TÜRK LOYDU

TL-I SC

Interpretations of the International Convention for SOLAS, 1974 and its Amendments

January 2020

These interpretations are prepared by embedding related IACS Unified Interpretations. In order to have consistency, the numbering of the interpretations are kept as the same with related IACS Unified Interpretations.

Unless otherwise specified, these Rules apply according to the implementation dates as defined in each interpretation. See Rule Change Summary on TL website for revision details.

This latest edition incorporates all rule changes.

"General Terms and Conditions" of the respective latest edition will be applicable (see Rules for Classification and Surveys).

If there is a difference between the rules in English and in Turkish, the rule in English is to be considered as valid. This publication is available in print and electronic pdf version. Once downloaded, this document will become UNCONTROLLED. Please check the website below for the valid version.

http:/www.turkloydu.org

TÜRK LOYDU

Head Office Postane Mah. Tersaneler Cad. No:26 Tuzla 34944 İSTANBUL / TÜRKİYE

Tel : (90-216) 581 37 00

Fax : (90-216) 581 38 00

E-mail : info@turkloydu.org

http://www.turkloydu.org

Regional Offices

Ankara Eskişehir Yolu Mustafa Kemal Mah. 2159. Sokak No : 6/4 Çankaya - ANKARA / TÜRKİYE

Tel : (90-312) 219 56 34

Fax : (90-312) 219 68 25

E-mail : ankara@turkloydu.org

İzmir Atatürk Cad. No :378 K.4 D.402 Kavalalılar Apt. 35220 Alsancak - İZMİR / TÜRKİYE

Tel : (90-232) 464 29 88

Fax : (90-232) 464 87 51

E-mail : izmir@turkloydu.org

Adana Çınarlı Mah. Atatürk Cad. Aziz Naci İş Merkezi No:5 K.1 D.2 Seyhan - ADANA / TÜRKİYE

Tel : (90- 322) 363 30 12

Fax : (90- 322) 363 30 19

E-mail : adana@turkloydu.org

CONTENTS

TL-I SC168 Hydrants for dangerous goods

TL-I SC171 Interpretation of the term "First Survey"

TL-I SC176 Fixed local application fire extinguishing system Reg. II-2/10.5.6

TL-I SC180 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 an single hold cargo ships other than bulk carriers (Resolution MSC.188(79))

TL-I SC182 Bulk carriers not complying with SOLAS XII/9 as of 1 January 2004

TL-I SC183 Endorsement of Certificates with the Date of Completion of the Survey on which they are Based

TL-I SC189 High pressure oil fuel delivery lines on small engines

TL-I SC190 Interpretations TL-I SC 190 for Application of SOLAS Regulation II-1/3-6 (Res MSC.134(76)) and Technical Provisions on Permanent Means of Access (Res MSC.133(76))

TL-I SC191 Interpretations TL- I SC 191 for the 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))

TL-I SC197 Non-combustible cargoes Reg. II-2/10.7.1.4

TL-I SC 203 Carriage requirements for shipborne navigational systems and equipment

TL-I SC208 SOLAS XII/6.5.1 in terms of protection of cargo holds from loading/discharge equipment SOLAS Regulation XII/6.5.1 and SLS.14/Circ.250

TL-I SC211 Protection of fuel oil Regulations II-2/3.6 and 4.5.1.1

TL-I SC213 Arrangements for remotely located survival craft 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 para. 4.1.3.2

TL-I SC215 Embarkation ladder SOLAS Regulation III/16.1

TL-I SC217 Nozzles installation for fixed water based local application fire-fighting systems for use in category A machinery spaces (MSC/Circ 913)

TL-I SC218 Fire testing of equivalent water-based fire extinguishing systems (IMO MSC/Circ.1165, Appendix B, 4.5.1)

TL-I SC219 Fire testing of equivalent water-based fire extinguishing systems (IMO MSC/Circ.1165, Appendix B, 4.5.4.1)

TL-I SC220 Special requirements for ro-ro passenger ships

TL-I SC223 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)

TL-I SC224 Measurement of Distances

TL-I SC 226 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

TL-I SC228 Machinery shutoff arrangements - oil mist detector arrangements SOLAS Regulation II-1/27.5

TL-I SC233 LSA code - lifeboat exterior colour LSA Code item 1.2.2.6 as amended by MSC Res. 207(81)

TL-I SC235 Navigation bridge visibility to ship's side Chapter V, Regulation 22

TL-I SC239 Insulation with approved non-combustible materials Reg. II-2/3.2.3

TL-I SC243 Access to controls for closing of ventilation of vehicle, special category and ro-ro spaces SOLAS II-2/20.3.1.4.1

