(2)(c)** of Annex **1** to **TM 1969**					
IACS UI Number	**TM1**	**UI** version	**1993**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

Where the upper deck is stepped and the raised part of the deck extends over the point at which the moulded depth is to be determined, the moulded depth shall be measured to a line of reference extending from the lower part of the deck along a line parallel with the raised part.

Interpretation

When calculating the net tonnage for ships with an open mooring deck aft, the moulded depth should be measured to the line of the open mooring deck continued forward parallel to the raised part of the upper deck (depth D1 in Figure 1) and not to the raised part of the upper deck (depth D2 in Figure 1). If the upper deck is continued aft over the mooring deck, the moulded depth should still be taken as D1 in Figure 1, provided that the side openings allow the space below the upper deck to be considered as an excluded space according to Regulation 2 (5) (b) and (c).

For ships with a step in the upper deck extending across the full breadth and greater than one metre in length, the moulded depth should be measured to the line of the lower point of the exposed deck extended parallel to the raised part of the exposed deck (depth D1 in Figure 2) and not to the raised part of the upper deck (depth D2 in Figure 2).

If the step or mooring deck is situated outside the length as defined in Article 2(8) of the Convention or if the length of the step or mooring deck is one metre or less, the moulded depth should be taken as D2 in Figures 1 and 2.

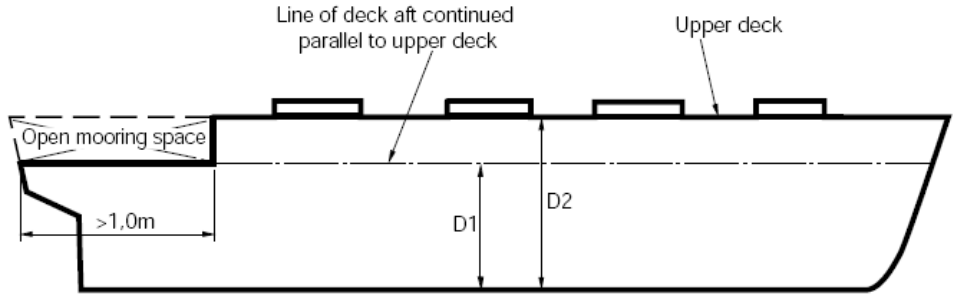


Fig. 1

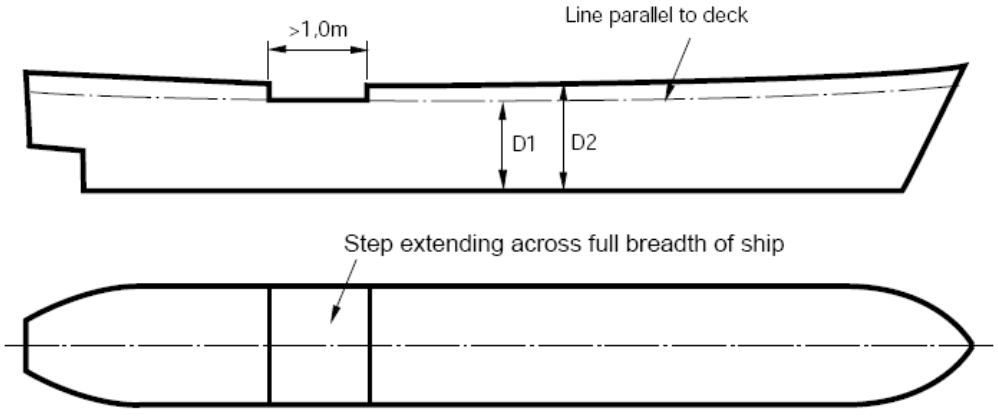


Fig. 2

Remarks

4.2 International Tonnage Convention 1969 -Heat Exchangers (Coolers) Treatment

Conventions (Amend.), Reg.		Regulation 2(4), 6(2) of Annex 1 to TM 1969 and Regulation 2(4)-9, 6(2)-1 of TM.5/Circ.6					
IACS UI Number	**TM2**	**UI version**	**Oct., 2015**	**Date of implementation**	**Jul. 1, 2016**	**Means of implementation**	

Conventions/Codes Requirements

International Convention on Tonnage Measurements of Ships, 1969 - Regulation 2(4):
Enclosed Spaces are all those spaces which are bounded by the ship's hull, by fixed or portable partitions or bulkheads, by decks or coverings other than permanent or movable awnings. No break in a deck, nor any opening in the ship's hull, in a deck or in a covering of a space, or in the partitions or bulkheads of a space, nor the absence of a partition or bulkhead, shall preclude a space from being included in the enclosed space.

International Convention on Tonnage Measurements of Ships, 1969 - Regulation 6(2):
Volumes of appendages shall be included in the total volume.

TM.5/Circ.6 - Interpretation R.2(4)-9:
Machinery such as mooring and towing equipment, winches, revolving cranes, cranes with truss structures, and other similar items should not be included in the total volume of all enclosed spaces (V).

TM.5/Circ.6 - Interpretation R.6(2)-1:
Bulbs, fairwaters, propeller shaft bossings or other structures should be treated as appendages.

Interpretation

Heat exchangers (coolers) fitted in hull recesses or outside of the hull shall be treated as machinery under TM.5/Circ.6 Interpretation R.2(4)-9 and not as appendages.

Technical Background

The International Convention on Tonnage Measurement of Ships and IMO Unified interpretations (TM5/Circ.6) does not provide information relevant the treatment of the heat exchangers (Coolers) which are fitted in hull recesses or outside of the hull.

Remarks

This UI is to be uniformly implemented by IACS Societies from 1 July 2016.

CHAPTER 5 INTERNATIONAL CODE OF SAFETY FOR HIGH SPEED CRAFT (HSC CODE)

5.1 Cupboard as part of the space

Conventions (Amend.), Reg.		Paragraph **7.3.1** of **HSC** Code **1994**					
IACS UI Number	**HSC1**	**UI** version	**1996/ Del,Nov.,2021**	Date of implementation	**-/ Jul.1,2022**	Means of implementation	

Conventions/Codes Requirements

Classification of space use in accordance with fire hazard risks

Interpretation

Deleted.

Technical Background

Deleted as it is included in paragraph 7.3.2.2 of the 2000 HSC Code as amended by Resolution MSC.222(82).

Remarks

5.2 Classification of stairways

Conventions (Amend.), Reg.		Paragraph **7.3.1.3** of **HSC** Code **1994**					
IACS UI Number	**HSC2**	**UI** version	**1996/ Del,Nov.,2021**	Date of implementation	**-/ Jul.1,2022**	Means of implementation	

Conventions/Codes Requirements

7.3.1.3 "Areas of minor fire hazard", referred to in Tables 7.4-1 and 7.4-2 by C, include the following spaces:

- auxiliary machinery spaces, as defined in 1.4.4;
- cargo spaces;
- fuel tank compartments;
- public spaces;
- tanks, voids and areas of little or no fire risk.

Interpretation

Deleted.

Technical Background

Deleted as it is included in 2000 HSC Code 7.3.1.3.

Remarks

5.3 Public spaces extending over 2 decks

Conventions (Amend.), Reg.		Paragraph **7.4.4.1** of **HSC** Code **1994**					
IACS UI Number	**HSC3**	**UI** version	**1996/ Del,Nov.,2021**	Date of implementation	**-/ Jul.1,2022**	Means of implementation	

Conventions/Codes Requirements

7.4.4.1 Internal stairways which serve more than two decks of accommodation should be enclosed at all levels with smoke-tight divisions of non-combustible or fire restricting materials, and where only two decks are served such enclosures should be provided on at least one level. Stairways may be fitted in the open in a public space, provided they lie wholly within such public space.

Interpretation

Deleted.

Technical Background

Deleted as it is included in paratraph 7.4.4.2 of the 2000 HSC Code as amended by Resolution MSC.222(82).

Remarks

5.4 Ventilation grille in toilet entrance door

Conventions (Amend.), Reg.		Table **7.4-1** of **HSC** Code **1994**					
IACS UI Number	**HSC4**	**UI** version	**1997/ Del,Nov.,2021**	Date of implementation	**-/ Jul.1,2022**	Means of implementation	

Conventions/Codes Requirements

The requirements for structural fire protection times for separating bulkheads and decks of passenger craft are given in Table 7.4-1

Interpretation

Deleted.

Technical Background

Deleted as it is included in paragraph 7.4.2.7 of the 2000 HSC Code as amended by Resolution MSC.222(82).

Remarks

5.5 Aluminium lube oil sump or tank

Conventions (Amend.), Reg.		Regulation **7.5.2** of **HSC** Code **1994**					
IACS UI Number	**HSC5**	**UI** version	**1997**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

7.5.2 Fuel oil tanks should not be located in or contiguous to major fire hazard areas. However, flammable fluids of a flashpoint not less than 60℃ may be located within such areas provided the tanks are made of steel or other equivalent material.

Interpretation

Deleted

Technical Background

The UI has already been incorporated in the amendments to the 2000 HSC Code, this UI was deleted.

Remarks

This UI was deleted in March 2021 by IACS

5.6 Protection of propeller shafts

Conventions (Amend.), Reg.		Paragraph 9.8 of **HSC** Code **2000**, Chapter 9, part B					
IACS UI Number	**HSC6**	**UI** version	**1997/ Rev.1,Nov.,2021**	Date of implementation	**-/ Rev.1,Jul.1,2022**	Means of implementation	

Conventions/Codes Requirements

Paragraph 9.8 reads as follows:

Means for return to a port of refuge for category B craft

Category B craft should be capable of maintaining the essential machinery and control so that, in the event of a fire or other casualties in any one compartment on board, the craft can return to a port of refuge under its own power.

Interpretation

On monohulls, propeller shaft and bearings of at least one main engine, when passing through the aft machinery space, are to be protected as follows:

- steel shaft bearings by water spray,
- shafts made of composite material (FRP), either by
  - passive fire protection for 60 minutes duration, or
  - a water spray system and able to transmit the full torque of the propulsion engine after a standard fire test of 7 minutes.

Technical Background

Revised to include a reference to the HSC 2000, Ch. 9, part B,Sec8.

Remarks

Rev.1 of this Unified Interpretation is to be uniformly implemented by IACS Societies on ships constructed on or after 1 July 2022.

5.7 Machinery installations – dead craft condition

Conventions (Amend.), Reg.		Paragraph **9.1.5** of **HSC** Code **1994/2000**					
IACS UI Number	**HSC7**	**UI** version	**Dec. 2003/ Rev. 1 Nov. 2005**	Date of implementation	**01.03.2004**	Means of implementation	

Conventions/Codes Requirements

Means shall be provided to ensure that the machinery can be brought into operation from the dead craft condition without external aid.

Interpretation

Dead craft condition for the purpose of Regulation 9.1.5 is to be understood to mean a condition under which the main propulsion plant and auxiliaries are not in operation and, in restoring the propulsion, no stored energy is assumed to be available for starting and operating the propulsion plant, the main source of electrical power and other essential auxiliaries. It is assumed that means are available at all times to start the emergency generator or one of the main generators when the main source is arranged according to paragraph 12.7.2.

Where the emergency source of power is an emergency generator which complies with section 12.4, or a main generator meeting the requirements of paragraph 12.7.2, it is assumed that means are available to start this generator and consequently this generator may be used for restoring operation of the main propulsion plant and auxiliaries where any power supplies necessary for engine operation are also protected to a similar level as the starting arrangements.

Where there is no emergency generator installed or an emergency generator does not comply with section 12.4, the arrangements for bringing main and auxiliary machinery into operation are to be such that initial charge of starting air or initial electrical power and any power supplies for engine operation can be developed on board the craft without external aid. If for this purpose an emergency air compressor or electric generator is required, these units are to be powered by a hand-starting oil engine or a hand-operated compressor. The arrangements for bringing main and auxiliary machinery into operation are to have a capacity such that the starting energy and any power supplies for engine operation are available within 30 minutes of a dead craft condition.

Remarks

Refer to MSC/Circ. 1177 (Rev.1 of this UI in its entirety is contained in the Circular).

5.8 Protection of load bearing structures

Conventions (Amend.), Reg.		**2000HSC Code 7.4.2.3**					
IACS UI Number	**HSC8**	**UI version**	**Jul.,2012**	**Date of implementation**	**Jan.1,2014**	**Means of implementation**	**Keel laying**

Conventions/Codes Requirements

HSC Code Ch.7.4.2.3:

Main load-carrying structures within areas of major fire hazard and areas of moderate fire hazard and structures supporting control stations shall be arranged to distribute load such that there will be no collapse of the construction of the hull and superstructure when it is exposed to fire for the appropriate fire protection time. The load-carrying structure shall also comply with the requirements of 7.4.2.4 and 7.4.2.5.

Interpretation

Protection time

The structural fire protection time of main load bearing structures located within areas of major fire hazard (classified as A) and areas of moderate fire hazard (classified as B), and load bearing structures supporting control stations shall, as a minimum, be the same as that required by tables 7.4-1 and 7.4-2 (as applicable), for the divisions enclosing the space where these supports are located. In accordance with para. 7.4.1.1 in no case shall the structural fire protection time be less than 30 min.

Load bearing structures made of steel, other than those constituting the divisions dealt with in tables 7.4-1 and 7.4-2 (as applicable), need not be insulated.

Extent of structural fire protection

The structures considered shall be all load-carrying structures within areas of major and moderate fire hazard (classified as A or B) as well as all structures (irrespective of where they are located) which are necessary to support control stations.

The vertical extent of structure supporting control stations shall be considered all the way down to and including spaces within the hull(s). However, all structures within voids in the hull can be exempted from this consideration

based on HSC Code 7.4.2.1 (first part).

Fire testing
Approvals from the standard fire test *according to the IMO FTP Code, Annex 1, Part 11* for a bulkhead or deck of a given material can be applied for protection of pillars of the same material. The structural fire protection time shall be considered to be the same as that achieved in the fire test.

Load case
When load carrying capability calculations are performed for an assumed fire within a space, all insulated or un-insulated steel structures, including pillars, as well as fire insulated aluminium and FRP structures in the space may be included; un-insulated aluminium and FRP structures shall not be included. A single fire concept can be applied where a fire is only presumed to originate in one enclosed space and not propagate to another enclosed space.
Example: Structures within a public space support a wheelhouse and a separate enclosed public space on the wheelhouse deck. Two load calculations shall then be made：
i) One presuming a fire below the wheelhouse; utilizing, in the load calculations un-insulated steel and insulated aluminium and FRP structures within the public space on the wheelhouse deck;
ii) Another presuming fire within the public spaces on the wheelhouse deck; utilizing, in the load calculations, un-insulated steel and insulated aluminium and FRP structures within the public space below the wheelhouse.

Technical Background

The intent of 2000 HSC Code 7.4.2.3 is that a fire in areas of moderate or major fire hazard will not impair the integrity of structural strength of the vessel and that spaces such as the wheelhouse will not collapse in case of a fire . IACS proposed this UI in relation to protection time, extent of the design fire and the corresponding extent of the structural fire protection, fire testing and load case so as to achieve a unified approach to this regulation among class societies and flag Administrations.

Remarks

5.9 Keel Laying Date for Fibre-Reinforced Plastic (FRP) Craft

Conventions (Amend.), Reg.		HSC Code/ICLL Convention/MARPOL Convention					
IACS UI Number	**HSC9-LL78-MPC104**	**UI version**	**Mar.,2013/ Corr.1, Jan.,2014**	**Date of implementation**	**Jan.1,2014**	**Means of implementation**	

Conventions/Codes Requirements

For the ships referred to the term “the keels of which are laid or which are at a similar stage of construction” in IMO Conventions and Codes (Performance Standards, Technical Standards, Resolutions and Circulars).

Interpretation

For the purposes of the application of the IMO Conventions and Codes (Performance Standards, Technical Standards, Resolutions and Circulars) for Fibre-Reinforced Plastic (FRP) Craft, the term “the keels of which are laid or which are at a similar stage of construction” should be interpreted as the date that the first structural reinforcement of the complete thickness of the approved hull laminate schedule is laid either in or on the mould.

Technical Background

The Keel Laying date can be difficult to define accurately when FRP Craft are considered. This has not caused a great problem in the past as FRP vessels are rare. However MARPOL Annex VI uses the term “ship constructed,” particularly in relation to NO_x Tier I/II/III requirements (noting that Tier III applies to a marine diesel engine that is installed on a ship constructed on or after 1 January 2016). For most composite vessels it would require the application of the latter, i.e. that the mass of 1% of the structural material is estimated from the laminate schedule and agreed between the Builder and the Surveyor. However, this is not a practical approach. It was considered necessary therefore to agree a consistent interpretation for the term “the keels of which are laid or which are at a similar stage of construction” for Fibre-Reinforced Plastic (FRP) Craft.

Remarks

5.10 Inclusion of mediums of the fire-fighting systems in lightweight (2000 HSC Code Chapter 1, Regulation 1.4.34)

Conventions (Amend.), Reg.		2000 HSC Code Chapter 1, Regulation 1.4.34					
IACS UI Number	**HSC 10**	**UI version**	**May 2016**	**Date of implementation**	**1 January, 2017**	**Means of implementation**	**contracted for construction**

Conventions/Codes Requirements

2000 HSC Code Chapter 1, Regulation 1.4.34

"Lightweight is the displacement of the craft in tonnes without cargo, fuel, lubricating oil, ballast water, fresh water and feedwater in tanks, consumable stores, passengers and crew and their effects."

Interpretation

The weight of mediums on board for the fixed fire-fighting systems (e.g. freshwater, CO2, dry chemical powder, foam concentrate, etc.) shall be included in the lightweight and lightship condition.

Technical Background

The above definition is similar to those contained in SOLAS regulations II-1/2.21 and II-2/3.28, 2008 IS Code, para. 2.23 where CO2 is not explicitly mentioned. It is decided to extend the text of the interpretation UI SC273 "Inclusion of the weight of mediums of the firefighting systems in lightweight" to the 2000 HSC Code by means of a dedicated HSC UI.

Remarks

The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

CHAPTER 6 (INTERNATIONAL) CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK (BCH/IBC CODE)

6.1 Restricted device

Conventions (Amend.), Reg.		Paragraph **3.9(b)** of Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (**BCH** Code) (corresponds to paragraph 13.1.1.2 of the IBC Code)					
IACS UI Number	**CC1**	**UI** version	**Rev. 1,1979/ Rev.2, Feb., 2007**	Date of implementation	**01.08.2007**	Means of implementation	
Conventions/Codes Requirements							
Restricted device which penetrates the tank and which, when in use, permits a small quantity of cargo vapour or liquid to be exposed to the atmosphere. When not in use, the device is completely closed. The design should ensure that no dangerous escape of tank contents (liquid or spray) can take place in opening device.							
Interpretation							
A restricted device could be a sounding pipe with inside diameter not exceeding 200 mm, with vapour tight cover.							
Technical Background							
IBC Amendments took effect on Jan.1 2007, and the sequence of paragraph to which the BCH Code corresponds is changed. Therefore this UI is revised to address this change with no substantial contents involved.(Rev.2)							
Remarks							

6.2 Tank venting systems

Conventions (Amend.), Reg.		Paragraph **4.9.2** of Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (**BCH** Code) (corresponds to paragraph 15.12.2 of the IBC Code)					
IACS UI Number	**CC2**	**UI** version	1977/Rev.1, Feb.2007	Date of implementation	**01.08.2007**	Means of implementation	
Conventions/Codes Requirements							
Tank venting systems should be provided with a connection for a vapour return line to shore installation.							
Interpretation							
This paragraph may be interpreted as follows in respect of the provision of a stop valve for the connection of tank venting systems with lines for the return of vapours to shore plants: "Tank venting systems should be provided with a stop valve for vapour return line to shore."							
Technical Background							
IBC Amendments took effect on Jan.1 2007, and the sequence of paragraph to which the BCH Code corresponds is changed. Therefore this UI is revised to address this change with no substantial contents involved.(Rev.1)							
Remarks							

6.3 Tank venting systems

Conventions (Amend.), Reg.		Paragraph **4.11.2** of Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (**BCH** Code) (corresponds to paragraph 15.14.4 of the IBC Code)					
IACS UI Number	**CC3**	**UI** version	**1977/Rev.1, Feb.2007**	Date of implementation	**01.08.2007**	Means of implementation	
Conventions/Codes Requirements							

Connections for returning the expelled gases ashore during loading should be provided.
Interpretation
This paragraph may be interpreted as follows in respect of the provision of a stop valve for the connection of tank venting systems with lines for the return of vapours to shore plants: "Tank venting systems should be provided with a stop valve for vapour return line to shore."
Technical Background
IBC Amendments took effect on Jan.1 2007, and the sequence of paragraph to which the BCH Code corresponds is changed. Therefore this UI is revised to address this change with no substantial contents involved.(Rev.1)
Remarks

6.4 Bypassing a pressure- or vacuum-relief valve or pressure/vacuum valve

Conventions (Amend.), Reg.		Paragraph **8.3.2** of International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (**IBC** Code)					
IACS UI Number	**CC4**	**UI** version	**June 2002**	Date of implementation	**01.01.2003**	Means of implementation	
Conventions/Codes Requirements							
Provision may be made for bypassing a pressure- or vacuum-relief valve or pressure/vacuum valve under certain operating conditions provided that the vent-line outlet is fitted with flame arresters and is located at the required height above the deck level. However, bypassing of high-velocity valves is not permitted.							
Interpretation							
Bypassing of P/V valves is allowed during cargo operations only for cargoes having a flash point exceeding 60℃ which do not require a vapor return system, provided that the vent-line outlet is fitted with flame arresters and is located at the required height above the deck level. However, bypassing of high-velocity valves is not permitted.							
Remarks							

6.5 Fire protection and fire extinction IBC Code Chapter 11

Conventions (Amend.), Reg.		Paragraph **11.1** of International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (**IBC** Code)					
IACS UI Number	**CC5**	**UI** version	**Sep.,2008**	Date of implementation	**Jan.1,2009**	Means of implementation	
Conventions/Codes Requirements							
Paragraphs 11.1.1.3 and 4 of IBC Code Chapter 11 (as amended by Res.MSC.219(82) and Res.MEPC.166(56)) read: "11.1.1 The requirements for tankers in SOLAS chapter II-2 shall apply to ships covered by the Code, irrespective of tonnage, including ships of less than 500 tons gross tonnage, except that: *.3 regulations 10.2, 10.4, and 10.5 shall apply as they would apply to cargo ships of 2,000 tons gross tonnage and over;* *.4 regulation 10.5.6 shall apply to ships of 2,000 gross tonnage and over;*							
Interpretation							
1. SOLAS Regulations II-2/10.2 and 10.4 apply to cargo ships of 500 gross tonnage and over under SOLAS and to chemical carriers, regardless of size, under the IBC Code. 2. SOLAS II-2/10.5, except for sub-paragraph 10.5.6, applies to chemical tankers, regardless of size, constructed on/after 1 July 1986. 3. SOLAS II-2/10.5.6 applies only to chemical tankers constructed on/after 1 July 2002 and of 2,000 gt and above.							
Technical Background							

Amendments to IBC Code (MSC.219(82) and MEPC.166(56)) entered into force on 1 January 2009. As there are disputes with regard to Paragraphs 11.1.1.3 and 11.1.1.4 of the Code, the interpretation of the two paragraphs is made after discussion of Statutory Panel.
Remarks

6.6 Lining approved for use with acids

Conventions (Amend.), Reg.		IBC Code item 15.11.2					
IACS UI Number	**CC6**	**UI** version	**Apr.,2011**	Date of implementation	**Jan.1,2012**	Means of implementation	
Conventions/Codes Requirements							
IBC Code 15.11 Acids 15.11.2 Proposals for lining steel tanks and related piping systems with corrosion-resistant materials may be considered by the Administration. The elasticity of the lining shall not be less than that of the supporting boundary plating.							
Interpretation							
"Lining" is an acid-resistant material that is applied to the tank or piping system in a solid state with a defined elasticity property.							
Technical Background							
Each IACS member adopts different method for the approval of "lining", so it is necessary to make an approval requirement to be commonly accepted. EG/Coating initially made the unified interpretation and it recommended that the "coating" could not substitute the "lining". However, the draft was rejected because IACS discussed and regarded that whether the lining applied to the transportation of acid type products was not determined by the name of "coating" or "lining", it should be related to the characteristic of product, During developing of a new unified interpretation, it is considered that the lining inside compartment or piping should be in solid state so that the thickness can be consistent. In addition, it is difficult to control the thickness of protection system (its edge and corner), which is applied inside the compartment or piping, and is also difficult to control the necessary hardening process subsequently, it is regarded that the spray on corrosion-resistant system can not be accepted according to the new unified interpretation, but the lining in solid type (such as the solid lining formed by rotational moulding) is acceptable. For this purpose, this above unified interpretation has been made.							
Remarks							

6.7 Unprotected openings

Conventions (Amend.), Reg.		**IBC Code - 2.9**					
IACS UI Number	**CC7**	**UI version**	**06.2016**	**Date of implementation**	**01.01.2017**	**Means of implementation**	**contracted for construction**
Conventions/Codes Requirements							
2.9.3 At final equilibrium after flooding, the righting-lever curve shall have a minimum range of 20° beyond the position of equilibrium in association with a maximum residual righting lever of at least 0.1 m within the 20° range; the area under the curve within this range shall not be less than 0.0175 m radians. Unprotected openings shall not be immersed within this range unless the space concerned is assumed to be flooded. Within this range, the immersion of any of the openings listed in 2.9.2.1 and other openings capable of being closed weathertight may be permitted.							
Interpretation							
Other openings capable of being closed weathertight do not include ventilators (complying with ILLC 19(4)) that for operational reasons have to remain open to supply air to the engine room or emergency generator room (if the same is considered buoyant in the stability calculation or protecting openings leading below) for the effective operation of							

the ship.
Technical Background
The Dutch Safety Board noted that one cause of the capsizing was that the weathertight closing appliances to the main engine room were left open in order to ensure an adequate air supply to achieve the required bollard pull. These openings had been considered as closed in the intact stability calculations.
Remarks
The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

CHAPTER 7 INTERNATIONAL CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING LIQUEFIED GASES IN BULK (IGC CODE)

7.1 Interpretation of the second sentence of paragraph 13.2.1

Conventions (Amend.), Reg.		**Paragraph 13.2.1 of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (MSC.5(48)) as amended by resolutions MSC.17(58), MSC.30(61), MSC.32(63), MSC.59(67), MSC.103(73), MSC.177(79) and MSC.220(82)**					
IACS UI Number	**GC2**	**UI** version	**1977/ Rev.1,12.2018**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

Where only one level gauge is fitted it should be arranged so that any necessary maintenance can be carried out while the cargo tank is in service.

Interpretation

In order to assess whether or not only one level gauge is acceptable in relation to the aforesaid sentence, "any maintenance" means that "any part" of the level gauge can be overhauled while the cargo tank is in service.

Technical Background

In the light of the revised IGC Code (MSC.370(93)), GPG tasked IACS panel members to review the applicable UIs. It was noted that interpretation as provided in UI GC2 remain applicable for ships constructed before 1 July 2016 complying with MSC.5(48), however many of the clarifications provided in UI GC2 having been included in the revised IGC Code (MSC.370(93)), it was proposed by the panel members that existing UI GC2 is to be retained and remains applicable to ships constructed before 1 July 2016 and complying with MSC.5(48).

Remarks

Rev.1 of this Unified Interpretation is to be uniformly implemented by IACS Societies on ships constructed on or after 1 July 1986 but before 1 July 2016.

7. 2 Closing Devices for Air Intakes

Conventions (Amend.), Reg.		**Interpretation of paragraph 3.2.6 of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (MSC.5(48)) as amended by resolutions MSC.17(58), MSC.30(61), MSC.32(63), MSC.59(67), MSC.103(73), MSC.177(79) and MSC.220(82)**					
IACS UI Number	**GC 5**	**UI** version	**1985/ Rev.1Feb 2016**	Date of implementation	**-/ 1 July2016**	Means of implementation	**construction**

Conventions/Codes Requirements

Interpretation of paragraph 3.2.6 of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (MSC.5(48)) as amended by resolutions MSC.17(58), MSC.30(61), MSC.32(63), MSC.59(67), MSC.103(73), MSC.177(79) and MSC.220(82):
All air intakes and openings into the accommodation spaces, service spaces and control stations should be fitted with closing devices. For toxic gases they should be operated from inside the space.

Interpretation

1. The requirement for fitting air intakes and openings with closing devices operable from inside the space in ships intended to carry toxic products should apply to spaces which are used for the ships' radio and main navigating equipment, cabins, mess rooms, toilets, hospitals, galleys, etc., but should not apply to spaces not normally manned such as deck stores, forecastle stores, engine room casings, steering gear compartments, workshops. The requirement does also not apply to cargo control rooms located within the cargo area.

2. When internal closing is required, this should include both ventilation intakes and outlets.

3. The closing devices should give a reasonable degree of gas tightness. Ordinary steel fire-flaps without gaskets/seals should normally not be considered satisfactory.

Technical Background

To clearly indicate that the existing UI GC5 does not apply to the revised IGC Code.

Remarks

1. Rev.1 of this Unified Interpretation is to be uniformly implemented by IACS Societies on ships constructed on or after 1 January 1986 but before 1 July 2016.
2 For ships whose keels are laid, or which are at a similar stage of construction, on or after 1 July 2016 refer to UI GC15.

7.3 Cargo tank clearances (for access to spaces in the cargo area)

Conventions (Amend.), Reg.		Section **3.5** of International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (**IGC** Code) (**MSC.5(48)**) as amended by resolutions MSC.17(58), MSC.30(61), MSC.32(63), MSC.59(67), MSC.103(73), MSC.177(79) and MSC.220(82)					
IACS UI Number	**GC6**	**UI** version	**1986/ Rev.1, Feb. 2016**	Date of implementation	-/ **Jul.1, 2016**	Means of implementation	

Conventions/Codes Requirements

Interpretation

This section may be interpreted as follows:
1 Designated passage ways below and above cargo tanks should have at least the cross sections as required by 3.5.3.1.3.
2 For the purpose of 3.5.1 or 3.5 2 the following should apply:

.1 Where the surveyor requires to pass between the surface to be inspected, flat or curved, and structural elements such as deck beams, stiffeners, frames, girders etc., the distance between that surface and the free edge of the structural elements should be at least 380 mm. The distance between the surface to be inspected and the surface to which the above structural elements are fitted, eg deck, bulkhead or shell, should be at least 450 mm in case of a curved tank surface (eg in case of type C-tank) or 600 mm in case of a flat tank surface (eg in case of type A-tank). (See figure 1).

.2 Where the surveyor does not require to pass between the surface to be inspected and any part of the structure, for visibility reasons the distance between the free edge of that structural element and the surface to be inspected should be at least 50 mm or half the breadth of the structure's face plate, whichever is the larger. (See Figure 2).

.3 If for inspection of a curved surface the surveyor requires to pass between that surface and another surface, flat or curved, to which no structural elements are fitted, the distance between both surfaces should be at least 380 mm (See Figure 3). Where the surveyor does not require to pass between that curved surface and another surface, a smaller distance than 380 mm may be accepted taking into account the shape of the curved surface.

.4 If for inspection of an approximately flat surface the surveyor requires to pass between two approximately flat and approximately parallel surfaces, to which no structural elements are fitted, the distance between those surfaces should be at least 600 mm (See Figure 4).

.5 The minimum distances between a cargo tank sump and adjacent double bottom structure in way of a suction wells should not be less than shown in Figure 5. If there is no suction well, the distance between the cargo tank sump and the inner bottom should not be less than 50 mm.

.6 The distance between a cargo tank dome and deck structures should not be less than 150 mm (See Figure 6).

.7 If necessary for inspection fixed or portable staging should be installed. This staging should not impair the

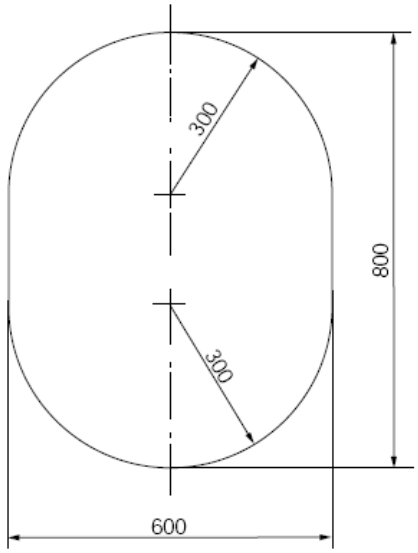
distances required under .1 to .4.

.8 If fixed or portable ventilation ducting has to be fitted in compliance with 12.2 such ducting should not impair the distances required under .1 to .4.

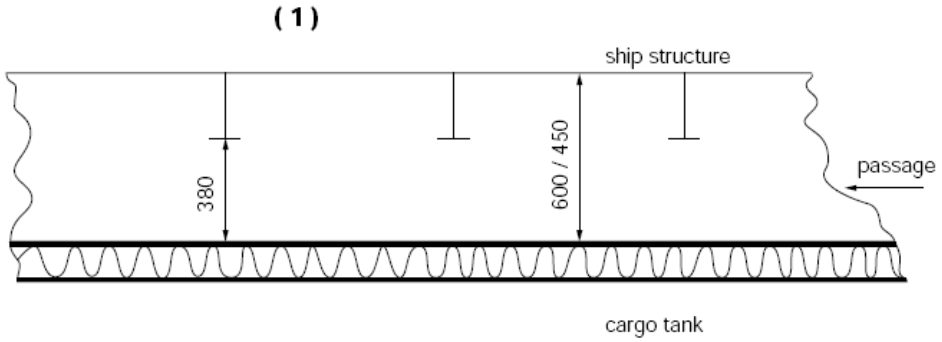
3 For the purpose of sub-paragraph 3.5.3.1.2 and .1.3 the following should apply:

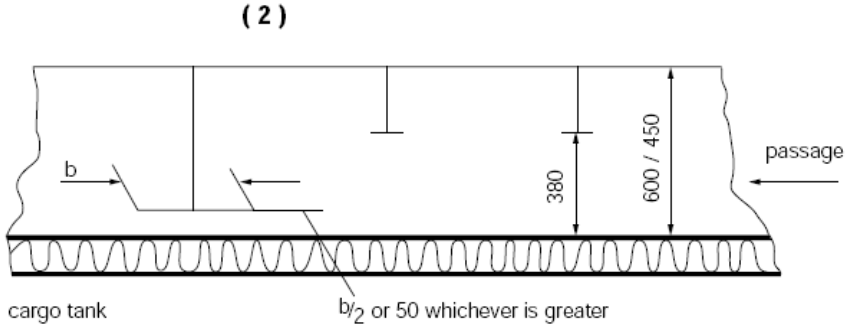
.1 The term "minimum clear opening of not less than 600 × 600 mm" means that such openings may have corner radii up to 100 mm maximum.

.2 The term "minimum clear opening of not less than 600 × 800 mm" includes also an opening of the following size:

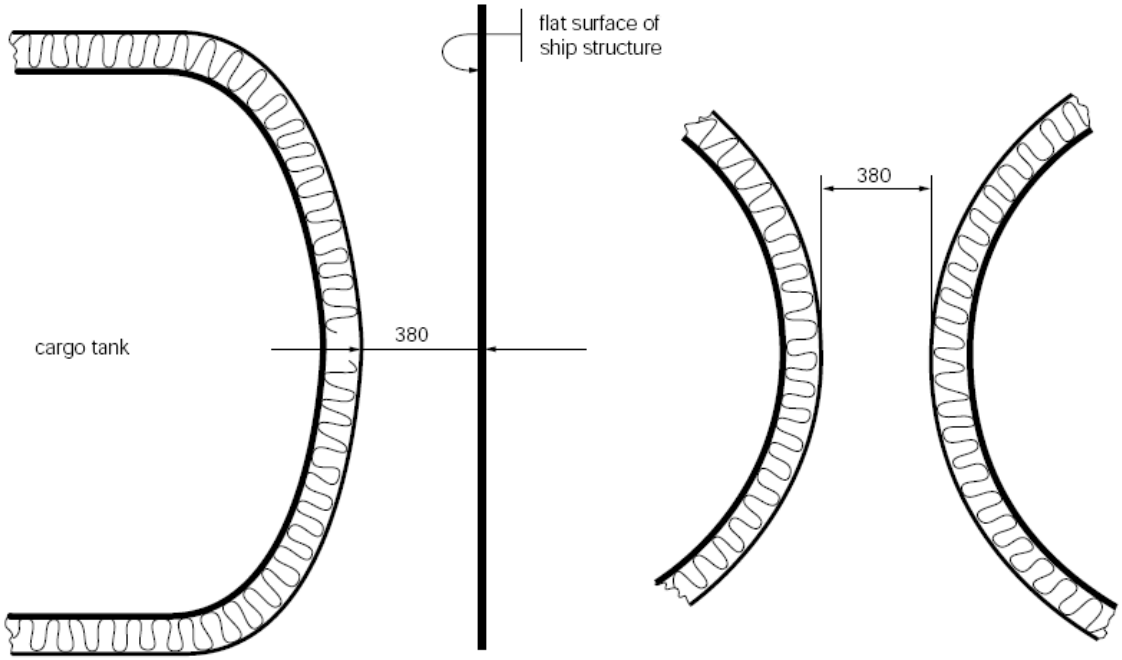


.3 Circular access openings in type-C cargo tanks should have diameters of not less than 600 mm.

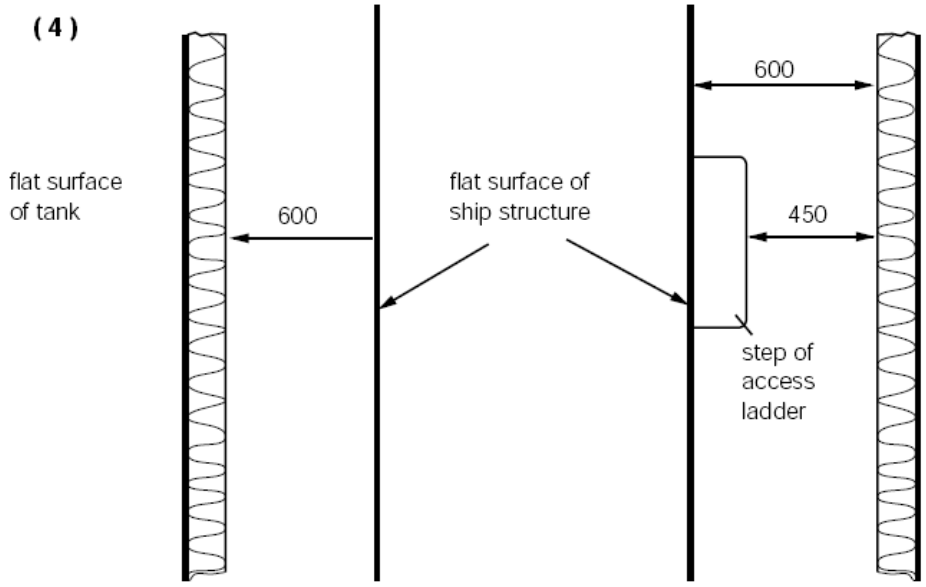


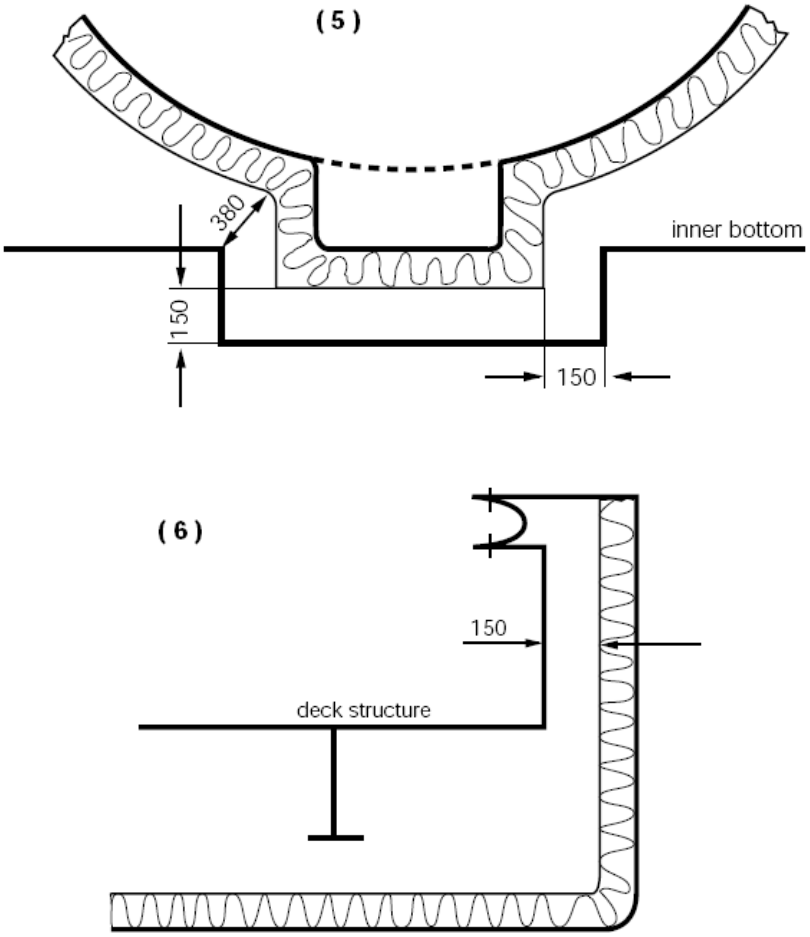


(3)


flat surface of
ship structure
cargo tank
380
380

(4)


flat surface
of tank
600
flat surface of
ship structure
600
450
step of
access
ladder



Remarks

1. This Unified Interpretation is to be uniformly implemented by IACS Societies on ships constructed on or after 1 January 1986 but before 1 July 2016.
2. For ships whose keels are laid, or which are at a similar stage of construction, on or after 1 July 2016 refer to UI GC16.

7.4 Carriage of products not covered by the Code

Conventions (Amend.), Reg.		**Section 4.23.1.2 of the IMO INTERNATIONAL CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING LIQUEFIED GASES IN BULK (MSC.370(93))**					
IACS UI Number	**GC7**	**UI** version	Rev.1 June 2016	Date of implementation	—/1 July 2016	Means of implementation	

Conventions/Codes Requirements

Section 4.23.1.2 of the IMO INTERNATIONAL CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING LIQUEFIED GASES IN BULK (MSC.370(93)) reads:

"4.23.1.2 The design vapour pressure shall not be less than:

$$P_o = 0.2 + AC(\rho_r)^{1.5} \quad (MPa)$$

where:

$$A = 0.00185\left(\frac{\sigma_m}{\Delta\sigma_A}\right)^2$$

with:

σ_m = *design primary membrane stress;*

$\Delta\sigma_A$ = *allowable dynamic membrane stress (double amplitude at probability level $Q = 10^{-8}$) and equal to:*

- *55 N/mm^2 for ferritic-perlitic, martensitic and austenitic steel;*
- *25 N/mm^2 for aluminium alloy (5083-O);*

C = a characteristic tank dimension to be taken as the greatest of the following:

h, 0.75b or 0.45ℓ,

with:

h = *height of tank (dimension in ship's vertical direction) (m);*

b = *width of tank (dimension in ship's transverse direction)(m);*

ℓ = *length of tank (dimension in ship's longitudinal direction) (m);*

ρ_r = *the relative density of the cargo (ρ_r = 1 for fresh water) at the design temperature.*

When a specified design life of the tank is longer than 10^8 wave encounters, $\Delta\sigma_A$ shall be modified to give equivalent crack propagation corresponding to the design life."

Interpretation

1. If the carriage of products not covered by the Code* is intended, it should be verified that the double amplitude of the primary membrane stress $\Delta\sigma_m$ created by the maximum dynamic pressure differential ΔP does not exceed the allowable double amplitude of the dynamic membrane stress $\Delta\sigma_A$ as specified in paragraph 4.23.1.2 of the Code, ie:

$$\Delta\sigma_m \leq \Delta\sigma_A$$

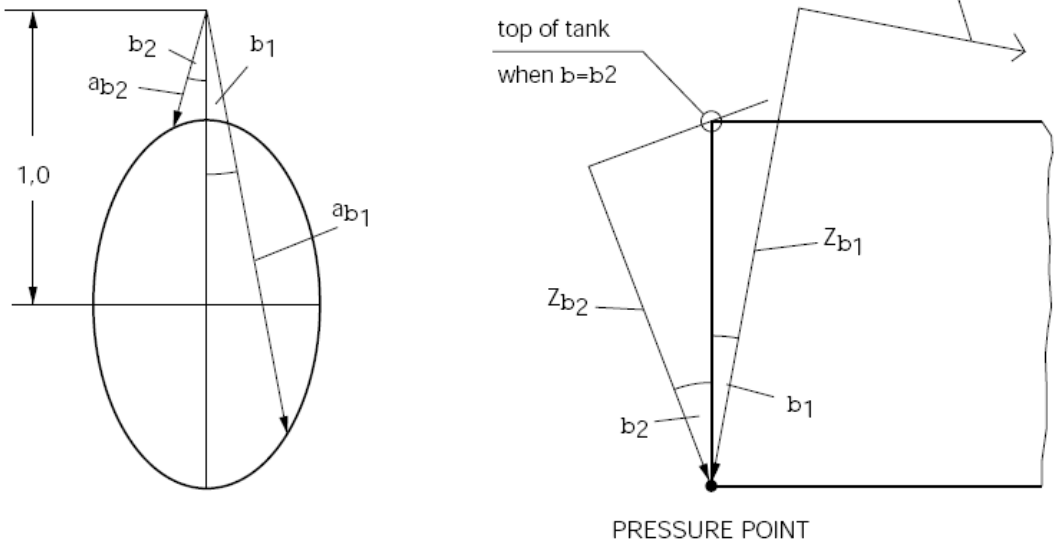
2. The dynamic pressure differential ΔP in MPa should be calculated as follows:

$$\Delta P = \frac{\rho}{1{,}02.10^5}\left(a_{\beta 1}Z_{\beta 1} - a_{\beta 2}Z_{\beta 2}\right)$$

where:

ρ is maximum liquid cargo density in kg/m^3 at the design temperature
a_β, Z_β are as defined in 4.28.1.2 of the Code, see also Figure below
$a_{\beta 1}$, $Z_{\beta 1}$ are the a_β and Z_β values giving the maximum liquid pressure $(P_{gd})_{max}$
$a_{\beta 2}$, $Z_{\beta 2}$ are the a_β and Z_β values giving the minimum liquid pressure $(P_{gd})_{min}$

In order to evaluate the maximum pressure differential ΔP, pressure differentials should be evaluated over the full range of the acceleration ellipse as shown in the sketches given below.



NOTE:
* The outlined procedure is only applicable to products having a relative density exceeding 1.0.

Remarks

7.5 Permissible stresses in way of supports of type C cargo tanks

Conventions (Amend.), Reg.		**Paragraph 4.23.3.1 of International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (MSC.370(93))**					
IACS UI Number	**GC8**	**UI** version	Rev.1 June 2016	Date of implementation	—/01.07.2016	Means of implementation	

Conventions/Codes Requirements

4.23.3.1 Plastic deformation

For type C independent tanks, the allowable stresses shall not exceed:

$\sigma_m \leq f$
$\sigma_L \leq 1.5f$
$\sigma_b \leq 1.5f$
$\sigma_L + \sigma_b \leq 1.5f$
$\sigma_m + \sigma_b \leq 1.5f$
$\sigma_m + \sigma_b + \sigma_g \leq 3.0f$
$\sigma_L + \sigma_b + \sigma_g \leq 3.0f,$

where:

σ_m = *equivalent primary general membrane stress;*
σ_L = *equivalent primary local membrane stress;*
σ_b = *equivalent primary bending stress;*

σ_g = *equivalent secondary stress; and*

f = *the lesser of R_m /A or R_e /B,*

with R_m and R_e as defined in 4.18.1.3. With regard to the stresses σ_m, σ_L, σ_b and σ_g, the definition of stress categories in 4.28.3 are referred. The values A and B shall be shown on the International Certificate of Fitness for the Carriage of Liquefied Gases in Bulk and shall have at least the following minimum values:

	Nickel steels and carbon-manganese steels	***Austenitic steels***	***Aluminium alloys***
A	*3*	*3.5*	*4*
B	*1.5*	*1.5*	*1.5*

Interpretation

The circumferential stresses at supports shall be calculated by a procedure acceptable to the Classification Society for a sufficient number of load cases.

1. Permissible stresses in stiffening rings:

For horizontal cylindrical tanks made of C-Mn steel supported in saddles, the equivalent stress in the stiffening rings shall not exceed the following values if calculated using finite element method:

$$\sigma_e \le \sigma_{all}$$

where:

$$\sigma_{all} = \min(0.57R_m; 0.85R_e)$$

$$\sigma_e = \sqrt{(\sigma_n + \sigma_b)^2 + 3\tau^2}$$

σ_e = von Mises equivalent stress in N/mm^2

σ_n = normal stress in N/mm^2 in the circumferential direction of the stiffening ring

σ_b = bending stress in N/mm^2 in the circumferential direction of the stiffening ring

τ = shear stress in N/mm^2 in the stiffening ring

R_m and R_e as defined in 4.18.1.3 of the Code.

Equivalent stress values σ_e should be calculated over the full extent of the stiffening ring by a procedure acceptable to the Classification Society, for a sufficient number of load cases.

2. The following assumptions should be made for the stiffening rings:

2.1 The stiffening ring should be considered as a circumferential beam formed by web, face plate, doubler plate, if any, and associated shell plating.

The effective width of the associated plating should be taken as:

.1 For cylindrical shells:

an effective width (mm) not greater than 0.78 $\sqrt{rt}$ on each side of the web. A doubler plate, if any, may be included within that distance.

where:

r = mean radius of the cylindrical shell (mm)

t = shell thickness (mm)

.2 For longitudinal bulkheads (in the case of lobe tanks):

the effective width should be determined according to established standards. A value of 20 t_b on each side of the web may be taken as a guidance value.

where:

t_b = bulkhead thickness (mm).

2.2 The stiffening ring should be loaded with circumferential forces, on each side of the ring, due to the shear stress, determined by the bi-dimensional shear flow theory from the shear force of the tank.

3. For calculation of reaction forces at the supports, the following factors should be taken into account:

3.1 Elasticity of support material (intermediate layer of wood or similar material).

3.2 Change in contact surface between tank and support, and of the relevant reactions, due to:

– thermal shrinkage of tank.

– elastic deformations of tank and support material.

The final distribution of the reaction forces at the supports should not show any tensile forces.

4. The buckling strength of the stiffening rings should be examined.

Remarks

7.6 Guidance for sizing pressure relief systems for interbarrier spaces

Conventions (Amend.), Reg.		**paragraph 8.1 of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (MSC.5(48)) as amended by resolutions MSC.17(58), MSC.30(61), MSC.32(63),MSC.59(67), SC.103(73), MSC.177(79) and MSC.220(82)**					
IACS UI Number	**GC9**	**UI** version	**1988/ Rev.1,12.2018**	Date of implementation		Means of implementation	

Conventions/Codes Requirements

The second sentence of paragraph 8.1 reads as follows:
Hold spaces and interbarrier spaces, which may be subject to pressures beyond their design capabilities, shall also be provided with a suitable pressure relief system

Interpretation

1 General

1.1 The formula for determining the relieving capacity given in section 2 is developed for interbarrier spaces surrounding independent type A cargo tanks, where the thermal insulation is fitted to the cargo tanks.

1.2 The relieving capacity of pressure relief devices of interbarrier spaces surrounding independent type B cargo tanks may be determined on the basis of the method given in section 2, however, the leakage rate is to be determined in accordance with 4.7.6.1 of the IGC-Code.

1.3 The relieving capacity of pressure relief devices for interbarrier spaces of membrane and semimembrane tanks is to be evaluated on the basis of specific membrane/semi-membrane tank design.

1.4 The relieving capacity of pressure relief devices for interbarrier spaces adjacent to integral type cargo tanks may, if applicable, be determined as for type A independent cargo tanks.

1.5 Interbarrier space pressure relief devices in the scope of this interpretation are emergency devices for protecting the hull structure from being unduly overstressed in case of a pressure rise in the interbarrier space due to primary barrier failure. Therefore such devices need not comply with the requirements of 8.2.9 and 8.2.10 of the IGC-Code.

2 Size of pressure relief devices

The combined relieving capacity of the pressure relief devices for interbarrier spaces surrounding type A independent cargo tanks where the insulation is fitted to the cargo tanks may be determined by the following formula:

$$Q_{sa} = 3.4 A_c \frac{\rho}{\rho_v} \sqrt{h} \quad (m^3/s)$$

where:

Q_{sa} = minimum required discharge rate of air at standard conditions of 273 K and 1.013 bar;

A_c = design crack opening area (m^2);

$A_c = \frac{\pi}{4} \delta 1$ (m^2);

δ = max, crack opening width (m);

δ = 0.2 t (m);

t = thickness of tank bottom plating (m);

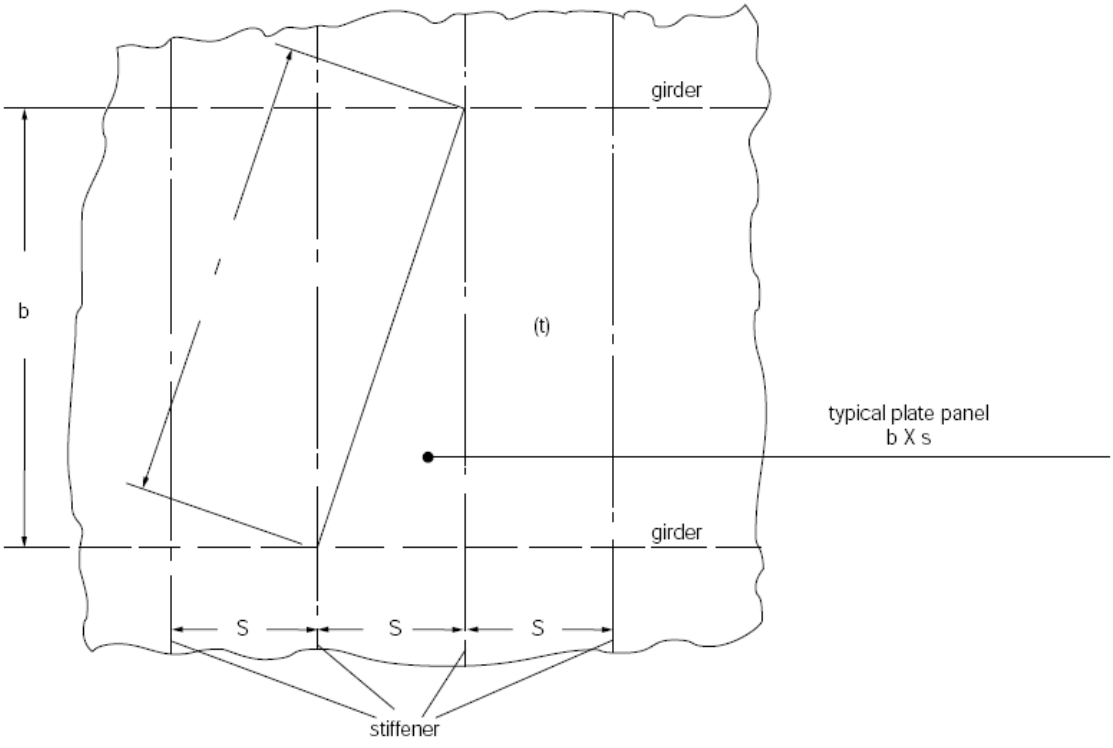
l = design crack length (m) equal to the diagonal of the largest plate panel of the tank bottom, see sketch below;

h = max liquid height above tank bottom plus 10 MARVS (m);

ρ = density of product liquid phase (kg/m^3) at the set pressure of the interbarrier space relief device;

ρ_v = density of product vapour phase (kg/m^3) at the set pressure of the interbarrier space relief device and a temperature of 273 K;

MARVS = max allowable relief valve setting of the cargo tank (bar).



Technical Background
The second sentence of paragraph 8.1 of IGC Code (MSC 5(48)) states that: Hold spaces, interbarrier spaces and cargo piping which may be subject to pressures beyond their design capabilities, shall also be provided with a suitable pressure relief system In order to assess whether "suitable pressure relief system" is provided to interbarrier spaces for various type of cargo tanks, the following is to be taken into account: 1) Leakage rate as provided taking due account for the liquid evaporation, 2) Pumping capacity and 3) Other relevant factors Also, the interbarrier space pressure relief is an emergency requirement for protection of the hull structure from being overstressed in case of primary barrier failure.
Remarks
Rev.1 of this Unified Interpretation is to be uniformly implemented by IACS Societies on ships constructed on or after 1 January 1988 but before 1 July 2016.

7.7 Reliquefaction plant of motor-driven LNG carriers

Conventions (Amend.), Reg.		**paragraph 7.2.1 of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (MSC.5(48)) as amended by resolutions MSC.17(58), MSC.30(61), MSC.32(63), MSC.59(67), MSC.103(73), MSC.177(79) and MSC.220(82)**					
IACS UI Number	**GC10**	**UI** version	**1988/ Rev.1,12.2018**	Date of implementation		Means of implementation	

Conventions/Codes Requirements
The second sentence of paragraph 7.2.1 reads as follows: Unless an alternative means of controlling the cargo pressure/temperature is provided to the satisfaction of the Administration, a stand-by unit (or units) affording space capacity at least equal to the largest required single unit should be provided.
Interpretation
1 Mechanical refrigeration fitted as the primary system for cargo pressure control 1.1 Section 7.2 is based on the assumption that paragraph 7.1.1 is being complied with by using means defined in sub-paragraph 7.1.1.1. That is to say, a mechanical refrigeration system is fitted as the primary means of maintaining the cargo tank pressure below MARVS. 1.2 Section 7.2 should apply to refrigeration systems when fitted on LNG carriers, ie standby capacity will be required as detailed in 7.2.1. A stand-by LNG/refrigerant heat exchanger need not be provided and the fitted LNG/refrigerant heat exchanger will not be required to have 25% excess capacity over that for normal requirements[1)]. Other heat exchangers utilizing water cooling should have a stand-by or have at least 25 per cent excess capacity. 1.3 Paragraph 7.2.1 states that unless an alternative means of controlling the cargo pressure/temperature is provided to the satisfaction of the Administration, a stand-by unit (or units) affording spare capacity at least equal to the largest required single unit should be fitted. For the purpose of complying with the above, a suitable alternative means of pressure/temperature control would be: 1.3.1 Auxiliary boiler(s) capable of burning the boil-off vapours and disposing of the generated steam or an alternative waste heat system acceptable to the Society. Consideration will be given to systems burning only part of the boil-off vapour if it can be shown that MARVS will not be reached within a period of 21 days. 1.3.2 Controlled venting of cargo vapours as specified in paragraph 7.1.1.5 if permitted by the Administrations concerned. 2 Mechanical refrigeration fitted as secondary system for cargo pressure control Where a refrigeration plant is fitted as a means of disposing of excess energy as detailed in the 2nd sentence of paragraph 7.1.1.2, no stand-by unit will be required for the refrigeration plant. 1) The reason for this relaxation is that corrosion and fouling problems are not expected in LNG/refrigerant heat exchangers.
Remarks
Rev.1 of this Unified Interpretation is to be uniformly implemented by IACS Societies on ships constructed on or after 1 January 1988 but before 1 July 2016.

7.8 Loading of cargo C tanks for ships constructed before 1 July 2016 and subject to IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (MSC.5(48))

Conventions (Amend.), Reg.		Paragraphs 15.1.2 and 15.1.5 of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (MSC.5(48)) as amended by Res.MSC.32(63)					
IACS UI Number	**GC11**	**UI** version	**Mar. 2006/ Rev.1 Feb. 2016**	Date of implementation	**Jul. 1, 2006/ Jul. 1, 2016**	Means of implementation	

Conventions/Codes Requirements

15.1.2 The maximum loading limit (*LL*) to which a cargo tank may be loaded should be determined by the following formula:

$$LL = FL\rho_R/\rho_L$$

where:

LL = loading limit expressed in percent which means the maximum allowable liquid volume relative to the tank volume to which the tank may be loaded;

FL = filling limits as specified in 15.1.1 or 15.1.3;

ρ_R = relative density of cargo at the reference temperature; and

ρ_L = relative density of cargo at the loading temperature and pressure.

15.1.5 The Administration may allow type C tanks to be loaded according to the following formula provided that the tank vent system has been approved in accordance with 8.2.18:

$$LL = FL\rho_R/\rho_L$$

where:

LL = loading limit as specified in 15.1.2;

FL = filling limits as specified in 15.1.1 or 15.1.3;

ρ_R = relative density of cargo at the highest temperature which the cargo may reach upon termination of loading, during transport, or at unloading, under the ambient design temperature conditions described in 7.1.2; and

ρ_L = as specified in 15.1.2.

This paragraph does not apply to products requiring a type 1G ship.

Interpretation

For ships constructed before 1 July 2016 and subject to IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (MSC.5(48)), type C cargo tanks can be loaded in accordance with the provisions of paragraph 15.1.5 or, alternatively, to the provisions of paragraph 15.1.2.

Remarks

7.9 Secondary Barrier Testing Requirements

Conventions (Amend.), Reg.		Paragraph 4.7.7 of Revised International Code for the Construction and Equipment of Ships Carrying Liquid Gases in Bulk (IGC Code) (MSC.5(48)) Paragraph 4.6.2.4 International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code) as amended by MSC.370(93)					
IACS UI Number	**GC12**	**UI** version	**Sep.,2007/ Corr.1, Nov.2007/ Rev.1, Oct.2013/ Rev.2, Aug.2015**	Date of implementation	**1 Jul. 2008 1 Jul. 2014 1 Jul. 2016**	Means of implementation	**Date of test**

Conventions/Codes Requirements

The International Code for the Construction and Equipment of Ships Carrying Liquid Gases in Bulk (IGC Code), 4.7.7 reads:

"The secondary barrier should be capable of being periodically checked for its effectiveness, by means of a pressure/vacuum test, a visual inspection or another suitable method acceptable to the Administration. The method should be submitted to the Administration for approval."

The International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code) as amended by MSC.370(93), entering into force on 1 January 2016, 4.6.2.4 reads:

"it is capable of being periodically checked for its effectiveness by means acceptable to the Administration or recognized organization acting on its behalf. This may be by means of a visual inspection or a pressure/vacuum test or other suitable means carried out according to a documented procedure agreed with the Administration or the recognized organization acting on its behalf;"

Interpretation

For containment systems with glued secondary barriers:

• At the time of construction, a tightness test should be carried out in accordance with approved system designers' procedures and acceptance criteria before and after initial cool down. Low differential pressures tests are not considered an acceptable test.

• If the designer's threshold values are exceeded, an investigation is to be carried out and additional testing such as thermographic or acoustic emissions testing should be carried out.

• The values recorded should be used as reference for future assessment of secondary barrier tightness.

For containment systems with welded metallic secondary barriers, a tightness test after initial cool down is not required.

Technical Background

Discussion was carried out within IACS Statutory Panel and LR Statutory Panel member requested that the Panel should determine if testing requirements should be created for the secondary barriers of LNG carriers. The team also considered the leakage of the secondary barrier by two vessels after delivery which resulted in the vessels being removed from service to be repaired. The current practice of testing the secondary membrane was discussed and found only one shipyard was currently testing the secondary barrier after initial cool down and most of the others refusing to test. The Survey Panel developed the UI to give secondary barrier testing requirements based on the findings by the Project Team consisting of ABS (Chair), BV, DNV, GL, LR and NK, and was approved.

(Rev.1) A project team was formed to review SBTT results among members with vessels having a glued secondary barrier. As new acceptance criteria for SBTT testing was issued by the system designer in the mean time, IACS UR revised Z16 and UI GC12 accordingly.

（Rev.2）IACS Survey Panel agreed with the principle that the test on glued secondary barrier, of the membrane containment system of a gas carrier, need to be tested before and after the initial cooling down at the time of the ship's construction.

Remarks

7.10 Examination before and after the first loaded voyage

Conventions (Amend.), Reg.		Paragraphs 4.10.14 and 4.10.16 of the International Code for the Construction and Equipment of Ships Carrying Liquid Gases in Bulk (IGC Code), MSC.5(48) as amended by resolutions MSC.17(58), MSC.30(61), MSC.32(63), MSC.59(67), MSC.103(73), MSC.177(79) and MSC.220(82)； Paragraphs 4.20.3.5&4.20.3.7 of the International Code for the Construction and Equipment of Ships Carrying Liquid Gases in Bulk (IGC Code), as amended by Res. MSC.370(93)					
IACS UI Number	**GC13**	**UI** version	**01.2008/ Rev.1,03.2016/ Rev.2,06.2019**	Date of implementation	**01.07.2008/ Rev.1,01.07.2016/ Rev.2,01.07.2020**	Means of implementation	**keels are laid, or which are at a similar stage of construction**

Conventions/Codes Requirements

The International Code for the Construction and Equipment of Ships Carrying Liquid Gases in Bulk (IGC Code), Paragraph 4.10.14 reads:
"The overall performance of the cargo containment system should be verified for compliance with the design parameters during the initial cool-down, loading and discharging of the cargo.Records of the performance of the components and equipment essential to verify the design parameters should be maintained and be available to the Administration."

Paragraph 4.10.16 reads:
"The hull should be inspected for cold spots following the first loaded voyage."

Paragraph 4.20.3.5 reads:
"The overall performance of the cargo containment system shall be verified for compliance with the design parameters during the first full loading and discharging of the cargo, in accordance with the survey procedure and requirements in 1.4 and the requirements of the Administration or recognized organization acting on its behalf. Records of the performance of the components and equipment essential to verify the design parameters, shall be maintained and be available to the Administration."

Paragraph 4.20.3.7 reads:
"The cargo containment system shall be inspected for cold spots during, or immediately following, the first loaded voyage. Inspection of the integrity of thermal insulation surfaces that cannot be visually checked shall be carried out in accordance with recognized standards."

Interpretation

The above paragraphs shall be interpreted as follows:
Application

This UI applies to all vessels carrying liquefied natural gases (LNG) in bulk which have satisfactorily completed gas trials.

Certification

The following initial certificates shall be "conditionally" issued at delivery subject to satisfactory completion of the first cargo loading and unloading survey requirements below in the presence of a Surveyor:

1. Classification Certificate

2. Short Term Certificate of Fitness for the Carriage of Liquefied Gases in Bulk

Note: The conditions may either be stated on the Classification Certificate or issued as a condition of class in the

vessel's Record.

Survey Requirements

First Loading (considered to be full loading):

1. Priority to be given to latter stages of loading (approximately last 6 hours).

2. Review cargo logs and alarm reports.
3. Witness satisfactory operation of the following:

- Gas detection system.
- Cargo control and monitoring systems such as level gauging equipment, temperature sensors, pressure gauges, cargo pumps and compressors, proper control of cargo heat exchangers, if operating, etc.
- Nitrogen generating plant or inert gas generator, if operating.
- Nitrogen pressure control system for insulation, interbarrier, and annular spaces, as applicable.
- Cofferdam heating system, if in operation.
- Reliquefaction plant, if fitted.
- Equipment fitted for the burning of cargo vapors such as boilers, engines, gas combustion units, etc., if operating.

4. Examination of on-deck cargo piping systems including expansion and supporting arrangements.

5. Witness topping off process for cargo tanks including high level alarms activated during normal loading.

6. Advise master to carry out cold spot examination of the hull and external insulation during transit voyage to unloading port.

First Unloading:
1. Priority to be given to the commencement of unloading (approximately first 4 - 6 hours).

2. Witness emergency shutdown system testing prior to commencement of unloading.

3. Review cargo logs and alarm reports.

4. Witness satisfactory operation of the following:

- Gas detection system.
- Cargo control and monitoring systems such as level gauging equipment, temperature sensors, pressure gauges, cargo pumps and compressors, proper control of cargo heat exchangers, if operating, etc.
- Nitrogen generating plant or inert gas generator, if operating.
- Nitrogen pressure control system for insulation, interbarrier, and annular spaces, as applicable.
- On membrane vessels, verify that the readings of the cofferdam and inner hull temperature sensors are not below the allowable temperature for the selected grade of steel. Review previous readings.
- Cofferdam heating system, if in operation.
- Reliquefaction plant and review of records from previous voyage.
- Equipment fitted for the burning of cargo vapors such as boilers, engines, gas combustion units, etc., if operating.

5. Examination of on-deck cargo piping systems including expansion and supporting arrangements.

6. Obtain written statement from the Master that the cold spot examination was carried out during the transit

voyage and found satisfactory. Where possible, the surveyor should examine selected spaces.

Technical Background

It is deemed necessary by IACS Statutory Panel to carry out further discussion on the survey scope of the first loaded and unloaded voyage of vessels carrying liquefied natural gases (LNG) in bulk and the method of survey. The Survey Panel has progressed its work through a Survey Panel Project Team consisting of ABS (Chair), BV, DNV, GL, LR and NK. The discussion was mainly focused on the issues regarding the IGC Code verification and inspection following the first loaded voyage to define survey requirements for paragraphs 4.10.14 and 4.10.16 and paragraph 1.5.4 for issuance of certificates of the IGC Code.

The matter of certification was discussed and decided a short term IGC Certificate should be issued pending first loading and unloading in the presence of a Surveyor. The Classification Certificate was to be issued "conditionally" requiring first loading and unloading in the presence of a Surveyor.

At present, the survey requirements apply to all vessels carrying liquefied natural gases (LNG) in bulk which have satisfactorily completed gas trials. Relevant survey requirements for other liquefied gas carriers will be developed if necessary.

Remarks

7.11 Pump Vents in Machinery Spaces

Conventions (Amend.), Reg.		**IGC Code Chapters 3.7.4 as amended by Res. MSC. 103(73) and IGC Code Chapters 3.7.5 as amended by Res. MSC. 370(93)**					
IACS UI Number	**GC14**	**UI** version	**Apr. 2015**	Date of implementation	**1 July 2016**	Means of implementation	

Conventions/Codes Requirements

IGC Code 3.7.4 as amended by Res. MSC. 103(73)

Ballast spaces, including wet duct keels used as ballast piping, fuel-oil tanks and gas-safe spaces may be connected to pumps in the machinery spaces. Dry duct keels with ballast piping passing through, may be connected to pumps in the machinery spaces, provided the connections are led directly to the pumps and the discharge from the pumps lead directly overboard with no valves or manifolds in either line which could connect the line from the duct keel to lines serving gas-safe spaces. Pump vents should not be open to machinery spaces.

IGC Code 3.7.5 as amended by Res. MSC. 370(93)

Ballast spaces, including wet duct keels used as ballast piping, oil fuel tanks and non-hazardous spaces, may be connected to pumps in the machinery spaces. Dry duct keels with ballast piping passing through may be connected to pumps in the machinery spaces, provided the connections are led directly to the pumps, and the discharge from the pumps is led directly overboard with no valves or manifolds in either line that could connect the line from the duct keel to lines serving non-hazardous spaces. Pump vents shall not be open to machinery spaces.

Interpretation

The requirements of "Pump vents should not be open to machinery spaces" and "Pump vents shall not be open to machinery spaces" apply only to pumps in the machinery spaces serving dry duct keels through which ballast piping passes.

Remarks

This Unified Interpretation is to be uniformly implemented by IACS Societies not later than 1 July 2016.

7.12 Closing Devices for Air Intakes

Conventions (Amend.), Reg.	Paragraph 3.2.6 of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (Resolution MSC.5(48) as amended by Resolution MSC.370(93))

IACS UI Number	GC15	UI version	Feb.,2016/ Rev.1, Aug.,2017	Date of implementation	01.07.2016/ 01.01.2018	Means of implementation	

Conventions/Codes Requirements

Paragraph 3.2.6 of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (Resolution MSC.5(48) as amended by Resolution MSC.370(93))

3.2.6 All air intakes, outlets and other openings into the accommodation spaces, service spaces and control stations shall be fitted with closing devices. When carrying toxic products, they shall be capable of being operated from inside the space. The requirement for fitting air intakes and openings with closing devices operated from inside the space for toxic products need not apply to spaces not normally manned, such as deck stores, forecastle stores, workshops. In addition, the requirement does not apply to cargo control rooms located within the cargo area.

Interpretation

1. The closing devices that need not be operable from within the single spaces may be located in centralized positions.
2. Engine room casings, cargo machinery spaces, electric motor rooms and steering gear compartments are generally considered as spaces not covered by paragraph 3.2.6 and, therefore, the requirement for closing devices need not be applied to these spaces.
3. The closing devices should give a reasonable degree of gas tightness. Ordinary steel fire-flaps without gaskets/seals should not be considered satisfactory.
4. Regardless of this interpretation, the closing devices shall be operable from outside of the protected space (SOLAS regulation II-2/5.2.1.1).

Remarks

7.13 Cargo tank clearances (on ships constructed on or after 1 July 2016)

Conventions (Amend.), Reg.		The International Code for the Construction and Equipment of Ships Carrying Liquid Gases in Bulk (IGC Code)（MSC.370(93)），3.5.3.1.2&3.5.3.1.3					
IACS UI Number	GC16	UI version	Mar. , 2016	Date of implementation	Jul. 1, 2016	Means of implementation	

Conventions/Codes Requirements

The International Code for the Construction and Equipment of Ships Carrying Liquid Gases in Bulk (IGC Code) as amended by Res. MSC.370(93),3.5.3.1.2 reads:
"access through horizontal openings, hatches or manholes. The dimensions shall be sufficient to allow a person wearing a breathing apparatus to ascend or descend any ladder without obstruction and also to provide a clear opening to facilitate the hoisting of an injured person from the bottom of the space. The minimum clear opening shall be not less than 600 mm x 600 mm;"

The International Code for the Construction and Equipment of Ships Carrying Liquid Gases in Bulk (IGC Code) as amended by Res. MSC.370(93), 3.5.3.1.3 reads:
"access through vertical openings or manholes providing passage through the length and breadth of the space. The minimum clear opening shall be not less than 600 mm x 800 mm at a height of not more than 600 mm from the bottom plating unless gratings or other footholds are provided;"

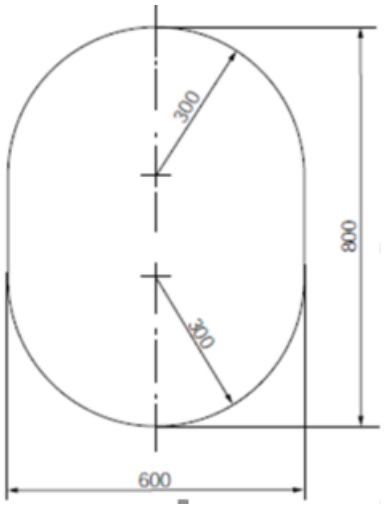
Interpretation

3.5.3.1.2
The minimum clear opening of 600 mm x 600 mm may have corner radii up to 100 mm maximum. In such a case

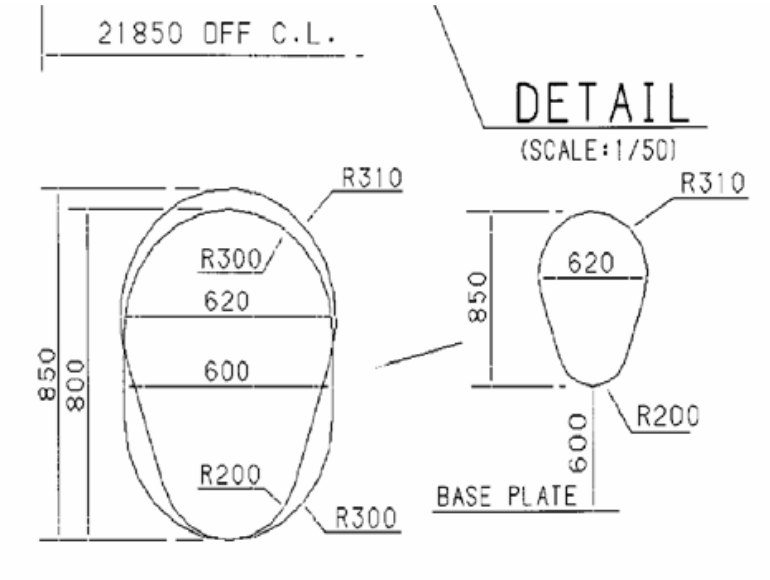
where as a consequence of structural analysis of a given design the stress is to be reduced around the opening, it is considered appropriate to take measures to reduce the stress such as making the opening larger with increased radii, e.g. 600 x 800 with 300 mm radii, in which a clear opening of 600 mm x 600 mm with corner radii up to 100 mm maximum fits.

3.5.3.1.3

1.The minimum clear opening of not less than 600 mm x 800 mm may also include an opening with corner radii of 300 mm. An opening of 600 mm in height x 800 mm in width may be accepted as access openings in vertical structures where it is not desirable to make large opening in the structural strength aspects, i.e. girders and floors in double bottom tanks.



2.Subject to verification of easy evacuation of injured person on a stretcher the vertical opening 850 mm x 620 mm with wider upper half than 600 mm, while the lower half may be less than 600 mm with the overall height not less than 850 mm is considered an acceptable alternative to the traditional opening of 600 mm x 800 mm with corner radii of 300 mm.



3.If a vertical opening is at a height of more than 600 mm steps and handgrips are to be provided. In such arrangements it is to be demonstrated that an injured person can be easily evacuated.

Technical Background

The interpretation is based upon the established Guidelines in MSC/Circ.686 and an innovative design is considered for easy access by humans through the opening.

Ref. Paragraphs 9 & Paragraphs 11of Annex of MSC/Circ.686.

Remarks
1.This UI is to be uniformly implemented by IACS Members on ships whose keels are laid, or which are at a similar stage of construction, on or after 1 July 2016. 2.For ships with keels laid, or at a similar stage of construction, before 1 July 2016, refer to UI GC6.

7.14 Unprotected openings

Conventions (Amend.), Reg.		IGC Code - 2.7					
IACS UI Number	**GC17**	**UI version**	**06.2016**	**Date of implementation**	**01.01.2017**	**Means of implementation**	**contracted for construction**
Conventions/Codes Requirements							
2.7.2.1 At final equilibrium after flooding, the righting lever curve shall have a minimum range of 20° beyond the position of equilibrium in association with a maximum residual righting lever of at least 0.1 m within the 20° range; the area under the curve within this range shall not be less than 0.0175 m-radians. The 20° range may be measured from any angle commencing between the position of equilibrium and the angle of 25° (or 30° if no deck immersion occurs). Unprotected openings shall not be immersed within this range unless the space concerned is assumed to be flooded. Within this range, the immersion of any of the openings listed in 2.7.1.1 and other openings capable of being closed weathertight may be permitted.							
Interpretation							
Other openings capable of being closed weathertight do not include ventilators (complying with ILLC 19(4)) that for operational reasons have to remain open to supply air to the engine room or emergency generator room (if the same is considered buoyant in the stability calculation or protecting openings leading below) for the effective operation of the ship.							
Technical Background							
The Dutch Safety Board noted that one cause of the capsizing was that the weathertight closing appliances to the main engine room were left open in order to ensure an adequate air supply to achieve the required bollard pull. These openings had been considered as closed in the intact stability calculations.							
Remarks							
The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.							

7.15 Test for cargo tank's high level alarm (on ships built on or after 1 July 2016)

Conventions (Amend.), Reg.		**The International Code for the Construction and Equipment of Ships Carrying Liquid Gases in Bulk (IGC Code) as amended by Res. MSC.370(93), 13.3.5**					
IACS UI Number	**GC18**	**UI** version	**Nov.,2016/ Corr.1,Mar., 2017**	Date of implementation	**01.01.2018**	Means of implementation	
Conventions/Codes Requirements							
13.3.5 reads: "The position of the sensors in the tank shall be capable of being verified before commissioning. At the first occasion of full loading after delivery and after each dry-docking, testing of high-level alarms shall be conducted by raising the cargo liquid level in the cargo tank to the alarm point.;"							
Interpretation							
The expression "each dry docking" is considered to be the survey of the outside of the ship's bottom required for the renewal of the Cargo Ship Safety Construction Certificate and or the Cargo Ship Safety Certificate.							
Technical Background							

The interpretation is based upon the fact that:

- the expression dry-docking is not defined along the Code
- all kinds of the surveys verifications are set by the Code under paragraph 1.4.2, and
- the one under paragraph 13.3.5 is linked to those required under paragraph 1.4.2.2 relevant to the renewal survey of the "International Certificate of Fitness of Liquefied Gases in Bulk", which requires:

A renewal survey at intervals specified by the Administration, but not exceeding five years, except where regulation 1.4.6.2.1, 1.4.6.5, 1.4.6.6 or 1.4.6.7 is applicable. The renewal survey shall be such as to ensure that the structure, equipment, fittings, arrangements and material fully comply with the applicable provisions of the Code.

- the renewal of the "International Certificate of Fitness of Liquefied Gases in Bulk" is linked to the renewal of the Cargo Ship Safety Construction Certificate and or the Cargo Ship Safety Certificate.

The Code does not expect specifically any dry-docking survey or inspection of the outside of the ship's bottom under paragraph 1.4.2. Therefore considering also the preamble of this paragraph it is concluded that the dry-docking recalled in paragraph 13.3.5 is the inspection of the outside of the ship's bottom of the ship required by the SOLAS Regulation I/10(v) to be carried out in conjunction with the renewal survey of the Cargo Ship Safety Construction Certificate and or the Cargo Ship Safety Certificate.

Ref.

SOLAS Reg. I/10.

Remarks

UI GC18 (Rev.1 July 2017) approved on 06 July 2017 was withdrawn on 05 June 2018 prior to coming into force on 1 July 2018.

7.16 External surface area of the tank for determining sizing of pressure relief valve (paragraph 8.4.1.2 and figure 8.1)

Conventions (Amend.), Reg.		Paragraph 8.4.1.2 of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (as amended by Resolution MSC.370(93))					
IACS UI Number	**GC19**	**UI** version	**Aug., 2017**	Date of implementation	**01.01.2018**	Means of implementation	**Contracted for construction**

Conventions/Codes Requirements

Paragraph 8.4.1.2 of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (as amended by Resolution MSC.370(93))

8.4.1.2 Vapours generated under fire exposure computed using the following formula:

$Q = FGA^{0.82}$ *(m³/s),*

where:

Q = minimum required rate of discharge of air at standard conditions of 273.15 Kelvin (K) and 0.1013 MPa;

F = fire exposure factor for different cargo types as follows:

- *1 for tanks without insulation located on deck;*
- *0.5 for tanks above the deck, when insulation is approved by the Administration. Approval will be based on*

the use of a fireproofing material, the thermal conductance of insulation and its stability under fire exposure;

- *0.5 for uninsulated independent tanks installed in holds;*
- *0.2 for insulated independent tanks in holds (or uninsulated independent tanks in insulated holds);*
- *0.1 for insulated independent tanks in inerted holds (or uninsulated independent tanks in inerted, insulated holds);*

0.1 for membrane and semi-membrane tanks. For independent tanks partly protruding through the weather decks, the fire exposure factor shall be determined on the basis of the surface areas above and below deck.

G = gas factor according to formula:

$$G = \frac{12.4}{LD}\sqrt{\frac{ZT}{M}}$$

with:

T = temperature in degrees Kelvin at relieving conditions, i.e. 120% of the pressure at which the pressure relief valve is set;

L = latent heat of the material being vaporized at relieving conditions, in kJ/kg;

D = a constant based on relation of specific heats k and is calculated as follows:

$$D = \sqrt{k\left(\frac{2}{k+1}\right)^{\frac{k+1}{k-1}}}$$

where:

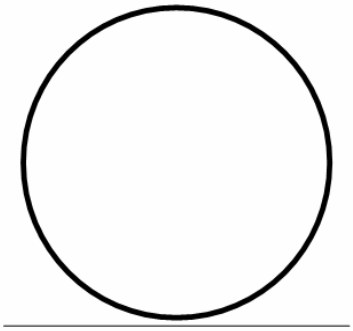
k = ratio of specific heats at relieving conditions, and the value of which is between 1 and 2.2. If k is not known, D = 0.606 shall be used;

Z = compressibility factor of the gas at relieving conditions. If not known, Z = 1 shall be used; and

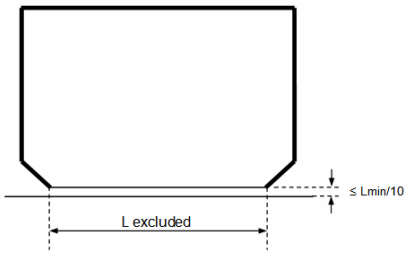
M = molecular mass of the product.

The gas factor of each cargo to be carried shall be determined and the highest value shall be used for PRV sizing.

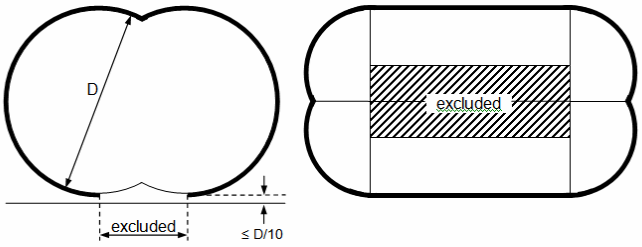
A = external surface area of the tank (m^2), as defined in 1.2.14, for different tank types, as shown in figure 8.1.



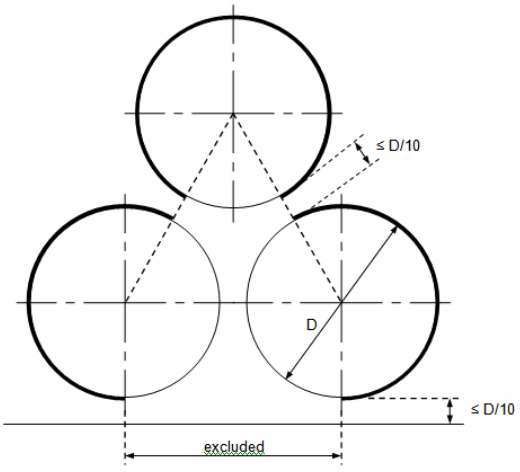
Cylindrical tanks with spherically dished, hemispherical or semi-ellipsoidal heads or spherical tanks



Prismatic tanks



Bilobe tanks



Horizontal cylindrical tanks arrangement

Figure 8.1

Interpretation
For prismatic tanks Lmin, for non-tapered tanks, is the smaller of the horizontal dimensions of the flat bottom of the tank. For tapered tanks, as would be used for the forward tank, Lmin is the smaller of the length and the average width. For prismatic tanks whose distance between the flat bottom of the tank and bottom of the hold space is equal to or less than Lmin/10: A = external surface area minus flat bottom surface area. For prismatic tanks whose distance between the flat bottom of the tank and bottom of the hold space is greater than Lmin/10: A = external surface area.
Remarks

7.17 Tee welds in type A or type B independent tanks

Conventions (Amend.), Reg.		**IGC Code paragraph 4.20.1.1**					
IACS UI Number	**GC20**	**UI** version	**04.2019**	Date of implementation	**01.07.2020**	Means of implementation	

Conventions/Codes Requirements

IGC Code paragraph 4.20.1.1:

4.20.1.1 All welded joints of the shells of independent tanks shall be of the in-plane butt weld full penetration type. For dome-to-shell connections only, tee welds of the full penetration type may be used depending on the results of the tests carried out at the approval of the welding procedure. Except for small penetrations on domes, nozzle welds shall also be designed with full penetration.

Interpretation

The regulation 4.20.1.1 is applicable to independent tanks of type A or type B, primarily constructed of plane surfaces. This includes the tank corners which are constructed using bent plating which is aligned with the tank surfaces and connected with in-plane welds.

The applicability of the expression "For dome-to-shell connections only" is clarified as follows:

- Welded corners (i.e. corners made of weld metal) shall not be used in the main tank shell construction, i.e. corners between shell side (sloped plane surfaces parallel to hopper or top side inclusive if any) and bottom or top of the tank, and between tank end transverse bulkheads and bottom, top or shell sides (sloped plane surfaces inclusive if any) of the tank. Instead, tank corners which are constructed using bent plating aligned with the tank surfaces and connected with in-plane welds are to be used.

- Tee welds can be accepted for other localised constructions of the shell such as suction well, sump, dome, etc. where tee welds of full penetration type shall also be used.

Note:

1. This Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 July 2020 when encountering design difficulties during the approval of type A or type B independent tanks of Gas Carriers covered by IGC Code (MSC.370(93)). The provisions of this Unified Interpretation will also be applied when design difficulties are encountered during the approval of type A or type B independent tanks of Gas Carriers covered by IGC Code (MSC.370(93)) on ships contracted for construction earlier than 1 July 2020 unless they are instructed otherwise in writing by the Administration on whose behalf they are

authorised to act as a Recognised Organisation.
2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

Technical Background

To make "in-plane" and "only" mentioned in paragraph 4.20.1.1 of IGC Code clear.

Remarks

7.18 Welds of type C independent bi-lobe tank with centreline bulkhead

Conventions (Amend.), Reg.		**IGC Code paragraph 4.20.1.2**					
IACS UI Number	**GC21**	**UI** version	**04.2019**	Date of implementation	**01.07.2020**	Means of implementation	

Conventions/Codes Requirements

IGC Code paragraph 4.20.1.2:

4.20.1.1 Welding joint details for type C independent tanks, and for the liquid-tight primary barriers of type B independent tanks primarily constructed of curved surfaces, shall be as follows:

1. all longitudinal and circumferential joints shall be of butt welded, full penetration, double vee or single vee type. Full penetration butt welds shall be obtained by double welding or by the use of backing rings. If used, backing rings shall be removed except from very small process pressure vessels. Other edge preparations may be permitted, depending on the results of the tests carried out at the approval of the welding procedure; and

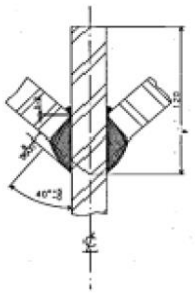
2. the bevel preparation of the joints between the tank body and domes and between domes and relevant fittings shall be designed according to a standard acceptable to the Administration or recognised organisation acting on its behalf. All welds connecting nozzles, domes or other penetrations of the vessel and all welds connecting flanges to the vessel or nozzles shall be full penetration welds.

Interpretation

The regulation 4.20.1.2 is applicable to type C independent tanks including bi-lobe tanks, primarily constructed of curved surfaces fitted with a centreline bulkhead.

The applicability of the expression "Other edge preparations" is clarified as follows:

- Cruciform full penetration welded joints in a bi-lobe tank with centreline bulkhead can be accepted for the tank structure construction at tank centreline welds with bevel preparation subject to the approval of the Administration or recognised organisation acting on its behalf, based on the results of the tests carried out at the approval of the welding procedure. (See below example)



Note:

1.This Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 July 2020 when encountering design difficulties during the approval of type C independent bi-lobe tank

with centreline bulkhead of Gas Carriers covered by IGC Code (MSC.370(93)). The provisions of this Unified Interpretation will also be applied when design difficulties are encountered during the approval of type C independent bi-lobe tank with centreline bulkhead of Gas Carriers covered by IGC Code (MSC.370(93)) on ships contracted for construction earlier than 1 July 2020 unless they are instructed otherwise in writing by the Administration on whose behalf they are authorised to act as a Recognised Organisation.. 2.The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.
Technical Background
To make "Other edge preparations" mentioned in paragraph 4.20.1.2 of IGC Code clear.
Remarks

7.19 Water spray system

Conventions (Amend.), Reg.		**Sections 11.3.1, 11.3.3, 11.3.4 of the INTERNATIONAL CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING LIQUEFIED GASES IN BULK (Resolution MSC.370(93))**					
IACS UI Number	**GC22**	**UI** version	**Apr. 2018 (wihtdrwaw on June 2019)/ June 2019/ Rev.1, Apr. ,2020**	Date of impleme ntation	**01.07.2019/ Rev.1,Jan. 1,2021**	Means of impleme ntation	**contracted for construction**

Conventions/Codes Requirements

IGC Code 2016 edition, Chapter 11 reads as follows:

11.3.1 On ships carrying flammable and/or toxic products, a water-spray system, for cooling, fire prevention and crew protection shall be installed to cover:

...

.7 exposed lifeboats, liferafts and muster stations facing the cargo area, regardless of distance to cargo area; and

…

11.3.3 The capacity of the water-spray pumps shall be capable of simultaneous protection of the greater of the following:

.1 any two complete athwartship tank groupings, including any gas process units within these areas; or

…

11.3.4 The boundaries of superstructures and deckhouses normally manned, and lifeboats, liferafts and muster areas facing the cargo area, shall also be capable of being served by one of the fire pumps or the emergency fire pump, if a fire in one compartment could disable both fire pumps.

Interpretation

a) Survival crafts protection

With reference to sub-paragraph .7 of IGC Code 11.3.1, the survival crafts on board including remote survival crafts (ref. SOLAS III/Reg. 31.1.4) facing the cargo area shall be protected by a water-spray system taking into consideration cargo area extension for fire-fighting purposes as stated in 11.1.4.

Remote liferafts located in areas covered by water-spray protection as required in sub-paragraph .6 may be considered as adequately protected.

b) Tank groups in cargo area

Expression “two complete athwartship tank groupings” in sub-paragraph .1 of IGC Code 11.3.3 means any two groups of tanks where one group is defined as tanks located in transverse direction from ship side to ship side. Where there is only one cargo tank occupying a hold space from ship side to ship side, it will be considered as a “grouping” for the purpose of this interpretation.

“Any two complete athwartship tank groupings” represents an area equal to the combined area of the two largest tank groupings including any gas process units within these areas

c) Fire pumps used as spray pumps (IGC Code, Paragraph 11.3.4):
In cases where the emergency fire pump is used to meet this requirement, its capacity, in addition to being capable of maintaining two jets of water as required by paragraph 12.2.2.1.1 of the FSS Code, shall be increased taking into account the spray application rates stated in paragraph 11.3.2.1, but limiting coverage to boundaries of normally manned superstructures and deckhouses, survival crafts and their muster areas.

For the purpose of this interpretation:
.1 the expression "one of the fire pumps or emergency fire pump" is related to fire pumps required by SOLAS regulation II-2/10.2.2 installed outside the space where spray pump(s) are located; and
.2 the expression "fire in one compartment" means a compartment provided with A class boundaries in which is located the fire pump(s), or the source of power of the fire pump(s), serving the water-spray system in accordance with paragraph 11.3.3.

Technical Background

IACS developed UI GC22 (new, Apr 2018) with regard to interpretation of the para.11.3.1, 11.3.3 and 11.3.4 of the revised IGC Code (MSC.370 (93)).Considering that CCC is discussing an item about the unified interpretation of paragraph 11.3.4 of IGC Code, the contents related to 11.3.4 in UI GC 22 (2018.04) is deleted, and the UI GC22 (New, Apr 2018) is replaced with UI GC22 (New, Jun 2019).

Draft section c) of UI GC 22 was agreed by the 6th CCC Sub-Committee and the UI amended accordingly.

Remarks

1. April 2018 version of this UI was withdrawn prior to coming into force on 1 July 2019.
2. June 2019 version of this UI is to be uniformly implemented by IACS Societies on ships constructed on or after 1 July 2019.
3. Rev.1 of this UI is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2021.

7.20 Cargo tank structure heating arrangement power supply

Conventions (Amend.), Reg.		**The International Code for the Construction and Equipment of Ships Carrying Liquid Gases in Bulk (Res. MSC.370(93)), 4.19.1.6**					
IACS UI Number	**GC 23**	**UI version**	**07.2018/ Corr.1,Dec., 2019**	**Date of implementation**	**01.07.2019**	**Means of implementation**	**Constructed on or after 1 July 2019**

Conventions/Codes Requirements

The International Code for the Construction and Equipment of Ships Carrying Liquid Gases in Bulk (IGC Code) as amended by Res. MSC.370(93), 4.19.1.6 reads:

4.19.1.6 The means of heating referred to in 4.19.1.5 shall comply with the following requirements:
.1 the heating system shall be arranged so that, in the event of failure in any part of the system, standby heating can be maintained equal to not less than 100% of the theoretical heat requirement;

.2 the heating system shall be considered as an essential auxiliary. All electrical components of at least one of the systems provided in accordance with 4.19.1.5.1 shall be supplied from the emergency source of electrical power; and

.3 the design and construction of the heating system shall be included in the approval of the containment system by the Administration or recognized organization acting on its behalf.

Interpretation

1.Heating system referred to on 4.19.1.6.1 is to be such that in case of a single failure of a mechanical or electrical component in any part of the system, heating can be maintained at not less than 100% of the theoretical heat requirement.

2.Where the above requirements are met by duplication of the system components, i.e., heaters, glycol circulation pumps, electrical control panel, auxiliary boilers etc., all electrical components of at least one of the systems are to be supplied from the emergency source of electrical power .

3.Where duplication of the primary source of heat, e.g., oil-fired boiler is not feasible, alternative proposals can be accepted such as an electric heater capable of providing 100% of the theoretical heat requirement provided and supplied by an individual circuit arranged separately on the emergency switchboard. Other solutions may be considered towards satisfying the requirements of 4.19.1.6.1 provided a suitable risk assessment is conducted to the satisfaction of the Administration. The requirement in paragraph 2 of this interpretation continues to apply to all other electrical components in the system.

Note:

1. This Unified Interpretation is to be uniformly implemented by IACS Societies on ships constructed on or after 1 July 2019.

Technical Background

Remarks

7.21 Fire Test for Emergency Shutdown Valves

Conventions (Amend.), Reg.		Paragraph 5.13.1.1.4 of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (as amended by Resolution MSC.370(93))					
IACS UI Number	**GC24**	**UI** version	**Jul.,2018/ Rev.1,02.2019**	Date of implementation	**01.07.2019/ Rev.1,01.01.2020**	Means of implement ation	

Conventions/Codes Requirements

Paragraph 5.13.1.1.4 of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (as amended by Resolution MSC.370(93))

Paragraph 5.13.1.1.4 reads:

5.13.1.1 Valves

Each type of valve intended to be used at a working temperature below -55 ℃ shall be subject to the following type tests:

.4 for emergency shutdown valves, with materials having melting temperatures lower than 925 ℃, the type testing

shall include a fire test to a standard acceptable to the Administration.

Interpretation

"Emergency shutdown valves, with materials having melting temperatures lower than 925°C" does not include an emergency shutdown valve in which components made of materials having melting temperatures lower than 925 ℃ do not contribute to the shell or seat tightness of the valve.

Technical Background

Technical Background (TB) document for UI GC24 (New July 2018): For emergency shutdown valves as mentioned in paragraph 5.13.1.1.4 of the IGC Code, it is concluded necessary to take into account the case where valves consist of materials having melting temperatures lower than 925 ℃ but the materials are used only in the parts whose failure does not cause deterioration of shell or seat tightness intrinsically, for example, rubber handle covers. Thus, IACS clarified, from a technical viewpoint, such valves need not be required to undergo a fire test.
Technical Background (TB) document for UI GC24 (Rev. 1 Feb 2019): CCC5 agreed to refine this text to clarify better the intention of the UI as follow: "Emergency shutdown valves, with materials having melting temperatures lower than 925 ℃" does not include an emergency shutdown valve in which components made of materials having melting temperatures lower than 925 ℃ do not contribute to the shell or seat tightness of the valve.

Remarks

7.22 Cargo piping insulation

Conventions (Amend.), Reg.		Paragraph 5.12.3.1 of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (as amended by Resolution MSC.370(93)					
IACS UI Number	**GC25**	**UI** version	**New, Jul., 2018/ Rev.1,Apr., 2019/ Corr.1,Dec., 2019**	Date of implement ation	**01.07.2019/ Rev.1,01.07.2020**	Means of implementat ion	**Rev.1:Const ructed on or after 1 July 2020**

Conventions/Codes Requirements

Interpretation of paragraph 5.12.3.1 of the IMO IGC (Resolution MSC.5(48) as amended by Resolution MSC.370(93)) Paragraph 5.12.3.1 reads:

Cargo piping systems shall be provided with a thermal insulation system as required to minimize heat leak into the cargo during transfer operations and to protect personnel from direct contact with cold surfaces.

Interpretation

The expression 'a thermal insulation system as required to minimize heat leak into the cargo during transfer operations' means that properties of the piping insulation are to be taken into consideration when calculating the heat balance of the containment system and capacity of the pressure/temperature control system.

The expression 'cargo piping systems shall be provided with a thermal insulation system as required ... to protect personnel from direct contact with cold surfaces' means that surfaces of cargo piping systems with which personnel is likely to contact under normal conditions shall be protected by a thermal insulation., with the exception of the following examples:

-.1 surfaces of cargo piping systems which are protected by physical screening measures to prevent such direct

contact;

-.2 surfaces of manual valves, having extended spindles that protect the operator from the cargo temperature; and

-.3 surfaces of cargo piping systems whose design temperature (to be determined from inner fluid temperature) is above minus 10 ℃.

Note:

1. The original version of this Unified Interpretation was withdrawn prior to coming into force on 1 July 2019.
2. Rev. 1 of this Unified Interpretation is to be uniformly implemented by IACS Societies on ships constructed on or after 1 July 2020.

Technical Background

Remarks

7.23 Type testing requirements for valves

Conventions (Amend.), Reg.		Paragraph 5.13.1.1.2 of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (as amended by Resolution MSC.370(93))					
IACS UI Number	**GC26**	**UI version**	**New, Oct., 2018/ Corr.1,Dec., 2019**	**Date of implementation**	**Jan. 1, 2020**	**Means of implementation**	**Constructed on or after 1 Jan. 2020**

Conventions/Codes Requirements

Paragraph 5.13.1.1.2 of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (as amended by Resolution MSC.370(93))

Paragraph 5.13.1.1.2 reads:

Each type of valve intended to be used at a working temperature below -55 ℃ shall be subject to the following type tests:

.2 the flow or capacity shall be certified to a recognized standard for each size and type of valve

Interpretation

The expression "Each type of valve…shall be certified to a recognized standard" means that:

1. for pressure relief valves (PRVs) that are subject to IGC Code paragraph 8.2.5, the flow or capacity are to be certified by the Administration or Recognized Organization acting on its behalf; and
2. for other types of valves, the manufacturer is to certify the flow properties of the valves based on tests carried out according to recognized standards.

Note:

1. This Unified Interpretation is to be uniformly implemented by IACS Societies on ships constructed on or after 1 January 2020.

Technical Background

Remarks

7.24 Level indicators for cargo tanks

Conventions (Amend.), Reg.		Paragraph 13.2.2 of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (MSC.5(48)) as amended by Resolution MSC.370(93)					
IACS UI Number	**GC27**	**UI version**	**Dec. ,2018/ Corr.1,Dec., 2019**	**Date of implementation**	**Jan. 1, 2020**	**Means of implementation**	**Constructed on or after 1 Jan. 2020**

Conventions/Codes Requirements

Interpretation of paragraph 13.2.2 of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (MSC.5(48)) as amended by Resolution MSC.370(93)

Paragraph 13.2.2 reads as follows:

13.2.2 Where only one liquid level gauge is fitted it shall be arranged so that it can be maintained in an operational condition without the need to empty or gas-free the tank.

Interpretation

In order to assess whether or not only one level gauge is acceptable in relation to the aforesaid sentence, the expression 'can be maintained' means that any part of the level gauge other than passive parts can be overhauled while the cargo tank is in service.

Note: passive parts are those parts assumed not subject to failures under normal service conditions.

Note:

1. This Unified Interpretation is to be uniformly implemented by IACS Societies on ships constructed on or after 1 January 2020.

Technical Background

Remarks

7.25 Guidance for sizing pressure relief systems for interbarrier spaces

Conventions (Amend.), Reg.		Paragraph 8.1 of IGC Code as amended by Resolutions MSC.370(93), MSC.411(97) and MSC.441(99)					
IACS UI Number	**GC28**	**UI** version	**Dec.,2018/ Rev.1, Dec.,2019/ Corr.1,Feb.,2021**	Date of implementation	**-/ Rev.1,Jan. 1, 2021**	Means of implementation	

Conventions/Codes Requirements

The second sentence of paragraph 8.1 reads as follows:

Hold spaces and interbarrier spaces, which may be subject to pressures beyond their design capabilities, shall also be provided with a suitable pressure relief system.

Interpretation

1 General

1.1 The formula for determining the relieving capacity given in section 2 is for interbarrier spaces surrounding

independent type A cargo tanks, where the thermal insulation is fitted to the cargo tanks.

1.2 The relieving capacity of pressure relief devices of interbarrier spaces surrounding independent type B cargo tanks may be determined on the basis of the method given in section 2, however, the leakage rate is to be determined in accordance with 4.7.2 of the IGC-Code.

1.3 The relieving capacity of pressure relief devices for interbarrier spaces of membrane and semi- membrane tanks is to be evaluated on the basis of specific membrane/semi-membrane tank design.

1.4 The relieving capacity of pressure relief devices for interbarrier spaces adjacent to integral type cargo tanks may, if applicable, be determined as for type A independent cargo tanks.

2 Size of pressure relief devices

The combined relieving capacity of the pressure relief devices for interbarrier spaces surrounding type A independent cargo tanks where the insulation is fitted to the cargo tanks may be determined by the following formula:

$$Q_{sa} = 3.4 \times A_c \frac{\rho}{\rho_v} \sqrt{h} \ (m^3/s)$$

Where:

Q_{sa} = minimum required discharge rate of air at standard conditions of 273 K and 1.013 bar

A_c = design crack opening area (m^2)

$A_c = \frac{\pi}{4} \delta . 1 \ (m^2)$

d = max, crack opening width (m)

d = 0.2t (m)

t = thickness of tank bottom plating (m)

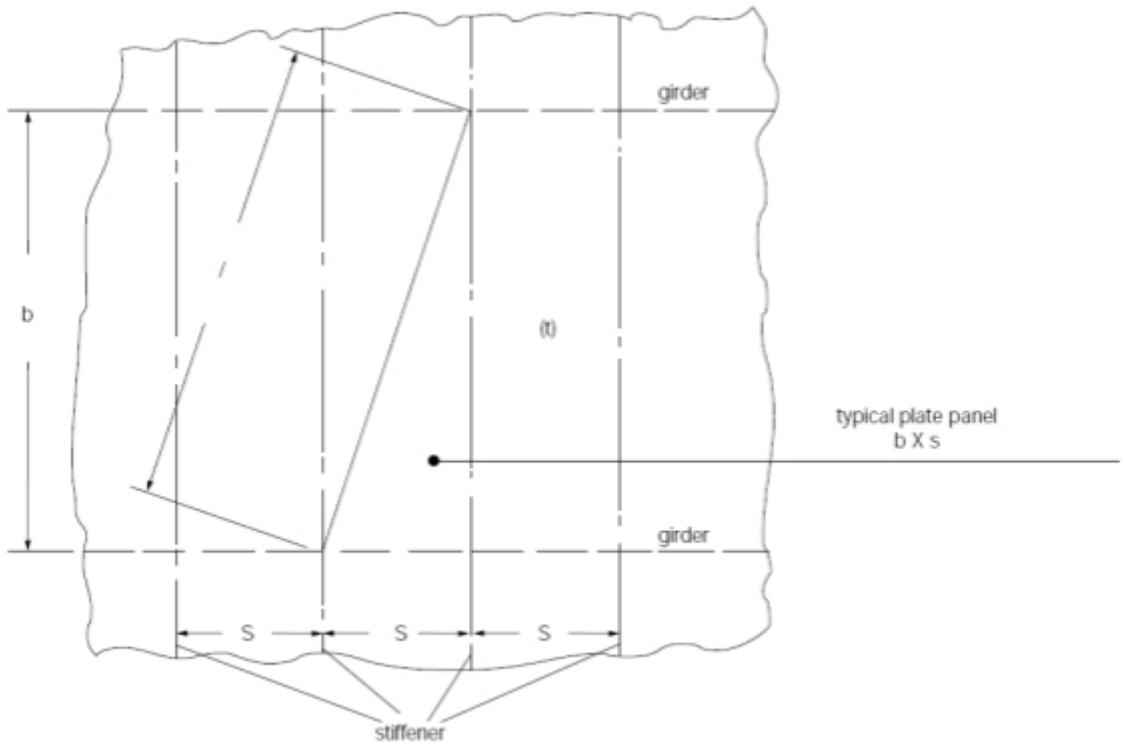
l = design crack length (m) equal to the diagonal of the largest plate panel of the tank bottom, see sketch below.

h = max liquid height above tank bottom plus 10.MARVS (m)

r = density of product liquid phase (kg/m3) at the set pressure of the interbarrier space relief device

r_v = density of product vapour phase (kg/m3) at the set pressure of the interbarrier space relief device and a temperature of 273 K

MARVS = max allowable relief valve setting of the cargo tank (bar).



Technical Background

During the CCC6 meeting, the Sub - Committee noted the concerns expressed on paragraph 1.5 going in the direction that it was not appropriate for the UI to disapply all the mentioned provisions of the Code; as consequence Rev.1:CCC6 agreed to the UI proposed by IACS with the exception for paragraph 1.5 which was rejected.

Paragraph 1.5 proposed in the UI GC28 (New, Dec 2018) has been deleted. Editorial modification has been done in paragraph 1.1 of the interpretation proposed in the UI GC28 (New, Dec 2018).

Corr.1: the item 1.5 which had been deleted in Rev.1 has already been applied to some ships constructed on or after 1 January 2020. The Machinery Panel agreed on changing the implementation date as a transitional measure.

Remarks

1. The original version of this Unified Interpretation was withdrawn prior to coming into force on 1 January 2020.
2. Rev.1 of this Unified Interpretation is to be uniformly implemented by IACS Societies on ships constructed for construction on or after 1 January 2021.
3. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction",refer to IACS Procedural Requirement (PR)No.29.

7.26 Integrated systems

Conventions (Amend.), Reg.		Paragraph 13.9.3 of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (as amended by Resolution MSC.370(93))					
IACS UI Number	**GC29**	**UI version**	**May ,2019/ Corr.1,Dec., 2019**	**Date of implementation**	**01.07.2020**	**Means of implementation**	**contracted for construction**

Conventions/Codes Requirements

IGC Code paragraph 13.9.3:

13.9.3 Key hazards of the integrated system shall be identified using appropriate risk-based techniques.

Interpretation

The expression "integrated system" means a combination of computer-based systems which are used for the control, monitoring/alarm and safety functions required for the carriage, handling and conditioning of cargo liquid and vapours and are interconnected in order to allow communication between computer-based systems and to allow centralized access to monitoring/alarm and safety information and/or command/control.

Referenced Guidelines

MSC/Circ.891 – Guidelines for the On-board Use and Application of Computers

2.1 Computer

A programmable electronic device for storing and processing data, making calculations, or any programmable electronic system (PES), including main-frame, mini-computer or micro-computer.

2.2 Computer-based system

A system of one or more computers, associated software, peripherals and interfaces.

2.3 Integrated system

A combination of computer-based systems which are interconnected in order to allow centralized access to sensor information and/or command/control.

Note:

1. This Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 July 2020.
2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

Technical Background

Remarks

7.27 Emergency fire pump

Conventions (Amend.), Reg.		Paragraphs 11.2 and 11.3.4 of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (Resolution MSC.5(48) as amended by Resolution MSC.370(93))					
IACS UI Number	**GC30**	**UI** version	**Apr. ,2020**	Date of impleme ntation	**Jan.1,2021**	Means of impleme ntation	**contracted for construction**

Conventions/Codes Requirements

Paragraph 11.2 reads:

11.2 Fire mains and hydrants

11.2.1 Irrespective of size, ships carrying products that are subject to the Code shall comply with the requirements of regulation II-2/10.2 of the SOLAS Convention, as applicable to cargo ships, except that the required fire pump capacity and fire main and water service pipe diameter shall not be limited by the provisions of regulations II-2/10.2.2.4.1 and II-2/10.2.1.3, when a fire pump is used to supply the water-spray system, as permitted by 11.3.3 of the Code. The capacity of this fire pump shall be such that these areas can be protected when simultaneously supplying two jets of water from fire hoses with 19 mm nozzles at a pressure of at least 0.5 MPa.

11.2.2 The arrangements shall be such that at least two jets of water can reach any part of the deck in the cargo area and those portions of the cargo containment system and tank covers that are above the deck. The necessary number of fire hydrants shall be located to satisfy the above arrangements and to comply with the requirements of regulations II- 2/10.2.1.5.1 and II-2/10.2.3.3 of the SOLAS Convention, with hose lengths as specified in regulation II-2/10.2.3.1.1. In addition, the requirements of regulation II-2/10.2.1.6 shall be met at a pressure of at

least 0.5 MPa gauge.

11.2.3 Stop valves shall be fitted in any crossover provided and in the fire main or mains in a protected location, before entering the cargo area and at intervals ensuring isolation of any damaged single section of the fire main, so that 11.2.2 can be complied with using not more than two lengths of hoses from the nearest fire hydrant. The water supply to the fire main serving the cargo area shall be a ring main supplied by the main fire pumps or a single main supplied by fire pumps positioned fore and aft of the cargo area, one of which shall be independently driven.
11.2.4 Nozzles shall be of an approved dual-purpose type (i.e. spray/jet type) incorporating a shutoff.
11.2.5 After installation, the pipes, valves, fittings and assembled system shall be subject to a tightness and function test.

Paragraph 11.3.4 reads:

11.3.4 The boundaries of superstructures and deckhouses normally manned, and lifeboats, liferafts and muster areas facing the cargo area, shall also be capable of being served by one of the fire pumps or the emergency fire pump, if a fire in one compartment could disable both fire pumps.

Interpretation

1 In paragraph 11.3.4 the term "fire pumps" where not qualified by the word "emergency" refers to the fire pumps required in accordance with SOLAS Reg.II-2/10.2.2.2.2.

2. If all the fire pumps mentioned in paragraph 1 above supplying the water spray system (for covering the superstructures and deckhouses) are disabled due to a fire in any one compartment; then the emergency fire pump shall be sized to cover:

.1 the water spray system for the boundaries of the superstructures and deckhouses, and lifeboats, liferafts and muster areas facing the cargo area, (as per paragraph 11.3.4); and
.2 two fire hydrants (as per paragraph 11.2).

3. When the ship is also fitted with a total flooding high expansion foam system protecting the engine-room (to comply with SOLAS II-2/10.4.1.1.2 and 10.5.1.1) and the emergency fire pump is intended to supply sea water to this system, then, the emergency fire pump shall also be sized to cover the foam system for dealing with an engine-room fire, when the main fire pumps are disabled.

4. On the basis of the principle of dealing with one single fire incident at a time, the emergency fire pump does not need to be sized to cover all three systems in 2 and 3 above (i.e. water spray, hydrants and foam) at the same time and shall need only be sized to cover the most demanding area and required systems, as follows:

.1 the foam system + two hydrants; or
.2 the water spray system + two hydrants;
whichever is greater.

Technical Background

CCC 6 agreed with the interpretation on the calculation for the capacity of the emergency fire pump.

Remarks

1.This UI is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2021.
2.The “contracted for construction” date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of “contract for construction”, refer to IACS Procedural Requirement (PR) No. 29.

7.28 Discharge test of dry chemical powder fire extinguishing systems

Conventions (Amend.), Reg.		Paragraph 11.4.8 of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (Resolution MSC.5(48) as amended by Resolution MSC.370(93))					
IACS UI	**GC31**	**UI**	**June ,2020**	Date of	**Jan.1,2021**	Means of	

Number		version		implementation		implementation	

Conventions/Codes Requirements

IGC Code 2016 edition, Chapter 11, Paragraph 11.4.8 – Fire protection and extinction, Dry chemical powder fire-extinguishing systems - reads as follows:

11.4.8 After installation, the pipes, valves, fittings and assembled systems shall be subjected to a tightness test and functional testing of the remote and local release stations. The initial testing shall also include a discharge of sufficient amounts of dry chemical powder to verify that the system is in proper working order. All distribution piping shall be blown through with dry air to ensure that the piping is free of obstructions."

Interpretation

Testing arrangements are to involve the discharge using dry chemical powder from all monitors and hand hose lines on board, but it is not required that there is a full discharge of the installed quantity of dry powder. This testing can also be used to satisfy the requirement that the piping is free of obstructions, in lieu of blowing through with dry air all the distribution piping. However, after the completion of this testing, the system, including all monitors and hand hose lines, are to be blown through with dry air; but only for the purpose of the system subsequently being clear from any residues of dry chemical powder.

Technical Background

The testing requirements for the Dry chemical powder fire-extinguishing systems (2014 IGC Code 11.4.8) states a "discharge of sufficient amounts of dry chemical powder to verify that the system is in proper working order". This term "sufficient amounts" was considered to be ambiguous and this UI aims to clarify the requirements of onboard discharge testing of dry chemical powder fire-extinguishing systems, as outlined under paragraph 11.4.8 of IGC Code.

Remarks

This UI is to be uniformly implemented by IACS Societies on ships constructed on or after 1January 2021.

7.29 Outer Duct in Gas Fuel Piping Systems

Conventions (Amend.), Reg.		Paragraph 5.4.4 and 5.13.2.4 of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (as amended by Resolution MSC.370(93) , MSC.411(97) and MSC.441(99))					
IACS UI Number	**GC32**	**UI** version	**New,Feb.,2021**	Date of implementation	**July 1,2021**	Means of implementation	

Conventions/Codes Requirements

Paragraphs 5.4.4 and 5.13.2.4 of the Code reads as follows:

5.4.4 The design pressure of the outer pipe or duct of gas fuel systems shall not be less than the maximum working pressure of the inner gas pipe. Alternatively, for gas fuel piping systems with a working pressure greater than 1 MPa, the design pressure of the outer duct shall not be less than the maximum built-up pressure arising in the annular space considering the local instantaneous peak pressure in way of any rupture and the ventilation arrangements.

5.13.2.4 In double wall gas-fuel piping systems, the outer pipe or duct shall also be pressure tested to show that it can withstand the expected maximum pressure at gas pipe rupture.

Interpretation

1. The expression "design pressure of the outer pipe or duct" in 5.4.4 is either of the following:

   .1 the maximum pressure that can act on the outer pipe or equipment enclosure after the inner pipe rupture as documented by suitable calculations taking into account the venting arrangements; or

   .2 for gas fuel systems with inner pipe working pressure greater than 1 MPa, the "maximum built-up pressure arising in the annular space", after the inner pipe rupture, which is to be calculated in accordance with paragraph 9.8.2 of the IGF Code as adopted by MSC.391(95).

2. The expression "maximum pressure at gas pipe rupture" in 5.13.2.4 is the maximum pressure to which the outer pipe or duct is subjected after the inner pipe rupture and for testing purposes it is the same as the design pressure used in 5.4.4.
Technical background
This UI clarifies the design pressure of the outer pipe to cover the case whereby the space between the outer pipe/duct and the inner pipe is pressurized with inert gas at a pressure greater than the inner pipe, or the inner pipe working pressure is not greater than 1.0 MPa. As the term "maximum built-up pressure arising in the annular space" is clarified in the IGF Code, that specific paragraph of the IGF Code is stated for ready reference.
Remarks
This Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 July 2021.

7.30 Cargo Sampling

Conventions (Amend.), Reg.		Paragraph 5.6.5 and section 18.9 of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (as amended by Resolution MSC.370(93) , MSC.411(97) and MSC.441(99))					
IACS UI Number	**GC33**	**UI** version	**New,Feb.,2021**	Date of implementation	**July 1,2021**	Means of implementation	

Conventions/Codes Requirements
Paragraphs 5.6.5 and section 18.9 of the Code read as follows: 5.6.5 Cargo sampling connections 5.6.5.1 Connections to cargo piping systems for taking cargo liquid samples shall be clearly marked and shall be designed to minimize the release of cargo vapours. For vessels permitted to carry toxic products, the sampling system shall be of a closed loop design to ensure that cargo liquid and vapour are not vented to atmosphere. *[...]* 18.9 Cargo sampling 18.9.1 Any cargo sampling shall be conducted under the supervision of an officer who shall ensure that protective clothing appropriate to the hazards of the cargo is used by everyone involved in the operation. *[...]* 18.9.5 After sampling operations are completed, the officer shall ensure that any sample valves used are closed properly and the connections used are correctly blanked.
Interpretation
These requirements are only applicable if such a sampling system is fitted on board. Connections used for control of atmosphere in cargo tanks during inerting or gassing up are not considered as cargo sampling connections.
Remarks
This Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 July 2021.

7.31 Cargo Filters

Conventions (Amend.), Reg.	Paragraph 5.6.6 of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (as amended by Resolution MSC.370(93) ,

		MSC.411(97) and MSC.441(99))					
IACS UI Number	**GC34**	**UI** version	**New,Feb.,2021**	Date of implementation	**July 1,2021**	Means of implementation	

Conventions/Codes Requirements

Paragraphs 5.6.6 of the Code reads as follows:

The cargo liquid and vapour systems shall be capable of being fitted with filters to protect against damage by extraneous objects. Such filters may be permanent or temporary, and the standards of filtration shall be appropriate to the risk of debris, etc., entering the cargo system. Means shall be provided to indicate that filters are becoming blocked, and to isolate, depressurize and clean the filters safely.

Interpretation

1. Means to indicate that filters are becoming blocked and filter maintenance is required is to be provided for fixed in-line filter arrangement and portable filter installations where dedicated filter housing piping is provided.
2. Where portable filters for fitting to manifold presentation flanges are used without dedicated filter housing, and these can be visually inspected after each loading and discharging operation, no additional arrangements for indicating blockage or facilitating drainage are required.

Remarks

This Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 July 2021.

7.32 Inhibition of Cargo Pump Operation and Opening of Manifold ESD valves with Level Alarms Overridden

Conventions (Amend.), Reg.		**table 18.1, note 4 and paragraph 13.3.7** of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (as amended by Resolution MSC.370(93) , MSC.411(97) and MSC.441(99))					
IACS UI Number	**GC35**	**UI** version	**New,Feb.,2021**	Date of implementation	**July 1,2021**	Means of implementation	

Conventions/Codes Requirements

The table 18.1, note 4 and paragraph 13.3.7 read as follows:

Note 4: The override system permitted by 13.3.7 may be used at sea to prevent false alarms or shutdowns. When level alarms are overridden, operation of cargo pumps and the opening of manifold ESD valves shall be inhibited except when high-level alarm testing is carried out in accordance with 13.3.5 (see 18.10.3.4).

13.3.7 Where arrangements are provided for overriding the overflow control system, they shall be such that inadvertent operation is prevented. When this override is operated, continuous visual indication shall be given at the relevant control station(s) and the navigation bridge.

Interpretation

In applying the second sentence of note 4 of table 18.1, a hardware system such as an electric or mechanical interlocking device is to be provided to prevent inadvertent operation of cargo pumps and inadvertent opening of manifold ESD valves.

Remarks

This Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 July 2021.

7.33 Oxygen Deficiency Monitoring Equipment in a Nitrogen Generator Room Area

Conventions (Amend.), Reg.		Paragraph 13.6.4 of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (as amended by Resolution MSC.370(93) , MSC.411(97) and MSC.441(99))					
IACS UI Number	**GC36**	**UI** version	**New,Feb.,2021**	Date of implementation	**July 1,2021**	Means of implementation	

Conventions/Codes Requirements

Paragraph 13.6.4 of the Code reads as follows:

13.6.4 Where indicated by an "A" in column "f" in the table of chapter 19 ships certified for carriage of non-flammable products, oxygen deficiency monitoring shall be fitted in cargo machinery spaces and cargo tank hold spaces. Furthermore, oxygen deficiency monitoring equipment shall be installed in enclosed or semi-enclosed spaces containing equipment that may cause an oxygen-deficient environment such as nitrogen generators, inert gas generators or nitrogen cycle refrigerant systems.

Interpretation

Two oxygen sensors are to be positioned at appropriate locations in the space or spaces containing the inert gas system, in accordance with paragraph 15.2.2.4.5.4 of the FSS Code, for all gas carriers, irrespective of the carriage of cargo indicated by an "A" in column "f" in the table in chapter 19 of the Code.

Technical background

The oxygen deficiency monitoring is required in two different cases:

1.in the cargo machinery spaces and in the cargo tank hold spaces of ships certified for the carriage of non-flammable products, where indicated in column "f" of the table in chapter 19 and

2. in enclosed or semi-enclosed spaces containing equipment that may cause an oxygen-deficient environment.

It is understood that the requirement for oxygen deficiency monitoring in enclosed or semi-enclosed spaces containing equipment that may cause an oxygen-deficient environment applies to all ships covered by the IGC Code, irrespective of the cargo carried by the ship and of the indication in column "f" of the table in chapter 19.

Remarks

This Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 July 2021.

7.34 Suitable Pressure Relief System for Air Inlet, Scavenge Spaces, Exhaust System and Crank Case

Conventions (Amend.), Reg.		The first sentence of paragraph 16.7.1.4 of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (as amended by Resolution MSC.370(93) , MSC.411(97) and MSC.441(99))					
IACS UI Number	**GC37**	**UI** version	**New,Feb.,2021**	Date of implementation	**July 1,2021**	Means of implementation	

Conventions/Codes Requirements

The first sentence of Paragraph 16.7.1.4 of the Code reads as follows:

16.7.1.4 Unless designed with the strength to withstand the worst case overpressure due to ignited gas leaks, air inlet manifolds, scavenge spaces, exhaust system and crank cases shall be fitted with suitable pressure relief systems. *[…]*

Interpretation

1. A suitable pressure relief system for air inlet manifolds, scavenge spaces and exhaust system is to be provided unless designed to accommodate the worst-case overpressure due to ignited gas leaks or justified by the safety concept of the engine. A detailed evaluation regarding the hazard potential of overpressure in air inlet

manifolds, scavenge spaces and exhaust system is to be carried out and reflected in the safety concept of the engine.

2. In the case of crankcases, the explosion relief valves, as required by Regulation 27.4 of SOLAS Chapter II-1 as amended by IMO resolutions up to MSC.436(99), are to be considered suitable for the gas operation of the engine. For engines not covered by said Regulation, a detailed evaluation regarding the hazard potential of fuel gas accumulation in the crankcase is to be carried out.

Remarks

This Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 July 2021.

CHAPTER 8 GUIDELINES FOR THE DESIGN, CONSTRUCTION AND OPERATION OF PASSENGER SUBMERSIBLE CRAFT (PASSUB)

8.1 Viewports in passenger submersible craft

Conventions (Amend.), Reg.		Paragraph **2.2.3** of IMO Guidelines for the Design, Construction and Operation of Passenger Submersible Craft, 2000					
IACS UI Number	**PASSUB1**	**UI** version	**May ,1999/ Rev. 1 Aug. ,2000**	Date of implement ation	**01.01.2001**	Means of implemen tation	

Conventions/Codes Requirements

Viewports should be of acrylic material and in accordance with the requirements of a recognised organisation to the satisfaction of the Administration. Viewports may be of other material, as appropriate, provided viewports of such material are at least as effective and in accordance with the requirements of a recognised organisation to the satisfaction of the Administration.

Interpretation

Acrylic viewports are to be designed, fabricated and maintained in accordance with the requirements of the latest edition of the American Society of Mechanical Engineers Safety Standard for Pressure Vessels for Human Occupancy (ASME PVHO) Section 2 Viewports and Section 3 Window Fabricators. Other standards and materials may be accepted by the Society provided they achieve an equivalent level of safety with respect to design, fabrication and maintenance.

Remarks

CHAPTER 9 INTERNATIONAL CODE FOR APPLICATION OF FIRE TEST PROCEDURES

9.1 Adhesives used in A or B class divisions

Conventions (Amend.), Reg.		FTP Code 3.1, Paragraph **3.2.3** of resolution **A.754**					
IACS UI Number	**FTP1**	**UI** version	**June,2006**	Date of implementation	**Jan.1,2001**	Means of implementation	
Conventions/Codes Requirements							
Interpretation							
Deleted							
Technical Background							
Amendments to the fire test procedures specified in appendix 1 of the revised FTP Code (MSC.307(88)) incorporates FTP1 as the procedures require adhesives used in A or B Class divisions to be low flame spread.							
Remarks							
IACS deleted the UI in Dec. 2020.							

9.2 Pipe and duct penetrations

Conventions (Amend.), Reg.		Paragraph **5.1** of resolution **A.754**					
IACS UI Number	**FTP2**	**UI** version	**June, 2006**	Date of implementation	**01.01.2001**	Means of implementation	
Conventions/Codes Requirements							
Interpretation							
In cases where a test specimen (deck) which includes the prototype penetration(s) is not mounted within a rigid restraint frame but is connected to the furnace roof by side wall coamings, the rigidity of the coamings is to be equivalent to that of a restraint frame and evaluated in accordance with Section 5.1 of A.754(18). In cases where insulation is fitted to the test pipe(s), the distance(s) of 500 ± 50 mm required in A.III/2.2.3 of A.754 to which the pipe should project is to be taken from the end of the insulation as this is considered an integral part of the penetration(s) being tested and it is necessary that a length of unprotected pipe is exposed to the furnace. In all cases, the support and fixing of the test pipe(s) is to be by a framework mounted from the restraint frame such that any movement of the bulkhead or deck relative to the pipe(s) will be experienced by the penetration(s) being tested.							
Remarks							

9.3 Fire Door

Conventions (Amend.), Reg.		FTP Code sub-section **5.3** and Annex **1**, Part **3** – Test for "**A**", "**B**", and "**F**" class divisions Paragraph **2.1**, paragraphs **2.3.1** & **2.6.1** of resolution **A.754(18)**					
IACS UI Number	**FTP3**	**UI** version	**Dec.,2004/ Rev.1,Jul.,2006/ Rev.2,Jul.,2010/ Rev.3, Apr. , 2021**	Date of implementation	**Jul.1,2005/ Rev.1,Jan.1,2007/ Rev.2,Jan.1,2011/ Rev.3, Jan.1,2022**	Means of implementation	Keel laying
Conventions/Codes Requirements							
FTP Code sub-section 5.3 reads: "5.3.1 The case-by-case approval means approval where a product is approved for installation on board a specific ship without using a type approval certificate. 5.3.2 The Administration may approve products using the applicable test procedures for specific ship applications without issuing a type approval certificate. The case-by-case approval is only valid for the specific ship."							

FTP Code Annex 1 FIRE TEST PROCEDURES PART 3 - TEST FOR "A", "B" AND "F" CLASS DIVISIONS reads:

1 Application

Where products (such as decks, bulkheads, doors, ceilings, linings, windows, fire dampers, pipe penetrations and cable transits) are required to be "A" or "B" or "F" class divisions, they shall comply with this part.*

*Products tested for use in buildings have similar classification markings. However, they do not correspond to the classes in marine use.

2 Fire test procedure

2.1 The products shall be tested and evaluated in accordance with the fire test procedure specified in resolution A.754(18). This contains test procedures also for windows, fire dampers and pipe and duct penetrations in its appendices.

2.2 Specimen sizes

2.2.1 For the purpose of this Code, the first sentence of paragraphs 2.1.1, 2.4.1 and 2.7.1 of the Annex to resolution A.754(18) is replaced by the following:

"The minimum overall dimensions of test specimen, including the perimeter details at the top, bottom and vertical edges, are 2,440 mm width and 2,500 mm height, except that the minimum overall dimensions of 2,440 mm in height and 4.65 m ²in the exposed surface of the test specimen may be used in testing up to 31 December 1998. The approval expiry date is 31 December 2003 for approvals based on tests with such smaller test specimen."

2.2.2 For the purpose of this Code, the first sentence of paragraphs 2.2.1, 2.5.1 and 2.8.1 of the Annex to resolution A.754(18) is replaced by the following:

"The minimum overall dimensions of test specimen, including the perimeter details at all the edges, are 2,440 mm width and 3,040 mm length, except that the minimum overall dimensions of 2,440 mm in length and 4.65 m ²in the exposed surface of the test specimen may be used in testing up to 31 December 1998. The approval expiry date is 31 December 2003 for approvals based on tests with such smaller test specimen."

2.2.3 The specimen sizes shall be given in the test reports.

2.3 Where thermal radiation through windows is required to be limited, the window assembly may be tested and evaluated in accordance with appendix 1 of this part.

2.4 Where ceilings or linings are required to be continuous "B" class ceilings or linings they may be tested and evaluated in accordance with appendix 2 of this part.

3 Additional requirements

3.1 The integrity of class "B" constructions shall be achieved with non-combustible materials. Adhesives used in the construction of the specimen are not required to be noncombustible; however, for the purpose of this Code, they shall have low flame-spread characteristics.

3.2 Materials placed at "B" class panel joints for avoiding vibration or noise transmission shall be of low flame spread characteristics and fire tested with "B" class divisions along which they are used. However, such materials shall be non-combustible if they are necessary to support the non-combustible "B" class structure or to achieve the required integrity.

3.3 Doors and shutters, which are fitted above the bulkhead deck and which are required to meet both fire protection and watertight requirements, shall comply with the fire protection requirements as required in the Convention, for the divisions where they are installed. The watertight doors fitted below the bulkhead deck are not required to be insulated.

4 Other references

4.1 The non-combustibility of materials used in "A" and "B" class divisions shall be verified in accordance with part 1.

4.2 Where combustible veneers are allowed to be provided in "A" and "B" class divisions, the low flame spread characteristics of such veneers, if required, shall be verified in accordance with part 5.

Interpretation

1 Methods of evaluation and testing

For doors larger than those which can be accommodated in the standard specimen size (e.g., 2,440 mm wide and 2,500 mm high), as specified in part 3 of the FTP Code,

1. if such doors can be accommodated into a larger test furnace, it is recommended to conduct a test with the full size specimen of the door; or

2. it is recommended to use the following method for evaluation of the fire performance of the door and approval of the door.

2 Doors of marginally larger dimensions

2.1 A fire door of marginally larger dimensions than a fire-tested fire door may be individually assessed and accepted

for a specific project with the same classification, provided all of the following is met:

1. dimensions (width, height) are not more than 15% above those of the tested door;

2. the surface area of the door is not more than 10% above that of the tested door;

3. the door design does not deviate in any other aspect from the one tested; and

4. the tested door has successfully satisfied both insulation and integrity criteria for the following times, as appropriate:

"B-0" 0 min insulation 36 min integrity
"B-15" 18 min insulation 36 min integrity
"A-0" 0 min insulation 68 min integrity
"A-15" 18 min insulation 68 min integrity
"A-30" 36 min insulation 68 min integrity
"A-60" 68 min insulation 68 min integrity.

2.2 If the door to be approved is larger than stated above and complies with the size requirements stated under section 3 below, the test shall also include additional instrumentation as specified in paragraph 3.4.2 below, or equivalent arrangement.

3 Doors larger than those in section 1 above, but not exceeding 50% in surface area

3.1 An engineering assessment can be used to extrapolate the fire test results of a door having a larger geometry than the tested door.

3.2 Such an assessment shall be used for verification only if the dimensions of the actual door are greater than the maximum permitted by the furnace (considering a furnace with an aperture of 2,440 mm width x 2,500 mm height) and the door involved has already been tested, with such dimensions, with satisfactory results in accordance with section 1 above, and the actual door does not exceed 50% in surface area.

3.3 The methodology used to extrapolate the fire tests results shall consider the following three steps:

1. standard fire test of the "specimen" to obtain reference temperature and structural displacements. Such a "specimen" may be either:

1.1 a door already certified through the fire test which is identical in design to the door to be analysed (fire test to include additional instrumentation as per paragraph 3.4.2; or equivalent arrangement); or

1.2 a specially-built specimen where the finite element method is to be performed to extrapolate the results of a specimen of an actual door having a size exceeding the maximum size allowed by the furnace of the testing laboratory; the specimen shall be a mock-up of the actual door, but having a size that fits in the furnace;

2. finite element analysis in paragraph 3.6, of the "specimen" to calibrate the thermal and mechanical boundary conditions of the FEM model, which are adjusted until the numerical and experimental temperature and displacement distribution compare satisfactorily; and

3. finite element analysis in paragraph 3.5, of the actual door carried out using the model calibrated as per paragraph 3.7, assuming that the differences in the geometry and dimensions between the actual door and the specimen door do not significantly influence the results..

3.4 Data to be submitted

3.4.1 In order for the analysis to be carried out, the following information should be submitted:

1. detailed drawings of the door, the door frame and the closure and locking devices including the indications of clearances and interferences;

2. test report of the prototype used to extrapolate the results. In this respect, additional instrumentation should consist of two sets of three 1.6 mm diameter thermocouples fitted through the thickness of the leaf, at depths of 1/3t, 1/2t, 2/3t. Such sets should be fitted, on the upper part of the door, within a circle of 100 mm in diameter whose centre is 150 mm aside of the surface thermocouples fitted in the centre of the top quarters;

3. mechanical characteristics of all materials used for the construction of the door and its insulation:

3.1Young's module;
3.2 yield strength; and
3.3 density; and

4. thermal properties:

4.1 thermal expansion coefficient;
4.2 thermal conductivity; and
4.3 specific heat.

3.4.2 Since all these properties are temperature dependent, it is necessary that the required data be given as a function of the temperature range foreseen for the fire tests. Where it is not possible to obtain experimental data, an engineering evaluation shall be submitted with the supporting considerations for the proposed curves of variation of mechanical and thermal characteristics as a function of the temperature in the considered range.

3.5 Method of analysis

The comparison of the fire resistance of doors having larger geometry shall be considered in two steps:

1. evaluation of the heat transmission through the specimen thickness and of the temperature on the unexposed specimen surface; and

2. evaluation of the strength characteristics and of the displacements of the structural members of the specimen.

3.6 Heat transmission analysis

3.6.1 By carrying out finite element calculations, the histories over time of the heat transmission within the structural assembly are computed and the temperature is compared with the temperature experienced by the assembly represented in the standard fire test.

3.6.2 Based on suitable data for the temperature-dependent variables, an iterative procedure is used for the evaluation of thermal-mechanic properties.

3.6.3 The thermal boundary conditions of convecting and radiative type are:

$$q_c = h_c\ (T_s - T_\infty)$$

and

$$q_r = \sigma_\varepsilon(T_s^4 - T_\infty^4)$$

where:

q_c and q_r: Convective and radiative heat flux, respectively

h_c: Convective heat transfer coefficient

σ: Stefan-Boltzmann constant

ε: Emissivity coefficient

T_s: Surface temperature

T_∞: Furnace or ambient temperature.

3.6.4 The two equations can be included in an equivalent boundary condition:

$$q = H_{eq}\ (\sigma, \varepsilon, T_s, T_\infty)\ (T_s - T_\infty)$$

where:

the equivalent coefficient Heq depends on the unknown surface temperature. However, it can be calculated as part of the finite element analysis using an emissivity coefficient appropriately calibrated with the fire test results.

3.6.5 The equivalent heat transfer coefficient can be assumed to be constant on the single exposed surface, as the furnace assembly built in accordance with the FTP Code gives uniformity of the temperature and heat flux within the furnace.

3.6.6 Alternatively, the temperature distribution measured on the specimen of the standard fire test can be directly applied on the finite element structural model taking into account the same time histories.

3.7 Structural analysis

3.7.1 Using the results of the heat transmission analysis and information on temperaturedependent material properties, the thermal stresses and deformations on the geometry are evaluated. When modelling the structural assembly, attention should be paid to using a sufficient number of elements to account for the non-uniform temperature distribution within the member and to catch the non-linear temperature-dependent behaviour.

3.7.2 Once the model is prepared, the analysis is to be carried out stepwise. For each element, the incremental strain or deformation caused by a temperature increase is calculated and a new stress level is obtained based on the stress-strain relationship applicable for that particular temperature increase.

3.7.3 The mechanical boundary conditions are to be congruent in order to represent the real interaction of the door with the external frame for the overall length of the test.

4 Larger doors exceeding 50% in surface area

4.1 For larger doors exceeding 50% in surface area, a full analysis based on SOLAS regulation II-2/17 shall be performed to assess the safety of the vessel.

4.2 The approach shall be based on the results of the fire test of the door having the maximum dimensions permitted by the furnace (considering a furnace with an aperture of 2,440 mm width x 2,500 mm height) according to the procedure described under section 3.

Technical Background

1. (Rev.1) Considering the application of larger fire doors on ships, they may be accepted where certain conditions are satisfied.

2. (Rev.2) UI FTP3 is revised to cover very large doors as defined in UI FTP3 and MSC/Circ.1273. This UI is revised to be applicable to hinged and sliding fire doors in order to maintain the consistency with MSC.1/Circ. 1319.

3. (Rev.3) UI FTP3 is edited to make it completely consistent with MSC.1/Circ.1319 text with no substantial change.

Remarks

9.4 Fire resistant windows on tankers

Conventions (Amend.), Reg.		Appendix **A. I** to resolution **A.754(18)**					
IACS UI Number	**FTP 4**	**UI** version	**Sept. ,2005/ Rev.1,Aug., 2006**	Date of impleme ntation	**01.01.2007**	Means of implementation	constructed ships

Conventions/Codes Requirements

2.2 Design

The bulkhead which includes the window should be insulated to class A-60 on the stiffened face, which should be the face exposed to the heating conditions of the test. This is considered to be most typical of the use of windows on board ships, not necessarily being the worst way around. There may be special applications of windows where the Administration considers it appropriate to test the window with the insulation of the bulkhead to the unexposed face of the structural core, or within bulkheads other than class A-60.

The window should be positioned within the bulkhead, shown in Figure 1 of the resolution, at that height which is intended for practical application. When this is not known, the window should be positioned with the top of its frame as close as possible, but not closer than 300 mm, to the top of the bulkhead.

Interpretation

Windows to be fitted at the forward bulkhead of accommodation block on tankers shall correspond to prototype subject to the "A" class standard fire test with the fire against its external side (i.e. the side which, after the installation on board, will be exposed to the weather). The insulation of the bulkhead used along with the window's specimen shall be fitted on the unexposed face of the structural core. *(MSC.1/Circ.1203)*

Technical background

1. This unified interpretation has been developed with the scope of clarifying that A-60 class windows to be fitted at the forward bulkhead of accommodation block on tankers are to be tested to the same condition that might be encountered in case of a fire in the cargo area. This condition was meant to be exactly the scenario predicted when the requirement relevant to the fire resistance of these windows was set.
2. This UI is editorially amended in August 2006 to refer to MSC/Circ.1203. (Rev.1)

Remarks

9.5 Testing and approval of "A" class divisions – fastening of insulation material and details of joints (IMO Res. A.754(18) / IMO FTP Code Part 3)

Conventions (Amend.), Reg.		**Resolution IMO A.754(18) / FTP Code, Part 3**					
IACS UI Number	**FTP5**	**UI** version	**Jun.,2010**	Date of implementation	**Jan.1,2011**	Means of implementation	Issuance of type approval certificate

Conventions/Codes Requirements

Regulation

IMO Res. A.754(18) item 1.6 / IMO FTP Code Part 3 Appendix 1 item 1.12 reads:

"The construction to be tested should be, as far as possible, representative of that to be used on board ships, including the materials and method of assembly".

IMO Res. A.754(18) item 7.5.1 / IMO FTP Code Part 3 Appendix 1 item 7.6.1 reads:

"Thermocouples shall be placed over all types of joints, both vertical and horizontal, and also at intersections between the joints".

Interpretation

To demonstrate that the tested "A" class assemblies are representative of that used on board ships, the following details shall, as a minimum when applicable, be clearly indicated in test reports and included in type approvals:

- Type, thickness, density and number of layers of insulation material;

- Size, types, materials and fixing methods of pins and washers;

- Spacing between pins;
- Maximum spacing between pins and adjacent joints;
- Stepping of joints for multi-layers if applicable;
- Insulation and pinning details on and around stiffeners;
- Details of wire mesh, alu tape etc, if used in the test;
- The type approval test report shall contain the information required by 2.1.3, 2.2.3, 6.1 and 10.4 of resolution A.754(18);
- Type approval certificate shall refer to drawing numbers of the test sample.

Technical Background

With regard to the installation of insulation materials in A-class divisions on board ships (in relation to insulation materials in A-class divisions which are normally fastened by means of steel pins and spring steel washers, various pinning distances during assembly in practice at the yards and arrangements of joints), this UI is developed with regard to detailed information to be included in test reports and type approvals, so as to ensure that the installation of insulation materials in A-class divisions on board ships is consistent with the arrangement in type approval.

Remarks

1.This UI is to be implemented uniformly in connection with UI SC239. The implementation date for the UI FTP5 is 1 July 2011 and for UI SC239 is 1 January 2012. The reasoning behind these implementation dates took into account:
1) that the surveyor is to ensure insulation is installed in accordance with type approval report, regardless if the type approval is provided in accordance with the new FTP UI or not; and
2) that the FTP UI will allow existing type approvals to expire thus avoiding a wholesale renewal of the certification on or before the implementation date of the new FTP UI.

9.6 Testing and approval of pipe penetrations and cable transits for use in "A" class divisions

Conventions (Amend.), Reg.		**IMO FTP Code 2010 Annex 1 Part 3**					
IACS UI Number	**FTP6**	**UI** version	**Feb 2013/ Rev.1, Jul., 2015**	Date of implementation	**Rev.1, Jan.1, 2016**	Means of implementation	**for approvals granted**

Conventions/Codes Requirements

IMO FTP Code 2010 Annex 1 Part 3 Appendix 1 item 1.13 reads:
The designs of the specimens proposed in this appendix are considered to reflect the worst case situations in order to provide maximum usefulness of the classifications to end-use applications. However, the Administration may accept or request special test arrangements which provide additional information required for approval, especially of those types of constructions which do not utilize the conventional components of horizontal and vertical divisions, e.g., where cabins may be of a modular type construction involving continuous connections between bulkheads, decks and ceilings.

Interpretation

Arrangement
"A"-class pipe penetrations and cable transits that are
a) constructed without structural sleeves of minimum 3 mm thickness and minimum 60 mm length welded or bolted to the division; and/or
b) constructed with removable, soft or intumescent filling material

are "those types of constructions which do not utilize conventional components of horizontal and vertical divisions" and are to be subject to additional testing and/or design criteria as described below:

Additional testing/design criteria
- Filling materials shall be adequately secured by bonded materials or mechanical means that cannot be removed

without the use of tools in order to prevent damage by normal ship vibrations and pressures.

- The pipe penetration/cable transit shall not have any visible openings. It shall not be possible to manually penetrate any part of the penetration with a 6 mm gap gauge, as described in paragraph 7.10 of Appendix 1 of Part 3 to Annex 1 of the 2010 FTP Code.

Approval

Penetrations in structural divisions shall not impair the structural strength of the division. The structural make-up of the penetration is to be fully described so that its use and the need for additional stiffening for the division can be fully assessed.

Technical Background

The issue was raised within the Safety Panel by the safety Panel Chairman. Members unanimously agreed with aligning UI FTP6 with the text of MSC.1/Circ.1488.

Remarks

1. This Unified Interpretation is to be uniformly implemented by IACS Societies for approvals granted on or after 1 January 2014.
2. Rev. 1 of this UI is to be uniformly implemented by IACS Societies for approvals granted on or after 1 January 2016.

CHAPTER 10 INTERNATIONAL REGULATIONS FOR PREVENTING COLLISIONS AT SEA, 1972 (COLREG)

10.1 Interpretation to COLREG 1972 Annex 1, Section 9(b)

Conventions (Amend.), Reg.		**COLREG 1972 Annex 1, Section 9(b)**					
IACS UI Number	**COLREG 1**	**UI version**	**Jan.,2006/ Rev.1, Oct.,2012/ Corr.1,Feb. ,2013**	**Date of implementation**	**Jul. 1,2006/ Jul. 1,2013**	**Means of implementation**	

Conventions/Codes Requirements

Annex 1, Section 9(b) reads:
(i) All round lights shall be so located as not to be obscured by masts, topmasts or superstructures within angular sectors of more than 6°, except anchor lights prescribed in Rule 30, which need not to be placed at an impractical height above the hull.
(ii) If it is impractical to comply with paragraph (b)(i) of this section by exhibiting only one all-round light, two all-round lights shall be used suitably positioned or screened so that they appear, as far as practicable, as one light at the distance of one mile.

Interpretation

1. In order to comply with the one (1) mile requirement in 9(b)(ii), the screening of each all-round light shall be as follows:

$$\theta_2 \leqslant 360 - \theta_1$$

where θ_1: Screened angle of one all-round light
θ_2: Screened angle of the other all-round light

2. Screenings details and the arrangement of obstacles are to be considered by CCS when carrying out the drawing approval process.

Technical Background

Rev.1 of the UI is developed to accept alternative arrangements of all-round lights with screened angles greater than 180 degrees. And, Corr.1 of the UI is to clarify the implementation statement of Rev.1 of the UI.

Remarks

Rev.1 of this UI is to be implemented by CCS from 1 July 2013 when carrying out the drawing approval process, including re-fitting of navigation light.

10.2 Interpretation to COLREG 1972 Rule 23(a)

Conventions (Amend.), Reg.		Rule **23(a)** of COLREG **1972**					
IACS UI Number	**COLREG 2**	**UI** version	**Jan.,2006/ Corr.1 Apr.,2006**	Date of implementation	**Jul.1,2006**	Means of implementation	

Conventions/Codes Requirements

Rule 23(a) reads:
A power-driven vessel underway shall exhibit:
(i) a masthead light forward;
(ii) a second masthead light abaft of and higher than the forward one; except that a vessel of less than 50 m in length shall not be obliged to exhibit such a light but may do so;
(iii) sidelights;
(iv) a stern light.

Interpretation

Deleted.

Remarks

Deleted 1st January 2009 to coincide with MSC.253(83).

10.3 Interpretation to COLREG 1972 Annex 1, Section 3(b)

Conventions (Amend.), Reg.		COLREG **1972** Annex **1**, Section **3(b)**					
IACS UI Number	**COLREG 3**	**UI** version	**Jan.,2006/ Rev.1,May,2009/ Corr.1,Jan.,2010**	Date of implementation	**Jul.1,2006/ Jan.,2010**	Means of implementation	

Conventions/Codes Requirements

On power-driven vessels of 20 m or more in length the sidelights shall not be placed in front of the forward masthead lights. They shall be placed at or near the side of the vessel.

Interpretation

The term "near the side" is interpreted as being a distance of not more than 10% of the breadth of the vessel inboard from the side, up to a maximum of 1 metre.Where the application of above requirement is impractical (e.g. small ships with superstructure of reduced width) exemption may be given on the basis of the Flag Authority acceptance.

Remarks

1. Changes introduced in Rev.1 are to be uniformly implemented by IACS Societies for ships contracted for construction on or after 1 January 2010.
2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

10.4 Interpretation to COLREG 1972 Rule 27(b)(i)

Conventions (Amend.), Reg.		Rule **27(b)(i)** of COLREG **1972**					
IACS UI Number	**COLREG 4**	**UI** version	**Jan. 2006/ Corr.1,Jul .,2007**	Date of implementation	**July 1, 2006**	Means of implementation	

Conventions/Codes Requirements

Rule 27(b)(i) reads:
A vessel restricted in her ability to manoeuvre, except a vessel engaged in mine clearance operations, shall exhibit:
(i) three all-round lights in line where they can best be seen. The highest and lowest of these lights shall be red and the middle light shall be white;

Interpretation

"Not under command" (NUC) all-round red lights (Rule 27(a)(ii)) may be used as part of the "Restricted Ability to Manouevre" (RAM) lights provided the vertical and horizontal distances required by COLREG 1972 are complied with and the electrical system is arranged so that the all-round white light (RAM) may be switched on independently from the two all-round red lights (NUC).

Technical Background

(Corr.1) "Rule 27(a)(ii)" is editorially corrected into "Rule 27(a)(i)".

Remarks

10.5 Interpretation to COLREG 1972 Annex I Sections 9(a)(i) and 10(a)(i)

Conventions (Amend.), Reg.		**COLREG 1972 Annex I Sections 9(a)(i) and 10(a)(i)**					
IACS UI Number	**COLREG 5**	**UI version**	**May ,2018**	**Date of implementation**	**01.07.2019**①	**Means of implementation**	**contracted for construction**

Conventions/Codes Requirements

Annex I, Sections 9(a)(i) and 10(a)(i) read:

9(a)(i) – Horizontal sectors

In the forward direction, sidelights as fitted on the vessel shall show the minimum required intensities. The intensities shall decrease to reach practical cut-off between 1 degree and 3 degrees outside the prescribed sectors.

10(a)(i) - Vertical sectors

The vertical sectors of electric lights as fitted, with the exception of lights on sailing vessels underway shall ensure that at least the required minimum intensity is maintained at all angles from 5 degrees above to 5 degrees below the horizontal;

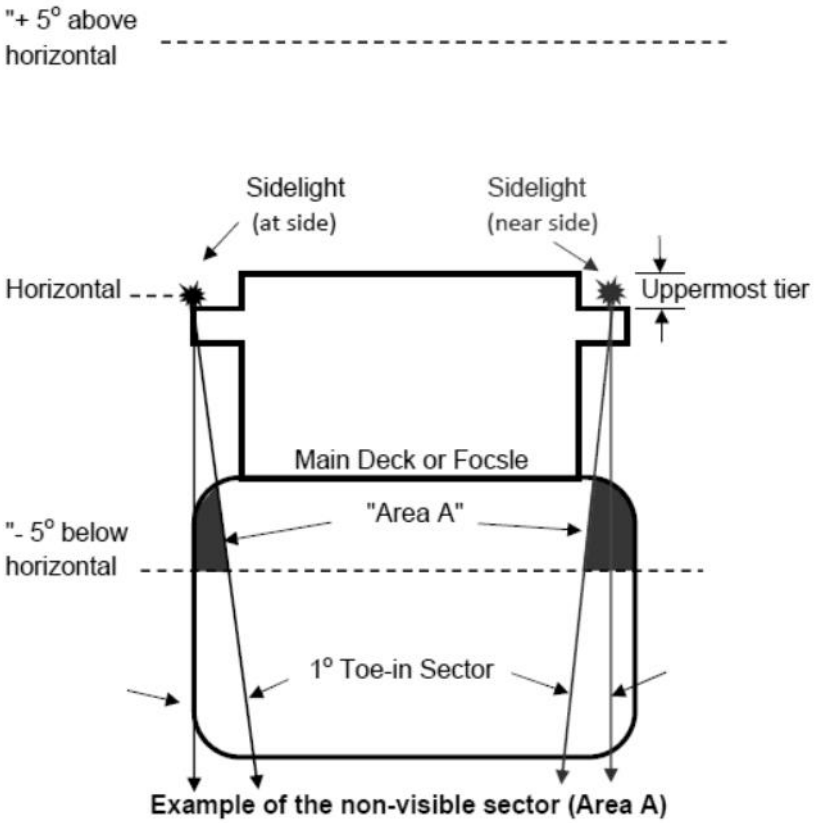
Interpretation

1. 9(a)(i) – Horizontal sectors (MSC.1/Circ.1427, MSC.1/Circ.1260/Rev.1)

COLREG Annex I, section 9(a)(i) would require the full intensity of the side lights to be maintained in the forward direction of 1° outside the prescribed sector (one-degree toe-in sector) with the practical cut-off between 1° and 3°. This is needed to enable other vessels to determine a "head-on-situation" as per COLREG rule 14.

2. 10(a)(i) - Vertical sectors

Where sidelights, installed in a position at or "near the side" ②, are not fully visible at all angles from 5 degrees above to 5 degrees below the horizontal including the 1° toe-in sector (e.g., see Area A), then that installation is acceptable provided the installed sidelights are visible, with the ship in all normal conditions of trim corresponding to the lightest seagoing draft in the approved T&S Booklet, at a minimum distance of 1000 m measured from the stem when viewed from sea level throughout the horizontal plane of 112.5º defined by Rule 21(b) including the horizontal 1° toe-in sector in the forward direction prescribed in 9(a)(i).



Footnote:

① The provisions of this Unified Interpretation will also be applied when design difficulties are encountered during

the approval of navigation light arrangements on ships contracted for construction earlier than 1 July 2019 unless they are instructed otherwise in writing by the Administration on whose behalf they are authorized to act as a Recognized Organization. ② Refer to MSC.1/Circ.1260/Rev.1, for interpretation of "near the side".
Technical Background
This newly adopted IACS UI provides a clarification on the possible blockage of hull structures to the horizontal plane and the vertical sector of side lights as respectively required by COLREG Annex 1 9(a)(i) and 10(a)(i).
Remarks

CHAPTER 11 INTERNATIONAL CODE OF SAFETY FOR SHIPS USING GASES OR OTHER LOW-FLASHPOINT FUELS (IGF CODE)

11.1 Test for gas fuel tank's high level alarm

Conventions (Amend.), Reg.		IGF Code, MSC Res.391(95), paragraph 15.4.2.3					
IACS UI Number	**GF1**	**UI** version	**Jan., 2017**	Date of implementation	**01.01.2018**	Means of implementation	

Conventions/Codes Requirements

15.4.2.3 states:
The position of the sensors in the liquefied gas fuel tank shall be capable of being verified before commissioning. At the first occasion of full loading after delivery and after each dry-docking, testing of high level alarms shall be conducted by raising the fuel liquid level in the liquefied gas fuel tank to the alarm point.

Interpretation

The expression "each dry docking" refers to:
- the survey of the outside of the ship's bottom required for the renewal of the Cargo Ship Safety Construction Certificate and or the Cargo Ship Safety Certificate, for cargo ships.
- the survey of the outside of the ship's bottom to be carried out every 60 months according to IMO Resolution A.1104(29, paragraphs 5.10.1 and 5.10.2), for passenger ships.

Ref.
SOLAS Reg. I/10.
IMO Res. A.1104(29)

Remarks

UI GF1 (Rev.1 July 2017) approved on 06 July 2017 was withdrawn on 05 June 2018 prior to coming into force on 1 July 2018.

11.2 Ship Steel Protection against Liquefied Gas Fuel

Conventions (Amend.), Reg.		**IGF Code Part A-1, paragraph 6.3.10**					
IACS UI Number	**GF2**	**UI** version	**Sept., 2017**	Date of implementation	**01.01.2019**	Means of implementation	

Conventions/Codes Requirements

If liquefied gas fuel storage tanks are located on open deck the ship steel shall be protected from potential leakages from tank connections and other sources of leakage by use of drip trays. (...)

Interpretation

Whether a drip tray is needed or not is to be in accordance with the following:
1. When the tank is located on the open deck, drip trays are to be provided to protect the deck from leakages from tank connections and other sources of leakage.
2. When the tank is located below the open deck but the tank connections are on the open deck, drip trays are to be provided to protect the deck from leakages from tank connections and other sources of leakage.
3. When the tank and the tank connections are located below the deck, all tank connections are to be located in a tank connection space. Drip trays in this case are not required.

Technical Background

Remarks

The “contracted for construction” date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of “contract for construction”, refer to IACS Procedural Requirement (PR) No. 29.

11.3 Tank connection space for tanks on open deck and tank connection space equipment

Conventions (Amend.), Reg.		**IGF Code paragraph 2.2.15.3**					
IACS UI Number	**UI GF3**	**UI** version	**Dec. ,2017**	Date of implementation	**01.01.2018**	Means of implementation	
Conventions/Codes Requirements							
IGF Code paragraph 2.2.15.3: Tank connection space is a space surrounding all tank connections and tank valves that is required for tanks with such connections in enclosed spaces.							
Interpretation							
1 A tank connection space may be required also for tanks on open deck. This may apply for ships where restriction of hazardous areas is safety critical. A tank connection space may also be necessary in order to provide environmental protection for essential safety equipment related to the gas fuel system like tank valves, safety valves and instrumentation. 2 A tank connection space may also contain equipment such as vaporizers or heat exchangers. Such equipment is considered to only contain potential sources of release, but not sources of ignition. Note: 1. This Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2018. 2. The “contracted for construction” date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of “contract for construction”, refer to IACS Procedural Requirement (PR) No. 29.							
Technical Background							
The UI is intended to establish a unified interpretation regarding the application of tank connection spaces and which equipment can be located therein. Sections 2.2.15.3, 6.3.4 and 6.3.10 of the IGF Code imply that a tank connection space is only required when LNG fuel tanks are located in enclosed spaces. However, IACS considers that a tank connection space should not be excluded from being applied to tanks on an open deck, where considered appropriate. A tank connection space is considered only to contain potential sources of release, but not sources of ignition.							
Remarks							

11.4 Fuel preparation room

Conventions (Amend.), Reg.		**IGF Code paragraph 2.2.17**					
IACS UI Number	**UI GF4**	**UI** version	**Dec. ,2017**	Date of implementation	**01.01.2018**	Means of implementation	
Conventions/Codes Requirements							
IGF Code paragraph 2.2.17: Fuel preparation room means any space containing pumps, compressors and/or vaporizers for fuel preparation							

purposes.

Interpretation

A tank connection space which has equipment such as vaporizers or heat exchangers installed inside is not regarded as a fuel preparation room. Such equipment is considered to only contain potential sources of release, but not sources of ignition.

Note:
1. This Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2018.
2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

Technical Background

The UI is intended to establish a unified interpretation regarding the definition of fuel preparation rooms.

The term "fuel preparation room" has evolved from the terms "compressor room" and "pump room" in the Interim Guidelines on safety for natural gas-fuelled engine installations in ships (resolution MSC.285(86)) and is based on the concept of compressor and pump rooms located above deck in the IGC Code. Hence, a tank connection space, even with passive equipment such as vaporizers or heat exchangers, installed inside is not regarded as a fuel preparation room.

Remarks

11.5 Appropriate location of premixed engines using fuel gas mixed with air before the turbocharger

Conventions (Amend.), Reg.		**IGF Code paragraph 5.4.1**					
IACS UI Number	**UI GF5**	**UI** version	**Dec. ,2017**	Date of implementation	**01.01.2018**	Means of implementation	

Conventions/Codes Requirements

IGF Code paragraph 5.4.1:

In order to minimize the probability of a gas explosion in a machinery space with gas-fuelled machinery one of these two alternative concepts may be applied:

.1 Gas safe machinery spaces: Arrangements in machinery spaces are such that the spaces are considered gas safe under all conditions, normal as well as abnormal conditions, i.e. inherently gas safe.

In a gas safe machinery space a single failure cannot lead to release of fuel gas into the machinery space.

.2 ESD-protected machinery spaces: Arrangements in machinery spaces are such that the spaces are considered non-hazardous under normal conditions, but under certain abnormal conditions may have the potential to become hazardous. In the event of abnormal conditions involving gas hazards, emergency shutdown (ESD) of non-safe equipment (ignition sources) and machinery shall be automatically executed while equipment or machinery in use or active during these conditions shall be of a certified safe type.

In an ESD protected machinery space a single failure may result in a gas release into the space. Venting is designed to accommodate a probable maximum leakage scenario due to technical failures.

Failures leading to dangerous gas concentrations, e.g. gas pipe ruptures or blow out of gaskets are covered by explosion pressure relief devices and ESD arrangements.

Interpretation
Premixed engines using fuel gas mixed with air before the turbocharger shall be located in ESD protected machinery spaces. Note: 1. This Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2018. 2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.
Technical Background
The UI is intended to establish a unified interpretation of the appropriate location of premixed engines using fuel gas mixed with air before the turbocharger. Premixed engines (i.e. gas or dual fuel engines where the gas is introduced before the turbocharger rather than direct into the cylinder or cylinder head port) were discussed in the Working Group at MSC 95 with respect to section 9.6.2 of the IGF Code and associated footnote 18, when it was confirmed that premixed engines should be located in ESD protected machinery spaces. For premixed engines a single failure may result in a gas release into the machinery space. Hence, such engines must be located in an ESD protected machinery space.
Remarks

11.6 Protection against cryogenic leakage and control of hazardous zones in fuel preparation rooms on open deck

Conventions (Amend.), Reg.		**IGF Code paragraph 5.8,6.2.1.1**					
IACS UI Number	**UI GF6**	**UI** version	**Dec. ,2017**	Date of implementation	**01.01.2018**	Means of implementation	
Conventions/Codes Requirements							
IGF Code Paragraph 5.8 states: Fuel preparation rooms shall be located on an open deck, unless those rooms are arranged and fitted in accordance with the regulations of this Code for tank connection spaces. Paragraph 6.2.1.1 states: the fuel containment system shall be so designed that a leak from the tank or its connections does not endanger the ship, persons on board or the environment. Potential dangers to be avoided include: .1 exposure of ship materials to temperatures below acceptable limits;							
Interpretation							
1. Fuel preparation rooms, regardless of location, shall be arranged to safely contain cryogenic leakages. 2. The material of the boundaries of the fuel preparation room shallhave a design temperature corresponding with the lowest temperature it can be subjected to in a probable maximum leakage scenario unless the boundaries of the space, i.e. bulkheads and decks, are provided with suitable thermal protection. 3. The fuel preparation room shallbe arranged to prevent surrounding hull structure from being exposed to unacceptable cooling, in case of leakage of cryogenic liquids. 4. The fuel preparation room shallbe designed to withstand the maximum pressure build up during such a leakage. Alternatively, pressure relief venting to a safe location (mast) can be provided. Note: 1. This Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for							

construction on or after 1 January 2018.

2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

Technical Background

The UI is intended to establish a unified interpretation regarding protection against cryogenic leakage and control of hazardous zones in fuel preparation rooms on open deck.

The IGF Code requires that a fuel preparation room located below deck shall be arranged in accordance with the regulations applicable for tank connection spaces. This implies that the material of the bulkheads of the fuel preparation room shall have a design temperature corresponding with the lowest temperature it can be subject to in a probable maximum leakage scenario, and that it is gastight towards non-hazardous spaces.

For a fuel preparation room located on an open deck, the IGF Code does not specify any prescriptive requirements. However, the functional requirements in sections 3.2.1 and 3.2.2. of the IGF Code are relevant for the fuel preparation room. Furthermore, IACS considers the functional requirement under section 6.2.1, on protection of ship materials from exposure to temperatures below acceptable limits, also to be relevant for fuel preparation rooms.

IACS considers that a fuel preparation room located on an open deck should be arranged in the same way as a fuel preparation room below deck. Protection against cryogenic leakages and control of hazardous zones are equally relevant for open deck locations.

Remarks

11.7 External surface area of the tank for determining sizing of pressure relief valve

Conventions (Amend.), Reg.		**IGF Code paragraph 6.7.3.1.1.2, figure 6.7.1**					
IACS UI Number	**UI GF7**	**UI** version	**Dec. ,2017**	Date of implementation	**01.01.2018**	Means of implementation	

Conventions/Codes Requirements

IGF Code paragraph 6.7.3.1.1.2:

vapours generated under fire exposure computed using the following formula:

$Q = FGA^{0.82}$ (m^3/s),

where:

Q = minimum required rate of discharge of air at standard conditions of 273.15 Kelvin (K) and 0.1013 MPa.

F = fire exposure factor for different liquefied gas fuel types:

F = 1.0 for tanks without insulation located on deck;

F = 0.5 for tanks above the deck when insulation is approved by the Administration. (Approval will be based on the use of a fireproofing material, the thermal conductance of insulation and its stability under fire exposure);

F = 0.5 for uninsulated independent tanks installed in holds;

F = 0.2 for insulated independent tanks in holds (or uninsulated independent tanks in insulated holds);

F = 0.1 for insulated independent tanks in inerted holds (or uninsulated independent tanks in inerted, insulated holds); and

F = 0.1 for membrane tanks.

For independent tanks partly protruding through the weather decks, the fire exposure factor shall be determined on the basis of the surface areas above and below deck.

G = gas factor according to formula:

$$G = \frac{12.4}{LD}\sqrt{\frac{ZT}{M}}$$

where:

T = temperature in Kelvin at relieving conditions, i.e. 120% of the pressure at which the pressure relief valve is set;

L = latent heat of the material being vaporized at relieving conditions, in kJ/kg;

D = a constant based on relation of specific heats k and is calculated as follows:

$$D = \sqrt{k\left(\frac{2}{k+1}\right)^{\frac{k+1}{k-1}}}$$

where:

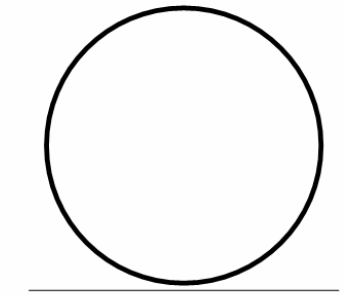
k = ratio of specific heats at relieving conditions, and the value of which is between 1.0 and 2.2. If k is not known, D = 0.606 shall be used;

Z = compressibility factor of the gas at relieving conditions; if not known, Z = 1.0 shall be used;

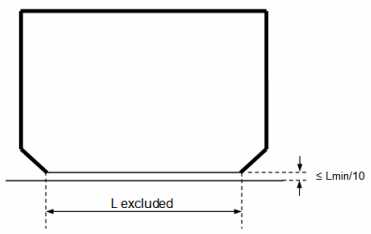
M = molecular mass of the product.

The gas factor of each liquefied gas fuel to be carried is to be determined and the highest value shall be used for PRV sizing.

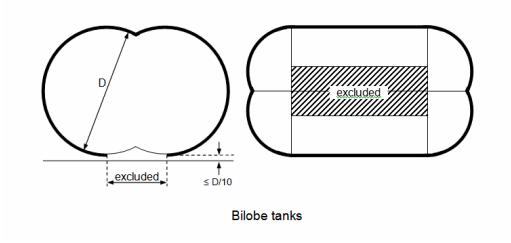
A = external surface area of the tank (m^2), as for different tank types, as shown in figure 6.7.1.



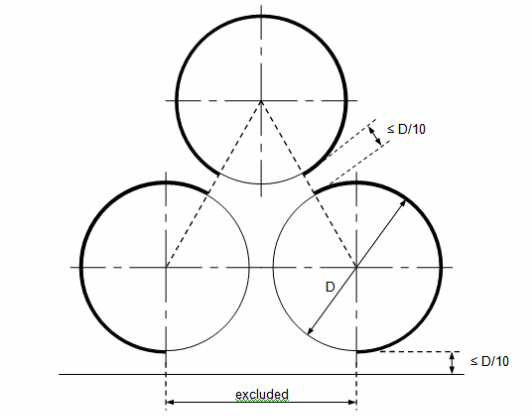
Cylindrical tanks with spherically dished, hemispherical or semi-ellipsoidal heads or spherical tanks



Prismatic tanks



Bilobe tanks



Horizontal cylindrical tanks arrangement

Figure 6.7.1

Interpretation

For prismatic tanks

L_{min}, for non-tapered tanks, is the smaller of the horizontal dimensions of the flat bottom of the tank. For tapered tanks, as would be used for the forward tank, L_{min} is the smaller of the length and the average width.

For prismatic tanks whose distance between the flat bottom of the tank and bottom of the hold space is equal to or less than $L_{min}/10$:

A = external surface area minus flat bottom surface area.

For prismatic tanks whose distance between the flat bottom of the tank and bottom of the hold space is greater than $L_{min}/10$:

A = external surface area.

Note:

1. This Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2018.
2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

Technical Background

The UI is intended to establish a unified interpretation regarding external surface area of the tank for determining sizing of pressure relief valve.

The sizes of pressure relief valves are determined according to paragraph 6.7.3.1.1.2 of the IGF Code. The external surface area of the tank for different tank types is calculated as shown in figure 6.7.1 of the Code.

In figure 6.7.1 of the IGF Code, for prismatic tanks, the area that is excluded from the external surface area is

still not clear, because the value "$L_{min}/10$", which is specified in this figure, is not defined and no methods are specified for determining the area to be excluded.

Remarks

11.8 Control and maintenance of pressure and temperature of liquefied gas fuel tanks after the activation of the safety system

Conventions (Amend.), Reg.		**IGF Code paragraph 6.9.1.1, paragraph 6.9.1.2**					
IACS UI Number	**UI GF8**	**UI** version	**Dec. ,2017**	Date of implementation	**01.01.2018**	Means of implementation	

Conventions/Codes Requirements

Paragraph 6.9.1.1 states:

With the exception of liquefied gas fuel tanks designed to withstand the full gauge vapour pressure of the fuel under conditions of the upper ambient design temperature, liquefied gas fuel tanks' pressure and temperature shall be maintained at all times within their design range by means acceptable to the Administration, e.g. by one of the following methods:

.1 reliquefaction of vapours;

.2 thermal oxidation of vapours;

.3 pressure accumulation; or

.4 liquefied gas fuel cooling.

The method chosen shall be capable of maintaining tank pressure below the set pressure of the tank pressure relief valves for a period of 15 days assuming full tank at normal service pressure and the ship in idle condition, i.e. only power for domestic load is generated.

Paragraph 6.9.1.2 states:

Venting of fuel vapour for control of the tank pressure is not acceptable except in emergency situations.

Interpretation

Liquefied gas fuel tank's pressure and temperature shall be controlled and maintained within the design range at all times including after activation of the safety system required in 15.2.2 for a period of minimum 15 days. The activation of the safety system alone is not deemed as an emergency situation.

Note:

1. This Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2018.
2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

Technical Background

The UI is intended to establish a unified interpretation regarding the control and maintenance of pressure and temperature of liquefied gas fuel tanks after the activation of the safety system.

Section 6.9.1.1 of the IGF Code states that the pressure and temperature of liquefied gas fuel tanks shall be maintained at all times. IACS considers that "at all times" includes those instances when the safety system is activated as a result of a fault condition and which may make the fuel supply system unavailable to some consumers.

Section 6.9.1.2 of the IGF Code states that venting of fuel vapour for control of the tank pressure is not acceptable except in emergency situations. Activation of the safety system is not necessarily regarded as an emergency situation.

Therefore, the pressure and temperature of liquefied gas fuel tanks shall be controlled and maintained within the design range at all times, including after activation of the safety system.

Remarks

11.9 Special consideration within the risk assessment of closed or semi-enclosed bunkering stations

Conventions (Amend.), Reg.		**IGF Code paragraph 8.3.1.1**					
IACS UI Number	**UI GF9**	**UI** version	**Dec. ,2017**	Date of implementation	**01.01.2018**	Means of implementation	

Conventions/Codes Requirements

IGF Code paragraph 8.3.1.1:

The bunkering station shall be located on open deck so that sufficient natural ventilation is provided. Closed or semi-enclosed bunkering stations shall be subject to special consideration within the risk assessment.

Interpretation

The special consideration shall as a minimum include, but not be restricted to, the following design features:

（1）segregation towards other areas on the ship

（2）hazardous area plans for the ship

（3）requirements for forced ventilation

（4）requirements for leakage detection (e.g. gas detection and low temperature detection)

（5）safety actions related to leakage detection (e.g. gas detection and low temperature detection)

（6）access to bunkering station from non-hazardous areas through airlocks

（7）monitoring of bunkering station by direct line of sight or by CCTV.

Note:

1. This Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2018.
2. The “contracted for construction” date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of “contract for construction”, refer to IACS Procedural Requirement (PR) No. 29.

Technical Background

The UI is intended to establish a unified interpretation regarding special consideration within the risk assessment of closed or semi-enclosed bunkering stations (paragraphs 8.3.1.1).

IACS considers that design features such as segregation, hazardous area, ventilation, leakage detection and related safety actions, access and monitoring should be included when considering closed or semi-enclosed bunkering stations in natural gas fuelled ship.

Remarks

11.10 Ventilation of machinery spaces

Conventions (Amend.), Reg.		**IGF Code paragraph 13.5.1**					
IACS UI Number	**UI GF10**	**UI** version	**Dec. ,2017**	Date of implementation	**01.01.2018**	Means of implementation	

Conventions/Codes Requirements

IGF Code paragraph 13.5.1:

The ventilation system for machinery spaces containing gas-fuelled consumers shall be independent of all other

ventilation systems.

Interpretation

Spaces enclosed in the boundaries of machinery spaces (such as purifier's room, engine-room workshops and stores) are considered an integral part of machinery spaces containing gas-fuelled consumers and, therefore, their ventilation system does not need to be independent of the one of machinery spaces.

Note:

1. This Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2018.
2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

Technical Background

The UI is intended to establish a unified interpretation regarding ventilation of machinery spaces containing gas fuelled consumers.

It is understood that the intention of IGF 13.5.1 is to segregate the ventilation system for machinery spaces containing gas-fuelled consumers from the ventilation system for other spaces in the ship such as the accommodation, not other spaces in the machinery space area such as purifier rooms or workshops.

Remarks

11.11 Ventilation of double piping and gas valve unit spaces in gas safe engine-rooms

Conventions (Amend.), Reg.		**IGF Code paragraph 13.8.2**					
IACS UI Number	**UI GF11**	**UI** version	**Dec. ,2017**	Date of implementation	**01.01.2018**	Means of implementation	

Conventions/Codes Requirements

IGF Code paragraph 13.8.2:

The ventilation system for double piping and for gas valve unit spaces in gas safe engine-rooms shall be independent of all other ventilation systems.

Interpretation

Double piping and gas valve unit spaces in gas safe engine-rooms are considered an integral part of the fuel supply systems and, therefore, their ventilation system does not need to be independent of other fuel supply ventilation systems provided such fuel supply systems contain only gaseous fuel.

Note:

1. This Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2018.
2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

Technical Background

The UI is intended to establish a unified interpretation regarding ventilation of double piping and gas valve unit spaces in gas safe engine rooms.

It is considered that segregation between the part of the system where there is potential for LNG leakages (e.g. tank connection space) and the part of the system where there is no potential for LNG leakages (e.g. double walled

gas supply piping) is what is safety critical; not necessarily the segregation between the ventilation system for double piping inside and outside the machinery space.
Remarks

11.12 Ventilation inlet for double wall piping or duct

Conventions (Amend.), Reg.		**IGF Code paragraph 13.8.3**					
IACS UI Number	**UI GF 12**	**UI** version	**Dec. ,2017**	Date of implementation	**01.01.2018**	Means of implementation	
Conventions/Codes Requirements							
IGF Code paragraph 13.8.3: The ventilation inlet for the double wall piping or duct shall always be located in a non-hazardous area away from ignition sources. The inlet opening shall be fitted with a suitable wire mesh guard and protected from ingress of water.							
Interpretation							
The ventilation inlet for the double wall piping or duct shall always be located in a non-hazardous area in open air away from ignition sources. _____ Note: 1. This Unified Interpretation is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2018. 2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.							
Technical Background							
The UI is intended to establish a unified interpretation regarding location of ventilation inlet of double wall piping or duct. It is understood that air inlets for the annular space and the gas valve unit room shall be located in open air (non-hazardous area) for both low pressure and high pressure gas fuel. This understanding is supported by the requirement in the second sentence of section 13.8.3 of the IGF Code that the inlet is to be fitted with a guard and protected from the ingress of water. The machinery space contains multiple ignition sources. Consequently, even in gas safe machinery spaces, allowing ventilation inlets to be taken from the machinery space is not best practice.							
Remarks							

11.13 Fire protection of spaces containing equipment for the fuel preparation

Conventions (Amend.), Reg.		IGF Code paragraph 11.3.1					
IACS UI Number	**GF 13**	**UI** version	**July ,2018**	Date of implementation	**01.07.2019**	Means of implementation	
Conventions/Codes Requirements							
IGF Code paragraph 11.3.1: 11.3 Regulations for fire protection 11.3.1 Any space containing equipment for the fuel preparation such as pumps, compressors, heat exchangers, vaporizers and pressure vessels shall be regarded as a machinery space of category A for fire protection purposes.							

Interpretation

1. Fire protection in 11.3.1 means structural fire protection, not including means of escape.

2. Enclosed spaces containing equipment for fuel preparation such as pumps or compressors or other potential ignition sources are to be provided with a fixed fire-extinguishing system complying with the provisions of SOLAS II-2/10.4.1.1 and the FSS Code and taking into account the necessary concentrations / application rate required for extinguishing gas fires.

Note:

1. This Unified Interpretation is to be uniformly implemented by IACS Societies on:

i) ships contracted for construction on or after 1 July 2019;

ii) ships which commence conversion to using low-flashpoint fuels on or after 1 July 2019;

iii) ships, using low-flashpoint fuels, which commence, on or after 1 July 2019, undertaking to use low-flashpoint fuels different from those which it was originally approved to use before 1 July 2019.

2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

3. The "commence conversion" date means the date on which the contract is placed for the conversion or in the absence of a contract, the date on which the work identifiable with the specific conversion begins.

4. The "commence undertaking to use" date is the date of the document accepted by the Classification Society as request for approval for the use of a new fuel.

Technical Background

IGF paragraph 11.3.1 is considered to be protecting other areas from the fire risk in the fuel preparation room.

IACS deems that Fuel preparation rooms including pumps or compressors or other potential ignition sources are to be provided with a fixed fire-extinguishing system.

IACS deems that the fixed fire-extinguishing system to be installed are to comply with the provisions of SOLAS II-2/10.4.1.1 and the FSS Code taking into account the necessary concentrations/application rate required for extinguishing gas fires.

Remarks

11.14 Hazardous area classification of fuel storage hold spaces

Conventions (Amend.), Reg.		IGF Code paragraph 12.5.2.1					
IACS UI Number	**GF 14**	**UI** version	**July ,2018**	Date of implementation	**01.07.2019**	Means of implementation	

Conventions/Codes Requirements

IGF Code Part A-1, Section 12.5.2.1 and footnote 23:

12.5.2 Hazardous area zone 1 [22]

This zone includes, but is not limited to:

.1 tank connection spaces, fuel storage hold spaces [23] and interbarrier spaces;

_____

23 Fuel storage hold spaces for type C tanks are normally not considered as zone 1.

Interpretation

For the purposes of hazardous area classification, fuel storage hold spaces containing Type C tanks with all potential leakage sources in a tank connection space and having no access to any hazardous area, shall be considered non-hazardous.

Where the fuel storage hold spaces include potential leak sources, e.g. tank connections, they shall be considered

hazardous area zone 1.
Where the fuel storage hold spaces include bolted access to the tank connection space, they shall be considered hazardous area zone 2.

Note:
1. This Unified Interpretation is to be uniformly implemented by IACS Societies on:
i) ships contracted for construction on or after 1 July 2019;
ii) ships which commence conversion to using low-flashpoint fuels on or after 1 July 2019;
iii) ships, using low-flashpoint fuels, which commence, on or after 1 July 2019, undertaking to use low-flashpoint fuels different from those which it was originally approved to use before 1 July 2019.
2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.
3. The "commence conversion" date means the date on which the contract is placed for the conversion or in the absence of a contract, the date on which the work identifiable with the specific conversion begins.
4. The "commence undertaking to use" date is the date of the document accepted by the Classification Society as request for approval for the use of a new fuel.

Technical Background

On the basis that Type C tanks are not to be considered as a source of release, IACS understands the fuel storage hold space for Type C tanks without leakages sources should be considered non-hazardous. It is noted that the fuel storage hold space for a Type C tank with tank connections located in the hold space will also be a tank connection space per 2.2.15 and will thereby be a hazardous area zone 1 as per 12.5.2.1 of the IGF Code. It is noted that the fuel storage hold spaces containing a Type C tank with its tank connection space (TCS), where the access to the TCS is from the hold space (through the required bolted hatch), shall be considered as hazardous area zone 2 as per 5.11.3 and 12.5.3.2 of the IGF Code.

Remarks

11.15 Alarms for loss of ventilation capacity

Conventions (Amend.), Reg.		IGF Code paragraph 15.10.1					
IACS UI Number	**GF 15**	**UI** version	**July ,2018**	Date of implementation	**01.07.2019**	Means of implementation	

Conventions/Codes Requirements

IGF Code Part A-1, Section 15.10.1:

15.10 Regulations for ventilation

15.10.1 Any loss of the required ventilating capacity shall give an audible and visual alarm on the navigation bridge or in a continuously manned central control station or safety centre.

Interpretation

Acceptable means to confirm that the ventilation system has the "required ventilating capacity" in operation are, but not limited to:

- Monitoring of the ventilation electric motor or fan operation combined with underpressure indication ; or
- Monitoring of the ventilation electric motor or fan operation combined with ventilation flow indication ; or
- Monitoring of ventilation flow rate to indicate that the required air flow rate is established.

Note:
1. This Unified Interpretation is to be uniformly implemented by IACS Societies on:
i) ships contracted for construction on or after 1 July 2019;
ii) ships which commence conversion to using low-flashpoint fuels on or after 1 July 2019;

iii) ships, using low-flashpoint fuels, which commence, on or after 1 July 2019, undertaking to use low-flashpoint fuels different from those which it was originally approved to use before 1 July 2019.

2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

3. The "commence conversion" date means the date on which the contract is placed for the conversion or in the absence of a contract, the date on which the work identifiable with the specific conversion begins.

4. The "commence undertaking to use" date is the date of the document accepted by the Classification Society as request for approval for the use of a new fuel.

Technical Background

The Machinery Panel considers that the key purpose of the requirement in 15.10.1 is to confirm adequate ventilation to enable gas detection and not necessarily verify that the actual flow rate meets the exact required air changes / hour. For example, this can be determined by underpressure correlation. For this reason flow indicators, or underpressure monitoring combined with ventilation fan monitoring would also be acceptable arrangements.

Remarks

11.16 Liquefied gas fuel tank loading limit higher than calculated using the reference temperature

Conventions (Amend.), Reg.		**IGF Code paragraph 6.8.2**					
IACS UI Number	**GF 16**	**UI** version	**Dec. ,2018**	Date of implementation	**01.01.2020**	Means of implement ation	**Ships contracted for construction**

Conventions/Codes Requirements

IGF Code Part A, Section 6.8.2:

6.8.2 In cases where the tank insulation and tank location make the probability very small for the tank contents to be heated up due to an external fire, special considerations may be made to allow a higher loading limit than calculated using the reference temperature, but never above 95%. This also applies in cases where a second system for pressure maintenance is installed, (refer to 6.9). However, if the pressure can only be maintained/controlled by fuel consumers, the loading limit as calculated in 6.8.1 shall be used.

Interpretation

The alternative loading limit option given under 6.8.2 is understood to be an alternative to 6.8.1 and should only be applicable when the calculated loading limit using the formulae in 6.8.1 gives a lower value than 95%.

Note:

1. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.

Technical Background

The UI is intended to establish a unified interpretation regarding application of the alternative liquefied gas fuel tank loading limit option.

IACS understands that the intention of paragraph 6.8.2 of the IGF Code is to allow for a higher loading limit than calculated by paragraph 6.8.1, but never above 95%, when the probability of heating the tank contents is very low.

Furthermore, IACS understands paragraph 6.8.2 is only applicable when the calculated loading limit using the formulae in 6.8.1 gives a lower value than 95%.

Remarks

11.17 Other rooms with high fire risk

Conventions (Amend.), Reg.		IGF Code paragraph 11.3.3					
IACS UI Number	**GF 17**	**UI** version	**Dec. ,2018**	Date of implementation	**01.01.2020**	Means of implementation	**Ships contracted for construction**

Conventions/Codes Requirements

IGF Code Part A, Section 11.3.3:

11.3.3 The space containing fuel containment system shall be separated from the machinery spaces of category A or other rooms with high fire risks. The separation shall be done by a cofferdam of at least 900 mm with insulation of A-60 class. When determining the insulation of the space containing fuel containment system from other spaces with lower fire risks, the fuel containment system shall be considered as a machinery space of category A, in accordance with SOLAS regulation II-2/9. The boundary between spaces containing fuel containment systems shall be either a cofferdam of at least 900 mm or A-60 class division. For type C tanks, the fuel storage hold space may be considered as a cofferdam.

Interpretation

The following "other rooms with high fire risk" should as a minimum be considered, but not be restricted to:

1. cargo spaces except cargo tanks for liquids with flashpoint above 60℃ and except cargo spaces exempted in accordance with SOLAS regulations II-2/10.7.1.2 or II-2/10.7.1.4;
2. vehicle, ro-ro and special category spaces;
3. service spaces (high risk): galleys, pantries containing cooking appliances, saunas, paint lockers and store-rooms having areas of 4 m^2 or more, spaces for the storage of flammable liquids and workshops other than those forming part of the machinery space, as provided in SOLAS regulations II-2/9.2.2.4, II-2/9.2.3.3 and II-2/9.2.4; and
4. accommodation spaces of greater fire risk: saunas, sale shops, barber shops and beauty parlours and public spaces containing furniture and furnishing of other than restricted fire risk and having deck area of 50 m^2 or more, as provided in SOLAS regulation II-2/9.2.2.3.

Note:

1. The “contracted for construction” date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of “contract for construction”, refer to IACS Procedural Requirement (PR) No. 29.

Technical Background

Since cargo spaces have the potential to have a prolonged fire (air and fire load inside the cargo hold), IACS considers these spaces should be regarded as a high fire risk in this context.

It could be argued that vehicle, ro-ro and special category spaces are included in "cargo spaces", but these spaces are added in a separate entry for clarity.

It is confirmed by IMO that service spaces (high risk) and accommodation spaces of greater fire risk should also be considered as "other rooms with high fire risk".

Remarks

11.18 Level indicator in the bilge well of tank connection spaces of independent liquefied gas storage tanks

Conventions (Amend.), Reg.		**IGF Code paragraph 15.3.2**					
IACS UI Number	**GF 18**	**UI** version	**Feb. ,2019**	Date of implementation	**01.01.2020**	Means of implementation	

Conventions/Codes Requirements

IGF Code Part A-1, Section 15.3.2:

15.3.2 A bilge well in each tank connection space of an independent liquefied gas storage tank shall be provided with both a level indicator and a temperature sensor. Alarm shall be given at high level in the bilge well. Low temperature indication shall activate the safety system.

Interpretation

The "level indicator" required by 15.3.2 of the IGF Code is understood to be required for the purposes of indicating an alarm status only; a level switch (float switch) is an instrument example considered to meet this requirement.

Note:

1. This Unified Interpretation is to be uniformly implemented by IACS Societies on:

i) ships contracted for construction on or after 1 January 2020;

ii) ships which commence conversion to using low-flashpoint fuels on or after 1 January 2020;

iii) ships which commence, on or after 1 January 2020, undertaking to use low-flashpoint fuels different from those which it was originally approved to use before 1 January 2020.

2. The “contracted for construction” date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of “contract for construction”, refer to IACS Procedural Requirement (PR) No. 29.

Technical Background

Members deemed that level indicator is understood to be required only for the purpose of indicating a level exceeding a predetermined threshold by activating an alarm, and is not required to indicate the actual level in the bilge well.

Therefore a level switch (float switch) is an instrument example considered to meet this requirement.

Remarks

CHAPTER 12 CAPE TOWN AGREEMENT OF 2012 ON THE IMPLEMENTATION OF THE PROVISIONS OF THE TORREMOLINOS PROTOCOL OF 1993 RELATING TO THE TORREMOLINOS INTERNATIONAL CONVENTION FOR THE SAFETY OF FISHING VESSELS, 1977 (CAPE TOWN AGREEMENT)

12.1 Strengthening for navigation in ice

Conventions (Amend.), Reg.	**CAPE TOWN AGREEMENT Reg II/1.2**

Conventions/Codes Requirements

CAPE TOWN AGREEMENT Reg II/1.2
(2) The hull of vessels intended for operation in ice shall be strengthened in accordance with the anticipated conditions of navigation and area of operation.

Interpretation

1 General requirements
1.1 The fishing vessels intended for operation in ice are to comply with the requirements of this Chapter besides the relevant requirements of other chapters.
1.2 The ice areas, where the fishing vessels operate, are those drift ice sea areas other than large stationary ice, which is the least severe condition. If the fishing vessels intend for operation in severer ice, the strengthen requirements shall be approved by RO.
1.3 While the fishing vessels navigate in ice, the ballast water tanks shall be equipped with appliances preventing icing of the water.

2 Shell plating
2.1 The longitudinal extent of strengthening of the shell plating within the ice belt is to be from the stem to the point exceeding 0.2L backward, and the vertical extent is to be from 500 mm above the maximum draught to 500 mm below the minimum operating draught.
2.2 The thickness of the shell plating within the ice belt shall be increased at least 25% compared with the Rule thickness of amidships shell plating, while the increased value of the thickness need not to be greater than 4mm.

3 Side framing
3.1 If intermediate frames are fitted in the fore peak or within the region from the stem to 0.075L, the section modulus of the intermediate frames is to be not less than 75% of that of the fore peak. The vertical extent of the intermediate frames is to be from 1,000 mm below the minimum operating draught to 1,000 mm above the maximum draught, and the frames need not be connected at their ends.
If intermediate frames are not fitted, the frame spacing is not to exceed 60% of the spacing of the amidships frames, but in no case is to be greater than 0.5 m.
3.2 The stringers, panting beams or perforated platforms, together with the extension parts, which located in the strengthened longitudinal 0.2L area, are to be fitted at each frame.

4 Stem
4.1 The plate thickness of a welded plate stem for 600 mm above the deepest draught is to be 1.1 times the Rule thickness, but need not exceed 20 mm.

Technical Background

Rules for Classification of Sea-Going Steel Ships

Remarks

12.2 Severe wind and rolling

Conventions (Amend.), Reg.	CAPE TOWN AGREEMENT Reg III/5

Conventions/Codes Requirements

CAPE TOWN AGREEMENT Reg III/5
Regulation 5 Severe wind and rolling

Vessels shall be able to withstand, to the satisfaction of the Administration, the effect of severe wind and rolling in associated sea conditions taking account of the seasonal weather conditions, the sea states in which the vessel will operate, the type of vessel and its mode of operation.

Interpretation

1 Severe wind and rolling criterion (weather criterion)

1.1 The ability of a ship to withstand the combined effects of beam wind and rolling shall be demonstrated, with reference to figure 1.1 as follows:

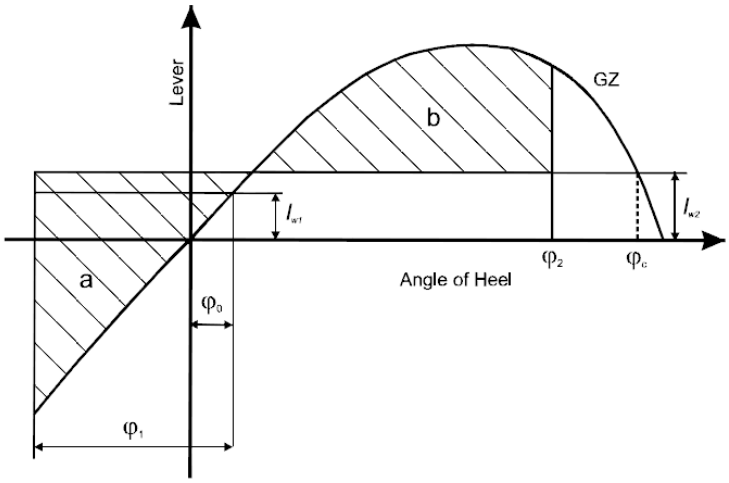


Figure 1.1 – Severe wind and rolling

where the angles in figure 1.1 are defined as follows:

l_{w1} = steady wind heeling lever, m;
l_{w2} = gust wind heeling lever, m;
φ_0 = angle of heel under action of steady wind;
φ_1 = angle of roll to windward due to wave action;
φ_2 = angle of down-flooding (φ_f) or 50˚or φ_c , whichever is less;
where:
φ_f = angle of heel at which openings in the hull, superstructures or deckhouses which cannot be closed weathertight immerse. In applying this criterion, small openings through which progressive flooding cannot take place need not be considered as open
φ_c = angle of second intercept between wind heeling lever l_{w2} and GZ curves.

1.2 The ship is subjected to a steady wind pressure acting perpendicular to the ship's centreline which results in a steady wind heeling lever (l_{w1}). The angle of heel under action of steady wind (φ_0) should not exceed 16˚or 80% of the angle of deck edge immersion, whichever is less.
1.3 From the resultant angle of equilibrium (φ_0), the ship is assumed to roll owing to wave action to an angle of roll (φ_1) to windward.
1.4 The ship is then subjected to a gust wind pressure which results in a gust wind heeling lever (l_{w2});

and
1.5 Under these circumstances, area *b* shall be equal to or greater than area *a*, as indicated in figure 1.1.

2 Calculation of criterion parameters

2.1 The wind heeling levers l_{w1} and l_{w2} referred to in 1 are constant values at all angles of inclination and shall be calculated as follows:

$$l_{w1} = 0.001PZA / (g\Delta) \quad \text{(m)} \qquad (2.1)$$

$$l_{w2} = 1.5\, l_{w1} \quad \text{(m)}$$

where:

P = wind pressure, Pa;

For ships with length of 45m or above, P=504 Pa;

For ships with length of less than 45m, P should be selected according to Table 2.1.

A = projected lateral area of the portion of the ship and deck cargo above the waterline (m^2)

Z = vertical distance from the centre of A to the centre of the underwater lateral area or approximately to a point at one half the mean draught (m)

Δ = displacement (t)

g = gravitational acceleration of 9.81 m/s^2.

P for ships less than 45m in length Table **2.1**

vertical distance from the centre of A to the waterline (m)	1.0	2.0	3.0	4.0	5.0	≥6.0
P (Pa)	316	386	429	460	485	504

2.2 The windage area consists of two parts, the continuous surfaces and discontinuous surfaces.

.1 The continuous surfaces include the projected lateral areas of the ship's hull, bulwarks, superstructures, deckhouses, masthouses, deck machinery, masts, derricks, derrick posts, funnels, large ventilators, lifeboats and liferafts on the centreline plane; for fishing vessels intended to carry fishing net on deck, the projections of the net is also to be taken into account. For isolated circular section structures, such as funnels, ventilators, masts, etc., the projected lateral areas are to be multiplied by a flow coefficient of 0.6.

.2 The windage area of crab pot and other similar fishing gear shall be calculated as the continuous surfaces.

.3 The discontinuous surfaces include the projected lateral areas of riggings, rails, trusses of lattice type, aerials and various small objects on the centreline plane.

.4 When calculating the projected lateral area of discontinuous surfaces, 5% of the projected lateral area of the continuous surfaces and 10% of the statical moment of the continuous surfaces calculated for the minimum draught of the basic loading conditions are to be taken for fishing vessels; and 3% of the projected lateral area and 6% of the statical moment for fishery auxiliary vessels. For all other loading conditions, the value of the projected lateral area of discontinuous surfaces and the position of its geometrical centre in relation to the base line are to be assumed to be the same as that obtained from the above mentioned minimum draught.

.5 For the fishing vessels hanging a large amount of nets on deck, such as saury boat, the windage area of the nets shall be calculated separately and added to the discontinuous surfaces and the statical moment stipulated in paragraph 2.2.4 additionally.

.6 The discontinuous surfaces can also be calculated one by one. While in this way, the projected lateral areas are to be multiplied by the following coefficients:

rails hanging nets 0.6;

rails not hanging nets 0.2;

trusses of lattice type 0.5;

rigging, preventer guy and other similar tools $0.044\, h/b$

where:

h is the height in m between the fixed point of rigging on the mast or derrick post and the bulwark or the deck for ships without bulwark.

b is the distances in m between the preventer guses on bulwark or deck for ships without bulwark, which lies before the mast and after the mast.

.7 When the projected lateral areas of two or more parts coincide, only the bigger one need to be calculated.

2.3 For ships having

.1 *B/d* smaller than 3.5;

.2 *(KG/d-1)* between - 0.3 and 0.5; and

.3 *T* smaller than 20 s.

The angle of roll (φ_1) shall be calculated as follows:

$$\varphi_1 = 109kX_1X_2\sqrt{r \cdot s} \qquad (^\circ)$$

For ships with parameters outside of the above limits the angle of roll (φ_1) may be determined with model experiments of a subject ship.

where:

X_1 = factor as shown in table 2.3

X_2 = factor as shown in table 2.3

k = factor as follows:

k = 1.0 for round-bilged ship having no bilge or bar keels

k = 0.7 for a ship having sharp bilges

k = as shown in table 2.3 for a ship having bilge keels, a bar keel or both

$r = 0.73 + 0.6\ OG/d$

with:

OG = KG - d

d = mean moulded draught of the ship (m)

s = factor as shown in table 2.3

Factor Table **2.3**

X_1		X_2		k		s	
B/d	X_1	C_B	X_2	$100A_k/(BL_{wl})$	k	T_φ	s
≤2.4	1.00	≤0.45	0.75	0	1.0	≤6	0.100
2.5	0.98	0.50	0.82	1.0	0.98	7	0.098
2.6	0.96	0.55	0.89	1.5	0.95	8	0.093
2.7	0.95	0.60	0.95	2.0	0.88	12	0.065
2.8	0.93	0.65	0.97	2.5	0.79	14	0.053
2.9	0.91	≥0.70	1.0	3.0	0.74	16	0.044
3.0	0.90			3.5	0.72	18	0.038
3.1	0.88			≥4.0	0.70	≥20	0.035
3.2	0.86						
3.3	0.84						
3.4	0.82						
≥3.5	0.80						

Intermediate values in these tables shall be obtained by linear interpolation;

B = moulded breadth of the ship (m)

d = mean moulded draught of the ship (m)

C_B = block coefficient (-)

A_k = total overall area of bilge keels, or area of the lateral projection of the bar keel, or sum of these areas (m^2)

L_{wl} = length of the ship at waterline (m)

T_φ = Rolling period (s)

$T_\varphi = 2CB/GM^{0.5}$ (s)

where:

$C = 0.373 + 0.023(B/d) - 0.043(Lwl/100)$.

GM = metacentric height corrected for free surface effect (m).

2.4 The roles of anti-roll appliances shall not be considered for the ships equipped with such appliances while calculating the angle of roll, unless the appliances are proved be effective even in the condition of interruption of power supply abruptly.

Technical Background

IS Code of IMO
Remarks

12.3 Inclining test

Conventions (Amend.), Reg.	**CAPE TOWN AGREEMENT Reg III/9.3**
Conventions/Codes Requirements	
CAPE TOWN AGREEMENT Reg III/9.3 *Regulation 9 Inclining test* *(3) The Administration may allow the inclining test of an individual vessel t o be dispensed with provided basic stability data are available from the inclining test of a sister ship and it is shown to the satisfaction of the Administration that reliable stability information for the exempted vessel can be obtained from such basic data.*	
Interpretation	
1 The RO may allow the inclining test of an individual fishing vessel to be dispensed with provided basic stability data are available from the inclining test of a sister ship and it is shown to the satisfaction of the RO that reliable stability information for the exempted ship can be obtained from such basic data. 2 A weight survey shall be carried out upon completion and the ship shall be inclined whenever in comparison with the data derived from the sister ship, a deviation from the lightship displacement exceeding 1.5% for ships of 110 m in length and 2% for ships of 50 m or less in length and as determined by linear interpolation for intermediate lengths or a deviation from the lightship longitudinal centre of gravity exceeding 0.5% of Ls is found. 3 The RO may also allow the inclining test of an individual ship or class of ships to be dispensed with when reference to existing data for similar ships clearly indicates that due to the ship's proportions and arrangements more than sufficient metacentric height will be available in all probable loading conditions. 4 Where any alterations are made to a ship so as to materially affect the stability information supplied to the master, amended stability information shall be provided. If necessary the ship shall be re-inclined. The ship shall be re-inclined if anticipated deviations exceed one of the values specified in paragraph 2.	
Technical Background	
IS Code of IMO	
Remarks	

12.4 Stability information

Conventions (Amend.), Reg.	**CAPE TOWN AGREEMENT Reg III/10.1**
Conventions/Codes Requirements	
CAPE TOWN AGREEMENT Reg III/10.1 *Regulation 10 Stability information* *(1) Suitable stability information shall be supplied to enable the skipper to assess with ease and certainty the stability of the vessel under various operating conditions. Such information shall include specific instructions to the skipper warning him of those operating conditions which could adversely affect either the stability or the trim of the vessel. A copy of the stability information shall be submitted to the Administration for approval.*	
Interpretation	

1 General requirement
1.1 Each ship should be provided with a stability booklet and the relating drawings by the designing company or the shipyard of fishing vessels. The booklet should be approved by the RO.
1.2 The stability booklet may include information on longitudinal strength. This Code addresses only the stability-related contents of the booklet.
1.3 The stability booklet should be easily available onboard for the use of the master and the check during the periodical survey.
2 The contents of the stability booklet
2.1 The format of the stability booklet and the information included will vary dependent on the ship type and operation. In developing the stability booklet, consideration should be given to including the following information:
.1 a table of contents and index for each booklet;
.2 a general description of the ship (including the name of the ship, usage, shipyard, date of build, register port, register number and main dimensions, etc.)
.3 instructions on the use of the booklet;
.4 general arrangement plans showing watertight compartments, closures, vents, downflooding angles, permanent ballast, allowable deck loadings and freeboard diagrams;
.5 hydrostatic curves or tables and cross curves of stability calculated on a free-trimming basis, for the ranges of displacement and trim anticipated in normal operating conditions;
.6 capacity plan or tables showing capacities and centres of gravity for each cargo stowage space;
.7 information on loading restrictions, such as maximum KG or minimum GM curve or table that can be used to determine compliance with the applicable stability criteria;
.8 instructions on the use of fish hold, ballast water tank, fuel oil tank, fresh water tank;
.9 standard operating conditions and examples for developing other acceptable loading conditions using the information contained in the stability booklet;
.10 a brief description of the stability calculations done including assumptions;
.11 general precautions for preventing unintentional flooding;
.12 information concerning the use of any special cross-flooding fittings with descriptions of damage conditions which may require cross-flooding;
.13 any other necessary guidance for the safe operation of the ship under normal and emergency conditions;
.14 inclining test report for the ship, or:
.14.1 where the stability data is based on a sister ship, the inclining test report of that sister ship along with the lightship measurement report for the ship in question; or
.14.2 where lightship particulars are determined by other methods than from inclining of the ship or its sister, a summary of the method used to determine those particulars;
.15 recommendation for determination of ship's stability by means of an in-service inclining test.
3
3.1 As an alternative to the stability booklet mentioned above, a simplified booklet in an approved form containing sufficient information to enable the master to operate the ship in compliance with the applicable provisions of the Code as may be provided at the discretion of the RO concerned.

Technical Background

IS Code of IMO

Remarks

12.5 Bow height

Conventions (Amend.), Reg.	**CAPE TOWN AGREEMENT Reg III/12**

Conventions/Codes Requirements

CAPE TOWN AGREEMENT Reg III/12
Regulation 12 Bow height
The bow height shall be sufficient, to the satisfaction of the Administration, to prevent the excessive shipping of water and shall be determined taking account of the seasonal weather conditions, the sea states in which the vessel will operate, the type of vessel and its mode of operation.

Interpretation

1 The bow height shall be not less than:

$$56L(1-\frac{L}{500})\frac{1.36}{C_b+0.68} \quad \text{mm}$$

where L is the length of the ship in metres,
Cb is the block coefficient which is to be taken as not less than 0.68

2 Where the bow height required in paragraph 1 of this Regulation is obtained by sheer, the sheer shall extend for at least 15 percent of the length of the ship measured from the forward perpendicular. Where it is obtained by fitting a superstructure shall extend form the stem to a point at least 0.07 L abaft the forward perpendicular. The superstructure shall be inclosed.

Technical Background

The original INTERNATIONAL CONVENTION ON LOAD LINES, 1966

Remarks

12.6 Maximum permissible operating draught

Conventions (Amend.), Reg.	**CAPE TOWN AGREEMENT Reg III/13**

Conventions/Codes Requirements

CAPE TOWN AGREEMENT Reg III/13
Regulation 13 Maximum permissible operating draught

A maximum permissible operating draught shall be approved by the Administration and shall be such that, in the associated operating condition, the stability criteria of this chapter and the requirements of chapters II and VI as appropriate are satisfied.

Interpretation

1 Minimum Freeboard
1.1 The minimum freeboard in summer
1.1.1 The minimum freeboard in summer shall be the freeboard calculated according to requirements of this Chapter, its value is to calculate as follows:

$$F = F_0 + f_1 + f_2 + f_3 + f_4 + f_5 + f_6 + f_7 + f_8 \qquad (1.1)$$

Where:
F_0 is the basic freeboard, mm;
f_1 is correction to the freeboard for ships under 100 m in length, mm;
f_2 is correction for block coefficient, mm;
f_3 is correction for hatch covers, mm;
f_4 is correction for depth, mm;
f_5 is correction for position of deck line, mm;
f_6 is correction for recess in working deck, mm;
f_7 is correction for superstructures, mm;
f_8 is correction for sheer, mm.
1.1.2 If the requirement of minimum bow height applies, the minimum freeboard is also to be modified by the correction relevant to the minimum bow height.
1.1.3 The freeboard in salt water, as calculated in accordance with 1.1, but without the correction for deck line, shall not be less than 50 mm. For ships having in position 1 hatchways with covers which do not comply with the weather

tight requirements, the freeboard shall be not less than 150 mm.

1.2 Tropical freeboard
1.2.1 The minimum freeboard in the Tropical Zone shall be the freeboard obtained by a deduction from the summer freeboard of one forty-eighth of the summer draught measured from the top of the keel to the centre of the ring of the load line mark.
1.2.2 The freeboard in salt water, as calculated in accordance with paragraph 2.1, but without the correction for deck line, shall not be less than 50 mm. For ships having in position 1 hatchways with covers which do not comply with the weather tight requirements, the freeboard shall be not less than 150 mm.

1.3 Winter freeboard
1.3.1 The minimum freeboard in winter shall be the freeboard obtained by an addition to the summer freeboard of one forty-eighth of summer draught, measured from the top of the keel to the centre of the ring of the load line mark.

1.4 Winter North Atlantic freeboard
1.4.1 The minimum freeboard for ships of not more than 100 m in length which enter any part of the North Atlantic during the winter seasonal period shall be the winter freeboard plus 50 mm. For other ships, the winter North Atlantic freeboard shall be the winter freeboard.

1.5 Fresh water freeboard
1.5.1 The minimum freeboard in fresh water of unit density shall be obtained from the minimum freeboard in salt water by deducting $0.25\Delta/T$ (mm), where Δ is the displacement in salt water in tonnes at the summer load waterline, and T is the tonnes per centimetre immersion in salt water at the summer load waterline.
1.5.2 If the displacement in salt water at the summer load waterline can not be decided, the deducting amount shall be a deduction from the summer freeboard of one forty-eighth of the summer draught measured from the top of the keel to the centre of the ring of the load line mark.

2 The basic freeboard and correction to the freeboard
2.1 The basic freeboard F_0
2.1.1 The basic freeboard F_0 shall be calculated as follows:

while L≤80m:	$F_0 = 0.062L^2 + 4L + 170$	mm
while 80<L≤120m:	$F_0 = 20.2L - 730$	mm
while 120<L≤160m:	$F_0 = 20.5L - 760$	mm

2.2 Correction to the freeboard for ships under 100 m in length f_1
2.2.1 The basic freeboard for a ship of between 24 m and 100 m in length having enclosed superstructures with an effective length of up to 35% of the length of the ship shall be increased by:

$$f_1 = 7.5\,(100 - L)\,(0.35 - E_1/L) \quad \text{mm} \qquad (2.2.1)$$

where
L is the length of the ship in m; and
E_1 is the effective length E of superstructure in m, but excluding the length of trunks.

2.3 Correction for block coefficient f_2
2.3.1 Where the block coefficient (Cb) exceeds 0.68, the basic freeboard shall be increased by:

$$f_2 = (F_0 + f_1)(C_b - 0.68)/1.36$$

The block coefficient is not to be taken greater than 1.0.

2.4 Correction for hatch covers f_3
2.4.1 The freeboard shall be increased as follows, excluding those ships having in position 1 hatchways with pontoon covers or complying with the weathertight requirements by tarpaulins and battening devices,

L （m）	f_3（mm）
L≤108	50
108<L≤118	2.5L－220

118＜L≤128	4L－396
128＜L≤148	5L－524
148＜L≤160	4L－373

2.5 Correction for depth f_4

2.5.1 Where D exceeds L/15 the freeboard shall be increased by $(D_1–L/15)(L/0.48)$ mm, where maximum value of $(L/0.48)$ shall be 250。

2.5.2 Where D is less than L/15 no reduction shall be made, except in a ship with an enclosed superstructure covering at least 0.6L amidships, where the freeboard shall be reduced at the rate prescribed in paragraph 2.5.1.

2.5.3 Where the height of the superstructure is less than the corresponding standard height, the calculated reduction shall be corrected in the ratio of the height of the actual superstructure to the applicable standard height.

2.6 Correction for position of deck line f_5

2.6.1 Where the actual depth to the upper edge of the deck line is greater or less than D_1, the difference between the depths shall be added to or deducted from the freeboard.

2.7 Correction for recess in working deck f_6

2.7.1 Where a recess is arranged in the working deck, and it does not extend to the sides of the ship, the freeboard calculated without regard to the recess shall be corrected for the consequent loss of buoyancy. The correction shall be equal to the value obtained by dividing the volume of the recess by the waterplane area of the ship at 85% of the least moulded depth (see figure 2.7.1)

$$f_6 = \frac{l \times b \times d_r}{\text{waterplane area}}$$

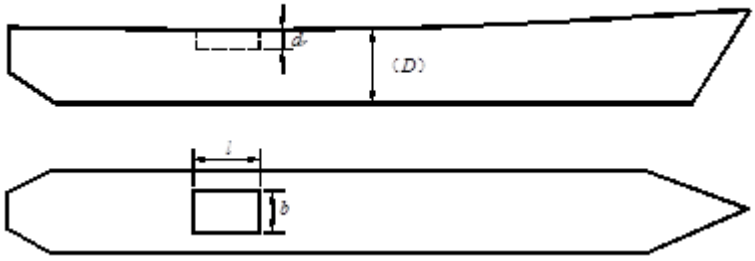


Figure 2.7.1

2.7.2 The correction shall be an addition to the freeboard obtained after all other corrections have been applied, except bow height correction.

2.7.3 Where the freeboard, corrected for lost buoyancy as above, is greater than the minimum geometric freeboard determined on the basis of a moulded depth measured to the bottom of the recess, the latter value may be used.

2.8 Correction for superstructures f_7

2.8.1 Standard height of superstructure

2.8.1.1 The standard height of a superstructure shall be as given in the following table:

Standard height (in m)		
L（m）	Raised quarterdeck	All other superstructures
30 or less	0.90	1.80
75	1.20	1.80
125 or more	1.80	2.30

The standard heights at intermediate lengths of the ship shall be obtained by linear interpolation.

2.8.2 Length of superstructure

2.8.2.1 Except as provided in paragraph 2.8.2.2, the length of a superstructure (S) shall be the mean length of the parts of the superstructure which lie within the length (L).

Where a superstructure bulkhead is recessed, the effective length of the superstructure shall be reduced by an

amount equal to the area of the recess in plan view divided by the breadth of the superstructure at the midlength of the recess. Where the recess is unsymmetrical about the centreline, the largest portion of the recess shall be considered as applying to both sides of the ship. A recess need not be decked over.

2.8.2.2 Where the end bulkhead of an enclosed superstructure extends in a fair convex curve beyond its intersection with the superstructure sides, the length of the superstructure may be increased on the basis of an equivalent plane bulkhead. This increase shall be two-thirds of the fore and aft extent of the curvature. The maximum curvature which may be taken into account in determining this increase is one-half the breadth of the superstructure at the point of intersection of the curved end of the superstructure with its side.

If the superstructure is set-in from the side, up to the limit allowed in its definition, the equivalent bulkhead should be calculated on the basis of the actual breadth of the superstructure (and not the breadth of the ship).

2.8.2.3 Superstructures which have sloped end bulkheads shall be dealt with in the following manner:

.1 When the height of superstructure, clear of the slope, is equal to or smaller than the standard height, length S is to be obtained as shown in figure 2.8.2.3-1.

.2 When the height is greater than the standard, length S is to be obtained as shown in figure 2.8.2.3-2.

.3 The foregoing will apply only when the slope, related to the base line, is 15 ° or greater. Where the slope is less than 15 °, the configuration shall be treated as sheer.

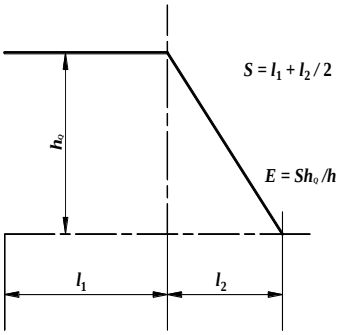


Figure 2.8.2.3-1

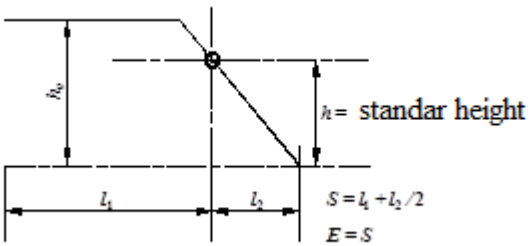


Figure 2.8.2.3-2

2.8.3 Effective length of superstructure

2.8.3.1 Except as provided for in paragraph 2.8.3.2, the effective length (E) of an enclosed superstructure of standard height shall be its length.

2.8.3.2 In all cases where an enclosed superstructure of standard height is set-in from the sides of the ship as permitted in its definition, the effective length shall be the length modified by the ratio of b/Bs, where: b is the breadth of the superstructure at the middle of its length; and Bs is the breadth of the ship at the middle of the length of the superstructure.

Where a superstructure is set-in for a part of its length, this modification shall be applied only to the set-in part.

2.8.3.3 Where the height of an enclosed superstructure is less than the standard height, the effective length shall be its length reduced in the ratio of the actual height to the standard height. Where the height exceeds the standard, no increase shall be made to the effective length of the superstructure (see figures 2.8.2.3-1and 2.8.2.3-2).

Where the height, clear of the slope, of a superstructure which has sloped end bulkheads is less than the standard height, its effective length E shall be its length S as obtained from figure 2.8.2.3-1, reduced in the ratio of the actual height to the standard height.

Where a poop or forecastle of less than standard height is fitted on a ship with excessive sheer but without any superstructure within 0.2L amidships, credit may be given to the height of the poop or forecastle by increasing the

actual height by the difference between the actual and the standard sheer profiles. The deduction for excess sheer in accordance with regulation 2.9.5.2 is not to be granted.
2.8.3.4 The effective length of a raised quarter deck, if fitted with an intact front bulkhead, shall be its length up to a maximum of 0.6L. Where the bulkhead is not intact, the raised quarter deck shall be treated as a poop of less than standard height.

The maximum effective length of 0.6L of a raised quarterdeck is to be measured from the after perpendicular, even where a poop is fitted in conjunction with the raised quarterdeck.
2.8.3.5 Superstructures which are not enclosed shall have no effective length.

2.8.4 Deduction for superstructures
2.8.4.1 Where the effective length of superstructures is 1L, the deduction from the freeboard shall be 350 mm at 24 m length of ship, 860 mm at 85 m length and 1,070 mm at 122 m length and above. Deductions at intermediate lengths shall be obtained by linear interpolation.
2.8.4.2 Where the total effective length of superstructures is less than 1L, the deduction shall be a percentage obtained from the following table:

Total Effective Length Superstructures	0	0.1*L*	0.2*L*	0.3*L*	0.4*L*	0.5*L*	0.6*L*	0.7*L*	0.8*L*	0.9*L*	1.0*L*
Percentage of deduction for all types of superstructures	0	7	14	21	31	41	52	63	75.3	87.7	100

Percentages at intermediate lengths of superstructures and trunks shall be obtained by linear interpolation.
2.8.4.3 Where the effective length of a forecastle is less than 0.07L no deduction is allowed.

2.9 Deduction for sheer f_8
2.9.1 Sheer
2.9.1.1 The sheer shall be measured from the deck at side to a line of reference drawn parallel to the keel through the sheer line amidships.
2.9.1.2 In flush deck ships and in ships with detached superstructures the sheer shall be measured at the working deck.
2.9.1.3 In ships with topsides of unusual form in which there is a step or break in the topsides, the sheer shall be considered in relation to the equivalent depth amidships.
2.9.1.4 In ships with a superstructure of standard height which extends over the whole length of the working deck, the sheer shall be measured at the superstructure deck. Where the height exceeds the standard, the least difference (Z) between the actual and standard heights shall be added to each end ordinate. Similarly, the intermediate ordinates at distances of 1/6L and 1/3L from each perpendicular shall be increased by 0.444Z and 0.111Z, respectively. Where there is an enclosed poop or forecastle superimposed on the superstructure, sheer credit shall be allowed for such a poop or forecastle, according to the method of paragraph 2.9.3.4 as shown in figure 2.9.1.4.

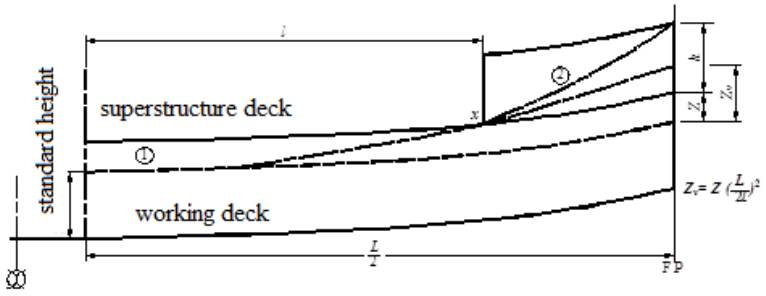


Figure 2.9.1.4

2.9.1.5 Where the deck of an enclosed superstructure has at least the same sheer as the exposed deck, the sheer of the enclosed portion of the exposed deck shall not be taken into account.
2.9.1.6 Where an enclosed poop or forecastle is of standard height with greater sheer than that of the working deck, or is of more than standard height, an addition to the sheer of the working deck shall be made as provided in paragraph 2.9.3.4.

Where a poop or forecastle consists of two layers, the method shown in figure 2.9.1.6 shall be used.

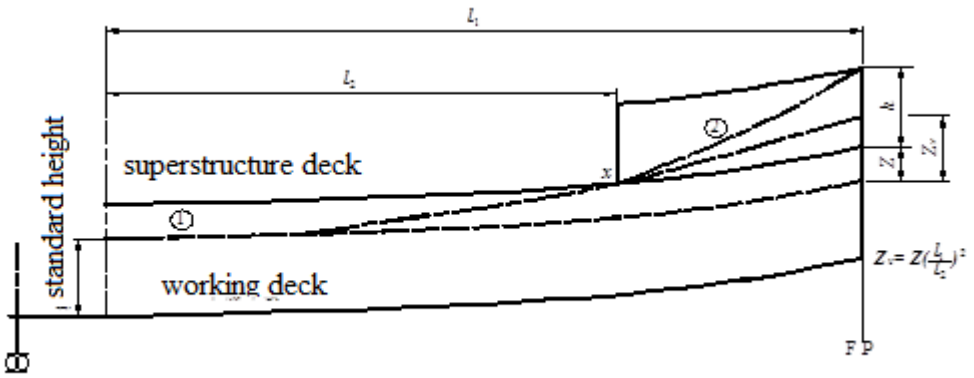


figure 2.9.1.6

In figures 2.9.1.4 and 2.9.1.6, the following definitions apply:

Z is as defined in paragraph 2.9.1.4; and

Zv is the end ordinate of a virtual standard parabolic curve taken through the point "X". If Zv is greater than (Z + h), the end ordinate shall be (Z + h), in which case point "X" shall be disregarded and curve (2) not taken into account.

When the length of the first tier superstructure is greater than 0.5l, the virtual standard parabolic curve shall commence at amidships as indicated in figure 2.9.1.4.

2.9.2 Standard sheer profile

2.9.2.1 The ordinates of the standard sheer profile are given in the following table:

Standard sheer profile (where L is in m)

	Station	Ordinate (in mm)	Factor
After half	After Perpendicular	25（*L*/3+10）	1
	1/6L from A.P.	11.1（*L*/3+10）	3
	1/3L from A.P.	2.8（*L*/3+10）	3
	Amidships	0	1
Forward half	Amidships	0	1
	1/3L from F.P.	5.6（*L*/3+10）	3
	1/6L from F.P.	22.2（*L*/3+10）	3
	Forward Perpendicular	50（*L*/3+10）	1

2.9.3 Measurement of variation from standard sheer profile

2.9.3.1 Where the sheer profile differs from the standard, the four ordinates of each profile in the forward or after half shall be multiplied by the appropriate factors given in the above table of ordinates. The difference between the sums of the respective products and those of the standard divided by 8 measures the deficiency or excess of sheer in the forward or after half. The arithmetical mean of the excess or deficiency in the forward and after halves measures the excess or deficiency of sheer.

2.9.3.2 Where the after half of the sheer profile is greater than the standard and the forward half is less than the standard, no credit shall be allowed for the part in excess and deficiency only shall be measured.

2.9.3.3 Where the forward half of the sheer profile exceeds the standard, and the after portion of the sheer profile is not less than 75% of the standard, credit shall be allowed for the part in excess. Where the after part is less than 50% of the standard no credit shall be given for the excess sheer forward. Where the after sheer is between 50% and 75% of the standard, intermediate allowances may be granted for excess sheer forward.

2.9.3.4 Where sheer credit is given for a poop or forecastle the following formula shall be used:

$$S = \frac{YL'}{3L} \qquad (2.9.3.4)$$

where:

s is the sheer credit, to be deducted from the deficiency, or added to the excess of sheer;

y is the difference between actual and standard height of superstructure at the after or forward perpendicular;

L' is the mean enclosed length of poop or forecastle up to a maximum length of 0.5 L; and

L is the length of the ship.

The above formula provides a curve in the form of a parabola tangent to the actual sheer curve at the freeboard deck and intersecting the end ordinate at a point below the superstructure deck a distance equal to the standard height of a superstructure. The superstructure deck shall not be less than standard height above this curve at any point. This curve shall be used in determining the sheer profile for forward and after halves of the ship.

2.9.3.5 Special cases:

.1 Any excess in the height of a superstructure which does not extend to the after perpendicular cannot be regarded as contributing to the sheer allowance.

.2 Where the height of a superstructure is less than standard, the superstructure deck shall not be less than the minimum height of the superstructure above the virtual shear curve at any point. For this purpose y shall be taken as the difference between the actual and minimum height of the superstructure at the after/forward perpendicular.

.3 For a raised quarterdeck credit may be given only when the height of this quarterdeck is greater than the standard height of 'other superstructures' as defined in regulation 2.8.1.1, and only for the amount by which the actual height of the raised quarterdeck exceeds that standard height.

.4 When a poop or a forecastle has sloping end bulkheads, the sheer credit may be allowed on account of excess height. The formula given in paragraph 2.9.3.4 shall be used, the values for y and L' being as shown in figure 2.9.3.5.

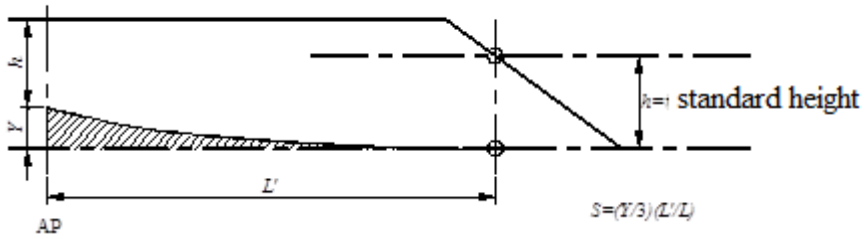


Figure 2.9.3.5

2.9.4 Correction for variations from standard sheer profile

2.9.4.1 The correction for sheer shall be the deficiency or excess of sheer (see paragraphs 2.9.3.1 to 2.9.3.3 inclusive), multiplied by

$$0.75 - \frac{S_1}{2L}$$

where S_1 is the total length S of enclosed superstructures without trunks.

2.9.5 Correction for sheer

2.9.5.1 Addition for deficiency in sheer.

Where the sheer is less than the standard, the correction for deficiency in sheer (see paragraph 2.9.4.1) shall be added to the freeboard.

2.9.5.2 Deduction for excess sheer.

In ships where an enclosed superstructure covers 0.1L before and 0.1L abaft amidships, the correction for excess of sheer as calculated under the provisions of paragraph 2.9.4.1 shall be deducted from the freeboard; in ships where no enclosed superstructure covers amidships, no deduction shall be made from the freeboard; where an enclosed superstructure covers less than 0.1L before and 0.1L abaft amidships, the deduction shall be obtained by linear interpolation. The maximum deduction for excess sheer shall be at the rate of 125 mm per 100 m of length.

In applying this paragraph, the height of the superstructure shall be related to its standard height. Where the height of the superstructure or raised quarterdeck is less than standard, the reduction shall be in the ratio of the actual to the standard height thereof.

Technical Background

The concept of minimum freeboard of Load line Convention is similar to the maximum operation draught of Cape Town Agreement.

Remarks

Simplified requirements of the Load line Convention.

12.7 Subdivision and damage stability

Conventions (Amend.), Reg.	**CAPE TOWN AGREEMENT Reg III/14**

Conventions/Codes Requirements

CAPE TOWN AGREEMENT Reg III/13
Regulation 14 Subdivision and damage stability

Vessels of 100 m in length and over, where the total number of persons carried is 100 or more, shall be capable, to the satisfaction of the Administration, of remaining afloat with positive stability, after the flooding of any one compartment assumed damaged, having regard to the type of vessel, the intended service and area of operation.

Interpretation

1 General requirement
1.1 The subdivision of a fishing vessel is considered sufficient if the attained subdivision index A, determined in accordance with regulation 3.2, is not less than the required subdivision index R calculated in accordance with regulation 3.1 and if, in addition, the partial indices As, Ap and Al are not less than 0.5R.
1.2 A fishing vessel with length not less than 80m shall calculate its subdivision and damage stability.

2 Definitions
2.1 Subdivision length (Ls) of the ship is the greatest projected moulded length of that part of the ship at or below deck or decks limiting the vertical extent of flooding with the ship at the deepest subdivision draught.
2.2 Mid-length is the mid-point of the subdivision length of the ship.
2.3 Aft terminal is the aft limit of the subdivision length.
2.4 Forward terminal is the forward limit of the subdivision length.
2.5 Breadth (B) is the greatest moulded breadth of the ship at or below the deepest subdivision draught.
2.6 Draught (d) is the vertical distance from the keel line at mid-length to the waterline in question.
2.7 Deepest subdivision draught (ds) is the waterline which corresponds to the summer load line draught of the ship.
2.8 Light service draught (dl) is the service draught corresponding to the lightest anticipated loading and associated tankage, including, however, such ballast as may be necessary for stability and/or immersion.
2.9 Partial subdivision draught (dp) is the light service draught plus 60% of the difference between the light service draught and the deepest subdivision draught.
2.10 Trim is the difference between the draught forward and the draught aft, where the draughts are measured at the forward and aft terminals respectively, disregarding any rake of keel.
2.11 Machinery spaces are spaces between the watertight boundaries of a space containing the main and auxiliary propulsion machinery, including boilers, generators and electric motors primarily intended for propulsion. In the case of unusual arrangements, the Administration may define the limits of the machinery spaces.
2.12 Permeability (μ) of a space is the proportion of the immersed volume of that space which can be occupied by water.
2.12.1 For the purpose of the subdivision and damage stability calculations of the regulations, the permeability of each general compartment or part of a compartment shall be as follows:

Spaces	Permeability
Appropriated to stores	0.60
Occupied by accommodation	0.95
Occupied by machinery	0.85
Void spaces	0.95
Intended for liquids	0 or 0.95[1]

[1] Whichever results in the more severe requirement.

2.12.2 For the purpose of the subdivision and damage stability calculations of the regulations, the permeability of each fish hold or part of a compartment shall be as follows:

Spaces	Permeability at draught d_s	Permeability at draught d_p	Permeability at draught d_l
fish hold	0.70	0.80	0.95

2.12.3 Other figures for permeability may be used if substantiated by calculations.

3 Calculation of subdivision and damage stability

3.1 Required subdivision index R

3.1.1 The degree of subdivision of fishing vessels to be provided shall be determined by the required subdivision index R, as follows.

3.1.2 In the case of fishing vessels greater than 100 m in length (Ls):

$$R = (L_s + 24) / (L_s + 152)$$

3.1.3 In the case of fishing vessels not less than 80 m in length (Ls) and not greater than 100 m in length (Ls):

$$R = L_s (L_s + 24) / [L_s (L_s + 24) + 12800]$$

3.2 Attained subdivision index A

3.2.1 The attained subdivision index A is obtained by the summation of the partial indices As, Ap and Al, (weighted as shown) calculated for the draughts ds, dp and dl in accordance with the following formula:

$$A = 0.4As + 0.4Ap + 0.2Al$$

Each partial index is a summation of contributions from all damage cases taken in consideration, using the following formula:

$$A = \Sigma \text{ pi si}$$

where:

i represents each compartment or group of compartments under consideration,

pi accounts for the probability that only the compartment or group of compartments under consideration may be flooded, disregarding any horizontal subdivision, as defined in regulation 3.3,

si accounts for the probability of survival after flooding the compartment or group of compartments under consideration, and includes the effect of any horizontal subdivision, as defined in regulation 3.4.

3.2.2 In the calculation of A, the level trim shall be used for the deepest subdivision draught and the partial subdivision draught. The actual service trim shall be used for the light service draught. If in any service condition, the trim variation in comparison with the calculated trim is greater than 0.5% of Ls, one or more additional calculations of A are to be submitted for the same draughts but different trims so that, for all service conditions, the difference in trim in comparison with the reference trim used for one calculation will be less than 0.5% of Ls.

3.2.3 When determining the positive righting lever (GZ) of the residual stability curve, the displacement used should be that of the intact condition. That is, the constant displacement method of calculation should be used.

3.2.4 The summation indicated by the above formula shall be taken over the ship's subdivision length (Ls) for all cases of flooding in which a single compartment or two or more adjacent compartments are involved. In the case of unsymmetrical arrangements, the calculated A value should be the mean value obtained from calculations involving both sides. Alternatively, it should be taken as that corresponding to the side which evidently gives the least favourable result.

3.2.5 Wherever wing compartments are fitted, contribution to the summation indicated by the formula shall be taken for all cases of flooding in which wing compartments are involved. Additionally, cases of simultaneous flooding of a wing compartment or group of compartments and the adjacent inboard compartment or group of compartments, but excluding damage of transverse extent greater than one half of the ship breadth B, may be added. For the purpose of this regulation, transverse extent is measured inboard from ship's side, at right angle to the centreline at the level of the deepest subdivision draught.

3.2.6 In the flooding calculations carried out according to the regulations, only one breach of the hull and only one free surface need to be assumed. The assumed vertical extent of damage is to extend from the baseline upwards to any watertight horizontal subdivision above the waterline or higher. However, if a lesser extent of damage will give a more severe result, such extent is to be assumed.

3.2.7 If pipes, ducts or tunnels are situated within the assumed extent of damage, arrangements are to be made to ensure that progressive flooding cannot thereby extend to compartments other than those assumed flooded. However, the Administration may permit minor progressive flooding if it is demonstrated that its effects can be easily controlled and the safety of the ship is not impaired.

3.3 Calculation of the factor pi

3.3.1 The factor pi for a compartment or group of compartments shall be calculated as follows.

.1 If the damage involves a single zone only:

$$p_i = p(x1_j, x2_j) \cdot [\, r(x1_j, x2_j, b_k) - r(x1_j, x2_j, b_{k-1})]$$

.2 If the damage involves two adjacent zones:

$$p_i = p(x1_j, x2_{j+1}) \cdot [\, r(x1_j, x2_{j+1}, b_k) - r(x1_j, x2_{j+1}, b_{k-1})] - p(x1_j, x2_j) \cdot [\, r(x1_j, x2_j, b_k) - r(x1_j, x2_j, b_{k-1})] - p(x1_{j+1}, x2_{j+1}) \cdot [\, r(x1_{j+1}, x2_{j+1}, b_k) - r(x1_{j+1}, x2_{j+1}, b_{k-1})]$$

.3 If the damage involves three or more adjacent zones:

$$p_i = p(x1_j, x2_{j+n-1}) \cdot [\, r(x1_j, x2_{j+n-1}, b_k) - r(x1_j, x2_{j+n-1}, b_{k-1})] - p(x1_j, x2_{j+n-2}) \cdot [\, r(x1_j, x2_{j+n-2}, b_k) - r(x1_j, x2_{j+n-2}, b_{k-1})] - p(x1_{j+1}, x2_{j+n-1}) \cdot [\, r(x1_{j+1}, x2_{j+n-1}, b_k) - r(x1_{j+1}, x2_{j+n-1}, b_{k-1})] + p(x1_{j+1}, x2_{j+n-2}) \cdot [\, r(x1_{j+1}, x2_{j+n-2}, b_k) - r(x1_{j+1}, x2_{j+n-2}, b_{k-1})]$$

and where $r(x1, x2, b_0) = 0$

where

j = the aftmost damage zone number involved in the damage starting with No.1 at the stern;

n = the number of adjacent damage zones involved in the damage;

k = is the number of a particular longitudinal bulkhead as barrier for transverse penetration in a damage zone counted from shell towards the centre line.
The shell has k = 0;

x1 = the distance from the aft terminal of Ls to the aft end of the zone in question;

x2 = the distance from the aft terminal of Ls to the forward end of the zone in question;

b = the mean transverse distance in metres measured at right angles to the centreline at the deepest subdivision loadline between the shell and an assumed vertical plane extended between the longitudinal limits used in calculating the factor pi and which is a tangent to, or common with, all or part of the outermost portion of the longitudinal bulkhead under consideration. This vertical plane shall be so orientated that the mean transverse distance to the shell is a maximum, but not more than twice the least distance between the plane and the shell. If the upper part of a longitudinal bulkhead is below the deepest subdivision loadline the vertical plane used for determination of b is assumed to extend upwards to the deepest subdivision waterline. In any case, b is not to be taken greater than B/2.

3.3.2 The factor p(x1, x2) is to be calculated according to the following formulae:

.1 Where neither limits of the compartment or group of compartments under consideration coincides with the aft or forward terminals:

$J \leq J_k$:

$$p(x1, x2) = p_1 = J^2 (b_{11} J + 3b_{12}) / 6$$

$J > J_k$:

$$p(x1, x2) = p_2 = -b_{11} J_k^3 / 3 + 0.5 (b_{11} J - b_{12}) J_k^2 + b_{12} J J_k - b_{21} (J_n^3 - J_k^3) / 3 + 0.5 (b_{21} J - b_{22})(J_n^2 - J_k^2) + b_{22} J (J_n - J_k)$$

.2 Where the aft limit of the compartment or group of compartments under consideration coincides with the aft terminal or the forward limit of the compartment or group of compartments under consideration coincides with the forward terminal:

$J \leq J_k$:

$$p(x1, x2) = 0.5(p_1 + J)$$

$J > J_k$:

$$p(x1, x2) = 0.5(p_2 + J)$$

.3 Where the compartment or groups of compartments considered extends over the entire subdivision length (Ls):

$$p(x1, x2) = 1$$

where:

Overall normalized max damage length: $J_{max} = 10/33$

Knuckle point in the distribution: $J_{kn} = 5/33$

Cumulative probability at Jkn: $P_k = 11/12$

Maximum absolute damage length: $l_{max} = 60$m

Length where normalized distribution ends: $L^* = 260$m

Probability density at J = 0: $b_0 = 2p_k / J_{kn} - 2(1-p_k) / (J_{max} - J_{kn})$

$J_m = \min \{ J_{max}, l_{max} / L_s \}$

$J_k = 0.5J_m + 1/b_0 - [1 + (1-2p_k)\, b_0 J_m + 0.25 (b_0 J_m)^2]^{0.5} / b_0$

$b_{12} = b_0$

$b_{11} = 4(1-p_k) / [J_k (J_m - J_k)] - 2p_k / J_k^2$

$b_{21} = -2(1-p_k) / (J_m - J_k)^2$

$b_{22} = -b_{21} J_m$

The non-dimensional damage length: $J = (x2 - x1) / L_s$

The normalized length of a compartment or group of compartments: Jn is to be taken as the lesser of J and Jm

3.3.3 The factor r(x1, x2, b) shall be determined by the following formulae:

$$r(x1, x2, b) = 1 - (1 - C) \cdot [1 - G / p(x1, x2)]$$

where:

$C = 12 J_b (4 - 45 J_b)$, where

$J_b = b / (15B)$

G shall be calculated as follows

.1 Where the compartment or groups of compartments considered extends over the entire subdivision length (Ls):

$$G = G_1 = 0.5 b_{11} J_b^2 + b_{12} J_b$$

.2 Where neither limits of the compartment or group of compartments under consideration coincides with the aft or forward terminals:

$G = G_2 = -b_{11} J_0^3 / 3 + 0.5 (b_{11} J - b_{12}) J_0^2 + b_{12} J J_0$, where

$J_0 = \min \{ J, J_b \}$

.3 Where the aft limit of the compartment or group of compartments under consideration coincides with the aft terminal or the forward limit of the compartment or group of compartments under consideration coincides with the forward terminal:

$$G = 0.5 (G_2 + J G_1)$$

3.4 Calculation of the factor si

3.4.1 The factor si, for any damage case at any initial loading condition, di, shall be obtained from the formula:

$$s_i = K \cdot (GZ_{max} / 0.12)^{0.25} \cdot (\theta_{scope} / 16)^{0.25}$$

where:

GZmax is the maximum positive righting lever, in metres, up to the angle θv. GZmax is not to be taken as more than 0.12 m;

θ_{scope} is the range of positive righting levers, in degrees, measured from the angle θe. The positive range is to be taken up to the angle θv; θ_{scope} is not to be taken as more than 16°;

K = 1 if $\theta e \leq 25°$

K = 0 if $\theta e \geq 30°$

K = $(6 - 0.2\theta_e)^{0.5}$ otherwise,

where:

θ v is the angle, in any stage of flooding, where the righting lever becomes negative, or the angle at which an opening incapable of being closed weathertight becomes submerged;

θ e is the equilibrium heel angle in any stage of flooding, in degrees;

Flooding stage is any discrete step during the flooding process, including the stage before equalization (if any) until final equilibrium has been reached.

3.4.2 Where horizontal watertight boundaries are fitted above the waterline under consideration the s-value calculated for the lower compartment or group of compartments shall be obtained by multiplying the value as determined in paragraph 3.4.1 by the reduction factor vm, which represents the probability that the spaces above the horizontal subdivision will not be flooded.

The factor vm shall be obtained from the formula, in no case is vm to be taken as less than zero or more than 1:

$$v_m = v(H_{j,n,m}, d) - v(H_{j,n,m-1}, d)$$

where:

$H_{j,n,m}$ is the least height above the baseline, in metres, within the longitudinal range of $x1_{(j)}$ ... $x2_{(j+n-1)}$ of the m^{th} horizontal boundary which is assumed to limit the vertical extent of flooding for the damaged compartments under consideration;

$H_{j,n,m-1}$ is the least height above the baseline, in metres, within the longitudinal range of $x1_{(j)}$ ... $x2_{(j+n-1)}$ of the $(m-1)^{th}$ horizontal boundary which is assumed to limit the vertical extent of flooding for the damaged compartments under consideration;

j signifies the aft terminal of the damaged compartments under consideration;

m represents each horizontal boundary counted upwards from the waterline under consideration;

d is the draught in question as defined in regulation 2; and

*x*1 and *x*2 represent the terminals of the compartment or group of compartments considered in regulation 3.3.

3.4.3 The factors $v(H_{j,n,m}, d)$ and $v(H_{j,n,m-1}, d)$ shall be obtained from the formulae:

$$v(H, d) = 0.1026\,(H - d)$$

where:

$v(H_{j,n,m}, d)$ is to be taken as 1, if H_m coincides with the uppermost watertight boundary of the ship within the range ($x1_{(j)}$ ... $x2_{(j+n-1)}$), and $v(H_{j,n,0}, d)$ is to be taken as 0.

3.4.4 In general, each contribution *dA* to the index A in the case of horizontal subdivisions is obtained from the formula:

$$dA = p_i \cdot [v_1 \cdot s_{\min 1} + (v_2 - v_1) \cdot s_{\min 2} + \ldots + (1 - v_{m-1}) \cdot s_{\min m}]$$

where:

vm = the v-value calculated in accordance with paragraph 3.4.2;

smin = the least s-factor for all combinations of damages obtained when the assumed damage extends from the assumed damage height H_m downwards.

3.4.5 Unsymmetrical flooding is to be kept to a minimum consistent with the efficient arrangements. Where it is necessary to correct large angles of heel, the means adopted shall, where practicable, be self-acting, but in any case where controls to equalization devices are provided they shall be operable from above the bulkhead deck. Suitable information concerning the use of equalization devices shall be supplied to the master of the ship.

.1 Tanks and compartments taking part in such equalization shall be fitted with air pipes or equivalent means of sufficient cross-section to ensure that the flow of water into the equalization compartments is not delayed.

.2 In all cases, si is to be taken as zero in those cases where the final waterline, taking into account sinkage, heel and trim, immerses the lower edge of openings through which progressive flooding may take place and such flooding is not accounted for in the calculation of factor si. Such openings shall include air-pipes, ventilators and openings which are closed by means of weathertight doors or hatch covers; and

.3 The factor si is to be taken as zero if, taking into account sinkage, heel and trim, any of the following occur in any intermediate stage or in the final stage of flooding:

.3.1 immersion of any vertical escape hatch in the bulkhead deck;

.3.2 any controls intended for the operation of watertight doors, equalization devices, valves on piping or on ventilation ducts intended to maintain the integrity of watertight bulkheads from above the bulkhead deck become inaccessible or inoperable;

.3.3 immersion of any part of piping or ventilation ducts carried through a watertight boundary that is located within any compartment included in damage cases contributing to the attained index A, if not fitted with watertight means of closure at each boundary.

.4 Except as provided in paragraph 3.4.5.3.1, openings closed by means of watertight manhole covers and flush scuttles, small watertight hatch covers, remotely operated sliding watertight doors, side scuttles of the non-opening type as well as watertight access doors and hatch covers required to be kept closed at sea need not be considered.

4 Double bottoms in fishing vessels

4.1 A double bottom shall be fitted extending from the collision bulkhead to the afterpeak bulkhead, as far as this is practicable and compatible with the design and proper working of the ship.

4.2 Where a double bottom is required to be fitted the inner bottom shall be continued out to the ship's sides in such a manner as to protect the bottom to the turn of the bilge. Such protection will be deemed satisfactory if the inner bottom is not lower at any part than a plane parallel with the keel line and which is located not less than a vertical distance h measured from the keel line, as calculated by the formula:

$$h = B/20$$

However, in no case is the value of h to be less than 760 mm, and need not be taken as more than 2,000 mm.

4.3 Small wells constructed in the double bottom in connection with drainage arrangements of fish holds, etc., shall not extend downward more than necessary. A well extending to the outer bottom is, however, permitted at the after end of the shaft tunnel. Other wells (e.g., for lubricating oil under main engines) may be permitted by the Administration if satisfied that the arrangements give protection equivalent to that afforded by a double bottom complying with this regulation. In no case shall the vertical distance from the bottom of such a well to a plane coinciding with the keel line be less than 500 mm.
4.4 A double bottom need not be fitted in way of watertight tanks, including dry tanks of moderate size, provided the safety of the ship is not impaired in the event of bottom or side damage.
4.5 Any part of a fishing vessel that is not fitted with a double bottom in accordance with paragraphs 4.1or 4.5 shall be capable of withstanding bottom damages, as specified in paragraph 4.7, in that part of the ship.
4.6 In the case of unusual bottom arrangements in a fishing vessel, it shall be demonstrated that the ship is capable of withstanding bottom damages as specified in paragraph 4.7.
4.7 Compliance with paragraphs 4.5 or 4.6 is to be achieved by demonstrating that si, when calculated in accordance with regulation 3.4, is not less than 1 for all service conditions when subject to a bottom damage assumed at any position along the ship's bottom and with an extent specified in subparagraph .2 below for the affected part of the ship:

.1 Flooding of such spaces shall not render emergency power and lighting, internal communication, signals or other emergency devices inoperable in other parts of the ship.

.2 Assumed extent of damage shall be as follows:

	For 0.3 L from the forward perpendicular of the ship	Any other part of the ship
Longitudinal extent	1/3 $L^{2/3}$ or 14.5 m, whichever is less	1/3 $L^{2/3}$ or 14.5 m, whichever is less
Transverse extent	$B/6$ or 10 m, whichever is less	$B/6$ or 5 m, whichever is less
Vertical extent, measured from the keel line	$B/20$ or 2 m, whichever is less	$B/20$ or 2 m, whichever is less

.3 If any damage of a lesser extent than the maximum damage specified in subparagraph .2 would result in a more severe condition, such damage should be considered.

5 Damage control information
5.1 There shall be permanently exhibited, or readily available on the navigation bridge, for the guidance of the officer in charge of the ship, plans showing clearly for each deck and fish hold the boundaries of the watertight compartments, the openings therein with the means of closure and position of any controls thereof, and the arrangements for the correction of any list due to flooding. In addition, booklets containing the aforementioned information shall be made available to the officers of the ship.
5.2 General precautions to be included shall consist of a listing of equipment, conditions, and operational procedures, considered by the Administration to be necessary to maintain watertight integrity under normal ship operations.
5.3 Specific precautions to be included shall consist of a listing of elements (i.e. closures, security of cargo, sounding of alarms, etc.) considered by the Administration to be vital to the survival of the ship, passengers and crew.
5.4 In case of fishing vessels to which damage stability requirements apply, damage stability information shall provide the master a simple and easily understandable way of assessing the vessel’s survivability in all damage cases involving a compartment or group of compartments.

Technical Background

Considering the development of the theory of damage stability and the improvement of calculation capacity, the damage stability of fishing vessels is modified according to the relevant requirements on cargo ships of SOLAS.

Remarks

12.8 LIFE–SAVING APPLIANCES REQUIREMENTS

Conventions (Amend.), Reg.	CAPE TOWN AGREEMENT Reg VII/17-32

Conventions/Codes Requirements

CAPE TOWN AGREEMENT Reg VII/17-32

PART C—LIFE–SAVING APPLIANCES REQUIREMENTS
Regulation 17 General requirements for lifeboats
(1) Construction of lifeboats

(a) All lifeboats shall be properly constructed and shall be of such form and proportions that they have ample stability in a seaway and sufficient freeboard when loaded with their full complement of persons and equipment. All lifeboats shall have rigid hulls and shall be capable of maintaining positive stability when in an upright position in calm water and loaded with their full complement of persons and equipment and holed in any one location below the waterline, assuming no loss of buoyancy material and no other damage.

(b) All lifeboats shall be of sufficient strength to enable them to be safely lowered into the water when loaded with their full complement of persons and equipment.

(c) Hulls and rigid covers shall be fire–retardant or noncombustible.

(d) Seating shall be provided on thwarts, benches or fixed chairs fitted as low as practicable in the lifeboat and constructed so as to be capable of supporting the number of persons each weighing 100 kg for which spaces are provided in compliance with the requirements of paragraph (2)(b)(ii).

(e) Each lifeboat shall be of sufficient strength to withstand a load, without residual deflection on removal of that load:

(i) in the case of boats with metal hulls, 1.25 times the total mass of the lifeboat when loaded with its full complement of persons and equipment; or

(ii) in the case of other boats, twice the total mass of the lifeboat when loaded with its full complement of persons and equipment.

(f) Each lifeboat shall be of sufficient strength to withstand, when loaded with its full complement of persons and equipment and with, where applicable, skates or fenders in position, a lateral impact against the vessel's side at an impact velocity of at least 3.5 m/s and also a drop into the water from a height of at least 3 m.

(g) The vertical distance between the floor surface and the interior of the enclosure or canopy over 50% of the floor area shall be:

(i) not less than 1.3 m for a lifeboat permitted to accommodate nine persons or less;

(ii) not less than 1.7 m for a lifeboat permitted to accommodate 24 persons or more;

(iii) not less than the distance as determined by linear interpolation between 1.3 m and 1.7 m for a lifeboat permitted to accommodate between 9 and 24 persons.

(2) Carrying capacity of lifeboats

(a) No lifeboat shall be approved to accommodate more than 150 persons.

(b) The number of persons which a lifeboat shall be permitted to accommodate shall be equal to the lesser of:

(i) the number of persons having an average mass of 75 kg, all wearing lifejackets, that can be seated in a normal position without interfering with the means of propulsion or the operation of any of the lifeboat's equipment; or

(ii) the number of spaces that can be provided on the seating arrangements in accordance with figure 1. The shapes may be overlapped as shown, provided footrests are fitted and there is sufficient room for legs and the vertical separation between the upper and lower seat is not less than 350 mm.

(c) Each seating position shall be clearly indicated in the lifeboat.

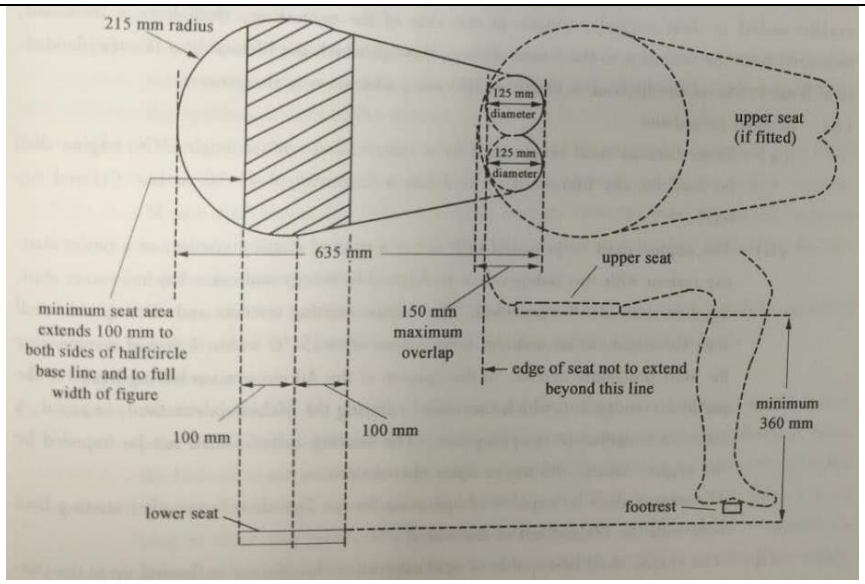


Figure 1

(3) Access into lifeboats

(a) Every vessel lifeboat shall be so arranged that it can be boarded by its full complement of persons in not more than 3 min from the time the instruction to board is given. Rapid disembarkation shall also be possible.

(b) Lifeboats shall have a boarding ladder that can be used on either side of the lifeboat to enable persons in the water to board the lifeboat. The lowest step of the ladder shall be not less than 0.4m below the lifeboat's light waterline.

(c) The lifeboat shall be so arranged that helpless people can be brought on board either from the sea or on stretchers.

(d) All surfaces on which persons might walk shall have a non–skid finish.

(4) Lifeboat buoyancy

All lifeboats shall have inherent buoyancy or shall be fitted with inherently buoyant material which shall not be adversely affected by seawater, oil or oil products, sufficient to float the lifeboat with all its equipment on board when flooded and open to the sea. Additional inherently buoyant material, equal to 280 N of buoyant force per person shall be provided for the number of persons the lifeboat is permitted to accommodate. Buoyant material, unless in addition to that required above, shall not be installed external to the hull of the lifeboat.

(5) Lifeboat freeboard and stability

All lifeboats, when loaded with 50% of the number of persons the lifeboat is permitted to accommodate seated in their normal positions to one side of the centreline, shall have a freeboard, measured from the waterline to the lowest opening through which the lifeboat may become flooded, of at least 1.5% of the lifeboat's length or 100 mm, whichever is the greater.

(6) Lifeboat propulsion

(a) Every lifeboat shall be powered by a compression ignition engine. No engine shall be used for any lifeboat if its fuel has a flashpoint of 43℃ or less (closed cup test).

(b) The engine shall be provided with either a manual starting system, or a power starting system with two independent rechargeable energy sources. Any necessary starting aids shall also be provided. The engine starting systems and starting aids shall start the engine at an ambient temperature of －15℃ within 2 min of commencing the start procedure unless, in the opinion of the Administration having regard to the particular voyages in which the vessel carrying the lifeboat is constantly engaged, a different temperature is appropriate. The starting systems shall not be impeded by the engine casing, thwarts or other obstructions.

(c) The engine shall be capable of operating for not less than 5 min after starting from cold with the lifeboat out of the water.

(d) The engine shall be capable of operating when the lifeboat is flooded up to the centreline of the crankshaft.

(e) The propeller shafting shall be so arranged that the propeller can be disengaged from the engine. Provision shall be made for ahead and astern propulsion of the lifeboat.

(f) The exhaust pipe shall be so arranged as to prevent water from entering the engine in normal operation.

(g) All lifeboats shall be designed with due regard to the safety of persons in the water and to the possibility of damage to the propulsion system by floating debris.

(h) The speed of a lifeboat when proceeding ahead in calm water, when loaded with its full complement of persons and equipment and with all engine–powered auxiliary equipment in operation, shall be at least 6 knots and at least 2 knots when towing a 25–person liferaft loaded with its full complement of persons and equipment or its equivalent. Sufficient fuel, suitable for use throughout the temperature range expected in the area in which the vessel operates, shall be provided to run the fully loaded lifeboat at 6 knots for a period of not less than 24 h.

(i) The lifeboat engine, transmission and engine accessories shall be enclosed in a fire–retardant casing or other suitable arrangements providing similar protection. Such arrangements shall also protect persons from coming into accidental contact with hot or moving parts and protect the engine from exposure to weather and sea. Adequate means shall be provided to reduce the engine noise. Starter batteries shall be provided with casings which form a watertight enclosure around the bottom and sides of the batteries. The battery casings shall have a tight fitting top which provides for necessary gas venting.

(j) The lifeboat engine and accessories shall be designed to limit electromagnetic emissions so that engine operation does not interfere with the operation of radio life–saving appliances used in the lifeboat.

(k) Means shall be provided for recharging all engine–starting, radio and searchlight batteries. Radio batteries shall not be used to provide power for engine starting. Means shall be provided for recharging lifeboat batteries from the vessel's power supply at a supply voltage not exceeding 55 V which can be disconnected at the lifeboat embarkation station.

(l) Water–resistant instructions for starting and operating the engine shall be provided and mounted in a conspicuous place near the engine starting controls.

(7) Lifeboat fittings

(a) All lifeboats shall be provided with at least one drain valve fitted near the lowest point in the hull, which shall automatically open to drain water from the hull when the lifeboat is not waterborne and shall automatically close to prevent entry of water when the lifeboat is waterborne. Each drain valve shall be provided with a cap or plug to close the valve, which shall be attached to the lifeboat by a lanyard, a chain, or other suitable means. Drain valves shall be readily accessible from inside the lifeboat and their position shall be clearly indicated.

(b) All lifeboats shall be provided with a rudder and tiller. When a wheel or other remote steering mechanism is also provided the tiller shall be capable of controlling the rudder in case of failure of the steering mechanism. The rudder shall be permanently attached to the lifeboat. The tiller shall be permanently installed on, or linked to, the rudder stock; however, if the lifeboat has a remote steering mechanism, the tiller may be removable and securely stowed near the rudder stock. The rudder and tiller shall be so arranged as not to be damaged by operation of the release mechanism or the propeller.

(c) Except in the vicinity of the rudder and propeller, a buoyant lifeline shall be becketed around the outside of the lifeboat.

(d) Lifeboats which are not self–righting when capsized shall have suitable handholds on the underside of the hull to enable persons to cling to the lifeboat. The handholds shall be fastened to the lifeboat in such a way that, when subjected to an impact sufficient to cause them to break away from the lifeboat, they break away without damaging the lifeboat.

(e) All lifeboats shall be fitted with sufficient watertight lockers or compartments to provide for the storage of the small items of equipment, water and provisions required by paragraph (8). Means shall be provided for the storage of collected rainwater.

(f) Every lifeboat to be launched by a fall or falls shall be fitted with a release mechanism complying with the following requirements:

(i) the mechanism shall be so arranged that all hooks are released simultaneously;

(ii) the mechanism shall have two release capabilities as follows:

(1) a normal release capability which will release the lifeboat when it is waterborne or when there is no load on the hooks;

(2) an on–load release capability which will release the lifeboat with a load on the hooks. This release shall be so arranged as to release the lifeboat under any conditions of loading from no–load with the lifeboat waterborne to a load of 1.1 times the total mass of the lifeboat when loaded with its full complement of persons and equipment. This release capability shall be adequately protected against accidental or premature use;

(iii) the release control shall be clearly marked in a colour that contrasts with its surroundings;

(iv) the mechanism shall be designed with a factor of safety of 6 based on the ultimate strength of the materials used, assuming the mass of the lifeboat is equally distributed between the falls.

(g) Every lifeboat shall be fitted with a release device to enable the forward painter to be released when under tension.

(h) Every lifeboat which is fitted with a fixed two–way VHF radiotelephone apparatus with an antenna which is separately mounted shall be provided with arrangements for siting and securing the antenna effectively in its operating position.

(i) Lifeboats intended for launching down the side of a vessel shall have skates and fenders as necessary to facilitate launching and prevent damage to the lifeboat.

(j) A manually controlled lamp visible on a dark night with a clear atmosphere at a distance of at least 2 miles for a period of not less than 12 h shall be fitted to the top of the cover or enclosure. If the light is a flashing light, it shall initially flash at a rate of not less than 50 flashes per minute over the first 2 h of operation of the 12 h operating period.

(k) A lamp or source of light shall be fitted inside the lifeboat to provide illumination for not less than 12 h to enable reading of survival and equipment instructions; however, oil lamps shall not be permitted for this purpose.

(l) Unless expressly provided otherwise, every lifeboat shall be provided with effective means of bailing or be automatically self-bailing.

(m) Every lifeboat shall be so arranged that an adequate view forward, aft and to both sides is provided from the control and steering position for safe launching and manoeuvring.

(8) Lifeboat equipment

All items of lifeboat equipment, whether required by this paragraph or elsewhere in this chapter, with the exception of boat–hooks which shall be kept free for fending off purposes, shall be secured within the lifeboat by lashings, storage in lockers or compartments, storage in brackets or similar mounting arrangements or other suitable means. The equipment shall be secured in such a manner as not to interfere with any abandonment procedures. All items of lifeboat equipment shall be as small and of as little mass as possible and shall be packed in a suitable compact form. Except where otherwise stated, the normal equipment of every lifeboat shall consist of:

(i) sufficient buoyant oars to make headway in calm seas. Thole pins, crutches or equivalent arrangements shall be provided for each oar provided. Thole pins or crutches shall be attached to the boat by lanyards or chains;

(ii) two boat–hooks;

(iii) a buoyant bailer and two buckets;

(iv) a survival manual;

(v) a binnacle containing an efficient compass which is luminous or provided with suitable means of illumination. In a totally enclosed lifeboat, the binnacle shall be permanently fitted at the steering position; in any other lifeboat, it shall be provided with suitable mounting arrangements;

(vi) a sea–anchor of adequate size fitted with a shock–resistant hawser and a tripping line which provides a firm hand grip when wet. The strength of the sea–anchor, hawser and tripping line shall be adequate for all sea conditions;

(vii) two efficient painters of a length equal to not less than twice the distance from the stowage position of the lifeboat to the waterline in the lightest seagoing condition or 15 m, whichever is the greater. One painter attached to the release device required by paragraph (7)(g) shall be placed at the forward end of the lifeboat and the other shall be firmly secured at or near the bow of the lifeboat ready for use;

(viii) two hatchets, one at each end of the lifeboat;

(ix) watertight receptacles containing a total of 3 l of fresh water for each person the lifeboat is permitted to accommodate, of which 1 l per person may be replaced by a de–salting apparatus capable of producing an equal amount of fresh water in two days;

(x) a rustproof dipper with lanyard;

(xi) a rustproof graduated drinking vessel;

(xii) a food ration totalling not less than 10,000 kJ for each person the lifeboat is permitted to accommodate; these rations shall be kept in airtight packaging and be stowed in a watertight container;

(xiii) four rocket parachute flares complying with the requirements of regulation 29; (xiv) six hand flares complying with the requirements of regulation 30;

(xv) two buoyant smoke signals complying with the requirements of regulation 31;

(xvi) one waterproof electric torch suitable for Morse signalling together with one spare set of batteries and one spare bulb in a waterproof container;

(xvii) one daylight signalling mirror with instructions for its use for signalling to ships and aircraft;

(xviii) one copy of the life–saving signals prescribed by regulation V/16 of the International Convention for the

Safety of Life at Sea, 1974, on a waterproof card or in a waterproof container;

(xix) one whistle or equivalent sound signal;

(xx) a first–aid outfit in a waterproof case capable of being closed tightly after use;

(xxi) six doses of anti–seasickness medicine and one seasickness bag for each person;

(xxii) a jack–knife to be kept attached to the boat by a lanyard;

(xxiii) three tin–openers;

(xxiv) two buoyant rescue quoits, attached to not less than 30 m of buoyant line;

(xxv) a manual pump;

(xxvi) one set of fishing tackle;

(xxvii) sufficient tools for minor adjustments to the engine and its accessories;

(xxviii) portable fire‑extinguishing equipment suitable for extinguishing oil fires; (xxix) a searchlight capable of effectively illuminating a light-coloured object at night having a width of 18 m at a distance of 180 m for a total period of 6 h and of working for not less than 3 h continuously;

(xxx) an efficient radar reflector, unless a survival craft radar transponder is stowed in the lifeboat;

(xxxi) thermal protective aids complying with the requirements of regulation 26 sufficient for 10% of the number of persons the lifeboat is permitted to accommodate or two, whichever is greater;

(xxxii) in the case of vessels engaged on voyages of such a nature and duration that, in the opinion of the Administration, the items specified in sub paragraphs (xii) and (xxvi) are unnecessary, the Administration may allow these items to be dispensed with.

(9) Lifeboat markings

(a) The dimension of the lifeboat and the number of persons which it is permitted to accommodate shall be marked on it in clear permanent characters.

(b) The name and port of registry of the vessel to which the lifeboat belongs shall be marked on each side of the lifeboat's bow in block capitals of the Roman alphabet.

(c) Means of identifying the vessel to which the lifeboat belongs and the number of the lifeboat shall be marked in such a way that they are, as far as practicable, visible from above.

Regulation 18
Self–righting partially enclosed lifeboats

(1) Self–righting partially enclosed lifeboats shall comply with the requirements of regulation 17 and, in addition, shall comply with the requirements of this regulation.

(2) Enclosure

(a) Permanently attached rigid covers shall be provided extending over not less than 20% of the length of the lifeboat from the stem and not less than 20% of the length of the lifeboat from the aftermost part of the lifeboat.

(b) The rigid covers shall form two shelters. If the shelters have bulkheads they shall have openings of sufficient size to permit easy access by persons each wearing an immersion suit or warm clothes and a lifejacket. The interior height of the shelters shall be sufficient to permit persons easy access to their seats in the bow and stern of the lifeboat.

(c) The rigid covers shall be so arranged that they include windows or translucent panels to admit sufficient daylight to the inside of the lifeboat with the openings or canopies closed so as to make artificial light unnecessary.

(d) The rigid covers shall have railings to provide a secure handhold for persons moving about the exterior of the lifeboat.

(e) Open parts of the lifeboat shall be fitted with a permanently attached foldable canopy so arranged that:

(i) it can be easily erected by not more than two persons in not more than 2 min;

(ii) it is insulated to protect the occupants against cold by means of not less than two layers of material separated by an air gap or other equally efficient means.

(f) The enclosure formed by the rigid covers and canopy shall be so arranged:

(i) as to allow launching and recovery operations to be performed without any occupant having to leave the enclosure;

(ii) that it has entrances at both ends and on each side, provided with efficient adjustable closing arrangements which can be easily and quickly opened and closed from inside or outside so as to permit ventilation but exclude seawater, wind and cold; means shall be provided for holding the entrances securely in the open and in the closed position;

(iii) that with the canopy erected and all entrances closed, sufficient air is admitted for the occupants at all times;

(iv) that it has means for collecting rainwater;

(v) that the exterior of the rigid covers and canopy and the interior of that part of the lifeboat covered by the canopy is of a highly visible colour. The interior of the shelters shall be of a colour which does not cause discomfort to the occupants;

(vi) that it is possible to row the lifeboat.

(3) Capsizing and re–righting

(a) A safety belt shall be fitted at each indicated seating position. The safety belt shall be so designed as to hold a person of a mass of 100 kg securely in place when the lifeboat is in a capsized position.

(b) The stability of the lifeboat shall be such that it is inherently or automatically self–righting when loaded with its full or a partial complement of persons and equipment and the persons are secured with safety belts.

(4) Propulsion

(a) The engine and transmission shall be controlled from the helmsman's position.

(b) The engine and engine installation shall be capable of running in any position during capsize and continue to run after the lifeboat returns to the upright or shall automatically stop on capsizing and be easily restarted after the lifeboat returns to the upright and the water has been drained from the lifeboat, The design of the fuel and lubricating systems shall prevent the loss of fuel and the loss of more than 250 ml of lubricating oil from the engine during capsize.

(c) Air–cooled engines shall have a duct system to take in cooling air from, and exhaust it to, the outside of the lifeboat. Manually operated dampers shall be provided to enable cooling air to be taken in from, and exhausted to, the interior of the lifeboat.

(5) Construction and fendering

(a) Notwithstanding regulation 17(1)(f), a self–righting partially enclosed lifeboat shall be so constructed and fendered as to ensure that the lifeboat renders protection against harmful accelerations resulting from an impact of the lifeboat, when loaded with its full complement of persons and equipment, against the vessel's side at an impact velocity of not less than 3.5 m/s.

(b) The lifeboat shall be automatically self–bailing.

Regulation 19
Totally enclosed lifeboats

(1) Totally enclosed lifeboats shall comply with the requirements of regulation 17 and, in addition, shall comply with the requirements of this regulation.

(2) Enclosure

Every totally enclosed lifeboat shall be provided with a rigid watertight enclosure which completely enclose the lifeboat. The enclosure shall be so arranged that:

(i) it protects the occupants against heat and cold;

(ii) access to the lifeboat is provided by hatches which can be closed to make the lifeboat watertight;

(iii) hatches are positioned so as to allow launching and recovery operations to be performed without any occupant having to leave the enclosure;

(iv) access hatches are capable of being opened and closed from both inside and outside and are equipped with means to hold them securely in open positions;

(v) it is possible to row the lifeboat;

(vi) it is capable, when the lifeboat is in the capsized position with the hatches closed and without significant leakage, of supporting the entire mass of the lifeboat, including all equipment, machinery and its full complement of persons;

(vii) it includes windows or translucent panels on both sides which admit sufficient daylight to the inside of the lifeboat with the hatches closed to make artificial light unnecessary;

(viii) its exterior is of a highly visible colour and its interior of a colour which does not cause discomfort to the occupants;

(ix) handrails provide a secure handhold for persons moving about the exterior of the lifeboat, and aid embarkation and disembarkation;

(x) persons have access to their seats from an entrance without having to climb over thwarts or other obstructions;

(xi) the occupants are protected from the effects of dangerous subatmospheric pressures which might be created by the lifeboat's engine.

(3) Capsizing and re–righting

(a) A safety belt shall be fitted at each indicated seating position. The safety belt shall be designed to hold a person of a mass of 100 kg securely in place when the lifeboat is in a capsized position.

(b) The stability of the lifeboat shall be such that it is inherently or automatically self–righting when loaded with its full or a partial complement of persons and equipment and all entrances and openings are closed watertight and the persons are secured with safety belts.

(c) The lifeboat shall be capable of supporting its full complement of persons and equipment when the lifeboat is in the damaged condition prescribed in regulation 17(1)(a) and its stability shall be such that, in the event of capsizing, it will automatically attain a position that will provide an above–water escape for its occupants.

(d) The design of all engine exhaust pipes, air ducts and other openings shall be such that water is excluded from the engine when the lifeboat capsizes and re–rights.

(4) Propulsion

(a) The engine and transmission shall be controlled from the helmsman's position.

(b) The engine and engine installation shall be capable of running in any position during capsize and continue to run after the lifeboat returns to the upright or shall automatically stop on capsizing and be easily restarted after the lifeboat returns to the upright. The design of the fuel and lubricating systems shall prevent the loss of fuel and the loss of more than 250 ml of lubricating oil from the engine during capsize.

(c) Air–cooled engines shall have a duct system to take in cooling air from, and exhaust it to, the outside of the lifeboat. Manually operated dampers shall be provided to enable cooling air to be taken in from, and exhausted to, the interior of the lifeboat.

(5) Construction and fendering

Notwithstanding regulation 17(1)(f), a totally enclosed lifeboat shall be so constructed and fendered as to ensure that the lifeboat renders protection against harmful accelerations resulting from an impact of the lifeboat, when loaded with its full complement of persons and equipment, against the vessel's side at an impact velocity of not less than 3.5 m/s.

(6) Free–fall lifeboats

A lifeboat arranged for free–fall launching shall be so constructed that it is capable of rendering protection against harmful accelerations resulting from being launched, when loaded with its full complement of persons and equipment, from at least the maximum height at which it is designed to be stowed above the waterline with the vessel in its lightest seagoing condition, under unfavourable conditions of trim of up to 10 °and with the vessel listed not less than 20 °either way.

Regulation 20

General requirements for liferafts

(1) Construction of liferafts

(a) Every liferaft shall be so constructed as to be capable of withstanding exposure for 30 days afloat in all sea conditions.

(b) The liferaft shall be so constructed that when it is dropped into the water from a height of 18 m, the liferaft and its equipment will operate satisfactorily. If the liferaft is to be stowed at a height of more than 18 m above the waterline in the lightest seagoing condition, it shall be of a type which has been satisfactorily drop–tested from at least that height.

(c) The floating liferaft shall be capable of withstanding repeated jumps on to it from a height of at least 4.5 m above its floor both with and without the canopy erected.

(d) The liferaft and it's fittings shall be so constructed as to enable it to be towed at a speed of 3 knots in calm water when loaded with its full complement of persons and equipment and with one of its sea–anchors streamed.

(e) The liferaft shall have a canopy to protect the occupants from exposure which is automatically set in place when the liferaft is launched and waterborne. The canopy shall comply with the following:

(i) it shall provide insulation against heat and cold by means of either two layers of material separated by an air gap or other equally efficient means. Means shall be provided to prevent accumulation of water in the air gap;

(ii) its interior shall be of a colour that does not cause discomfort to the occupants;

(iii) each entrance shall be clearly indicated and be provided with efficient adjustable closing arrangements which can be easily and quickly opened from inside and outside the liferaft so as to permit ventilation but exclude seawater, wind and cold. Liferafts accommodating more than eight persons shall have at least two diametrically opposite entrances;

(iv) it shall admit sufficient air for the occupants at all times, even with the entrances closed;

(v) it shall be provided with at least one viewing port;

(vi) it shall be provided with means for collecting rainwater;

(vii) it shall have sufficient headroom for sitting occupants under all parts of the canopy.

(2) Minimum carrying capacity and mass of liferafts

(a) No liferaft shall be approved which has a carrying capacity of less than six persons calculated in accordance with the requirements of regulation 21(3) or 22(3) as appropriate.

(b) Unless the liferaft is to be launched by an approved launching appliance complying with the requirements of regulation 32 and is not required to be portable, the total mass of the liferaft, its container and its equipment shall not be more than 185 kg.

(3) Liferaft fittings

(a) Lifelines shall be securely becketed around the inside and outside of the liferaft.

(b) The liferaft shall be fitted with an efficient painter of length equal to not less than twice the distance form the stowed position to the waterline in the lightest seagoing condition or 15 m whichever is the greater.

(4) Davit–launched liferafts

(a) In addition to the above requirements, a liferaft for use with an approved launching appliance shall:

(i) when the liferaft is loaded with its full complement of persons and equipment, be capable of withstanding a lateral impact against the vessel's side at an impact velocity of not less than 3.5 m/s and also a drop into the water from a height of not less than 3 m without damage that will affect its function;

(ii) be provided with means for bringing the liferaft alongside the embarkation deck and holding it securely during embarkation.

(b) Every davit–launched liferaft shall be so arranged that it can be boarded by its full complement of persons in not more than 3 min from the time the instruction to board is given.

(5) Equipment

(a) The normal equipment of every liferaft shall consist of:

(i) one buoyant rescue quoit, attached to not less than 30 m of buoyant line;

(ii) one knife of the non‑folding type having a buoyant handle and lanyard attached and stowed in a pocket on the exterior of the canopy near the point at which the painter is attached to the liferaft. In addition, a liferaft which is permitted to accommodate 13 persons or more shall be provided with a second knife which need not be of the non–folding type;

(iii) for a liferaft which is permitted to accommodate not more than 12 persons, one buoyant bailer. For a liferaft which is permitted to accommodate 13 persons or more, two buoyant bailers;

(iv) two sponges;

(v) two sea‑anchors each with a shock‑resistant hawser and tripping line, one being spare and the other permanently attached to the liferaft in such a way that when the liferaft inflates or is waterborne it will cause the liferaft to lie oriented to the wind in the most stable manner. The strength of each sea–anchor and its hawser and tripping line shall be adequate for all sea conditions. The sea–anchors shall be fitted with a swivel at each end of the line and shall be of a type which is unlikely to turn inside–out between its shroud lines;

(vi) two buoyant paddles;

(vii) three tin‑openers; safety knives containing special tin‑opener blades are satisfactory for this requirement;

(viii) one first‑aid outfit in a waterproof cast capable of being closed tightly after use;

(ix) one whistle or equivalent sound signal;

(x) four rocket parachute flares complying with the requirement of regulation 29;

(xi) six hand flares complying with the requirements of regulation 30;

(xii) two buoyant smoke signals complying with the requirements of regulation 31;

(xiii) one waterproof electric torch suitable for Morse signalling together with one spare set of batteries and one spare bulb in a waterproof container;

(xiv) an efficient radar reflector, unless a survival craft radar transponder is stowed in the liferaft;

(xv) one daylight signalling mirror with instructions on its use for signalling to ships and aircraft;

(xvi) one copy of the life–saving signals referred to in regulation V/16 of the International Convention for the Safety of Life at Sea, 1974, on a waterproof card or in a waterproof container;

(xvii) one set of fishing tackle;

(xviii) a food ration totalling not less than 10,000 kJ for each person the liferaft is permitted to accommodate; these rations shall be kept in airtight packaging and be stowed in a watertight container;

(xix) watertight receptacles containing a total of 1.5 l of fresh water for each person the liferaft is permitted to accommodate, of which 0.5 l per person may be replaced by a de–salting apparatus capable of producing an equal amount of fresh water in two days;

(xx) one rustproof graduated drinking vessel;

(xxi) six doses of anti–seasickness medicine and one seasickness bag for each person the liferaft is permitted to accommodate;

(xxii) instructions on how to survive;

(xxiii) instructions for immediate action;

(xxiv) thermal protective aids complying with the requirements of regulation 26 sufficient for 10% of the number of persons the liferaft is permitted to accommodate or two, whichever is the greater.

(b) The marking required by regulations 21(7)(c)(v) and 22(7)(vii) on liferafts equipped in accordance with subparagraph (a) shall be SOLAS A PACK in block capitals of the Roman alphabet.

(c) Where appropriate the equipment shall be stowed in a container which, if it is not an integral part of, or permanently attached to, the liferaft, shall be stowed and secured inside the liferaft and be capable of floating in water for at least 30 min without damage to its contents.

(6) Float–free arrangements for liferafts

(a) Painter system

The liferaft painter system shall provide a connection between the vessel and the liferaft and shall be so arranged as to ensure that the liferaft when released and, in the case of an inflatable liferaft, inflated is not dragged under by the dinking vessel.

(b) Weak link

If a weak link is used in the float–free arrangements, it shall:

(i) not be broken by the force required to pull the painter from the liferaft container;

(ii if applicable, be of sufficient strength to permit the inflation of the liferaft;

(iii) break under a strain of 2.2 ±0.4 kN.

(c) Hydrostatic release units

If a hydrostatic release unit is used in the float–free arrangements, it shall:

(i) be constructed of compatible materials so as to prevent malfunction of the unit. Galvanizing or other forms of metallic coating on parts of the hydrostatic release unit shall not be accepted;

(ii) automatically release the liferaft at a depth of not more than 4 m;

(iii) have drains to prevent the accumulation of water in the hydrostatic chamber when the unit is in its normal position;

(iv) be so constructed as to prevent release when seas wash over the unit;

(v) be permanently marked on its exterior with its type and serial number;

(vi) be provided with a document or identification plate stating the date of manufacture, type and serial number;

(vii) be such that each part connected to the painter system has a strength of not less than that required for the painter;

(viii) if disposable, have instructions for determining the date of expiry and means for marking the date on the unit.

Regulation 21
Inflatable liferafts

(1) Inflatable liferafts shall comply with the requirements of regulation 20 and, in addition, shall comply with the requirements of this regulation.

(2) Construction of inflatable liferafts

(a) The main buoyancy chamber shall divided into not less than two separate compartments, each inflated through a nonreturn inflation valve on each compartment. The buoyancy chambers shall be so arranged that, in the event of any one of the compartments being damaged or failing to inflate, the intact compartments shall be able to support, with positive freeboard over the liferaft's entire periphery, the number of persons which the liferaft is permitted to accommodate, each having a mass of 75 kg and seated in their normal positions.

(b) The floor of the liferaft shall be waterproof and shall be capable of being sufficiently insulated against cold either:

(i) by means of one or more compartments that the occupants can inflate, or which inflate automatically and can be deflated and reinflated by the occupants; or

(ii) by other equally efficient means not dependent on inflation.

(c) The liferaft shall be inflated with a non‑toxic gas. Inflation shall be completed within a period of 1 min at an ambient temperature of between 18℃ and 20℃ and within a period of 3 min at an ambient temperature of ‑30℃. After inflation the liferaft shall maintain its form when loaded with its full complement of persons and equipment.

(d) Each inflatable compartment shall be capable of withstanding a pressure equal to at least three times the working pressure and shall be prevented from reaching a pressure exceeding twice the working pressure either by means of relief valves or by a limited gas supply. Means shall be provided for fitting the topping‑up pump or bellows required by paragraph (10)(a)(ii) so that the working pressure can be maintained.

(3) Carrying capacity of inflatable liferafts

The number of persons which a liferaft shall be permitted to accommodate shall be equal to the lesser of:

(i) the greatest whole number obtained by dividing by 0.096 the volume, measured in cubic metres, of the main buoyancy tubes (which for this purpose shall include neither the arches nor the thwarts, if fitted) when inflated; or

(ii) the greatest whole number obtained by dividing by 0.372 the inner horizontal cross‑sectional area of the liferaft measured in square metres (which for this purpose may include the thwart or thwarts, if fitted) measured to the innermost edge of the buoyancy tubes; or

(iii) the number of persons having an average mass of 75 kg all wearing lifejackets, that can be seated with sufficient comfort and headroom without interfering with the operation of any of the liferaft's equipment.

(4) Access into inflatable liferafts

(a) At least one entrance shall be fitted with a semi–rigid boarding ramp to enable persons to board the liferaft from the sea so arranged as to prevent significant deflation of the liferaft if the ramp is damaged. In the case of a davit–launched liferaft having more than one entrance, the boarding ramp shall be fitted at the entrance opposite the bowsing lines and embarkation facilities.

(b) Entrances not provided with a boarding ramp shall have a boarding ladder, the lowest step of which shall be situated not less than 0.4 m below the liferaft's light waterline.

(c) There shall be means inside the liferaft to assist persons to pull themselves into the liferaft from the ladder.

(5) Stability of inflatable liferafts

(a) Every inflatable liferaft shall be so constructed that, when fully inflated and floating with the canopy uppermost, it is stable in a seaway.

(b) The stability of the liferaft when in the inverted position shall be such that it can be righted in a seaway and in calm water by one person.

(c) the stability of the liferaft when loaded with its full complement of persons and equipment shall be such that

it can be towed at speeds of up to 3 knots in calm water.

(6) Inflatable liferaft fittings

(a) The breaking strength of the painter system including its means of attachment to the liferaft, except the weak link required by regulation 20(6)(b), shall be not less than 10.0 kN for a liferaft permitted to accommodate nine persons or more, and not less than 7.5 kN for any other liferaft. The liferaft shall be capable of being inflated by one person.

(b) A manually controlled lamp visible on a dark night with a clear atmosphere at a distance of at least 2 miles for a period of not less than 12 h shall be fitted to the top of the liferaft canopy. If it is a flashing light it shall flash at a rate of not less than 50 flashes per minute for the first 2 h of operation of the 12 h operating period. The lamp shall be powered by a sea–activated cell or a dry chemical cell and shall light automatically when the liferaft inflates. The cell shall be of a type that does not deteriorate due to damp or humidity in the stowed liferaft.

(c) A manually controlled lamp shall be fitted inside the liferaft capable of continuous operation for a period of at least 12 h. It shall light automatically when the liferaft inflates and be of sufficient intensity to enable reading of survival and equipment instructions.

(7) Containers for inflatable liferafts

(a) The liferaft shall be packed in a container that is;

(ⅰ) so constructed as to withstand hard wear under conditions encountered at sea;

(ⅱ) of sufficient inherent buoyancy, when packed with the liferaft and its equipment, to pull the painter from within and to operate the inflation mechanism should the vessel sink;

(ⅲ) as far as practicable watertight, except for drain holes in the container bottom.

(b) The liferaft shall be packed in its container in such a way as to ensure, as far as possible, that the waterborne liferaft inflates in an upright position on breaking free from its container.

(c) The container shall be marked with:

(ⅰ) maker’s name or trade mark;

(ⅱ) serial number;

(ⅲ) name of approving authority and the number of persons it is permitted to carry;

(ⅳ) SFV;

(ⅴ) type of emergency pack enclosed;

(ⅵ) date when last serviced;

(ⅶ) length of painter;

(ⅷ) maximum permitted height of stowage above waterline (depending on drop－test height and length of painter);

(ⅸ) launching instructions.

(8) Markings on inflatable liferafts

The liferaft shall be marked with:

(ⅰ) maker’s name or trade mark;

(ⅱ) serial number;

(ⅲ) date of manufacture (month and year);

(ⅳ) name of approving authority;

(ⅴ) name and place of servicing station where it was last serviced;

(ⅵ) number of persons it is permitted to accommodate over each entrance in characters not less than 100 mm in height of a colour contrasting with that of the liferaft.

(9) Davit–launched inflatable liferafts

(a) In addition to complying with the above requirements, a liferaft for use with an approved launching appliance shall, when suspended from its lifting hook or bridle, withstand a load of:

(ⅰ) 4 times the mass of its full complement of persons and equipment, at an ambient temperature and a stabilized liferaft temperature of 20 ± 3℃ with all relief valves inoperative; and

(ⅱ) 1.1 times the mass of its full complement of persons and equipment at an ambient temperature and a stabilized liferaft temperature of －30℃with all relief valves operative.

(b) Rigid containers for liferafts to be launched by a launching appliance shall be so secured that the container or

parts of it are prevented from falling into the sea during and after inflation and launching of the contained liferaft.

(10) Additional equipment for inflatable liferafts.

(a) In addition to the equipment required by regulation 20(5), every inflatable liferaft shall be provided with:

(i) one repair outfit for repairing punctures in buoyancy compartments;

(ii) one topping－up pump or bellows.

(b) The knives required by regulation (20)(5)(a)(ii) shall be safety knives.

Regulation 22
Rigid liferafts

(1) Rigid liferafts shall comply with the requirements of regulation 20 and, in addition, shall comply with the requirements of this regulation.

(2) Construction of rigid liferafts

(a) The buoyancy of the liferaft shall be provided by approved inherently buoyant material placed as near as possible to the periphery of the liferaft. The buoyant material shall be fire–retardant or be protected by a fire–retardant covering.

(b) The floor of the liferaft shall prevent the ingress of water and shall effectively wupplrt the occupants out of the water and insulate them from cold.

(3) Carrying capacity of rigid liferafts

The number of persons which a liferaft shall be permitted to accommodate shall be equal to the lesser of:

(i) the greatest whole number obtained by dividing by 0.096 the volume, measured in cubic metres, of the buoyancy material multiplied by a factor of 1 minus the specific gravity of that material; or

(ii) the greatest whole number obtained by dividing by 0.372 the horizontal cross－sectional area of the floor of the liferaft measured in square metres; or

(iii) the number of persons having an average mass of 75 kg all wearing lifejackets, that can be seated with sufficient comfort and headroom without interfering with the operation of any of the liferaft’s equipment.

(4) Access into rigid liferafts

(a) At least one entrance shall be fitted with a rigid boarding ramp to enable persons to board the liferaft from the sea. In the case of a davit–launched liferaft having more than one entrance, the boarding ramp shall be fitted at the entrance opposite to the bowsing and embarkation facilities.

(b) Entrances not provided with a boarding ramp shall have a boarding ladder, the lowest step of which shall be situated not less than 0.4 m below the liferaft’s light waterline.

(c) There shall be means inside the liferaft to assist persons to pull themselves into the liferaft from the ladder.

(5) Stability of rigid liferafts

(a) Unless the liferaft is capable of operating safely whichever way up it is floating, its strength and stability shall be such that it is either self–fighting or can be readily righted in a seaway and in calm water by one person.

(b) The stability of the liferaft when loaded with its full complement of persons and equipment shall be such that it can be towed at speeds of up to 3 knots in calm water.

(6) Rigid liferaft fittings

(a) The liferaft shall be fitted with an efficient painter. The breaking strength of the painter system, including its means of attachment to the liferaft, except the weak link required by regulation 20(6)(b), shall be not less than 10.0 kN for liferafts permitted to accommodate nine persons or more, and not less than 7.5 kN for any other liferaft.

(b) A manually controlled lamp visible on a dark night with a clear atmosphere at a distance of at least 2 miles for a period of not less than 12 h shall be fitted to the top of the liferaft canopy. If the light is a flashing light it shall flash at a rate of not less than 50 flashes per minute for the first 2 h of operation of the 12 h operating period. The lamp shall be powered by a sea–activated cell or a dry chemical cell and shall light automatically when the liferaft canopy is set in place. The cell shall be of a type that does not deteriorate due to damp or humidity in the stowed liferaft.

(c) A manually controlled lamp shall be fitted inside the liferaft, capable of continuous operation for a period of at least 12 h. It shall light automatically when the canopy is set in place and be of sufficient intensity to enable

reading of survival and equipment instructions.

(7) Markings on rigid liferafts
The liferafts shall be marked with:
(i) name and port of registry of the vessel to which it belongs;
(ii) maker's name or trade mark;
(iii) serial number;
(iv) name of approving authority;
(v) number of persons it is permitted to accommodate over each entrance in characters not less than 100 mm in height of a colour contrasting with that of the liferaft;
(vi) SFV;
(vii) type of emergency pack enclosed;
(viii) length of painter;
(ix) maximum permitted height of stowage above waterline (drop – test height);
(x) launching instructions.

(8) Davit–launched rigid liferafts
In addition to the above requirements, a rigid liferaft for use with an approved launching appliance shall, when suspended from its lifting hook or bridle, withstand a load of four times the mass of its full complement of persons and equipment.

Regulation 23
Rescue boats

(1) General requirements
(a) Except as provided by this regulation, all rescue boats shall comply with the requirements of regulations 17(1) to 17(7)(d) inclusive and (17)(7)(f), 17(7)(g), 17(7)(i), 17(7)(l) and 17(9).
(b) Rescue boats may be either of rigid or inflated construction or a combination of both and shall:
(i) be not less than 3.8 m and not more than 8.5 m in length except where, owing to the size of the vessel, or for other reasons where the carriage of such boats is considered unreasonable or impracticable, the Administration may accept a rescue boat of a lesser length but not less than 3.3 m;
(ii) be capable of carrying at least five seated persons and a person lying down or in the case of a rescue boat less than 3.8 m in length, such lesser number as may be determined by the Administration.
(c) The number of persons which a boat shall be permitted to accommodate shall be determined by the Administration.
(d) Rescue boats which are a combination of rigid and inflated construction shall comply with the appropriate requirements of this regulation to the satisfaction of the Administration.
(e) Unless the rescue boat has adequate sheer, it shall be provided with a bow cover extending for not less than 15% of its length.
(f) Rescue boats shall be capable of manoeuvring at speeds up to 6 knots and maintaining that speed for a period of at least 4 h.
(g) Rescue boats shall have sufficient mobility and manoeuvrability in a seaway to enable persons to be retrieved from the water, marshal liferafts and tow the largest liferaft carried on the vessel when loaded with its full complement of persons and equipment or its equivalent at a speed of at least 2 knots.
(h) A rescue boat shall be fitted with an inboard engine or outboard motor. If it is fitted with an outboard motor, the rudder and tiller may form part of the engine. Notwithstanding the requirements of regulation 17(6)(a), petrol–driven outboard engines with an approved fuel system may be fitted in rescue boats provided the fuel tanks are specially protected against fire and explosion.
(i) Arrangements for towing shall be permanently fitted in rescue boats and shall be sufficiently strong to marshal or tow liferafts as required by paragraph (1)(g).
(j) Rescue boats shall be fitted with weathertight stowage for small items of equipment.

(2) Rescue boat equipment
(a) All items of rescue boat equipment, with the exception of boathooks which shall be kept free for fending off purposes, shall be secured within the rescue boat by lashings, storage in lockers or compartments, storage in

brackets or similar mounting arrangements, or other suitable means. The equipment shall be secured in such a manner as not to interfere with any launching or recovery procedures. All items of rescue boat equipment shall be as small and of as little mass as possible and shall be packed in suitable and compact form.

(b) The normal equipment of every rescue boat shall consist of:

(i) sufficient buoyant oars or paddles to make headway in calm seas. Thole pins, crutches or equivalent arrangements shall be provided for each oar. Thole pins or crutches shall be attached to the boat by lanyards or chains;

(ii) a buoyant bailer;

(iii) a binnacle containing an efficient compass which is luminous or provided with suitable means of illumination;

(iv) a sea - anchor and tripping line with a hawser of adequate strength not less than 10 m in length;

(v) a painter of sufficient length and strength, attached to the release device complying with the requirements of regulation 17(7)(g) and placed at the forward end of the rescue boat;

(vi) one buoyant line, not less than 50 m in length, of sufficient strength to tow a liferaft as required by paragraph (1)(g);

(vii) one waterproof electric torch suitable for Morse signalling, together with one spare set of batteries and one spare bulb in a waterproof container;

(viii) one whistle or equivalent sound signal;

(ix) a first - aid outfit in a waterproof case capable of being closed tightly after use;

(x) two buoyant rescue quoits, attached to not less than 30 m of buoyant line;

(xi) a searchlight capable of effectively illuminating a light - coloured object at night having a width of 18 m at a distance of 180 m for a total period of 6 h and of working for at least 3 h continuously;

(xii) an efficient radar reflector;

(xiii) thermal protective aids complying with the requirements of regulation 26 sufficient for 10% of the number of persons the rescue boat is permitted to accommodate or two, whichever is the greater

(c) In addition to the equipment required by paragraph (2)(b), the normal equipment of every rigid rescue boat shall include:

(i) a boat - hook;

(ii) a bucket;

(iii) a knife or hatchet.

(d) In addition to the equipment required by paragraph (2)(b) the normal equipment of every inflated rescue boat shall consist of:

(i) a buoyant safety knife;

(ii) two sponges;

(iii) an efficient manually operated bellows or pump;

(iv) a repair kit in a suitable container for repairing punctures;

(v) a safety boat - hook.

(3) Additional requirements for inflated rescue boats

(a) The requirements of regulations 17(1)(c) and 17(1)(e) do not apply to inflated rescue boats.

(b) An inflated rescue boat shall be constructed in such a way that, when suspended by its bridle or lifting hook:

(i) it is of sufficient strength and rigidity to enable it to be lowered and recovered with its full complement of persons and equipment;

(ii) it is of sufficient strength to withstand a load of 4 times the mass of its full complement of persons and equipment at an ambient temperature of 20 ± 3 ℃ with all relief valves inoperative;

(iii) it is of sufficient strength to withstand a load of 1.1 times the mass of its full complement of persons and equipment at an ambient temperature of - 30℃, with all relief valves operative.

(c) Inflated rescue boats shall be so constructed as to be capable of withstanding exposure:

(i) when stowed on an open deck on a vessel at sea;

(ii) for 30 days afloat in all sea conditions.

(d) In addition to complying with the requirements of regulation 17(9), inflated rescue boats shall be marked with a serial number, the maker's name or trade mark and the date of manufacture.

(e) The buoyancy of an inflated rescue boat shall be provided by either a single tube subdivided into at least five separate compartments of approximately equal volume or two separate tubes neither exceeding 60% of the total volume. The buoyancy tubes shall be so arranged that, in the event of any one of the compartments being damaged,

the intact compartments shall be able to support the number of persons which the rescue boat is permitted to accommodate, each having a mass of 75 kg, when seated in their normal positions with positive freeboard over the rescue boat's entire periphery.

(f) The buoyancy tubes forming the boundary of the inflated rescue boat shall on inflation provide a volume of not less than 0.17 m3 for each person the rescue boat is permitted to accommodate.

(g) Each buoyancy compartment shall be fitted with a nonreturn valve for manual inflation and means for deflation. A safety relief valve shall also be fitted unless the Administration is satisfied that such an appliance is unnecessary.

(h) Underneath the bottom and on vulnerable places on the outside of the inflated rescue boat, rubbing strips shall be provided to the satisfaction of the Administration.

(i) Where a transom is fitted, it shall not be inset by more than 20% of the overall length of the Administration.

(j) Suitable patches shall be provided for securing the painters fore and aft and the becketed lifelines inside and outside the boat.

(k) The inflated rescue boat shall be maintained at all times in a fully inflated condition.

Regulation 24
Lifejackets

(1) General requirements for lifejackets

(a) A lifejacket shall not sustain burning or continue melting after being totally enveloped in a fire for a period of 2 s.

(b) A lifejacket shall be so constructed that:

(i) after demonstration, a person can correctly don it within a period of 1 min without assistance;

(ii) it is capable of being worn inside‐out or is clearly capable of being worn in only one way and, as far as possible, cannot be donned incorrectly;

(iii) it is comfortable to wear;

(iv) it allows the wearer to jump from a height of at least 4.5 m into the water without injury and without dislodging or damaging the lifejacket.

(c) A lifejacket shall have sufficient buoyancy and stability in calm fresh water to:

(i) lift the mouth of an exhausted or unconscious person not less than 120 mm clear of the water with the body inclined backwards at an angle of not less than 20° and not more than 50° from the vertical position;

(ii) turn the body of an unconscious person in the water from any position to one where the mouth is clear of the water in not more than 5 s.

(d) A lifejacket shall have buoyancy which is not reduced by more than 5% after 24 h submersion in fresh water.

(e) A lifejacket shall allow the person wearing it to swim a short distance and to board a survival craft.

(f) Each lifejacket shall be fitted with a whistle firmly secured by a cord.

(2) Inflatable lifejackets

A lifejacket which depends on inflation for buoyancy shall have not less than two separate compartments and comply with the requirements of paragraph (1) and shall:

(i) inflate automatically on immersion, be provided with a device to permit inflation by a single manual motion and be capable of being inflated by mouth;

(ii) in the event of loss of buoyancy in any one compartment be capable of complying with the requirements of paragraph (1)(b), (c) and (e);

(iii) comply with the requirements of paragraph (1)(d) after inflation by means of the automatic mechanism.

(3) Lifejacket lights

(a) Each lifejacket shall have a light which shall:

(i) have a luminous intensity of not less than 0.75 cd;

(ii) have a source of energy capable of providing a luminous intensity of 0.75 cd for a period of at least 8 h;

(iii) be visible over as great a segment of the upper hemisphere as is practicable when attached to a lifejacket.

(b) If the light referred to in paragraph (3)(a) is a flashing light it shall, in addition:

(i) be provided with a manually operated switch;

(ii) not be fitted with a lens or curved reflector to concentrate the beam;

(iii) flash at a rate of not less than 50 flashes per minute with an effective luminous intensity of at least 0.75 cd.

Regulation 25
Immersion suits

(1) General requirements for immersion suits

(a) The immersion suit shall be constructed with waterproof materials such that:

(i) it can be unpacked and donned without assistance within 2 min taking into account any associated clothing, and a lifejacket if the immersion suit is to be worn in conjunction with a lifejacket;

(ii) it will not sustain burning or continue melting after being totally enveloped in a fire for a period of 2 s;

(iii) it will cover the whole body with the exception of the face. Hands shall also be covered unless permanently attached gloves are provided;

(iv) it is provided with arrangements to minimize or reduce free air in the legs of the suit;

(v) following a jump from a height of not less than 4.5 m into the water there is no undue ingress of water into the suit.

(b) An immersion suit which also complies with the requirements of regulation 24 may be classified as a lifejacket.

(c) An immersion suit shall permit the person wearing it, and also wearing a lifejacket if the immersion suit is to be worn in conjunction with a lifejacket to:

(i) climb up and down a vertical ladder at least 5 m in length;

(ii) perform normal duties during abandonment;

(iii) jump from a height of not less than 4.5 m into the water without damaging or dislodging the immersion suit, or being injured;

(iv) swim a short distance through the water and board a survival craft.

(d) An immersion suit which has buoyancy and is designed to be worn without a lifejacket shall be fitted with a light complying with the requirements of regulation 24(3) and the whistle prescribed by regulation 24(1)(f).

(e) If the immersion suit is to be worn in conjunction with a lifejacket, the lifejacket shall be worn over the immersion suit. A person wearing such an immersion suit shall be able to don a lifejacket without assistance.

(2) Thermal performance requirements for immersion suits

(a) An immersion suit made of material which has no inherent insulation shall be:

(i) marked with instructions that it must be worn in conjunction with warm clothing;

(ii) so constructed that, when worn in conjunction with warm clothing and with a lifejacket if the immersion suit is to be worn with a lifejacket, the immersion suit continues to provide sufficient thermal protection following one jump by the wearer into the water from a height of 4.5 m to ensure that when it is worn for a period of 1 h in calm circulating water at a temperature of 5 ℃ the wearer’s body core temperature does not fall more than 2 ℃.

(b) An immersion suit made of material with inherent insulation when worn either on its own or with a lifejacket, if the immersion suit is to be worn in conjunction with a lifejacket, shall provide the wearer with sufficient thermal insulation following one jump into the water from a height of 4.5 m to ensure that the wearer’s body core temperature does not fall more than 2℃ after a period of 6 h immersion in calm circulating water at a temperature of between 0℃ and 2℃.

(c) The immersion suit shall permit the person wearing it with hands covered to pick up a pencil and write after being immersed in water at 5℃ for a period of 1 h.

(3) Buoyancy requirements

A person in fresh water wearing either an immersion suit complying with the requirements of regulation 24 or an immersion suit with a lifejacket shall be able to turn from a face–down to a face–up position in not more than 5 s.

Regulation 26
Thermal protective aids

(1) A thermal protective aid shall be made of waterproof material having a thermal conductivity of not more than 0.25 W/m.K and shall be so constructed that, when used to enclose a person, it shall reduce both the convective and evaporative heat loss from the wear’s body.

(2) The thermal protective aid shall:

(ⅰ) cover the whole body of a person wearing a lifejacket with the exception of the face. Hands shall also be covered unless permanently attached gloves are provided;

(ⅱ) be capable of being unpacked and easily donned without assistance in a survival craft or rescue boat;

(ⅲ) permit the wearer to remove it in the water in not more than 2 min, if it impairs ability to swim.

(3) The thermal protective aid shall function properly throughout an air temperature range －30℃ to +20℃.

Regulation 27
Lifebuoys

(1) Lifebuoy specification
Every lifebuoy shall:

(ⅰ) have an outer diameter of not more than 800 mm and an inner diameter of not less than 400 mm;

(ⅱ) be constructed of inherently buoyant material; it shall not depend upon rushes, cork shavings or granulated cork, any other loose granulated material or any air compartment which depends on inflation for buoyancy;

(ⅲ) be capable of supporting not less than 14.5 kg of iron in fresh water for a period of 24 h;

(ⅳ) have a mass of not less than 2.5 kg;

(ⅴ) not sustain burning or continue melting after being totally enveloped in a fire for a period of 2 s;

(ⅵ) be constructed to withstand a drop into the water from the height at which it is stowed above the waterline in the lightest seagoing condition or 30 m, whichever is the greater, without impairing either its operating capability or that of its attached components;

(ⅶ) if it is intended to operate the quick－release arrangement provided for the self－activated smoke signals and self－igniting lights, have a mass sufficient to operate the quick－release arrangement or 4 kg, whichever is the greater;

(ⅷ) be fitted with a grabline not less than 9.5 millimetres in diameter and not less than four times the outside diameter of the body of the buoy in length. The grabline shall be secured at four equidistant points around the circumference of the buoy to form four equal loops.

(2) Lifebuoy self–igniting lights
Self–igniting lights required by regulation 10(2) shall:

(ⅰ) be such that they cannot be extinguished by water ;

(ⅱ) be capable of either burning continuously with a luminous intensity of not less than 2 cd in all directions of the upper hemisphere or flashing (discharge flashing) at a rate of not less than 50 flashes per minute with at least the corresponding effective luminous intensity;

(ⅲ) be provided with a source of energy capable of meeting the requirement of subparagraph (ⅱ) for a period of at least 2 h;

(ⅳ) be capable of withstanding the drop test required by paragraph (1)(ⅵ).

(3) Lifebuoy self–activating smoke signals
Self–activating smoke signals required by regulation 10(3) shall:

(ⅰ) emit smoke of a highly visible colour at a uniform rate for a period of at least 15 min when floating in calm water;

(ⅱ) not ignite explosively or emit any flame during the entire smoke emission time of the signal;

(ⅲ) not be swamped in a seaway;

(ⅳ) continue to emit smoke when fully submerged in water for a period of at least 10 s;

(ⅴ) be capable of withstanding the drop test required by paragraph (1)(ⅵ).

(4) Buoyant lifelines
Buoyant lifelines required by regulation 10(4) shall;

(ⅰ) be non－kinking;

(ⅱ) have a diameter of not less than 8 mm;

(ⅲ) have a breaking strength of not less than 5 kN.

Regulation 28
Line–throwing appliances

(1) Every line–throwing appliance shall:
(ⅰ) be capable of throwing a line with reasonable accuracy;
(ⅱ) include not less than four projectiles each capable of carrying the line at least 230 m in calm weather;
(ⅲ) include not less than four lines each having a breaking strength of not less than 2 kN;
(ⅳ) have brief instructions or diagrams clearly illustrating the use of the line－throwing appliance.

(2) The rocket, in the case of a pistol–fired rocket, or the assembly, in the case of an integral rocket and line, shall be contained in a water–resistant casing. In addition, in the case of a pistol–fired rocket, the line and rockets together with the means of ignition shall be stowed in a container which provides protection from the weather.

Regulation 29
Rocket parachute flares

(1) The rocket parachute flare shall:
(ⅰ) be contained in a water－resistant casing;
(ⅱ) have brief instructions or diagrams clearly illustrating the use of the rocket parachute flare printed on its casing;
(ⅲ) have integral means of ignition;
(ⅳ) be so designed as not to cause discomfort to the person holding the casing when used in accordance with the manufacturer’s operating instructions.

(2) The rocket shall, when fired vertically, reach an altitude of not less than 300 m. At or near the top of its trajectory, the rocket shall eject a parachute flare, which shall:
(ⅰ) burn with a bright red colour;
(ⅱ) burn uniformly with an average luminous intensity of not less than 30,000 cd;
(ⅲ) have a burning period of not less than 40 s;
(ⅳ) have a rate of descent of not more than 5 m/s;
(ⅴ) not damage its parachute or attachments while burning.

Regulation 30
Hand flares

(1) The hand flare shall:
(ⅰ) be contained in a water－resistant casing;
(ⅱ) have brief instructions or diagrams clearly illustrating the use of the hand flare printed on its casing;
(ⅲ) have self－contained means of ignition;
(ⅳ) be so designed as not to cause discomfort to the person holding the casing and not endanger the survival craft by burning or glowing residues when used in accordance with the manufacturer’s operating instructions.

(2) The hand flare shall:
(ⅰ) burn with a bright red colour;
(ⅱ) burn uniformly with an average luminous intensity of not less than 15,000 cd;
(ⅲ) have a burning period of not less than 1 min;
(ⅳ) continue to burn after having been immersed for a period of 10 s under 100 mm of water.

Regulation 31
Buoyant smoke signals:

(1) The buoyant smoke signal shall:
(ⅰ) be contained in a water－resistant casing;

(ii) not ignite explosively when used in accordance with the manufacturer's operating instructions;

(iii) have brief instructions or diagrams clearly illustrating the use of the buoyant smoke signal printed on its casing.

(2) The buoyant smoke signal shall:

(i) emit smoke of a highly visible colour at a uniform rate for a period of not less than 3 min when floating in calm water;

(ii) not emit any flame during the entire smoke emission time;

(iii) not be swamped in a seaway;

(iv) continue to emit smoke when submerged in water for a period of 10 s under 100 mm of water.

Regulation 32
Launching and embarkation appliances

(1) General requirements

(a) Each launching appliance together with all its lowering and recovery gear shall be so arranged that the fully equipped survival craft or rescue boat it serves can be safely lowered against a trim of up to 10 °and a list of up to 20 °either way:

(i) when boarded by its full complement of persons;

(ii) without persons in the survival craft or rescue boat.

(b) A launching appliance shall not depend on any means other than gravity or stored mechanical power which is independent of the vessel's power supplies to launch the survival craft or rescue boat it serves in the fully loaded and equipped condition and also in the light condition.

(c) A launching mechanism shall be so arranged that it may be actuated by one person from a position on the vessel's deck, and from a position within the survival craft or rescue boat; the survival craft shall be visible to the person on deck operating the launching mechanism.

(d) Each launching appliance shall be so constructed that a minimum amount of routine maintenance is necessary. All parts requiring regular maintenance by the vessel's crew shall be readily accessible and easily maintained.

(e) The winch brakes of a launching appliance shall be of sufficient strength to withstand:

(i) a static test with a proof load of not less than 1.5 times the maximum working load; and

(ii) a dynamic test with a proof load of not less than 1.1 times the maximum working load at maximum lowering speed.

(f) The launching appliance and its attachments other than winch brakes shall be of sufficient strength to withstand a static proof load on test of not less than 2.2 times the maximum working load.

(g) Structural members and all blocks, falls, padeyes, links, fastenings and all other fittings used in connection with launching equipment shall be designed with not less than a minimum factor of safety on the basis of the maximum working load assigned and the ultimate strength of the material used for construction. A minimum factor of safety of 4.5 shall be applied to all davit and winch structural members, and a minimum factor of safety of 6 shall be applied to falls, suspension chains, links and blocks.

(h) Each launching appliance shall, as far as practicable, remain effective under conditions of icing.

(i) A lifeboat launching appliance shall be capable of recovering the lifeboat with its crew.

(j) The arrangements of the launching appliance shall be such as to enable safe boarding of the survival craft in accordance with the requirements of regulations 20(4)(b) and 17(3)(a).

(2) Launching appliances using falls and a winch

(a) Falls shall be of rotation–resistant and corrosion–resistant steel wire rope.

(b) In the case of a multiple drum winch, unless an efficient compensatory device is fitted, the falls shall be so arranged as to wind off the drums at the same rate when lowering, and to wind on to the drums evenly at the same rate when hoisting.

(c) Every rescue boat launching appliance shall be fitted with a powered winch motor of such capacity that the rescue boat can be raised from the water with its full complement of persons and equipment.

(d) An efficient hand gear shall be provided for recovery of each survival craft and rescue boat. Hand gear handles or wheels shall not be rotated by moving parts of the winch when the survival craft or rescue boat is being lowered or when it is being hoisted by power.

(e) Where davit arms are recovered by power, safety devices shall be fitted which will automatically cut off the

power before the davit arms reach the stops in order to avoid overstressing the falls or davits, unless the motor is designed to prevent such overstressing.

(f) The speed at which the survival craft or rescue boat is lowered into the water shall be not less than that obtained from the formula:

S=0.4+0.02H

where:

S=speed of lowering in metres per second, and

H=height in metres from davit head to the waterline in the lightest seagoing condition.

(g) The maximum lowering speed shall be established by the Administration having regard to the design of the survival craft or rescue boat, the protection of its occupants from excessive forces, and the strength of the launching arrangements taking into account inertia forces during an emergency strop. Means shall be incorporated in the appliance to ensure that this speed is not exceeded.

(h) Every rescue boat launching appliance shall be capable of hoisting the rescue boat when loaded with its full rescue boat complement of persons and equipment at a rate of not less than 0.3m/s.

(i) Every launching appliance shall be fitted with brakes capable of stopping the descent of the survival craft or rescue boat and holding it securely when loaded with its full complement of persons and equipment; brake pads shall, where necessary, be protected from water and oil.

(j) Manual brakes shall be so arranged that the brake is always applied unless the operator, or a mechanism activated by the operator, holds the brake control in the "off" position.

(3) Float–free launching

Where a survival craft requires a launching appliance and is also designed to float free, the float–free release of the survival craft from its stowed position shall be automatic.

(4) Free–fall launching

Every free–fall launching appliance using an inclined plane shall, in addition to complying with the applicable requirements of paragraph (1), also comply with the following requirements:

(ⅰ) the launching appliance shall be so arranged that excessive forces are not experienced by the occupants of the survival craft during launching;

(ⅱ) the launching appliance shall be a rigid structure with a ramp angle and length sufficient to ensure that the survival craft effectively clears the vessel;

(ⅲ) the launching appliance shall efficiently protected against corrosion and be so constructed as to prevent incendive friction or impact sparking during the launching of the survival craft.

(5) Evacuation–slide launching and embarkation

Every evacuation–slide launching appliance shall, in addition to complying with the applicable requirements of paragraph (1), also comply with the following requirements:

(ⅰ) the evacuation slide shall be capable of being deployed by one person at the embarkation station;

(ⅱ) the evacuation slide shall be capable of being used in high winds and in a seaway.

(6) Liferaft launching appliance

Every liferaft appliance shall comply with the requirements of paragraphs (1) and (2), except with regard to use of gravity for turning out the appliance, embarkation in the stowed position and recovery of the loaded liferat, The launching appliance shall be so arranged as to prevent premature release during lowering and shall release the liferaft when waterborne.

(7) Embarkation ladders

(a) Handholds shall be provided to ensure a safe passage from the deck to the head of the ladder and vice versa.

(b) The steps of the ladder shall be:

(ⅰ) made of hardwood, free from knots or other irregularities, smoothly machined and free from sharp edges and splinters, or of suitable material of equivalent properties;

(ⅱ) provided with an efficient non－slip surface either by longitudinal grooving or by the application of an approved non－slip coating;

(ⅲ) not less than 480 mm long, 115 mm wide and 25 mm in depth, excluding any non－slip surface or coating;

(ⅳ) equally spaced not less than 300 mm or more than 380 mm apart and secured in such a manner that they

will remain horizontal.

(c) The side ropes of the ladder shall consist of two uncovered manila ropes not less than 65 mm in circumference on each side. Each rope shall be continuous with no joints below the top step. Other materials may be used provided the dimensions, breaking strain, weathering, stretching and gripping properties are at least equivalent to those of manila rope. All rope ends shall be secured to prevent unravelling.

Interpretation

Considering the development of the technology, the life-saving appliances, if complying with the latest LSA Code of IMO and been surveyed by RO, will be regarded as having complied with the requirements of the Cape Town Agreement.

Technical Background

Remarks

CHAPTER 13 OTHERS

13.1 Fire Prevention in Machinery Spaces of Ships in Service – Guidance to Owners

IACS Number	Rec. 18	version	1987/ Rev.1, June,1999/ Rev.2, Feb.,2021	Date of implement ation		Means of implementation	

Main Contents

1. Introduction

1.1 Based on past experience it is known that the combination of combustible materials and sources of ignition are the main cause of machinery space fires. The combustible material involved is in the majority of cases oil, i.e. fuel oil, lubricating oil, thermal oil or hydraulic oil. However, plastic materials in electrical installations may also be combustible material causing outbreak of fires.
1.2 There is a large variety of potential ignition sources and the most common are hot surfaces, e.g. exhaust pipes and steam pipes, over-heating of machinery or ignition from electrical installations due to short circuiting or sparks caused by operation of switchgear. Other frequent ignition sources are those associated with human activities, e.g. smoking, welding and grinding.
1.3 The experiences of classification societies confirm the importance of machinery space fire prevention and the reports of survey - class surveys as well as Passenger Ship Safety Surveys and Cargo Ship Safety Equipment Surveys - contain frequent references to lack of maintenance of fire safety of machinery spaces.
1.4 Where there is any doubt in applying this Guideline, clarification should be obtained from the individual classification society. Attention is directed to the separate published Rules of each. This Guideline is not meant as a substitute for the society's Rules or the independent judgement and experience of Owners and Surveyors.

2. Contributing Factors to Machinery Space Fires

2.1 Failures resulting from the daily use of machinery space installations, such as e.g. oil leakages, breakage of flexible pipes.
2.2 Lack of adequate cleanliness adds to the fire hazard in two ways.
a) In the first place the probability of occurrence of fire, in particular due to ignition caused by human activities is increased because of the widespread presence of the combustible material in the form of oil spill/oily deposits.
b) Secondly, an unclean machinery space may cause a small fire to spread, e.g. a fire in an electrical switchboard or panel may develop into a full machinery space fire due to the presence of oil spills/oily deposits.

3. Measures to Reduce the Fire Risk

3.1 The classification requirements for the construction and inspection of machinery spaces cannot, alone, ensure the fire safety at all times; the effort of all parties concerned is necessary.
3.2 The Shipowners and their crews should apply a programme of maintenance and housekeeping.
3.3 Where leakage of flammable liquids occurs during normal service or routine maintenance work, special arrangement and early clean-up should be made by the crew to prevent these fluids from reaching other parts of the machinery where danger of ignition may arise.

4. What is IACS Doing?

4.1 At the occasion of the class periodical surveys a machinery and electrical plant survey is carried out as prescribed in the Chapter I, regulations 7 and 10 of the International Convention for the Safety of Life at Sea, 1974, as amended.
4.2 The periodical surveys should mainly ensure that the standard to which the installation was originally built is maintained.
4.3 The Surveyor can only assess the actual condition of the machinery space fittings at the time of survey. In between two inspections the proper maintenance must remain the owner's responsibility.

4.4 Reference document: UR F35, Rec. No.58 and MSC.1/Circ.1321.

5. Defects to Machinery Space Installations

5.1 This part deals with various types of defects found in machinery spaces, which for the most part are caused by a lack of proper maintenance or by improper operation.

5.2 Shielding of high pressure fuel oil pipes

Typical defects found may be of the following nature:

- Partially lacking or damaged shielding.
- Loose or defective end attachments of shielding.
- Flexible pipes used for shielding fitted in such a way that contact between high pressure fuel pipe and flexible pipe causes wear damage.
- Defective drainage arrangements.

5.3 Insulation of Exhaust Pipes, Thermal Oil Pipes and Steam Pipes. Commonly found defects are:

- Partially lacking insulation, typically in way of flanges or at locations where removal of insulation is necessary for maintenance.
- Oil soaked insulation due to damage or the lack of steel sheeting.
  The standard of insulation and protection against oil penetration into the insulation is an area where the general standard has improved over the years. In earlier days it was not uncommon for flanges to be left uninsulated and that metal sheeting of the insulation was incomplete. In cases where incomplete insulation or unsheeted insulation is found in locations where oil leakages may occur, the owner and operating personnel should make improvements regardless of the original standard.

5.4 Shielding of electrical equipment against oil and water leakages

Oil leakages into electrical equipment may be ignited due to sparks normally generated by operation of switchgear (fine oil spray is probably most susceptible to ignition). Water leakages may cause short circuiting and ignition of insulation or other material of plastic type. The owner and operating personnel should in particular look for signs of leaking flanges, deterioration of pipes and leakages from other machinery which may come into contact with subject electrical equipment.

6. Crew's and Owner's Duties with Respect to Machinery Space Installations

6.1 Attention should be directed at the condition of flexible pipes used in oil systems, e.g. in connection with hydraulic power arrangements, flexible pipes are used to prevent harmful vibrations and noise. High pressures in combination with pulsations may cause breakage of the flexible pipes, particularly in way of end attachments.

6.2 Also, flexible pipes for connecting fuel oil supply to oil burners are extensively used. Any signs of deteriorating conditions being revealed, should be replaced or at least temporarily repaired.

6.3 Broken or loose fastenings of oil pipes should be repaired because they may result in future damage.

6.4 It is Owner's responsibility to ensure that the machinery space is maintained in a clean condition.

A cleanliness level is not acceptable in cases where floor plates are slippery from extensive oil spills, or oil is seeping from machinery, or if painted surfaces have an oil layer, or when a fire hazard exists due, for instance, to accumulation of rags or other similar materials or presence of oil on bilge water surface.

Note

13.2 Fire Protection of Machinery Spaces

IACS Number	Rec. 58	version	June,1999/ Rev.1, July,2003/ Corr.1, Jan.,2004/ Rev.2, Feb.,2021	Date of implementation		Means of implementation	

Main Contents

1. Distribution piping for flammable liquids

Cocks or valves should be provided for isolating instruments from the main pipes.

Temperature sensors should be fitted in pockets.

All valves and cocks forming part of the fuel installation should be capable of being operated from readily accessible positions.

2. Leakage containment arrangements for engines, equipment and boilers

Containment provided for areas where frequent leakage may be expected such as oil burners, purifiers, drains and valves under daily service tanks etc. should be fitted with adequate drainage. Where drain pipes are provided from collected leakages, they should be led to a suitable oil drain tank not forming part of an overflow system.

3. Valve for oil fuel pumps

Stop valves or cocks should be fitted on both suction and delivery sides of oil fuel pumps. All oil fuel pumps should be provided with pressure relief valves on the dis- charge side so that the discharged oil may be led to the suction side of the pump.

Pressure relief valves need not be fitted when the system is served only be centrifugal pumps, so designed that the pressure delivered cannot exceed that for which the piping is designed.

4. Overheating and seizure — oil heaters

4.1. Where steam heaters or heaters using other heating media are provided in fuel or lubricating oil systems, they should be fitted with at least a high temperature alarm or low flow alarm in addition to a temperature control, except where the temperature dangerous for the ignition of the medium cannot be reached.

4.2. When electric heaters are fitted, means should be provided to ensure that heating elements are permanently submerged during the operation.

In order to avoid in any case a surface temperature of heating element above 220℃, a safety temperature switch, independent from the automatic control sensor, should be provided. The safety switch should cut off the electrical power supply in the event of excessive temperature and shall be provided with manual reset.

5. Hot surfaces

The insulation of hot surfaces should be of a type and so supported that it will not crack or deteriorate when subject to vibration.

6. Oil spillages coming into contact with hot surfaces, electrical installations or other sources of ignition

6.1. Oil filters fitted in parallel for the purpose of enabling cleaning without disrupting oil supply to engines (e.g. duplex filters) should be provided with arrangements that will minimise the possibility of a filter under pressure being opened by mistake. Filters/filter chambers should be provided with suitable means for:

- venting when put into operation

- depressurising before being opened

Valves or cocks with drain pipes led to a safe location should be used for this purpose.

6.2. Hydraulic units with working pressure above 15 bar should preferably be placed in separate spaces. If it is impracticable to locate such units in a separate space, adequate shielding should be provided.

7. Faults in boiler firing, scavenging manifold, boiler uptakes and exhaust gas uptakes

7.1. The oil burners should be so arranged that they cannot be withdrawn unless the oil supply to the burners is cut off.

7.2. The fuel supply to all burners should be capable of being automatically cut off in case of total lack of flame in the combustion chamber; moreover, this should be warned by a visual audible alarm. The alarms need not be fitted for domestic boilers.

8. Thermal oil installations

8.1. System arrangements

The inlet and outlet valves of oil-fired thermal oil heaters and exhaust-fired thermal oil heaters should be controllable from outside the compartment where they are situated. As an alternative, an arrangement for quick gravity drainage of the thermal oil contained in the system into a collecting tank is acceptable.

Heating of liquid cargoes with flash points below 60 ℃ should be arranged by means of a separate secondary system, located completely within the cargo area.

However, a single circuit system may be accepted on the following conditions:

- system should be so arranged that a positive pressure in the coil should be at least 3 m water column above the static head of the cargo when circulating pump is not in operation.

- the thermal oil system expansion tank should be fitted with high and low level alarms.

- means should be provided in the thermal oil system expansion tank for detection of flammable cargo vapours. Portable equipment may be accepted.

- valves for the individual heating coils should be provided with locking arrangement to ensure that the coils are under static pressure at all times.

The thermal oil circulating pumps should be arranged for emergency stopping from a position outside the space where they are situated.

Vents from expansion tanks and thermal oil storage tanks of thermal oil heating plants should be led to open deck.

8.2. Exhaust-fired thermal oil heaters

The heater should be so designed and installed that all tubes may easily and readily be inspected for signs of corrosion and leakage.

Visual inspection and tightness testing of the heater tubes to not less the working pressure should be carried out annually, and hydraulic testing shall be carried out bi- annually.

The heater should be fitted with temperature sensor(s) and an alarm for fire detection.

A fixed fire extinguishing and cooling system should be fitted. A drenching system providing copious amounts of water may be accepted. The exhaust ducting below the exhaust boiler should be arranged for adequate collection and drainage, to prevent water flowing into the diesel engine. The drain should be led to a suitable location.

9. Segregation of fuel oil purifiers

9.1. Fuel oil purifiers for heated fuel oil should be subject to the following.

9.1.1. The fuel oil purifiers should be placed in a separate room, enclosed by steel bulkheads extending from deck to deck and provided with self-closing steel doors.

9.1.2. The room should be provided with:

1 independent mechanical ventilation or a ventilation arrangement which can be isolated from the machinery space ventilation,

2 fire detecting system,

3 fixed fire extinguishing installation:

The extinguishing installation should be capable of being activated from outside the room.

Closing of ventilation openings should be effected from a position close to where the extinguishing system is activated.

The extinguishing system should be separate for the room, but may be a part of the main fire extinguishing system for the machinery space.

9.2. Where the size and/or design of the engine room makes it impracticable to locate the fuel oil purifiers in a separate space, special consideration should be given with regard to location, containment of possible leakages, and shielding and ventilation.

A local fixed fire extinguishing system should be provided, capable of being activated automatically or activated manually from the machinery control position or from other suitable location. If automatic release is provided, additional manual release should be arranged.

Note
This document should be referenced together with MSC.1/Circ.1321 “Guidelines for measures to prevent fires in engine-rooms and cargo pump-rooms”

13.3 Voyage Data Recorder（VDR）

IACS Number	**Rec.85**	**Version**	**Rev.1/ Dec. 2018**	**Date of implement ation**	**01.07. 2014**	**Means of implementatio n**	**VDR installation onboard ship**

Main Contents

These Recommendations are applicable to Voyage Data Recorders (VDR) required by SOLAS Chapter V, Reg. 20.

These Recommendations may be used by IACS Member Societies in conjunction with their requirements and procedures when approving VDR installation for ships.

The recommendations are based on the understanding that the applicable regulations and guidelines issued by the International Maritime Organization are complied with and, in particular IMO Res. A.694(17) and Res. MSC.333(90).

These Recommendations refer to VDRs installed on or after 1 July 2014. For VDRs installed before 1 July 2014 refer to Res. A.861(20), as amended by resolution MSC.214(81).

1. Type Approval

The VDR should be type approved (ref. SOLAS reg.V/18.1) and installed according to IMO Res. MSC.333(90). The VDR should be type tested according to IEC 61996.

2. Approval of documents

The following documents should be submitted for plan approval prior for the VDR installation onboard ship:

- General description of the installation
- Cable plan/block diagram identifying all sensors and cable types
- List of data items to be recorded by VDR
- All sensor's interface specification
- Location of all VDR components (e.g. main unit, fixed recording medium in its protective capsule, float-free recording medium in its float-free capsule, long-term recording medium, dedicated reserve power source, microphones)
- Information about power supply to the VDR
- Type Approval Certificate for the VDR issued by or on behalf of the Administration.

3. Survey

3.1 Testing of a new installation.

The final installation should be tested according to the manufacturer's instructions. Testing of the installation normally requires attendance from the manufacturer representative and use of special playback equipment (ref. IMO Res. MSC.333(90), Annex, 5.1.3).

Before the surveyor attends the test, the VDR should record for a period of at least 12 hours with all sensor inputs

active (in operation) before the recorded data is presented for the surveyor item by item according to paragraph 7 in this document.

The survey is to verify that the installation complies with paragraphs 4, 5 and 7 of this document. In addition to verifying that the required sensor data of paragraph 7 are recorded as applicable, it should be verified that the configuration file includes proper identification of the data received on the various input channels.

The procedures required for data retrieval should be included in the ship's safety management system[①] and to be verified by or on behalf of the Administration.

3.2 Annual testing of VDR.

The voyage data recorder system, including all sensors, should be subjected to an annual performance test. The test should be conducted by an approved service supplier to verify the accuracy, duration and recoverability of the recorded data. In addition, tests and inspections should be conducted to determine the serviceability of all protective enclosures and devices fitted to aid location (Ref. SOLAS Ch. V Reg.18.8 and HSC Reg.13.16.2).

The service supplier should be approved by the Society or approvals done by the Flag Administration itself or duly authorised organisations acting on behalf of the Flag Administration. Service supplier approvals granted on behalf of the Flag Administration are to be conducted in accordance with the procedures detailed in IACS UR Z17, with reference to Annex 1, paragraph 9 therein.

The Surveyor should check that the vessel has a copy of a valid Certificate of Compliance (COC) which should contain following information:

- name and IMO number of the ship
- date and place of successfully passed testing
- manufacturer, type and serial number of the VDR
- name and address of service supplier
- name and signature of the technician carrying out the annual performance test
- Society service supplier approval certificate number and the date of expire of the service supplier certificate.

If the ship is not able to present a Certificate Of Compliance to document the annual test, only a conditional short term Passenger Ship Safety Certificate/Cargo Ship Safety Equipment Certificate/Cargo Ship Safety Certificate should be issued.

4. Location of the VDR components

All VDR components should be installed according the VDR manufacturer's installation guidelines and any special requirements stated in the Type Approval Certificate.

① see section 10 of the ISM Code.

4.1 Fixed and float-free recording medium

The protective capsule should be located in open deck area close to the bridge and as near to the centerline of the ship as practically possible. Considerations should be made to ensure both the accessibility for routine maintenance and the accessibility for both ROVs and divers in case of underwater removal after an accident. The location of the float-free capsule should minimise the interference by radar beam and the risk of obstruction after release.

4.2 Microphones

Microphones should be so positioned on the bridge covering all work stations as described in MSC/Circ.982 so that conversation is recorded. The recording should be such that, on playback, a normal speaking voice should provide adequate intelligibility while the ship is performing its normal operations. This performance should be maintained at all work stations while there is a single audio alarm anywhere on the bridge or any noise, including noise from faulty equipment or mounting, or wind. This should be achieved through the use of at least two channels of audio recording. Microphones positioned outside on bridge wings, should be recorded on at least one additional separate channel.

4.3 Alarm unit

The VDR alarm unit (audible alarm device and visual indicator) should be located in the navigation bridge.

4.4 Other components

All other VDR components can be located as found appropriate allowing for easy maintenance (ref. IMO Res. MSC.333(90), Annex, 5.1.3).

5. Power supply

The VDR should be connected to the ship's main and emergency source of power and backed-up by the dedicated reserve source of electrical power for a period of 2 hours.

Recording should be continuous unless automatically terminated at the end of the 2 hour period of the supply by the dedicated reserve source of electrical power.

6. Sensor interfacing

Loss of one sensor should not cause loss of other data items that do not depend upon the particular sensor (e.g. failure of the radar should not cause loss of other data items than the radar picture).

The signal information may be derived from discrete sensors wired directly to the VDR or may also be derived from a suitable data network connection. Where the information is derived from a data network the interfacing should be implemented in such a manner that the network will continue to operate as intended in the event of any VDR system or interface component fault. The data transfer should be conducted in accordance with a relevant international interface standard (ref. IMO Res. MSC.333(90), Annex, 8).

7. Sensor input

7.1 Date and time

Date and time, referenced to UTC, should be obtained from a source external to the ship and an internal clock should be synchronized with valid date and time data. During times of a loss of the external source, the internal clock should be used. The recording should indicate which source is in use. The recording method should be such that the timing of all other recorded data items can be derived on playback with a resolution and continuity sufficient to reconstruct the history of the incident in detail (ref. IMO Res. MSC.333(90), Annex, 5.5.1).

7.2 Ship's position

From a global navigation satellite system receiver or alternatively, a terrestrial radionavigation system. The ships position should be recorded, as available on the ship, up to a resolution of 0.0001 min of arc.

7.3 Speed

Speed through water and speed over ground, including an indication which it is, derived from the speed and distance measuring equipment (speed log) should be recorded, as available on the ship, up to a resolution of 0.1 knots. The interval between recordings is not exceed 1 second.

Speed over ground input from an Electronic Position Fixing System (EPFS) will require that EPFS is approved as speed log.

7.4 Heading

Heading from the main heading source in use should be recorded, as available on the ship, up to a resolution of 0.1. The interval between recordings is not exceed 1 second.

7.5 Bridge audio

The bridge audio signals should be recorded in accordance with paragraph 4.6.5 of IEC 61996.

7.6 Communication audio

From the VHF installed nearest to the conning position (see SOLAS Ch. V Reg. 22) or alternatively, nearest to the main radar display.

7.7 Radar data

The radar picture from the main radar (normally X-band at main conning position). Updating period less than every 15 second.

For ships where the statutory instrument requires two radar installations to be fitted and where inter switching facilities are provided between each installation the information from the radar installation that is in use by the navigator at the time of recording is the information that should be held in the voyage data recorder final recording medium.

7.8 ECDIS

Where a vessel is fitted with an ECDIS installation, the VDR should record the ECDIS display in use at the time as

the primary means of navigation.

NOTE: In the case of a ship fitted with an INS, 'ECDIS display' signifies 'route monitoring task and functions display'.

Where multiple ECDIS are installed and when it is not possible to determine which ECDIS image is used as the primary means of navigation, all images should be recorded in sequence such that at least one image is recorded at an interval not exceeding 15 s, with the most recent image from each location stored in turn. E.g. when 3 ECDIS displays are in use then each ECDIS image should be recorded at least every 45 s.

7.9 Echo sounder

Depth below the keel up to a resolution of 0.1m as available on the ship. The depth scale currently being displayed and other status information should be recovered where available. Updating frequency better than 1 Hz.

7.10 Main alarms

This should include the status of all mandatory alarms on the bridge, as listed in Resolution A.1021(26), Code on Alerts and Indicators, table 10.1.1.

Where the alarm functions described in table 10.1.1 include more than one alarm, the items should be recorded such that the status of each individual alarm can be identified within the final recording medium.

Where the statutory instruments permits the installation of override arrangements of shutdown or alarm functions, the activation of the override should be identified in the final recording medium.

7.11 Rudder order and response

The status of all steering gear power units installed in the ship and the status and settings of the control mode should be identified within the final recording medium.

Where arrangements are made for the remote control of the steering gear from more than one location, such as bridge wings or from automatic control systems such as autopilots and track controllers the individual order and response for the steering gear from the control location in operation and settings of the control mode in operation should be identified within the final recording medium.

Rudder order and response angles should be recorded up to a resolution of 1 degree as available and permitted on the ship. The interval between recordings is not exceed 1 second.

7.12 Engine and thruster order and response

This should include the positions of engine telegraph or direct engine/propeller pitch controls in operation, including shaft(s) r.p.m (or equivalent), and feedback indications, if fitted, including ahead/astern indicators. This should also include status of all propulsion thrusters (i.e. r.p.m., pitch and thrust direction).

RPM should be recorded up to resolution of 1 r.p.m. Where the controllable pitch propeller is used, the pitch should be recorded up to a resolution of 1 degree. The interval between recordings is not exceed 1 second.

7.13 Hull openings status

This should include all mandatory status information required to be displayed on the bridge.

Reference	Alarm	Applicability	Comments
SOLAS II-1			
15-1.2	Position of watertight external openings, except for cargo hatch covers	Cargo ships	

7.14 Watertight and fire door status

This should include all mandatory status information required to be displayed on the bridge.

Reference	Alarm	Applicability	Comments
SOLAS II-1			
13.6 and 14.2	Power-operated watertight doors indication	Passenger ships constructed on or after 1 February 1992 or passenger ships carrying goods vehicles and accompanying personnel regardless of the date of construction (ref. SOLAS II-1/16.1/2)	*
13-1.2	Position of internal watertight doors used while at sea	Cargo ships	*
13-1.3	Position of internal watertight door and access hatch covers normally closed at sea	Cargo ships	*
SOLAS II-2			
7.9.3	Fire door indication	Passenger ships carrying more than 36 passengers	* If located on the bridge
9.4.1.1.5.6	Fire door indication	Passenger ships	* If located on the bridge
9.4.1.1.5.13	Special category space fire door indication	Passenger ships	* Except if power operated and automatically closed

* The status of each individual door should be identified within the final recording medium.

7.15 Accelerations and hull stresses

Where a ship is fitted with IMO mandated hull stress and response-monitoring equipment, all the data items that have been pre-selected within the equipment should be identified within the final recording medium. The interval between the recordings is not to exceed 1 second.

7.16 Wind speed and direction

This should be applicable where a ship is fitted with a sensor having a suitable output in accordance with IEC 61162. Either relative or true wind speed and direction should be identified within the final recording medium together with the information which of relative or true wind speed is recorded. The interval between the recordings is not to exceed 15 seconds.

7.17 AIS

All AIS data should be recorded.

7.18 Rolling Motion

The VDR should be connected to an electronic inclinometer if installed. The recording method should be such that the rolling motion can be reconstructed during playback.

7.19 Electronic Logbook

Where a ship is fitted with an electronic logbook in accordance with the standards of the IMO the information from this should be recorded.

NOTE: At the time of writing the IMO has not published any standards for this purpose.

7.20 Additional information

All other information recorded by the VDR should not degrade the performance of the VDR (e.g. reduce the capacity of the Protective Memory Capsule).

Technical Background

Amendments to REC. No. 85 are for consistency with the revised IGC Code (MSC.370(93)).

13.4 IACS Model Report for IMO Resolution MSC.215(82) Annex 1 "Test Procedures for Coating Qualification"

IACS Number	**Rec.101**	version	**Jun.,2008**	Date of implementation	**Jul.1,2008**	Means of implementation	

Model Report

Example Coating Producer

Ballast Tank Coating test of 2 * 160 µm Example Epoxy Paint on Example Shop Primer
1. Summary

The coating system, 2 * 160 µm Example Epoxy Paint from Example Coating Producer, applied to Example zinc silicate shop primed panels has been tested in accordance with the IMO Performance Standard for protective Coatings /1/. The coating was applied after 2 months weathering of the shop primer.
The results from the testing show that the Example Epoxy Paint from Example Coating Producer has passed all the requirements given in the Performance Standard for Protective Coatings /1/.

2. Scope of work
The following work and tests have been performed:
Identification of the coating system
Film thickness measurements and pin hole detection on panels before testing
180 days testing in condensation chamber
180 days testing in wave tank
180 days testing in heating cabinet
Evaluation of results after testing, including blister detection, undercutting from scribe, adhesion and coating flexibility
Evaluation of cathodic protection during testing (wave tank)

3. Work carried out prior to exposure
3.1 Identification
The coating system was identified by infrared scanning (by means of a ….(name and model of the instrument)) and by determination of specific gravity (according to ISO 2811 -1) by means of an Pyknometer (name and model of the instrument) .
3.2 Surface preparation
Surface preparation was carried out according to the data given in Table B-1 Appendix B.
3.3 Application
3.3.1 Application procedure
Example zinc silicate shop primer was applied to the blast cleaned panels according to the data given in Table 2. The shop primed panels were then exposed out-door for 2 months. The environmental data for the exposure period is given in Appendix A.
Two coats (specified dry film thickness 160 µm per coat) of Example Epoxy Paint were applied to the weathered and cleaned zinc silicate shop primed panels. The application data are given in Table B-2 Appendix B.
3.3.2 Coding
The panels were coded as shown in Figure B-1 in Appendix B.
3.4 Dry film thickness
The dry film thickness measurements were carried out by means of a (name and model of the instrument) dry film thickness unit before testing. Templates, as given in Figure B-2 in Appendix B, were used for the measurements. The results from the measurements are given in Table B-3 in Appendix B.
3.5 Pin hole detection
Pin hole detection was performed on the coated test panels before testing. The detection was carried out by means of a (name and model of the instrument) Pinhole detector at 90 volts.

4. Exposure
The testing was carried out according to the IMO Performance Standard for Protective Coatings /1/. The exposure was started 02.11.07 and terminated 14.06.08.

5. Tests carried out after exposure
Evaluation of blisters and rust, adhesion, undercutting from scribe and flexibility was carried out according to specifications and standards referred to in the IMO Performance Standard /1/.

6. Test results
The results of the product identification are given in Table 1.
The results of the examination of the coated test panels are schematically given in Table 2 and more detailed in Appendix B. Pictures of the panels after exposure are enclosed as Appendix C.

Table 1 Results of analyses (Product identification)

Product	Batch no.	IR identification (main components)	Specific gravity (g/cm^3)
Example, part A	123	Ethyl silicate	0.93
Example, part B	234	NA*	2.21
Example Epoxy Paint Grey, base	345	Epoxy	1.48
Example Epoxy Paint hardener	456	Amide	0.96
Example Epoxy Paint Buff, base	567	Epoxy	1.47

* Identified and spectres stored. No generic correlation to the spectres in the data base found.

Table 2 Results of examination of the coated test samples

Test parameter	**Acceptance criteria**	**Test results**	**Passed / failed**
Pin holes (no)	No pinholes	0	Passed
Blisters and rust (all panels) [1)]	No blisters or rust	0	Passed
Adhesion values (MPa) – wave tank panels [2)]	>3.5 adhesive failure >3.0 cohesive failure	Average: 5.4 Maximum: 7.4 Minimum: 4.2 70 – 80 % cohesive failure 20 – 30 % adhesive failure	Passed
Adhesion values (MPa) –condensation chamber panels [3)]	>3.5 adhesive failure >3.0 cohesive failure	Average: 5.6 Maximum: 6.9 Minimum: 4.1 70 – 80 % cohesive failure 20 – 30 % adhesive failure	Passed
Undercutting from scribe (mm) - average maximum values wave tank panels [4)]	< 8	3.5	Passed
Cathodic disbondment (mm) – Wave tank bottom panel [5)]	< 8	7.2	Passed
Current demand (mA/m^2) – bottom panel [5)]	< 5	3.3	Passed
U-beam [1)]	No degradation (defects, cracking or detachment at the angle or weld)	No degradation	Passed

1) Details of blister and rust and u-beam in Table B-4 Appendix B.
2) Details of Pull-off adhesion test, wave tank and heat exposed panels in Table B-5 Appendix B.
3) Details of Pull-off adhesion test, condensation chamber in Table B-6 Appendix B.
4) Details of physical testing in Table B-7 Appendix B.
5) Details of Cathodic Protection in Table B-8 Appendix B.

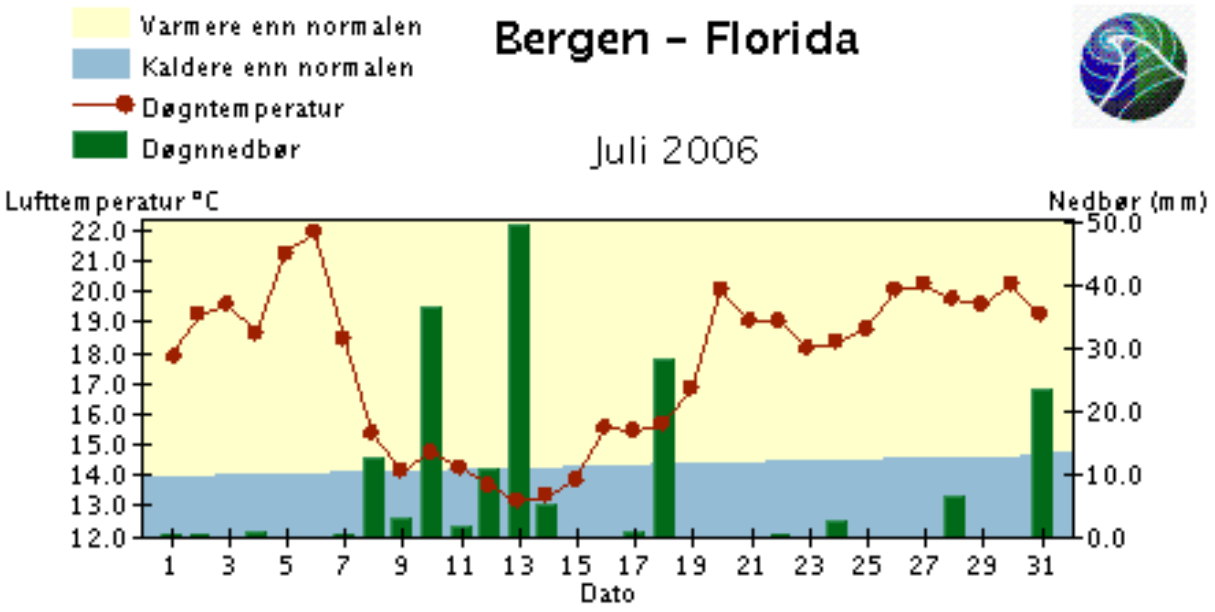
7. Conclusion

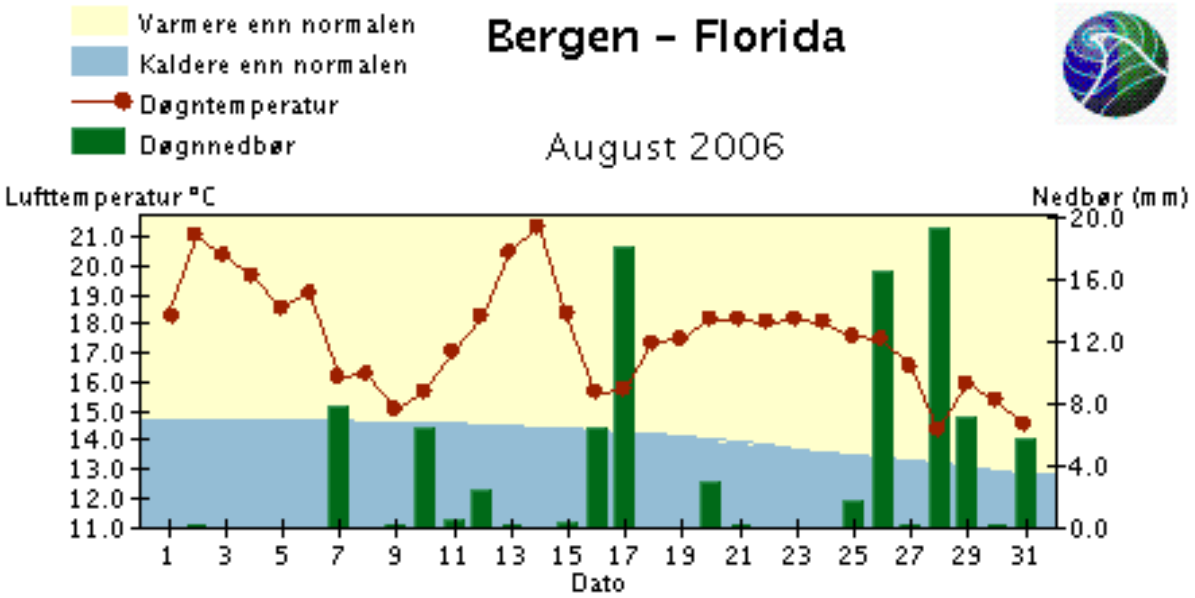
The results from the testing show that Example Epoxy Paint from Example Coating Producer has passed all the requirements given in the Performance Standard for Protective Coatings /1/.

8. References

/1/ MSC 215 (82) :2006 Performance Standard for Protective Coatings for dedicated sea water ballast tanks in all types of ships and double-side skin spaces of bulk carriers

9. Appendix A - Environmental data - weathering of shop primed panels





10. Appendix B - Details of surface preparation, application and test results

Table B-1 Surface preparation data.

Surface preparation date	November 2007 The prepared panels were stored at ambient in- door conditions until use
Surface preparation method	Blast cleaning
Blasting standard	Sa 2 ½
Abrasive used	AlSil A3+ steel shot
Roughness (µm)	R_{max} 50 -75
Water soluble salts	32, 38 and 40 mg / m^2 Spot check performed on 3 out of 30 panels produced at the same time
Dust and abrasive inclusions	No dust or abrasive inclusions observed by visual examination.
Treatment of shopprimer after weathering	Low pressure washing
Water soluble salts after treatment of shopprimer	Spot check 28, 41 and 38 mg / m^2

Table B-2 Application data.

Coating data:	Shop primer	1st coat	2nd coat
Paint system:	Example red	Example Epoxy Paint Al Grey	Example Epoxy Paint Buff
Manufacturer:	Example Coating Producer		
Date	20.11.07	22.01.08	23.01.08
Time	10:00	10:00	10:00
Batch No. curing agent			
Batch No. base			
Thinner name (if used)			
Batch No. thinner(if used)			
Equipment used	Graco King 68:1	Graco King 68:1	Graco King 68:1
Air pressure (bar)	100	170	170
Size nozzle (inches)	0.021	0.021	0.021
Fan width ( )	60	60	60
Mix. ratio (volume)	A: B = 3:1	3:1	3:1
Volume solid (volume)	30 ±2	80	80
Wet film thickness (µ)	55-70	275	275
Dry film thickness (µ)	15-25	See Table 3	See Table 4
Thinner (%)	0	0	0
Air temperature ( )	25	25	25
Humidity (% RH)	78	80	82
Steel temp. ( )	25	25	25
Dew point ( )	20	20	20

Present at application of shop primer: nn – MM Group (painter) and mm – laboratory. Present at application of test coating: kk - Example Coating Producer, nn – MM Group, and mm – laboratory.

Comments:

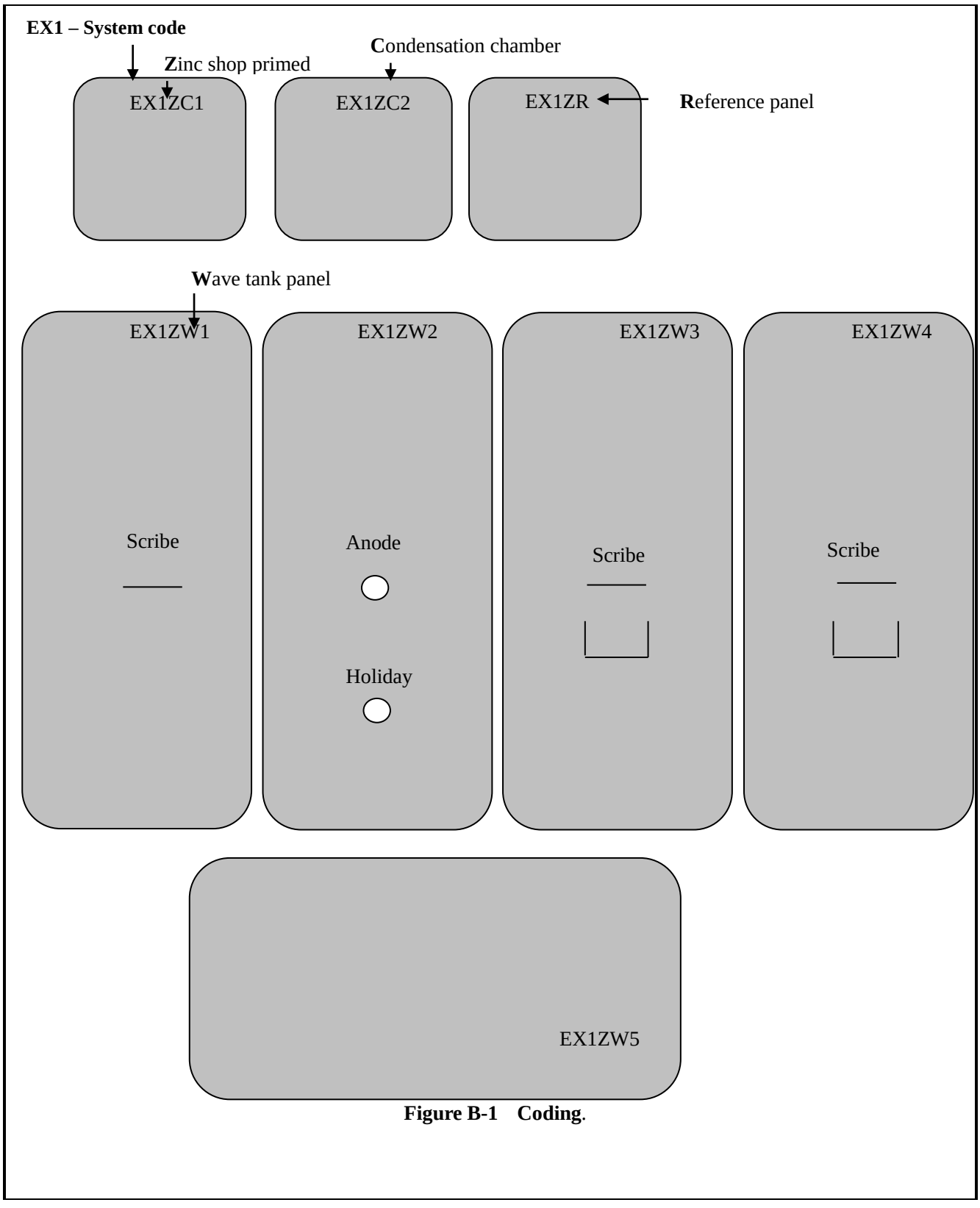


Figure B-1 Coding.

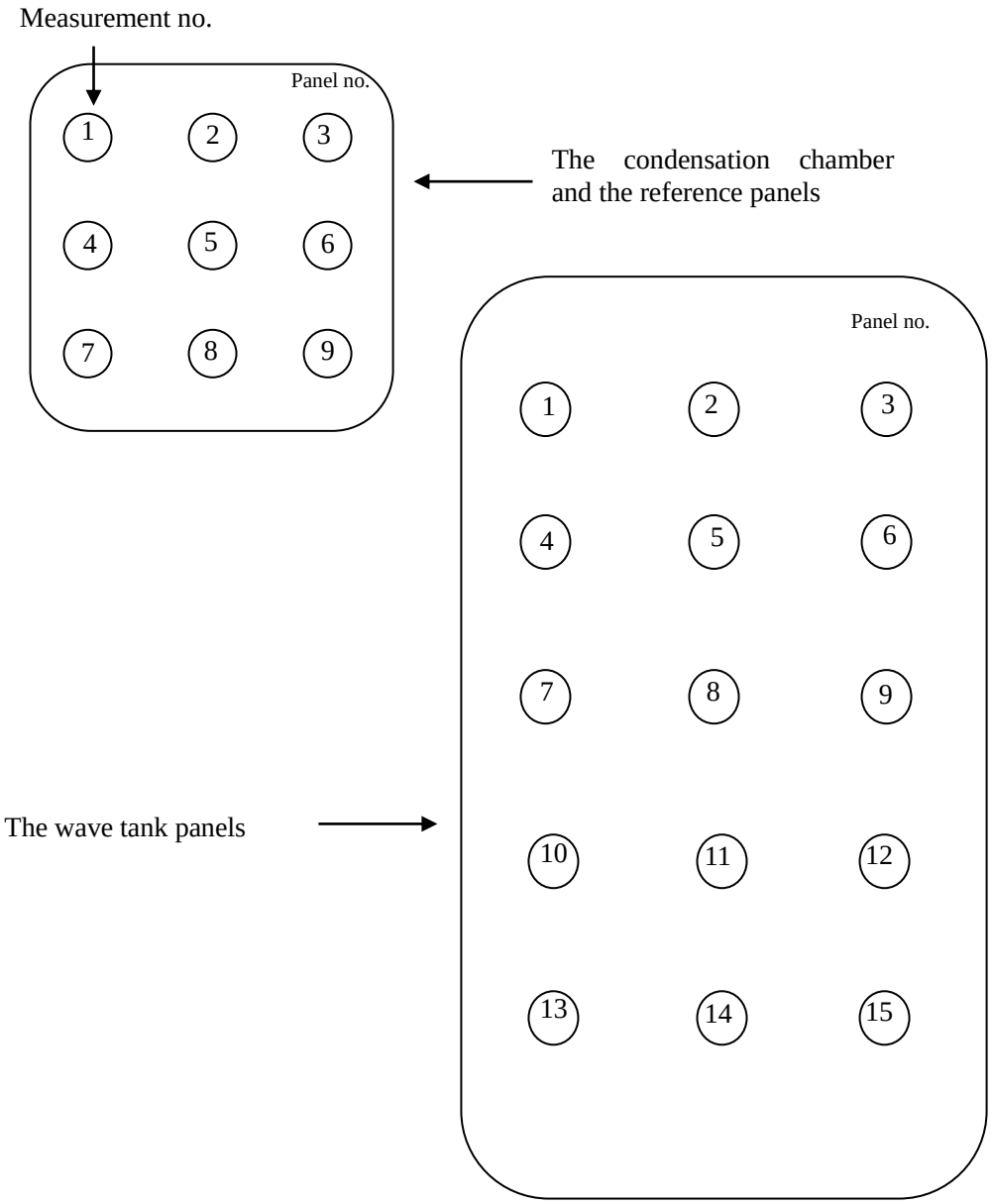


Figure B-2 Thickness measurement locations.

Table B-3 Total Dry Film Thickness – Example Epoxy Paint (20 µm subtracted for shop primed substrate).

	Panel no EX1-								
Measurement	ZW1	ZW2	ZW3	ZW4	ZW5	ZC1	ZC2	ZR	Total
1	332	330	338	322	324	325	320	354	
2	324	356	362	360	388	360	322	320	
3	320	320	328	326	336	342	334	322	
4	320	344	368	320	320	330	340	364	
5	352	356	412	350	326	346	358	336	
6	340	320	340	320	320	362	342	342	
7	320	326	366	356	320	340	330	320	
8	380	348	428	398	348	358	320	346	
9	338	320	380	364	330	338	322	320	
10	320	319	356	338	316				
11	342	360	408	456	340				
12	316	320	326	324	324				
13	320	344	356	332	320				
14	366	424	410	380	366				

15	342	348	330	350	346				
Max	380	424	428	456	388	362	358	364	456
Min	316	319	326	320	316	325	320	320	316
Average	**335**	**342**	**367**	**353**	**335**	**345**	**332**	**336**	**344**
StDev	19	27	34	37	20	13	13	17	27

Table B-4 Development of blisters and rust after exposure.

Code	Description	Blister size	Blister density	Rust	Other defects
EX1ZW1	Top wave tank panel with scribe	0	0	0	0
EX1ZW2	Bottom wave tank panel with anode	0	0	0	0
EX1ZW3	Side wave tank panel with scribe and U-beam Cooling	0	0	0	0
EX1ZW4	Side wave tank panel with scribe and U-beam No cooling	0	0	0	0
EX1ZW5	Panel exposed to 70 ℃ air (heating chamber)	0	0	0	0
EX1ZC1	Condensation chamber	0	0	0	0
EX1ZC2	Condensation chamber	0	0	0	0

Table B-5 Results of the Pull-off adhesion test, wave tank and heat exposed panels.

Panel no.	Adhesion strength (MPa)	Fracture
Top wave tank panel with scribe W1	4.5	30 % B, 20 % C, 30 % C/D, 20 % D
	5.2	20 % B, 30 % C, 30 % C/D, 20 % D
	4.8	30 % B, 20 % C, 20 % C/D, 30 % D
Bottom wave tank panel with anode W2	5.3	30 % B, 20 % C, 20 % C/D, 30 % D
	4.2	30 % B, 20 % C, 30 % C/D, 20 % D
	6.1	20 % B, 30 % C, 30 % C/D, 20 % D
Side wave tank panel with scribe and U-beam Cooling W3	7.0	20 % B, 30 % C, 30 % C/D, 20 % D
	4.6	30 % B, 20 % C, 20 % C/D, 30 % D
	5.3	30 % B, 20 % C, 30 % C/D, 20 % D
Side wave tank panel with scribe and U-beam No cooling W4	5.3	30 % B, 20 % C, 30 % C/D, 20 % D
	7.4	20 % B, 30 % C, 30 % C/D, 20 % D
	5.1	30 % B, 20 % C, 20 % C/D, 30 % D
Panel exposed to 70 ℃ air (heating chamber) W5	4.6	30 % B, 20 % C, 20 % C/D, 30 % D
	6.6	30 % B, 20 % C, 30 % C/D, 20 % D
	5.3	20 % B, 30 % C, 30 % C/D, 20 % D
Average	5.4	70 – 80 % Cohesive failure, 20 – 30 % Adhesive
Max	7.4	
Min	4.2	

A/B Fracture between the steel surface and 1st coat (shop primer).
B Fracture in the 1st coat.
B/C Fracture between the 1st and 2nd coat.
C Fracture in the 2nd coat.
C/D Fracture between the 2nd and 3rd coat.
D Fracture in the 3rd coat
-/Y Fracture between the outer coat and the glue.

Table B-6 Results of the Pull-off adhesion test, condensation chamber and reference panels.

Condensation chamber panel C1	6.1	20 % B, 30 % C, 30 % C/D, 20 % D
	4.1	30 % B, 20 % C, 20 % C/D, 30 % D
	6.9	30 % B, 20 % C, 30 % C/D, 20 % D
Condensation chamber panel C2	4.6	30 % B, 20 % C, 30 % C/D, 20 % D
	5.2	20 % B, 30 % C, 30 % C/D, 20 % D
	6.4	30 % B, 20 % C, 20 % C/D, 30 % D
Average	5.6	70 – 80 % Cohesive failure, 20 – 30 % Adhesive
Max	6.9	

Min	4.1	
Reference panel (not exposed) R	4.1	30 % B, 20 % C, 20 % C/D, 30 % D
	4.5	30 % B, 20 % C, 30 % C/D, 20 % D
	5.0	20 % B, 30 % C, 30 % C/D, 20 % D

A/B Fracture between the steel surface and 1st coat (shop primer).
B Fracture in the 1st coat.
B/C Fracture between the 1st and 2nd coat.
C Fracture in the 2nd coat.
C/D Fracture between the 2nd and 3rd coat.
D Fracture in the 3rd coat
-/Y Fracture between the outer coat and the glue.

Table B-7 Results of physical testing.

Panel	Undercutting from scribe (mm)*	Flexibility**	Comment
Top wave tank panel EX1ZW1	5.7	150 mm	≤ 2 % elongation
Cooled side wave tank panel EX1ZW3	2.2	NA	
Not cooled side wave tank panel EX1ZW4	2.6	NA	
Average	3.5		
Reference panel (not exposed) EX1ZR	Not applicable	75 mm	≤ 4 % elongation

* *Evaluated by scraping with knife.*

** *Flexibility[1)] modified according to panel thickness (3 mm steel, 300 μm coating, 150 mm cylindrical mandrel gives 2% elongation) for information only;1) Reference standards: ASTM D4145:1983. Standard Test Method for Coating Flexibility of Prepainted Sheet.*

Undercutting from scribe:

"Rinse the test panel with fresh tap water immediately after exposure, blowing off residues of water from the surface using compressed air if necessary, and inspect for visible changes. Carefully remove any loose coating using a knife blade held at an angle, positioning the blade at the coating/substrate interface and lifting the coating away from the substrate." (From ISO 4628-8:2005, section 5.3.1.)

"Calculate the degree of delamination d, in millimetre using the equation d=(d1-w)/2 where d1 is the mean overall width of the zone of delamination, in millimetres; w is the width of the original scribe, in millimetres." (From ISO 4628-8:2005, section 6.1.)

"Calculate the degree of corrosion c, in millimetre using the equation c=(wc-w)/2 where wc is the mean overall width of the zone of corrosion, in millimetres; w is the width of the original scribe, in millimetres." (From ISO 4628-8:2005, section 6.2.)

Additionally IACS interpretation of IMO PSPC: Undercutting from scribe can be either corrosion of the steel substrate or delamination between the shop primer and the epoxy coating (compability test). For PSPC maximum width is used (MSC.215(82), Appendix 1, section 2.2.6 and not mean overall width as in the ISO standard. The average of the three maximum records (three panels with scribe) is used for acceptance and shall be less than 8 mm for epoxy based systems to be acceptable. Cohesive adhesion failure in the shop primer is not to be included as part of the delamination.

Table B-8 Results of Cathodic Protection (CP).

Panel	Cathodic disbondment (mm)	Blisters / rust	Zinc anode weight loss (g)	Current demand (mA/m^2)
EX1ZW2	7.2	0	1.2345	3.32

Exposure time: 120 days (Total time 180 days. Each cycle consists of 2 weeks seawater immersion and 1 week exposure in air)

Utilisation factor: 0.8
Consumption rate for Zn-anodes: 11.3 kg/A year
Cathodic protection; disbonding from artificial holiday:

"On completion of the test, thoroughly rinse the panel with tap water, taking care not to damage the coating." (From ISO 15711:2003)

"Assess loss of adhesion at the artificial holiday by using a sharp knife to make two cuts through the coating to the substrates, intersection at the holiday. With the point of the knife, attempt to lift and peel back the coating from around the holiday. Record whether the adhesion of the coating to the substrate has been reduced and the approximate distance, in millimetres, that the coating can be peeled." (From ISO 15711:2003)

Additionally IACS interpretation of IMO PSPC: Repeat the cutting and lifting all around the artificial holiday to find the maximum loss of adhesion. Disbonding from artificial holiday can be either loss of adhesion to the steel substrate or between the shop primer and the epoxy coating and shall be less than 8 mm for epoxy based systems to be acceptable (compability test). Cohesive adhesion failure in the shop primer is not to be included as part of the loss of adhesion.

11.Appendix C – Photo documentation

(It should be overview pictures of the panels and close up pictures of the undercutting from scribe and the disbonding from artificial holiday)

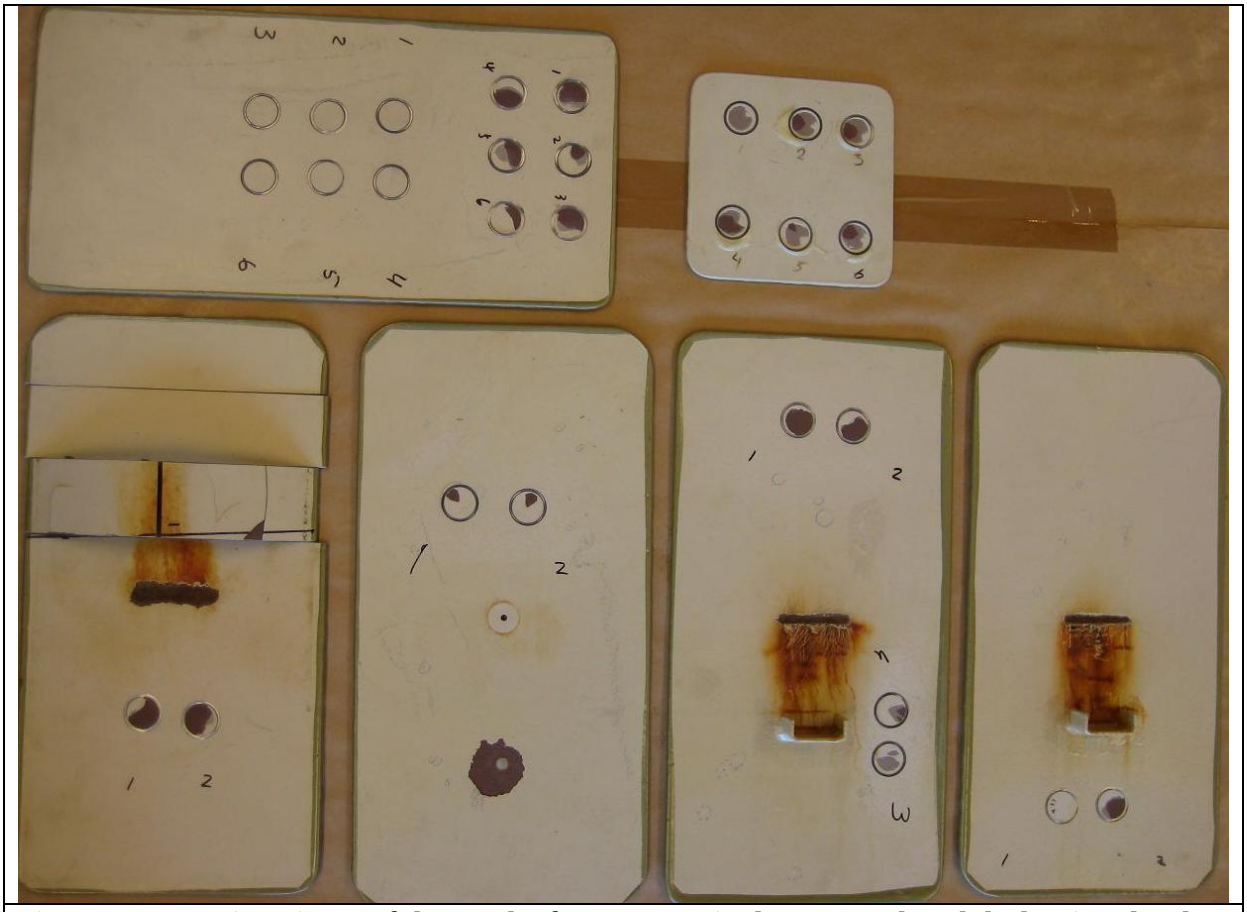


Figure C-1 Overview picture of the panels after exposure in the wave tank and the heating chamber. Reference panel not exposed on the top right. Picture taken after examination (example picture not connected to example results in this model report).

Picture missing

Figure C-2 Overview picture of the panels exposed in condensation chamber (example picture not connected to example results in this model report).



Figure C-3 Scribe area of top wave tank panel before removing of loose coating (example picture not connected to example results in this model report).

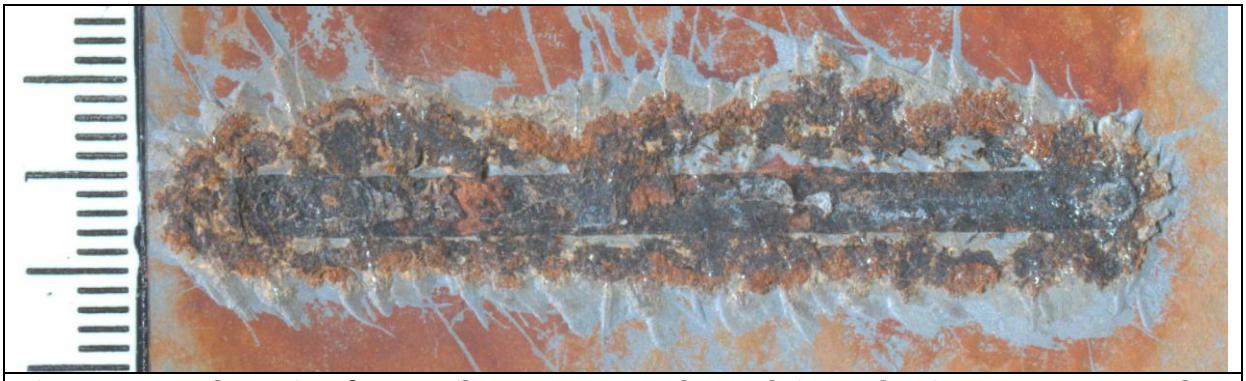


Figure C-4 Undercutting from scribe, top wave tank panel (example picture not connected to example results in this model report).

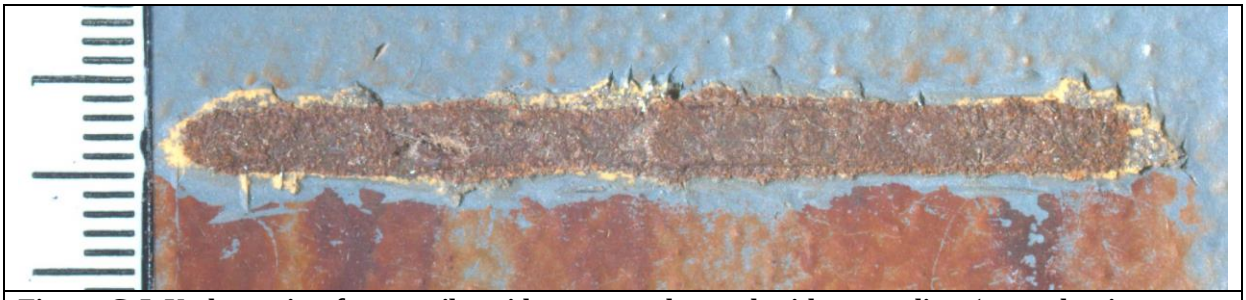


Figure C-5 Undercutting from scribe, side wave tank panel without cooling (example picture not connected to example results in this model report).

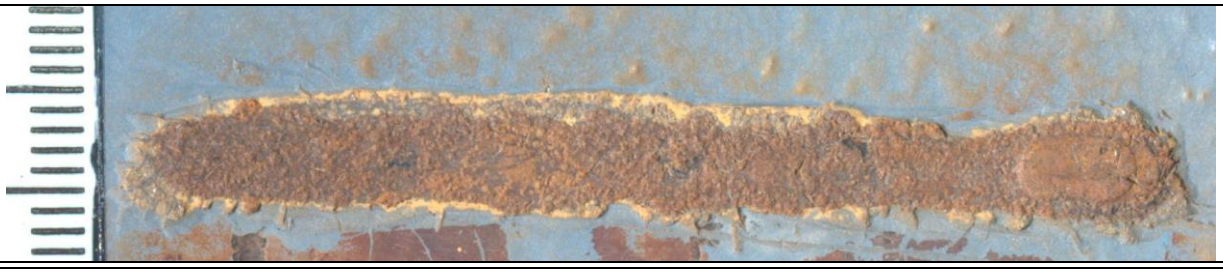


Figure C-6 Undercutting from scribe, side wave tank panel with cooling (example picture not connected to example results in this model report).

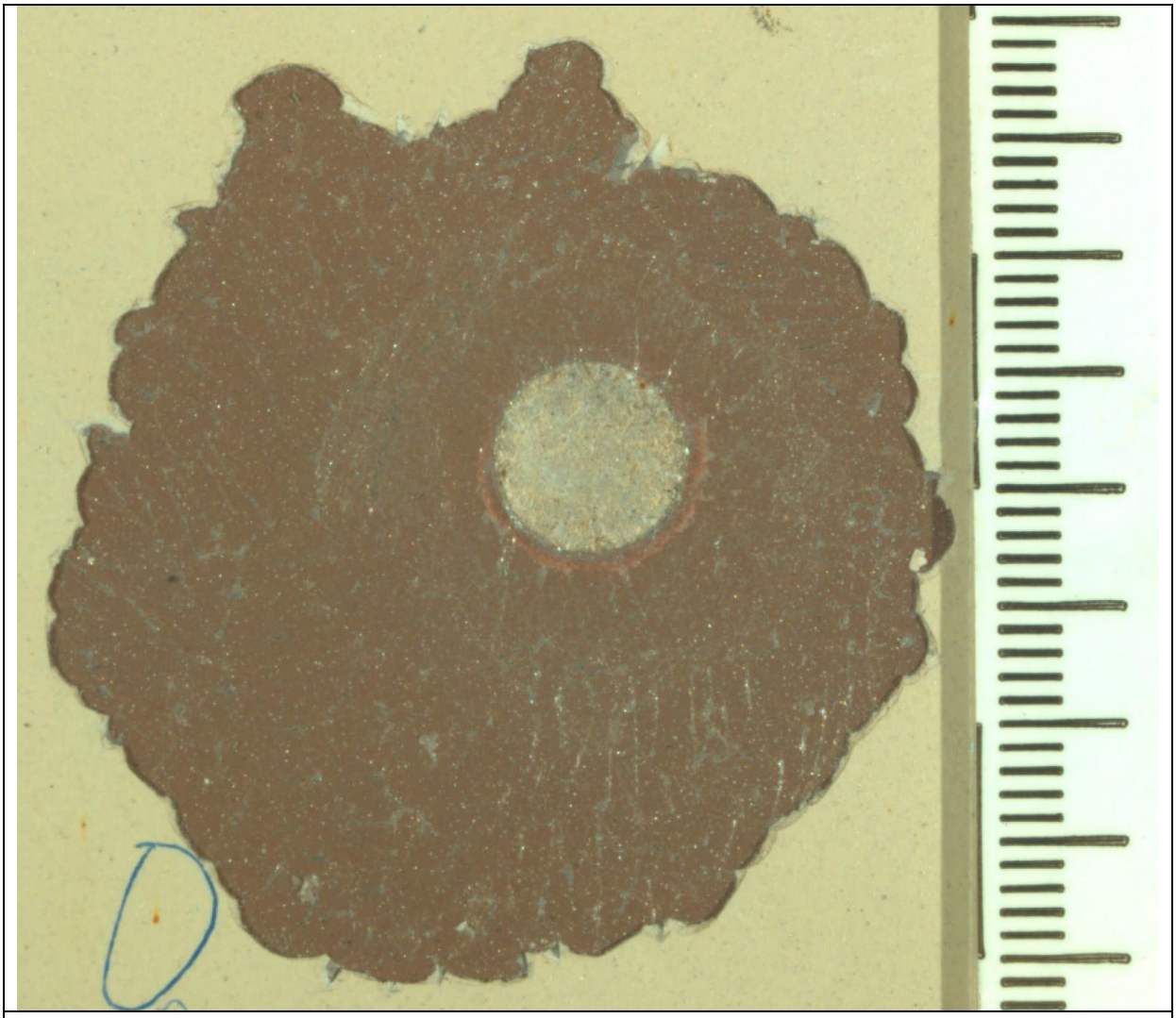


Figure C-7 Disbonding from artificial holiday, bottom wave tank panel (example picture not connected to example results in this model report).

12. Appendix D - Infrared Scanning Charts

Figure D-1

Figure D-2

Figure D-3

Figure D-4

Figure D-5

Figure D-6

13.5 IACS Model Report for IMO Resolution MSC.215(82) Annex 1 "Test Procedures for Coating Qualification", Section 1.7 – Crossover Test

IACS Number	Rec.102	version	Jun.,2008	Date of implementation	Jul.1,2008	Means of implementation	

Model Report

Example Coating Producer

Ballast Tank Coating test of 2 * 160 µm Example Epoxy Paint on Example Shop Primer

1. Summary

The coating system, 2 * 160 µm Example Epoxy Paint from Example Coating Producer, applied to Example zinc silicate shop primed panels has been tested in accordance with the IMO Performance Standard for protective Coatings /1/, section 1.7 of appendix 1 to annex 1 without wave movement (crossover test). The coating was applied after 2 months weathering of the shop primer.

The results from the testing show that the Example Epoxy Paint from Example Coating Producer has passed all the requirements given in the Performance Standard for Protective Coatings /1/.

2. Scope of work

The following work and tests have been performed:

Identification of the coating system

Film thickness measurements and pin hole detection on panels before testing

180 days testing in wave tank conditions, but without wave movement

Evaluation of results after testing, including blister detection, disbonding from artificial holiday and adhesion

3. Work carried out prior to exposure

3.1 Identification

The coating system was identified by infrared scanning (by means of a ….(name and model of the instrument)),and by determination of specific gravity (according to ISO 2811 -1) by means of an Pyknometer (name and model of the instrument).

3.2 Surface preparation

Surface preparation was carried out according to the data given in Table B-1 Appendix B.

3.3 Application

3.3.1 Application procedure

Example zinc silicate shop primer was applied to the blast cleaned panels according to the data given in Table 2. The shop primed panel were then exposed out-door for 2 months. The environmental data for the exposure period is given in Appendix A.

Two coats (specified dry film thickness 160 µm per coat) of Example Epoxy Paint were applied to the weathered and cleaned zinc silicate shop primed panel. The application data are given in Table B-2 Appendix B.

3.3.2 Coding

The panel were coded as shown in Figure B-1 in Appendix B.

3.4 Dry film thickness

The dry film thickness measurements were carried out by means of a (name and model of the instrument) dry film thickness unit before testing. Templates, as given in Figure B-2 in Appendix B, were used for the measurements. The results from the measurements are given in Table B-3 in Appendix B.

3.5 Pin hole detection

Pin hole detection was performed on the coated test panel before testing. The detection was carried out by means of a (name and model of the instrument) Pinhole detector at 90 volts.

4. Exposure

The testing was carried out according to the IMO Performance Standard for Protective Coatings /1/. The exposure was started 02.11.07 and terminated 14.06.08.

5. Tests carried out after exposure

Evaluation of blisters and rust, adhesion, undercutting from scribe and flexibility was carried out according to specifications and standards referred to in the IMO Performance Standard /1/.

6. Test results

The results of the product identification are given in Table 1.
The results of the examination of the coated test panels are schematically given in Table 2 and more detailed in Appendix B. Pictures of the panels after exposure are enclosed as Appendix C.

Table 1 Results of analyses (Product identification)

Product	Batch no.	IR identification (main components)	Specific gravity (g/cm^3)
Example, part A	123	Ethyl silicate	0.93
Example, part B	234	NA*	2.21
Example Epoxy Paint Grey, base	345	Epoxy	1.48
Example Epoxy Paint hardener	456	Amide	0.96
Example Epoxy Paint Buff, base	567	Epoxy	1.47

* Identified and spectres stored. No generic correlation to the spectres in the data base found.

Table 2 Results of examination of the coated test samples

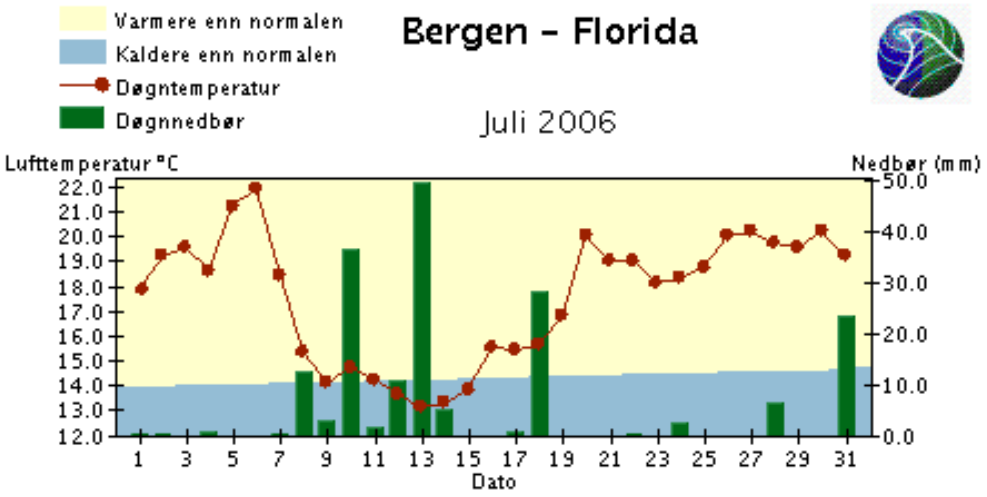
Test parameter	**Acceptance criteria**	**Test results**	**Passed / failed**
Pin holes (no)	No pinholes	0	Passed
Blisters and rust [1)]	No blisters or rust	0	Passed
Adhesion values (MPa) [2)]	>3.5 adhesive failure >3.0 cohesive failure	Average: 5.2 Maximum: 6.1 Minimum: 4.2 70 – 80 % cohesive failure 20 – 30 % adhesive failure	Passed
Cathodic disbondment (mm) [3)]	< 8	7.2	Passed
Current demand (mA/m^2) [3)]	< 5	3.3	Passed

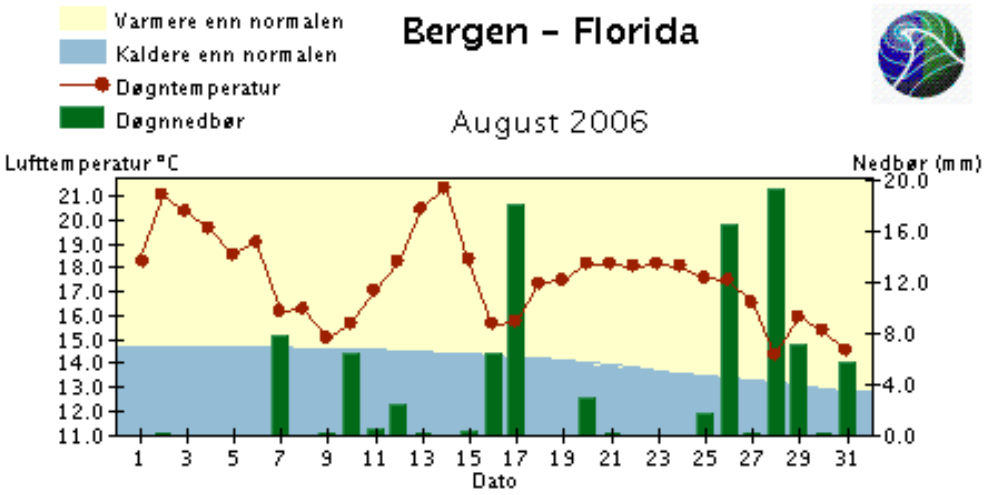
1) Details of blister and rust Table B-4 Appendix B.
2) Details of Pull-off adhesion test in Table B-5 Appendix B.
3) Details of Cathodic Protection in Table B-6 Appendix B.

7. Conclusion
The results from the testing show that Example Epoxy Paint from Example Coating Producer has passed all the requirements for the crossover test given in the Performance Standard for Protective Coatings /1/.

8. References
/1/ MSC 215 (82) :2006 Performance Standard for Protective Coatings for dedicated sea water ballast tanks in all types of ships and double-side skin spaces of bulk carriers

9. Appendix A - Environmental data - weathering of shop primed panels





10. Appendix B - Details of surface preparation, application and test results

Table B-1 Surface preparation data.

Surface preparation date	November 2007 The prepared panels were stored at ambient in- door conditions until use
Surface preparation method	Blast cleaning
Blasting standard	Sa 2 ½
Abrasive used	AlSil A3+ steel shot
Roughness (µm)	R_{max} 50 -75
Water soluble salts	32, 38 and 40 mg / m^2 Spot check performed on 3 out of 30 panels produced at the same time
Dust and abrasive inclusions	No dust or abrasive inclusions observed by visual examination.
Treatment of shopprimer after weathering	Low pressure washing
Water soluble salts after treatment of shopprimer	Spot check 28, 41 and 38 mg / m^2

Table B-2 Application data.

Coating data:	Shop primer	1st coat	2nd coat
Paint system:	Example red	Example Epoxy Paint Al Grey	Example Epoxy Paint Buff
Manufacturer:	Example Coating Producer		
Date	20.11.07	22.01.08	23.01.08
Time	10:00	10:00	10:00
Batch No. curing agent			
Batch No. base			
Thinner name (if used)			
Batch No. thinner(if used)			
Equipment used	Graco King 68:1	Graco King 68:1	Graco King 68:1
Air pressure (bar)	100	170	170
Size nozzle (inches)	0.021	0.021	0.021
Fan width ( )	60	60	60
Mix. ratio (volume)	A: B = 3:1	3:1	3:1
Volume solid (volume)	30 ±2	80	80
Wet film thickness (µ)	55-70	275	275
Dry film thickness (µ)	15-25	See Table 3	See Table 4
Thinner (%)	0	0	0
Air temperature (℃)	25	25	25
Humidity (% RH)	78	80	82
Steel temp. (℃)	25	25	25
Dew point (℃)	20	20	20

Present at application of shop primer: nn – MM Group (painter) and mm – laboratory. Present at application of test coating: kk - Example Coating Producer, nn – MM Group, and mm – laboratory.

Comments:

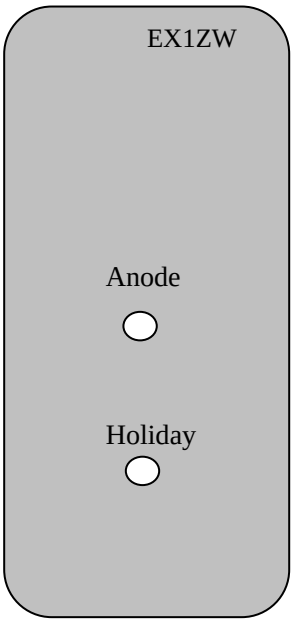


Figure B-1 Coding.

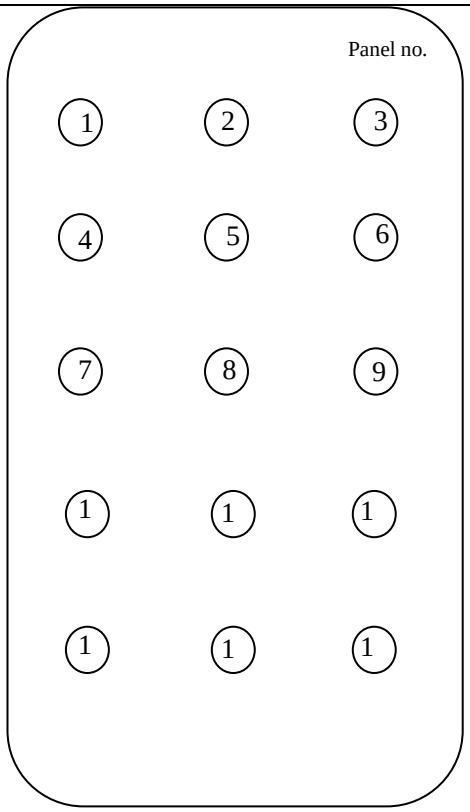


Figure B-2 Thickness measurement locations.

Table B-3 Total Dry Film Thickness – Example Epoxy Paint (20 µm subtracted for shop primed substrate).

Measurement	Panel no EX1ZW2
1	330
2	356
3	320
4	344
5	356
6	320
7	326
8	348
9	320
10	319
11	360
12	320
13	344
14	424
15	348
Max	424
Min	319
Average	**342**
StDev	27

Table B-4 Development of blisters and rust after exposure.

Code	Description	Blister size	Blister density	Rust	Other defects
EX1ZW2	Bottom wave tank panel with anode	0	0	0	0

Table B-5 Results of the Pull-off adhesion test, wave tank and heat exposed panels.

Panel no.	Adhesion strength (MPa)	Fracture
Bottom wave tank panel with anode W2	5.3	30 % B, 20 % C, 20 % C/D, 30 % D
	4.2	30 % B, 20 % C, 30 % C/D, 20 % D
	6.1	20 % B, 30 % C, 30 % C/D, 20 % D
Average	5.2	70 – 80 % Cohesive failure, 20 – 30 % Adhesive
Max	6.1	
Min	4.2	

A/B Fracture between the steel surface and 1st coat (shop primer).
B Fracture in the 1st coat.
B/C Fracture between the 1st and 2nd coat.
C Fracture in the 2nd coat.
C/D Fracture between the 2nd and 3rd coat.
D Fracture in the 3rd coat
-/Y Fracture between the outer coat and the glue.

Table B-8 Results of Cathodic Protection (CP).

Panel	Cathodic disbondment (mm)	Blisters / rust	Zinc anode weight loss (g)	Current demand (mA/ m^2)
EX1ZW2	7.2	0	1.2345	3.32

Exposure time: 120 days (Total time 180 days. Each cycle consists of 2 weeks seawater immersion and 1 week exposure in air)
Utilisation factor: 0.8
Consumption rate for Zn-anodes: 11.3 kg/A year
Cathodic protection; disbonding from artificial holiday:

"On completion of the test, thoroughly rinse the panel with tap water, taking care not to damage the coating." (From ISO 15711:2003)

"Assess loss of adhesion at the artificial holiday by using a sharp knife to make two cuts through the coating to the substrates, intersection at the holiday. With the point of the knife, attempt to lift and peel back the coating from around the holiday. Record whether the adhesion of the coating to the substrate has been reduced and the approximate distance, in millimetres, that the coating can be peeled." (From ISO 15711:2003)

Additionally IACS interpretation of IMO PSPC: Repeat the cutting and lifting all around the artificial holiday to find the maximum loss of adhesion. Disbonding from artificial holiday can be either loss of adhesion to the steel substrate or between the shop primer and the epoxy coating and shall be less than 8 mm for epoxy based systems to be acceptable (compability test). Cohesive adhesion failure in the shop primer is not to be included as part of the loss of adhesion.

11. Appendix C – Photo documentation

(It should be overview picture of the panel and close up picture of the disbonding from artificial holiday)



Figure C-1 Disbonding from artificial holiday, bottom wave tank panel (example picture not connected to example results in this model report).

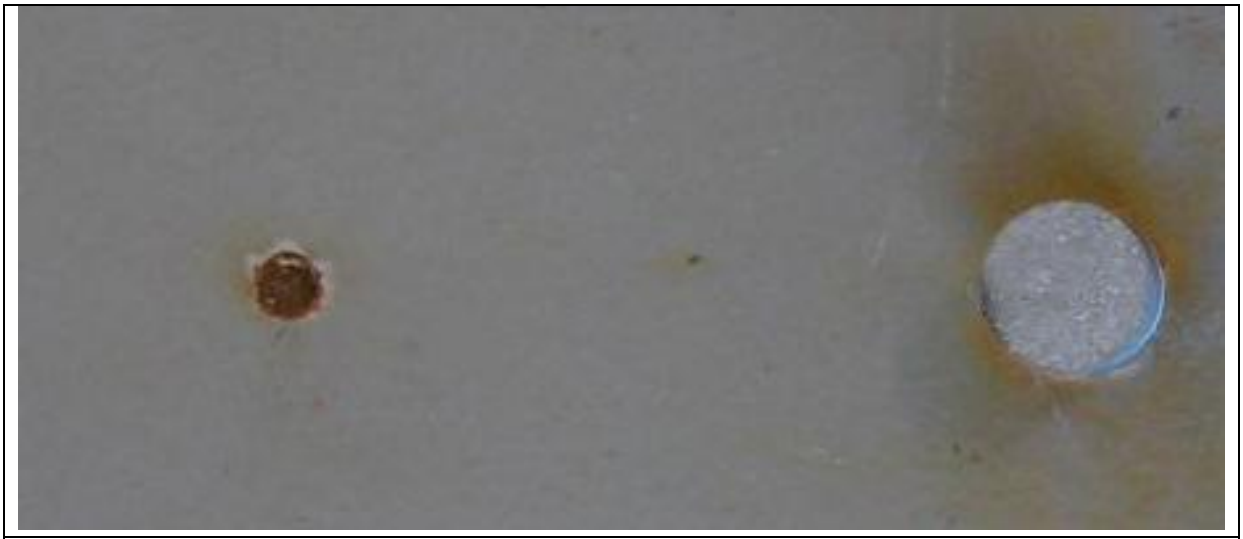


Figure C-2 Disbonding from artificial holiday, bottom wave tank panel (example picture not connected to example results in this model report).

12. Appendix D - Infrared Scanning Charts

Figure D-1

Figure D-2

Figure D-3

Figure D-4

Figure D-5

Figure D-6

13.6 Guidance for the compilation of the IOPP Supplement

IACS Number	Rec.103	UI version	New,Dec. 2008/ Rev.1, July, 2020	Date of implementation		Means of implementation	

Main Contents

1. Form B Supplement to IOPP Certificate indicates the level of compliance of a tanker to Annex I to MARPOL 73/78.
2. In order to avoid misunderstandings of the different annotations, the following table should be considered by the Surveyor when filling in the above mentioned Supplement.

1	2	3	4	5	6	7	8	9	10	11
IOPP Form B Item "Date" is the applicable date according to the referenced regulation relative to the date of contract, keel laying date or delivery date of the vessel	Oil tankers > R19 Date (DWT ≥ 5000 t)	R19 Oil Tankers < R19 Date (DWT ≥ 5000 t)	R20.1.3 or R21.1.2	Cat.2 or Cat.3 Oil tanker (DWT ≥ 5000 t)	Oil Tankers > R19 Date (600 ≤ DWT < 5000 t)	Oil tankers > R19 Date (600 ≤ DWT < 5000) and in compliance with R21.4.2	Oil tankers < R19 Date (600 ≤ DWT < 5000 t)			Oil tankers (DWT < 600 t)
							SH(2)	DB(2)	DH(2)	
5.6 Double hull construction 5.6.1 The ship is required to be constructed in accordance with regulation 19 and complies with the requirements of: -Regulation 19.3 (double hull construction) -Regulation 19.4 (mid-height deck tankers with double side construction) -Regulation 19.5 (alternative method approved by the Marine Environment Protection Committee)	X	X	-	-	X(3)	-	-	-	-	-
5.6.2 The ship is required to be constructed according to and complies with the requirements of regulation 19.6	-	-	-	-	X(3)	X(4)	-	X	X(4)	-
5.6.3 The ship is not required to comply with the requirements of regulation 19	-	X	X	-	-	-	X	X	X	X
5.6.4 The ship is subject to regulation 20 and:	-	-	-	X	-	-	-	-	-	-
5.6.5 The ship is not subject to regulation 20	X	X	X	-	X	X	X	X	X	X

5.6.6 The ship is subject to regulation 21 and:	-	-	-	X (1)	X (1)	-	X (1)	X (1)	-	-
5.6.7 The ship is not subject to regulation 21	X	X	X	X (1)	X (1)	X	X (1)	X (1)	X	X

(1) The appropriate sub-item(s) under 5.6.6 is(are) to be annotated with "X" if tanker carries HGO. Or if the tanker does not carry HGO, item 5.6.7 is to be annotated with "X".
(2) SH: Single Hull Construction, DB: Double Bottom Construction in accordance with R19.6, DH: Double Hull Construction in accordance with 21.4.2
(3) Either 5.6.1 or 5.6.2 is to be marked, but not both. Footnote (1) is applicable when item 5.6.2 is annotated with "X". Regulation 19.5 does not apply under 5.6.2.
(4) Item 5.6.2 is to be annotated with the proviso:"(Complies with double hull requirement as per 21.4.2)"

Remarks

13.7 Guideline for Scope of Damage Stability Verification on new oil tankers, chemical tankers and gas carriers *)

IACS Number	**Rec. 110**	**version**	**Rev.1,Nov.,2010**	Date of implementation	**Jan.1，2011**	Means of implementation	**Contracted for construction**

Main Contents

Deleted

Note

13.8 Uniform Application of MARPOL Annex I, Revised Regulation 12

IACS Number	**Rec. 121**	**version**	**Dec.，2011/ Rev.1,Aug.，2018 / Corr.1,Jun.，2021**	Date of implementation	**Jul. 1, 2012/ Rev. 1, Jan. 1, 2019**	Means of implementation	

Main Contents

1. History of Revised Regulation 12 of MARPOL Annex

- Following an increase in the number of prosecutions due to MARPOL Annex I sludge tank related issues, at MEPC 55 in October 2006 commenced a review of MARPOL Annex I Regulation 12.
- A correspondence group looked into all sludge tank issues including Oil Record Books, IBTS and plan approval, reporting to DE 51 through paper DE 51/18/1.
- DE 51 reviewed the CG report and a new Regulation 12.1bis was introduced to further define sludge tanks.
- This was discussed at MEPC 58 where Regulation 12 was again reviewed and amended, Regulation 12.1bis becoming Regulation 12.2. MEPC.1/Circs 641 and 642 were also issued.
- MEPC 59 further developed the text, issuing MEPC 187(59) and MEPC.1/Circ 676 (IBTS).
- Korean paper MEPC 61/7/7 introduced a new Unified Interpretation concerning oil residue (sludge) service tanks. This text still included original UI 17.1.3 which stated that, *".3. there should be no interconnections between the sludge tank discharge piping and bilge-water piping other than possible common piping leading to the standard discharge connection referred to in regulation 13*." During discussions at MEPC 61,

Footnotes:
*) Excluding combination carriers.

new MARPOL Unified Interpretations were approved and the old UI 17.1.3 was deleted.

- MEPC.187(59) entered into force on 1 January 2011.
- In July 2011 at MEPC 62 a new Unified Interpretation was agreed, published as MEPC.1/Circ 753 confirming that Regulation 12.2.2 should not be retroactively applied to ships delivered before 1 January 2014, and reinstating the text from old UI 17.1.3 stating that, *"There should be no interconnections between the sludge tank discharge piping and bilge-water piping other than possible common piping leading to the standard discharge connection referred to in regulation 13."*
- In March 2012 MEPC 63, having considered documents MEPC 63/7/9 (IACS) and MEPC63/7/5(Denmark, Spain and BIMCO), providing further comments and proposals to the matter, referred both documents to DE 57 for further consideration and advice". DE 57 agreed to consider the proposed draft amendments to regulation 12 of MARPOL Annex I at its next session, and recommended further amendments to the UI MEPC.1/Circ.753.
- In May 2013, MEPC 65 having considered the draft text prepared by DE 57 approved the revised Unified Interpretation and distribute it through MEPC.1/Circ.753/Rev.1 (20 June 2013). The revised UI clarified that the use of screw-down non return valves arranged in lines connecting to common piping leading to the standard discharge connection required by regulation 13, provide a means equivalent to an arrangement that has "no interconnection" or "no discharge connections" as so specified in regulation 12.2.
- In March 2014 the Sub-Committee on Ship Systems and Equipment (SSE 1) prepared draft amendments to MARPOL Annex I with a view to subsequent adoption and draft revised UI of regulation 12.3.3 intended to replace the UI MEPC.1/Circ.753/Rev.1, as set out respectively in annexes 11 and 12 of document SSE 1/21. The MEPC 67 approved the draft amendments with a view to adoption at MEPC 68 and agreed to keep the draft revised UI in abeyance for approval by MEPC 70.
- MEPC 68 in May 2015 adopted the draft amendments to MARPOL Annex I with resolution MEPC.266(68).
- MPEC73 in Oct 2018 issued the 2018 Guidelines for the application of the revised MARPOL Annex I requirements to floating production, storage and offloading facilities (FPSOs) and floating storage units (FSUs) with resolution MEPC.311(73).

2. Implications for ships:

- This applies to new and existing vessels.
- In effect, the change moved IMO Unified Interpretation 17.1.3 for vessels with keel laying after 31 December 1990; to all vessels after 1 January 2017.
- Incinerator oil mixing tanks are now regarded as Oil Residue (sludge) service tanks.
- In July 2011, at MEPC 62 a new Unified Interpretation was approved stating that Regulation 12.2.2 should not be retroactively applied to ships delivered before 1 January 2014 (contract before 1 January 2011; or in absence of contract keel laying before 1 January 2012; or delivered before 1 January 2014).
- However, MEPC.266(68) no longer allows for existing arrangements where an oil residue (sludge) tank may have discharge connections to the bilge system, oily bilge water holding tank(s), tank top or oily water separators, as could be allowed under MEPC.1/Circ.753/Rev.1. Any modifications that may be required for ships constructed before 1 January 2017 with arrangements that are not compliant with the revised Regulation 12 requirements are to be completed no later than the first renewal survey carried out on or after 1 January 2017.
- In MEPC 311(73) the Annexed table clarifies that MARPOL Annex I, Regulation 12 is applicable to FPSOs and FSUs.

3. Documents referenced:

- MARPOL consolidated edition 2006.
- MEPC.187(59).
- MEPC 61 Meeting report Annex 14, modified by IMO MEPC.1/Circular 753
- MEPC.1/Circular 641.
- MEPC.1/Circular 642, modified by MEPC.1/Circular 676.
- MEPC.1/Circ.753/Rev.1.
- Resolution MEPC.266(68).
- MEPC.1/Circ.867.
- MEPC.311(73).

4. Revised Regulation 12.3.2 - Designated Pump

- Regulation 12.3.2 states that, *"The oil residue (sludge) tank(s) shall be provided **with a designated pump** for disposal that is capable of taking suction from the oil residue (sludge) tank(s)."*
- The Unified Interpretation to new Regulation 12.3(previous Regulation 12.2) states that, *"A designated pump should be interpreted as any pump used for the disposal of oil residue (sludge) through the standard discharge connection referred to in regulation 13, or any pump used to transfer oil residue (sludge) to any other approved means of disposal such as an incinerator, auxiliary boiler suitable for burning oil residues (sludge) or other acceptable means which are prescribed in paragraph 3.2 of the Supplement to IOPP Certificate Form A or B."*
- A *"Dedicated"* pump is not necessary.
- The Unified Interpretation requires that the pump is used as the means for the disposal of sludge.
- It also implies that it may also pump oily bilge water to the standard discharge connection for disposal ashore.

5. Revised Regulation 12.3.3 – Decanting Sludge to Bilge & Sludge discharge piping

- Regulation 12.3.3 states that *"The oil residue (sludge) tank(s) shall have no discharge connections to the bilge system, oily bilge water holding tank(s), tank top or oily water separators except that:*

  .1 the tank(s) may be fitted with drains, with manually operated self-closing valves and arrangements for subsequent visual monitoring of the settled water, that lead to an oily bilge water holding tank or bilge well, or an alternative arrangement, provided such arrangement does not connect directly to the bilge discharge piping system.";and

  .2 the sludge tank discharge piping and bilge-water piping may be connected to a common piping leading to the standard discharge connection referred to in regulation 13; the connection of both systems to the possible common piping leading to the standard discharge connection referred to in regulation 13 shall not allow for the transfer of sludge to the bilge system;"

  Ships constructed before 1 January 2017 shall be arranged to comply with the revised regulation 12.3.3 not later than the first renewal survey carried out on or after 1 January 2017.

6. Revised Regulation 12.3.3.1 - Decanting Sludge to Bilge

- Regulation 12.3.3.1 states that, *"The oil residue (sludge) tank(s) shall have no discharge connections to the bilge system, oily bilge water holding tank(s), tank top or oily water separators except that the tank(s) **may be fitted with drains, with manually operated self-closing valves and arrangements for subsequent***

***visual monitoring of the settled water**, that lead to an oily bilge water holding tank or bilge well, or an alternative arrangement, provided such arrangement does not connect directly to the bilge discharge piping system."*

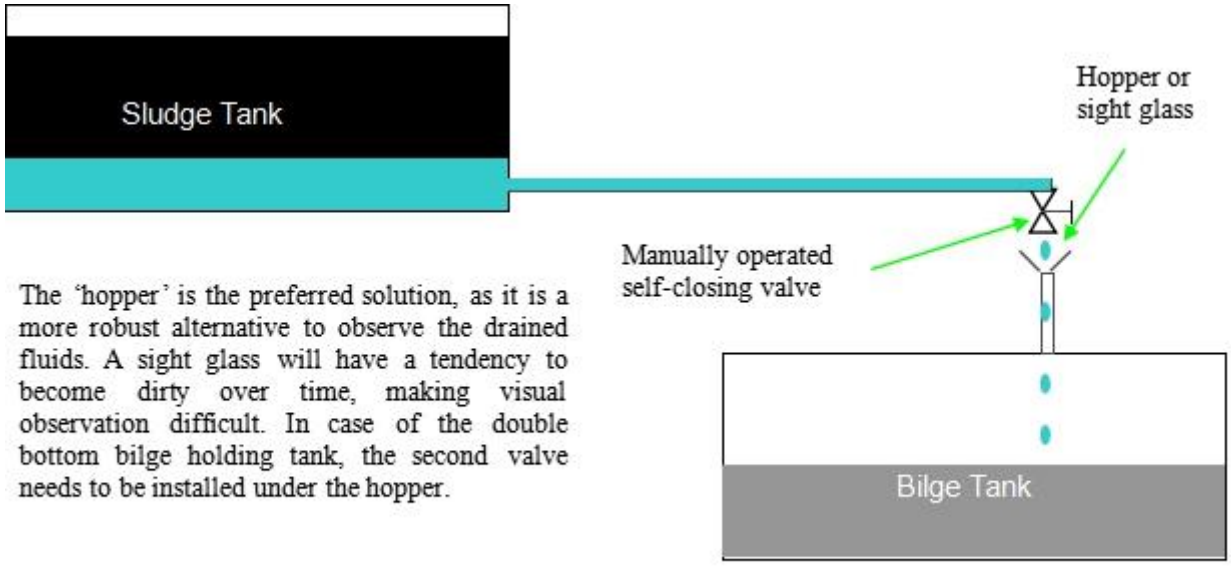
- The exception to this general rule allows draining of settled water from the sludge tank if certain conditions are met.

  1. the water is drained **only** to the bilge water holding tank or bilge well (not to the bilge piping system or other bilge areas); and

  2. the drains have a manually operated self-closing valve; and

the draining operation is visually monitored.

"Visually monitored" means monitoring the draining operation in real-time either through a site glass or through a funnel, whereby the draining can be stopped immediately if oil is seen.



The 'hopper' is the preferred solution, as it is a more robust alternative to observe the drained fluids. A sight glass will have a tendency to become dirty over time, making visual observation difficult. In case of the double bottom bilge holding tank, the second valve needs to be installed under the hopper.

- If the previous arrangement is not possible, such as in way of double bottom spaces, then the following could be a possible solution (an exemption would be required from the Flag Administration):

- Pumping settled water from the double bottom oil residue (sludge) tank to an oily bilge water holding tank provided that the requirements of MARPOL Annex I, Regulation 12.3 are met and the other requirements of Regulation 12.3. 3 are satisfied i.e.:

  1.the water is pumped **only** to the oily bilge water holding tank or bilge well by a small oily sludge pump; and

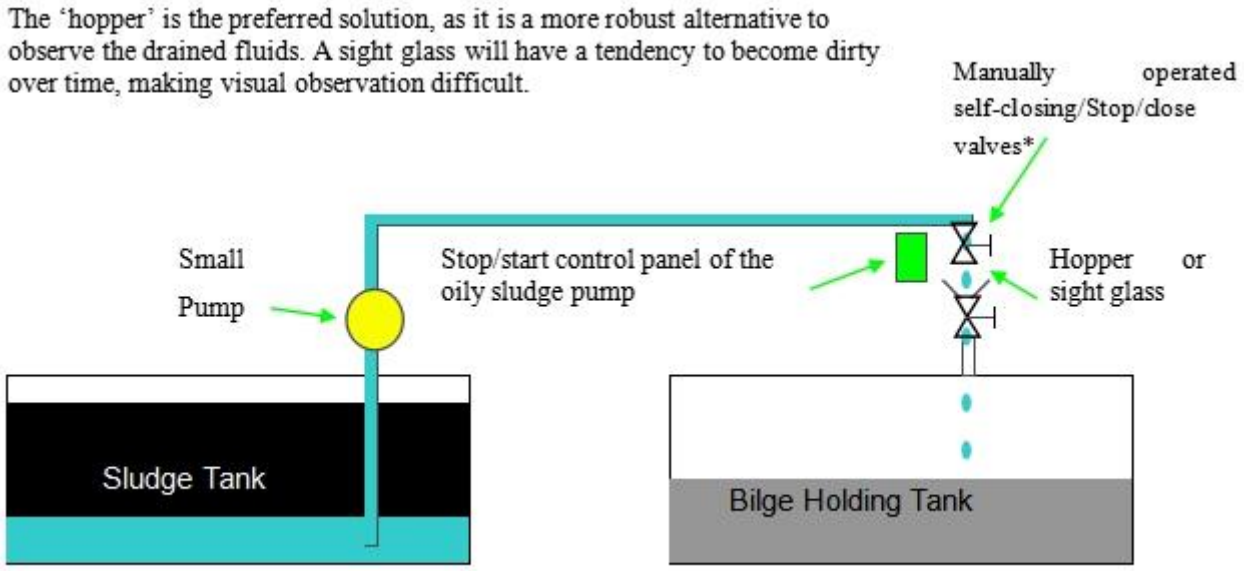
  2.the pumping operation is visually monitored by a responsible person; and

  3.the stop/start control panel of the oily sludge pump must be located close to the operator checking the transfer of settled water.

- If settled water is removed from the oil residue (sludge) tank using this method, the discharge line leading from the oil residue (sludge) tank must be connected directly to the oily bilge water holding tank or bilge well and **must not under any circumstances connect directly to any section of the bilge piping system or bilge area**.

- In the event that the double bottom oil sludge or bilge holding tanks are damaged by grounding or

stranding, the engine room may progressively flood via the transfer line to the bilge holding tank or via hopper as shown below. To prevent this situation, the above transfer lines are to be provided with manually operated self-closing valves or stop/close valves where appropriate to prevent the ER flooding in the event of damage to these double bottom tanks.

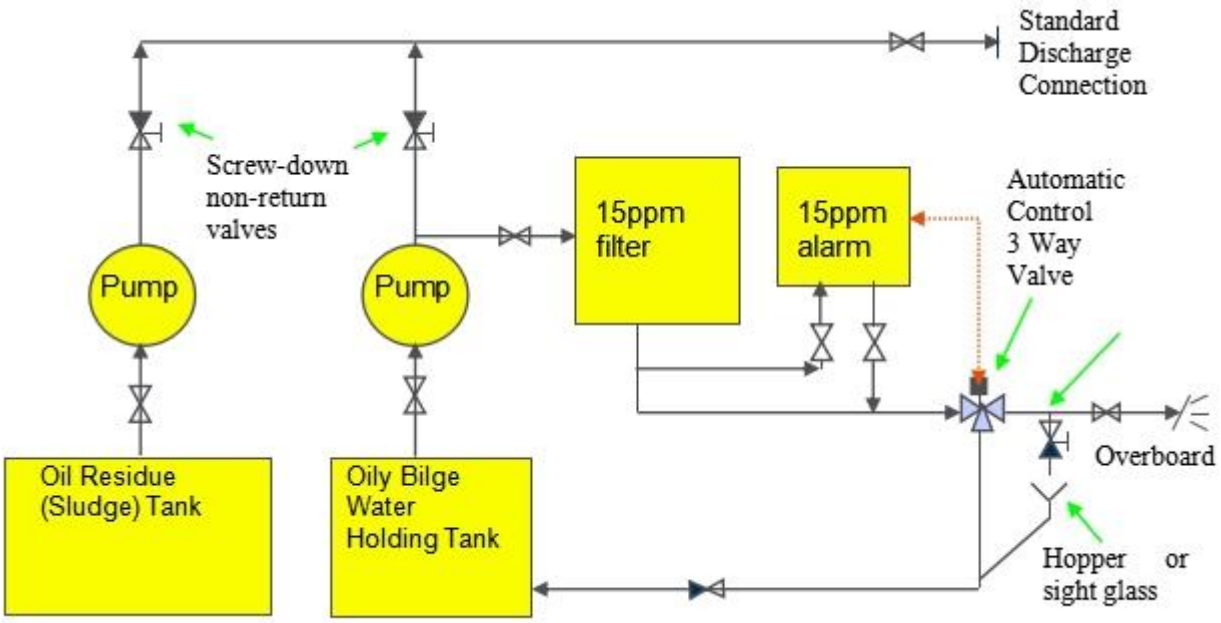


*) The second valve needs to be installed under the hopper, if settled water is transferred to the bilge holding tank. No valve needs to be installed under the hopper in case where settled water is transferred to the bilge well.

7. Acceptable Arrangements to Revised Regulation 12.3.3.2

The following diagrams describe, in simplified form, some common compliant arrangements found on ships:

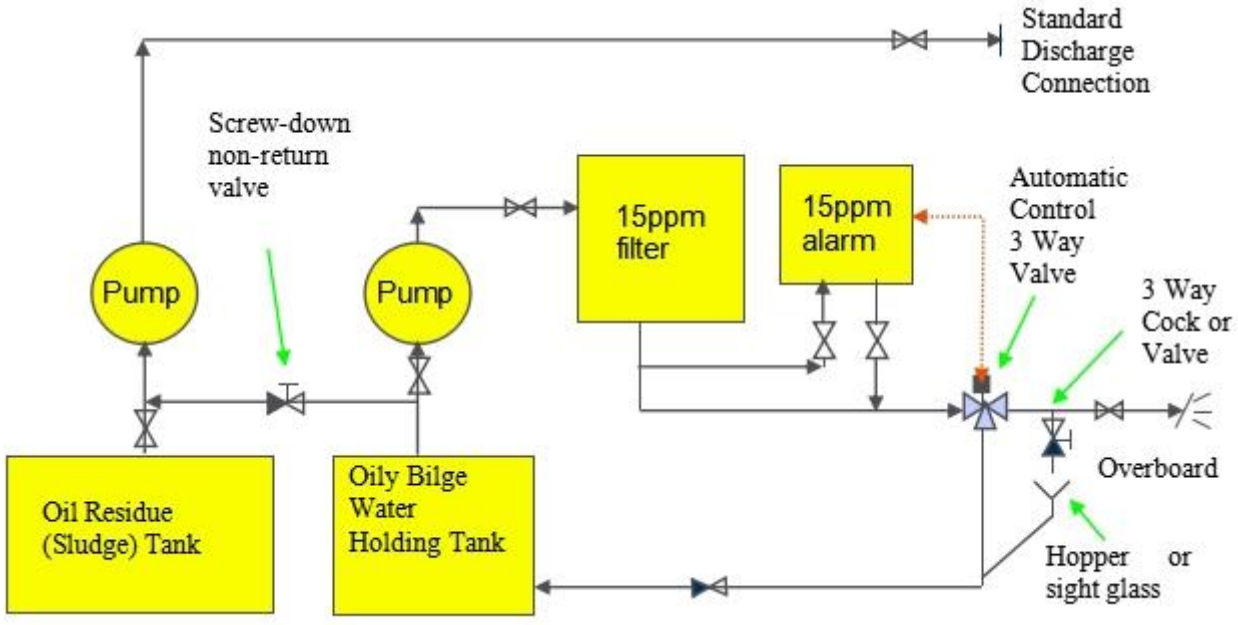
3 Way
Cock or
Valve



The above arrangement is considered acceptable:

- Where common arrangements are provided for the discharge of bilge water and sludge through the standard discharge connection, a screw-down non-return valve must be provided to prevent the accidental discharge of sludge to the bilge system.

- The screw-down non-return valve stops possible discharge of oil residue (sludge) to the 15 ppm Filter Unit and also the Oil Bilge Water Holding Tank.

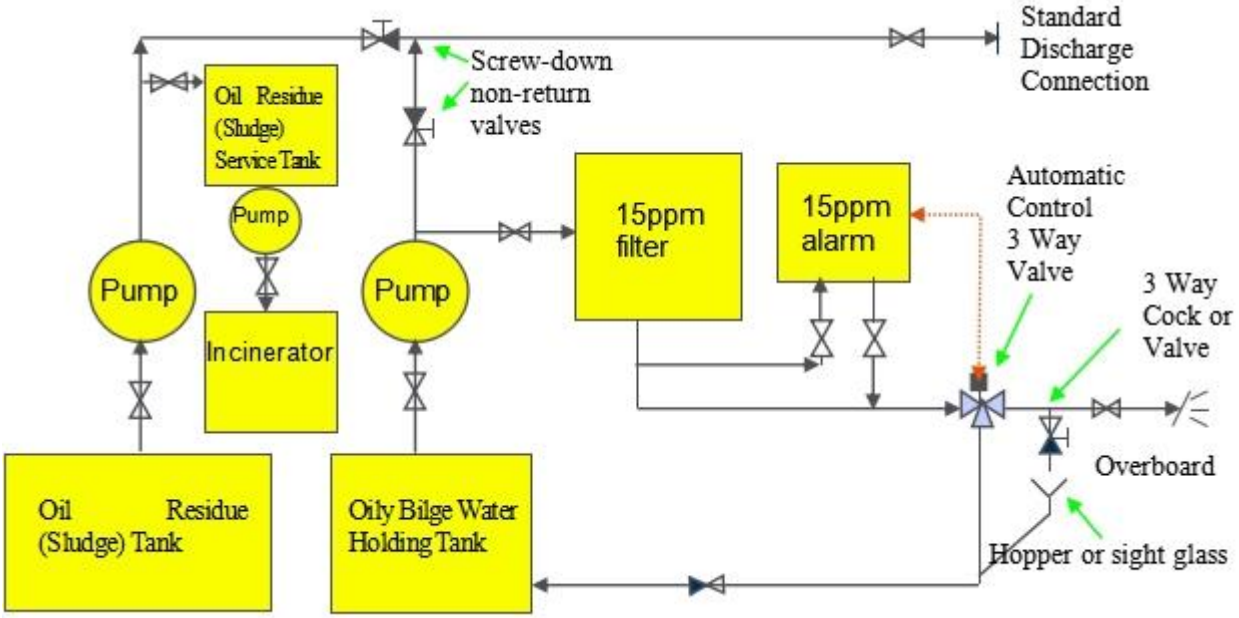


The above arrangement is considered acceptable:

- Where there are common arrangements for discharge of bilge water and sludge through the standard discharge connection, a screw-down non-return valve is arranged in the line to the common piping leading to the standard discharge connection required by Regulation 13. To satisfy this interpretation, the common

line with a screw-down non-return valve is to be arranged on the suction side of the pumps; and

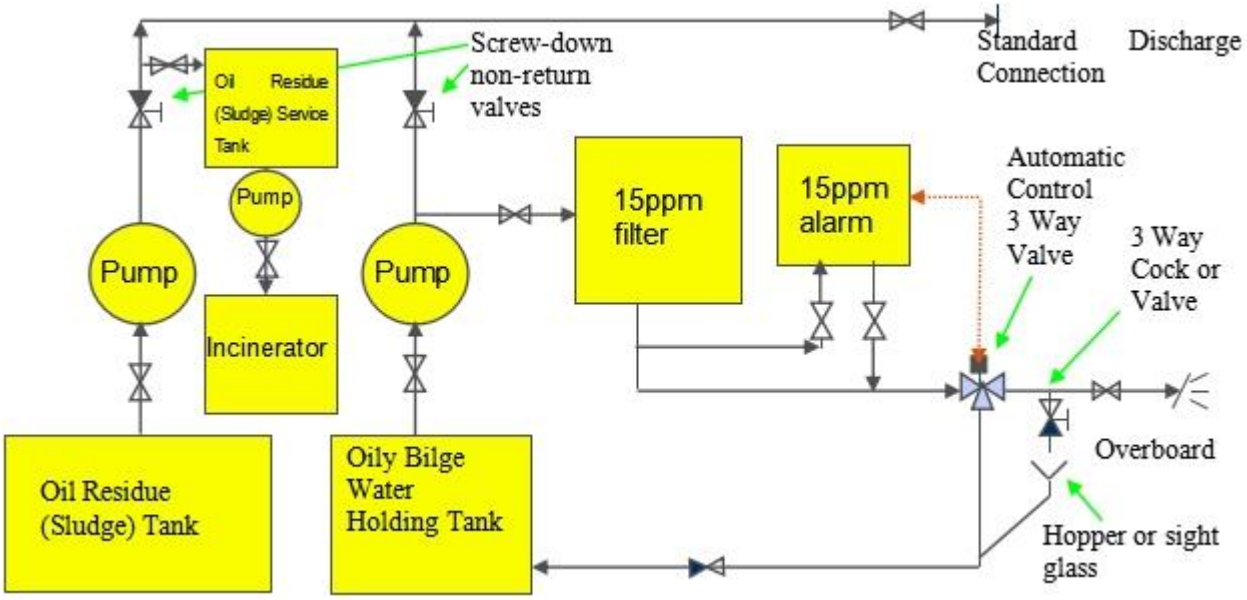
- The screw-down non-return valve stops possible discharge of oil residue (sludge) to the 15 ppm Filter Unit and also to the Oil Bilge Water Holding Tank.



The above arrangement is considered acceptable:

- Where common arrangements are provided for the discharge of bilge water and sludge through the standard discharge connection, and the sludge can also be transferred to an incinerator, screw-down non-return valves must be provided to prevent the accidental discharge of sludge to the bilge system.

- The screw-down non-return valve stops possible discharge of oil residue (sludge) to the 15 ppm Filter Unit and also the Oil Bilge Water Holding Tank.



The above arrangement is considered acceptable:

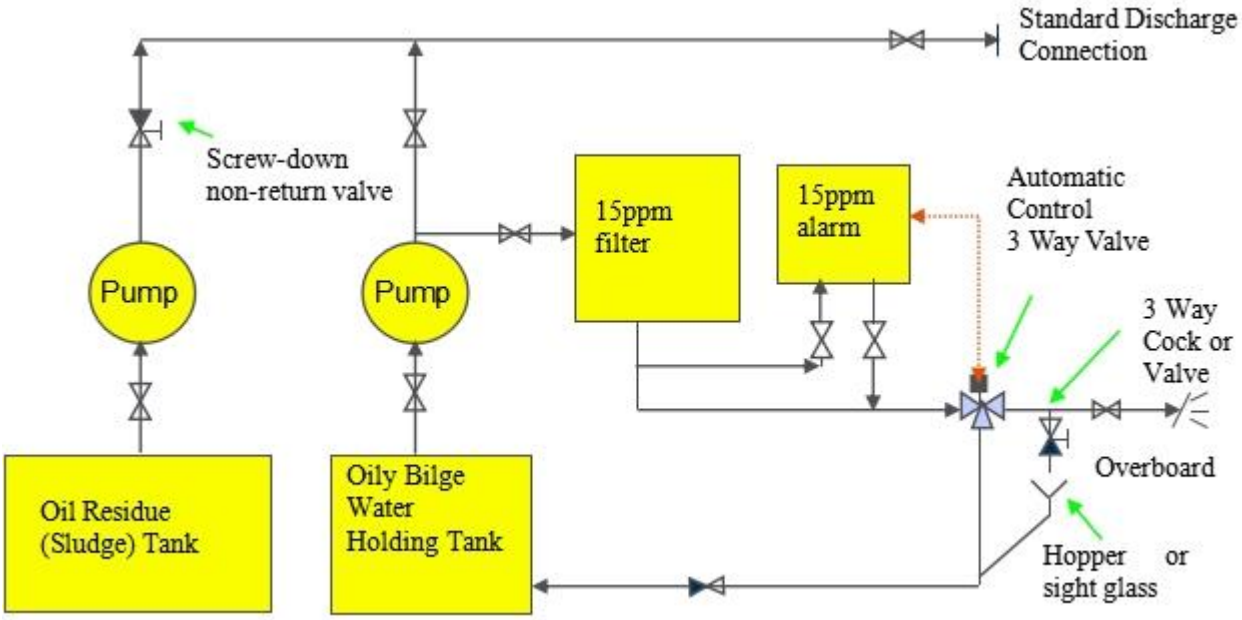
- Where common arrangements are provided for the discharge of bilge water and sludge through the standard discharge connection, and the sludge can also be transferred to an incinerator, screw-down non-return

valves must be provided to prevent the accidental discharge of sludge to the bilge system.

- This arrangement also allows for the transfer of suitable oily bilge water to the incinerator oil residue (sludge) service tank for burning.
- The screw-down non-return valve stops possible discharge of oil residue (sludge) to the 15 ppm Filter Unit and also the Oil Bilge Water Holding Tank.

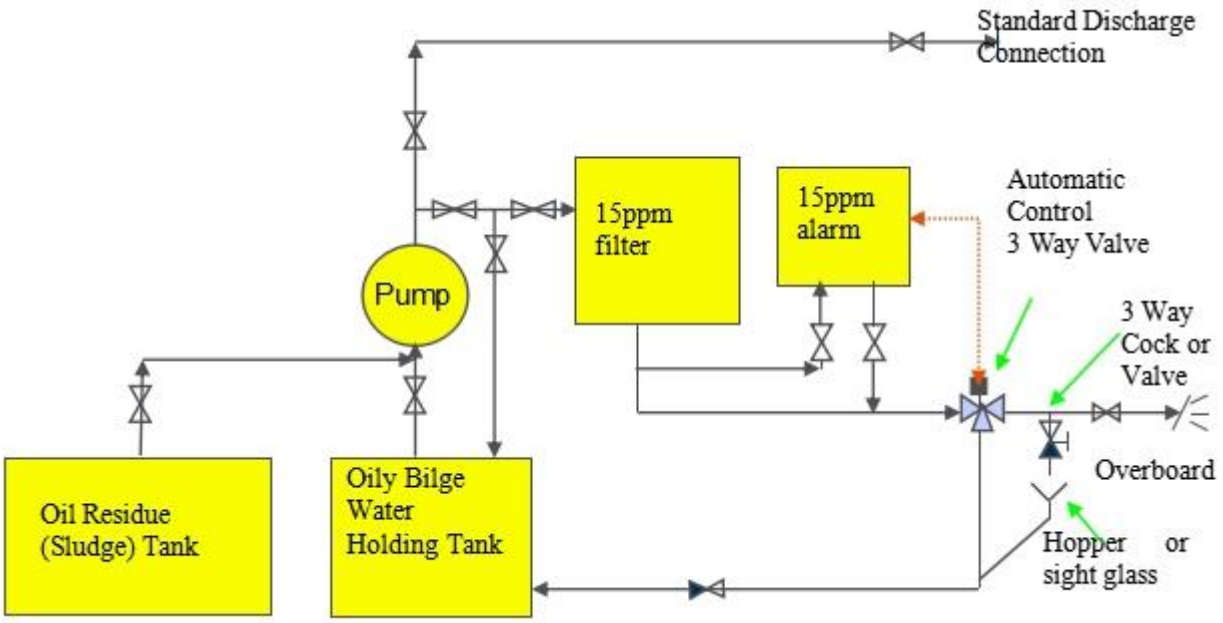
8. Non-Compliant Arrangements to Revised Regulation 12.3.3.2

The following diagrams describe, in simplified form, some common non-compliant arrangements:

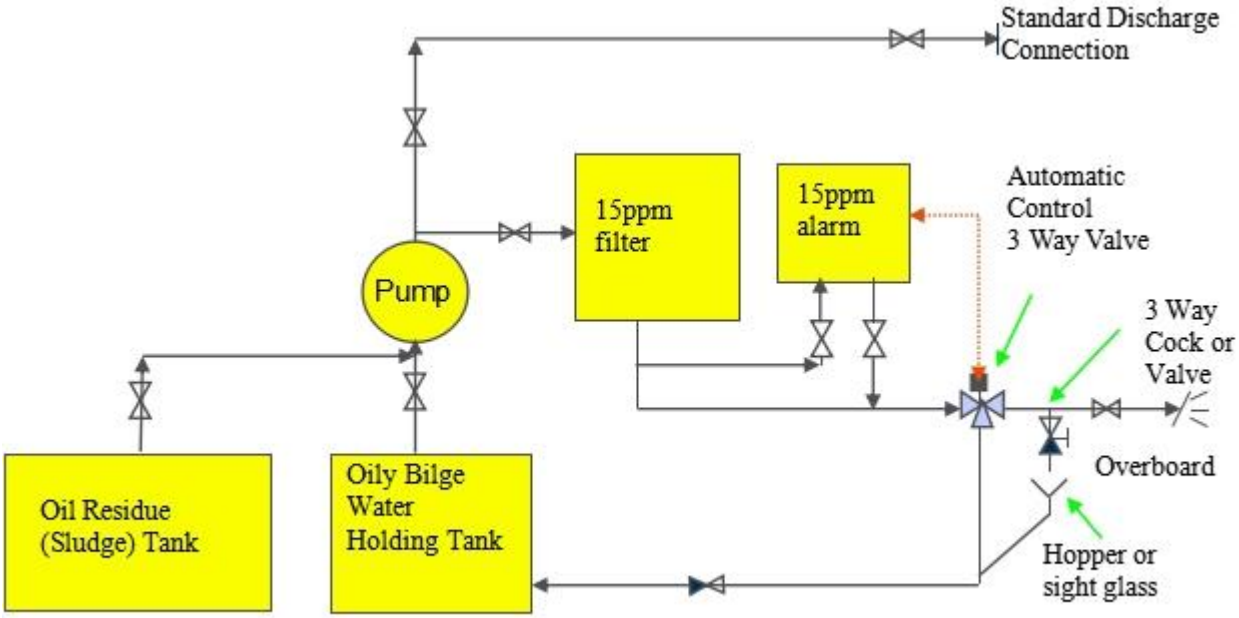


The arrangement above is not acceptable as there is a sludge discharge connection to the oily water separator, bilge system and Oily Bilge Water Holding Tank – prohibited under Regulation 12.3.3.

****

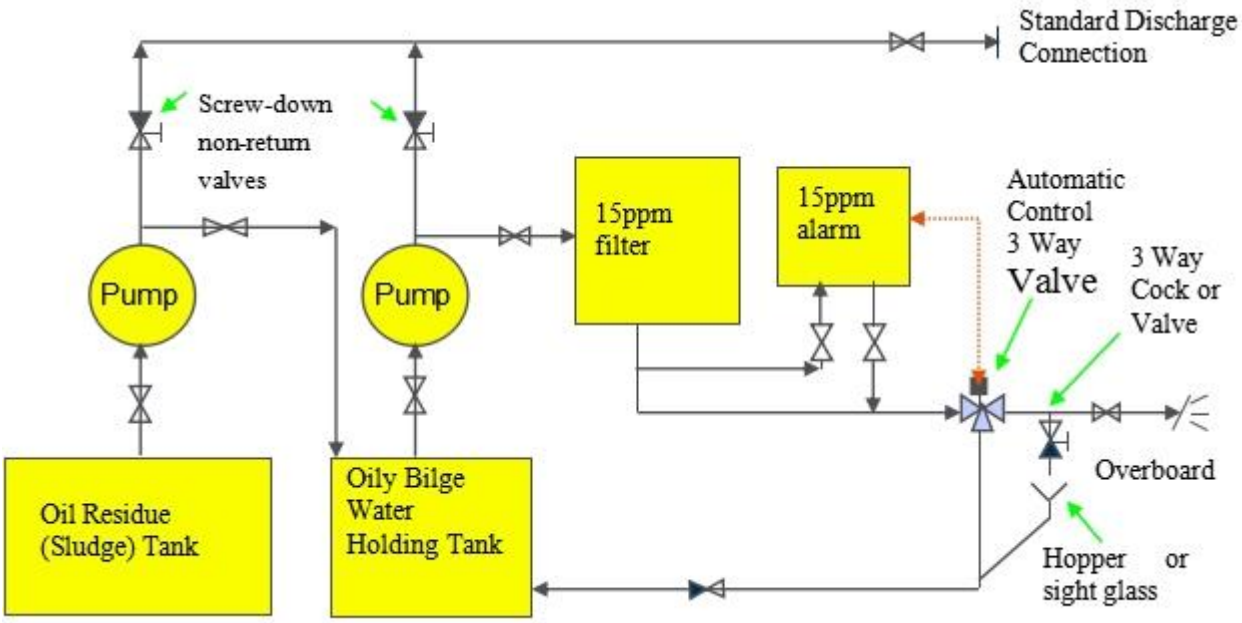


The arrangement above is not acceptable as there is a sludge discharge connection to the oily water separator, bilge system and Oily Bilge Water Holding Tank – prohibited under Regulation 12.3. 3.



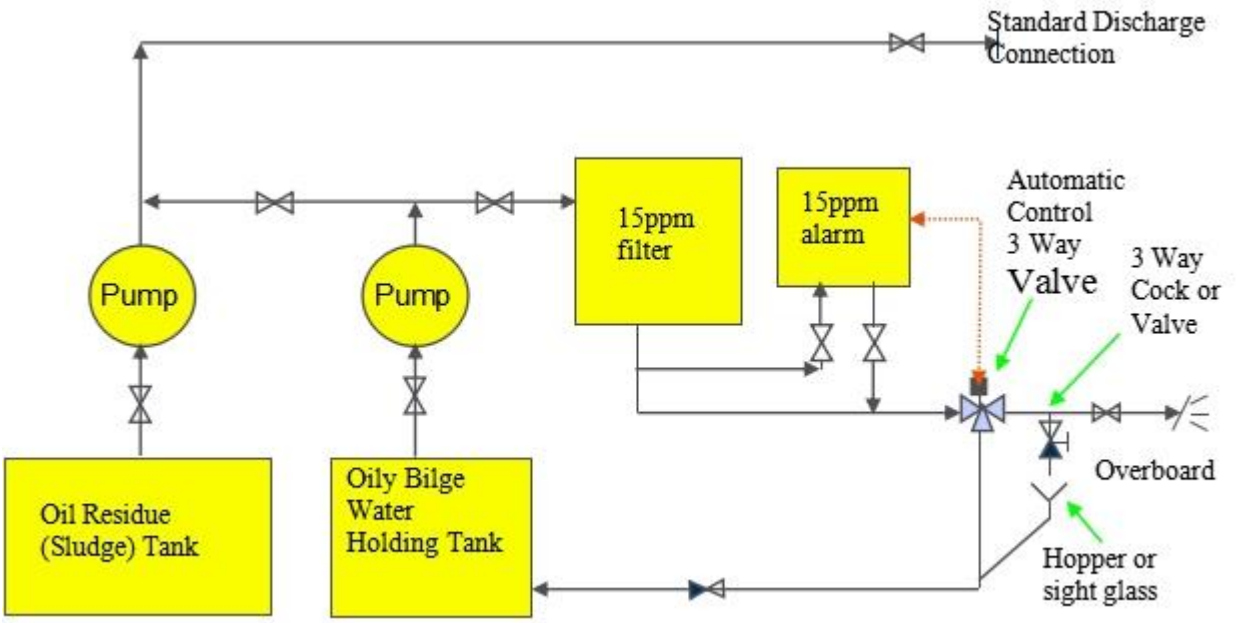
The arrangement above is not acceptable as there is a sludge discharge connection to the oily water separator and bilge system – prohibited under Regulation 12.3. 3.

****

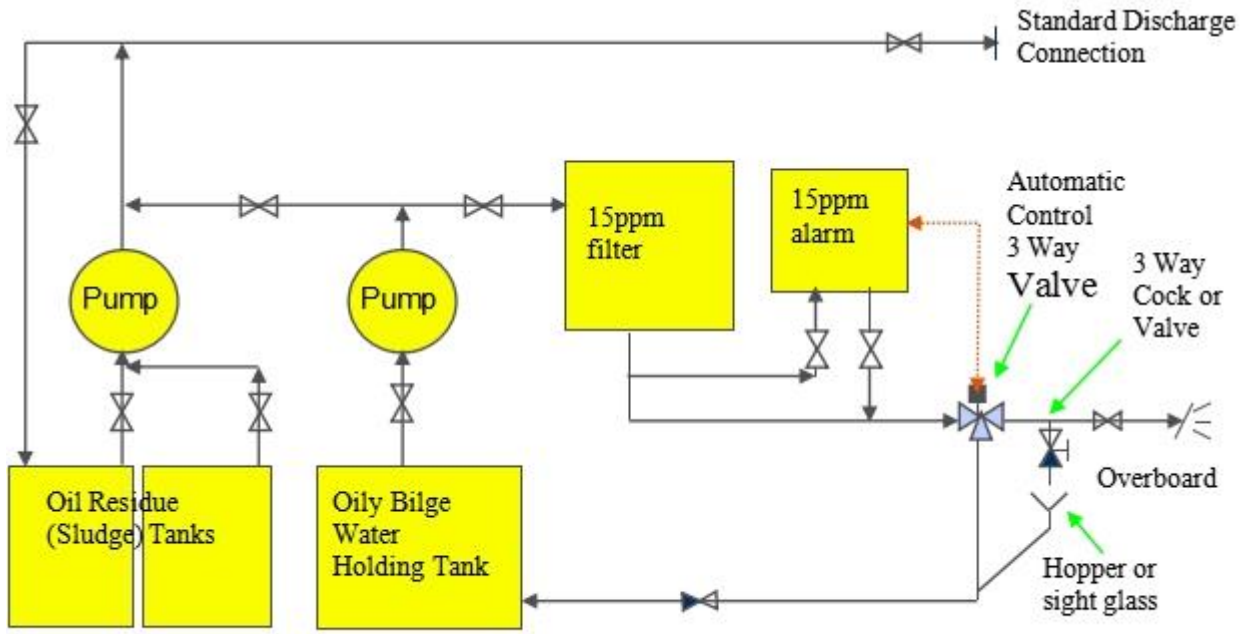


The arrangement above is not acceptable as there is a sludge discharge connection to the oily bilge water holding tank – prohibited under Regulation 12.3. 3.

****



The arrangement above is not acceptable as there is a sludge discharge connection to the oily bilge water holding tank – prohibited under Regulation12.3. 3.



The arrangement above is not acceptable as there is a sludge discharge connection to the oily water separator, Bilge system and Oily Bilge Water Holding Tank – prohibited under Regulation 12.3. 3.

This arrangement is also not acceptable under MEPC.1/Circ.641 paragraph 5.3, as it is not permissible to use a common discharge pipe as an internal sludge transfer pipe between sludge tanks.

Note

13.9 Integral Buoyancy Casings in Lifeboats and Rescue Boats

IACS Number	Rec. 122	version	New,Jan.,2012	Date of implementation		Means of implementation	

Main Contents

History and Purpose

With reference of a particular case of rescue boat accident due to the water ingress in buoyancy chamber, a Survey Panel Member proposed to discuss this matter with a view to providing guidance on the assessment of integral buoyancy chambers of lifeboats and rescue boats. Panel discussed this matter under PSU11017 and unanimously agreed with the draft IACS Recommendation, which should be followed by safety officer or the Service Company at the time of boat inspection. GPG approved the recommendation submitted by the Survey Panel.

Reference

1. Cases have been discovered where water ingress into the Integrated (Built-in) Buoyancy Casings of Rescue Boats and Lifeboats has caused damage to the internal buoyancy foam material. Where such foam is of the open cell two-part expanding polyurethane type the ingress can lead to significant damage to the foam, which may absorb the water and take on sponge-like characteristics. In these cases the laden weight of the boat may be significantly affected and may cause an overload on the boat or launching appliance.

2. Where the foam is known to be of the open cell type, or doubt exists as to the type of foam incorporated in the boat's buoyancy casings, it is recommended that the following precautions be taken by the safety officer or Service Company at the time of each boat inspection.

2.1 The boat's hull in way of all buoyancy casings should be thoroughly examined for cracks, holes, buckling or folding of the structure and general deterioration. Particular attention should be paid in way of the hull to deck connection and the buoyancy casing to hull connections.

2.2 Any foam injection points (subsequently closed) should be examined for cracking or deterioration.

2.3 The external hull and any fendering points in way of integrated buoyancy casings should be examined for holing, cracking and deterioration.

2.4 Any penetrations to the buoyancy chambers, for example, where seat belts, thwarts or grab lines are attached, should be closely examined for fit, gasketting (where fitted) and tightness. Loose fittings should be adjusted and the affected buoyancy chamber examined with special care regarding water penetration.

2.5 The drain plugs should be removed from the boat at the time of the inspection and the quantity of water drained should be monitored to ensure it is not excessive.

2.6 Boat performance whilst manoeuvring should be monitored for unusual performance, heaviness or excessive sluggishness which might be attributable to an increased boat weight.

3. Should any doubt exist as to the integrity of the integral buoyancy, and water ingress is suspected, the boat should be weighed to confirm that boat weight remains unchanged.

Note

13.10 Uniform application of SOLAS Ch.II-2 Reg. 4.5.7.3.2.1 for accepting a constant operative inerting systems (COIS) as an alternative to fixed hydrocarbon gas detection equipment in double hull and double-bottom spaces on oil tankers

IACS Number	Rec.131	version	Jul.23,2013	Date of implementation		Means of implementation	

Main Contents

Background:

1. SOLAS Regulation II-2/4.5.7.3.2 gives an alternative to fixed hydrocarbon gas detection systems in double hull spaces.

2. IACS has agreed the following interpretation:

A "constant operative inerting system" is a permanently fitted inert gas system connected to those spaces detailed in SOLAS Regulation II-2/4.5.7.3.1 in lieu of a fixed hydrocarbon gas detection system. The system complies with the requirements for inert gas systems for cargo tanks and is capable of constantly maintaining such spaces under an inert atmosphere at all times except when all adjacent spaces have been confirmed gas free for the purpose of entry.

3. Anticipating that designers would probably prefer to utilize the ship's existing inert gas system for the purpose of fulfilling the requirement for a COIS, there is a need to assess additional features that may be applied to such systems. For the purpose of ensuring harmonized practices regarding the approval of such systems the following additional requirements should be considered:

Applicability:

4. The requirement in SOLAS Regulation II-2/4.5.7.3.2 applies to all spaces detailed in SOLAS Regulation

II-2/4.5.7.3.1 and includes *"all ballast tanks and void spaces in the double-hull and double-bottom spaces adjacent to the cargo tanks, including the forepeak tank and any other tanks and spaces under the bulkhead deck adjacent to cargo tanks"*.
Due to the safety hazards related to inerting of spaces that are arranged for normal entry during operation, the use of COIS should not be permitted for such spaces.

Inert gas distribution piping:

5. SOLAS Regulation II-2/4.5.5.1.3 requires the following:

Tankers required to be fitted with inert gas systems shall comply with the following provisions:
.1 double hull spaces shall be fitted with suitable connections for the supply of inert gas;
.2 where hull spaces are connected to a permanently fitted inert gas distribution system, means shall be provided to prevent hydrocarbon gases from the cargo tanks entering the double hull spaces through the system; and
.3 where such spaces are not permanently connected to an inert gas distribution system, appropriate means shall be provided to allow connection to the inert gas main.

6. The above does not consider the hazards related to hydrocarbon gas backflow from spaces detailed in SOLAS Regulation II-2/4.5.7.3.1 to non-hazardous spaces. These spaces are typically defined as hazardous zones 1 on tankers. Hence, means for prevention of gas backflow from ballast tanks to the inert gas unit and the non-hazardous area in which it is located are required. The following is therefore proposed:

Prevention of hydrocarbon gas backflow from spaces detailed in SOLAS Regulation II-2/4.5.7.3.1:

7. In addition to SOLAS Regulation II-2/4.5.5.1.3, the COIS should be provided with means for prevention of backflow of hydrocarbon gas from spaces detailed in SOLAS Regulation II-2/4.5.7.3.1 to the inert gas unit and the non-hazardous space in which it is located. Acceptable means are;
- Double block and bleed arrangements as per IACS UR F20 or,
- At least two non-return devices as per FSS Code Ch.15 Reg.2.3.1.4.1.

8. Transfer of inert gas between spaces detailed in SOLAS Regulation II-2/4.5.7.3.1 and cargo tanks should not be permitted.

Prevention of gas backflow from cargo tanks to spaces detailed in SOLAS Regulation II-2/4.5.7.3.1:

9. Considering that the COIS has to be continuously operated (even during inerting and topping up of cargo tanks), the above means are also required for connections allowing gas backflow from cargo tanks into spaces detailed in SOLAS Regulation II-2/4.5.7.3.1.

10. Transfer of inert gas between cargo tanks and spaces detailed in SOLAS Regulation II-2/4.5.7.3.1 should not be permitted.

Prevention of water ingress into cargo tanks and void spaces/cofferdams:

11. To prevent water ingress (due to overfilling of ballast tanks) into the inert gas generator unit and the space in which it is located, a non-return valve with a positive means of closure should be provided in the main COIS distribution line.

12. Unless alternative means of prevention of water ingress are provided, where a common distribution system is arranged for ballast tanks and void spaces/cofferdams, a high level alarm should be provided in the ballast tank and a water ingress detector should be provided in the void space.

13. If the COIS is interconnected with the inert gas system serving cargo tanks, a non-return valve with a positive means of closure should be so located that water ingress into cargo tanks is also prevented.

Means for isolation for the purpose of safe entry:

14. Means should be provided for isolating each space detailed in SOLAS Regulation II-2/4.5.7.3.1 from a common COIS distribution system. Where stop valves are fitted, they should be provided with locking arrangements which should be under the control of the responsible ship's officer. There should be a clear visual indication of the operational status of the valves or other acceptable means.

Piping design:

15. The COIS distribution system should be so designed as to prevent accumulation of water in the system under all normal conditions.

Consequences of system failure:

16. The COIS is an alternative to fixed HC gas detection and thus requires continuous operation. The system must therefore be arranged with redundancy in accordance with the requirements for inert gas systems in The FSS Code Ch.15. In case of failure of the COIS, emergency manual gas detection is required as a temporary means. Compliance with SOLAS Regulation II-2/4.5.7.2 is therefore required also for ships with COIS.

Automation:

17. The COIS is required to be constantly operating. This implies that the system should be arranged as follows:
- The COIS provides a continuous overpressure supply of inert gas (padding).
- The inert gas system serving the COIS is arranged for automatic start in case of low pressure.

Monitoring:

18. The COIS may be arranged to supply inert gas to spaces detailed in SOLAS Regulation II-2/4.5.7.3.1 independently or simultaneously with the supply of inert gas to cargo tanks for topping up purposes. Accordingly, the following independent instrumentation is required for a COIS distribution system serving the spaces detailed in SOLAS Regulation II-2/4.5.7.3.1:

- Low water level in deck water seals as per FSS Code Ch.15.2.4.3.1.7 (if provided for the COIS).
- Double-block and bleed activation and alarms as per IACS UR F20 (if provided for the COIS).
- Low pressure in the COIS distribution piping as per FSS Code Ch.15.2.4.3.1.8.
- High pressure in the COIS main distribution piping as per FSS Code Ch.15.2.4.3.1.9.

Air pipe/ventilation arrangements:

19. Spaces detailed in SOLAS Regulation II-2/4.5.7.3.1 are required to be maintained in an inert condition. Accordingly, unless arrangements are made for continuously purging such spaces with inert gas, means should be required to ensure that inert gas does not escape via individual air pipes fitted to such spaces when inert gas is not supplied with due care taken to provide protection from overpressure and underpressure from additional thermal variation in the event the tank becomes isolated in the process of ensuring the gas does not escape[1].

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1 In determining the type of inerting system to be provided the following should be considered:

a. If the spaces are required to be fully inerted and pressurised then a closed pressurised system with P/V valves should be fitted with low pressure alarms, high pressure alarms and automatic make up.

b. An open venting system constantly leaking inert gas onto the deck is possible. In this case a constant supply of inert gas is required. A low pressure alarm would not be effective and a constant low flow of inert gas to all spaces irrespective of pressure should be provided. Arrangements should prevent the build-up of pockets of inert gas on deck and the introduction of inert gas into ventilation inlets.

c. A simple 'partly inerted' ballast tank philosophy with an open venting system is possible. As inert gas is slightly heavier than air, the tank will be mainly inerted but could have a layer of air on top of the gas. In time there would be dilution of the inert gas and mixing of air and inert gas. Occasional make up with inert gas is required.

d. In all cases the venting system should be arranged to effectively disperse the inert gas when the ballast tanks are being filled. The aggregate area of the venting system opening should be not less than 125% of the effective area of the ballast tank filling line.

20. Arrangements for isolation of ballast tanks from the tank venting system should be such that inadvertent isolation does not lead to structural failure due to ballast operations.

21. The capacity of the means must not result in overpressure (static and dynamic) exceeding structural design limits, even in the event of overfilling of ballast tanks. Additionally, the capacity of the means must not result in under-pressure exceeding structural design.

22. For common venting systems, considerations should be made with respect to damage stability and progressive flooding.

System capacities:

23. Where an inert gas production plant provides inert gas for both the cargo inerting and COIS system then the following should be applied[2]:

- At least 125% of the combined maximum discharge rate of the cargo and ballast tanks where systems and operational procedures available onboard permit simultaneous cargo and ballast discharge; or
- At least 125% of the combined maximum discharge rate of the cargo or ballast tanks, whichever is greater, where the system has an interlocking arrangement for the gas regulating valves that do not permit simultaneous inerting of cargo and ballast tanks and operational procedures available onboard are limited to this type of inerting.

If ballast tanks are arranged for gravity drainage, the maximum discharge rate of ballast tanks should be taken as the maximum discharge rate using ballast pumps or the maximum obtainable gravity discharge rate, whichever is greater.

24. Where a separate inert gas production plant is provided for the COIS system then the plant should have a capacity of at least 125% of the maximum discharge rate of the ballast tanks.

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2 This assumes that there will be one I.G. system serving both the cargo tanks and COIS. This is not necessarily the case.

Remarks