TL-I SC244 Load testing of hooks for primary release of lifeboats and rescue boats (IMO Res. MSC.81(70), Part 2, Ch. 5.3.4)

TL-I SC245 Suction and discharge piping of emergency fire pumps, which are run through the machinery space SOLAS II-2/10.2.1.4.1

TL-I SC247 Emergency exit hatches to open deck SOLAS Reg. II-2/13.1

TL-I SC248 Greatest launching height for a free-fall lifeboat LSA Code 1.1.4

TL-I SC249 Implementation of SOLAS II-1, Regulation 3-5 and MSC.1/Circ.1379

TL-I SC250 Fire-Extinguishing Arrangements in Cargo Spaces (Res. MSC.268(85), IMSBC Code)

TL-I SC252 Controls for releasing carbon dioxide and activating the alarm in the protected space FSS Code 5.2.2.2 (MSC.1/Circ.1392 and Circ.1327)

TL-I SC 254 Fall Preventer Devices (MSC.1/Circ.1392 and Circ.1327)

TL-I SC257 Pilot transfer arrangements (SOLAS V/23 as amended by Resolution MSC.308(88))

TL-I SC258 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

TL-I SC259 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)

TL-I SC262 Fixed foam fire extinguishing systems, foam-generating capacity (FSS Code / Chapter 6 / 3.2.1.2 and 3.3.1.2 as amended by Res. MSC.327(90))

TL-I SC265 Code of safe practice for cargo stowage and securing – Annex 14

TL-I SC266 Revised guidelines for cargo securing manual and code of safe practice for cargo stowage and securing - scope of application

TL-I SC267 Implementation of the requirements relating to lifeboat release and retrieval systems (LSA Code Paragraph 4.4.7.6 as amended by resolution MSC.320(89))

TL-I SC274 Hazardous area classification in respect of selection of electrical equipment, cables and wiring and positioning of openings and air intakes

TL-I SC276 Escape from machinery spaces on passenger ships

TL-I SC277 Escape from machinery spaces on cargo ships

TL-I SC279 Annual testing of VDR, S-VDR, AIS and EPIRB

TL-I SC284 Automatic shutdown of the inert gas systemand its components parts

TL-I SC285 Operational status of valves to cargo tanks

TL-I SC286 Operational status of the inert gas system

TL-I SC287 Low pressure audible alarm system

TL-I SC288 Carriage of Dangerous Goods – Required Air Changes

TL- I SC 30 Fire-extinguishing arrangements in machinery spaces

(Interpretation of Chapter II-2, Regulation 10.5.1 and 10.5.2)

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-extin-guish-ing system**	**Portable foam applica-tor[*1]**	**Portable foam extin-guishers**	**Add'l portable foam extin-guishers**	**135 *l* foam extin-guisher**	**45 *l* foam extinguis-hers[*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.

Note: This interpretation is implemented from 1 January 2001.

TL- I SC52 Special requirements for ships carrying dangerous goods

(Reg. II-2/19.3.4.2)

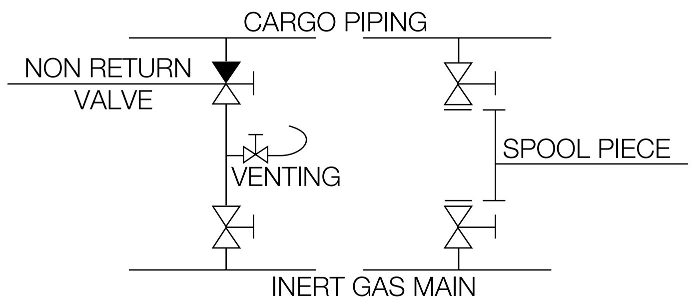
1 Exhaust fans are to be of non-sparking type in accordance with TL - R F 29, as revised.
2 The purpose of "suitable wire mesh guards" is to prevent foreign objects from entering into the fan casing. The standard wire mesh guards are to have a size of 13 mm x 13 mm.
(MSC/Circ. 1120)

Note:
This interpretation is implemented from1 July 2006.

TL- I SC62 Inert gas systems

(FSS Code, Ch. 15, 2.3.2.7 and 2.3.2.8)

As a guide, the effective isolation required by this regulation may be achieved by the two arrangements shown in the following sketches.



(MSC/Circ. 1120)

TL- I
SC83

Continuity of the Supply when Transformers Constitutes an Essential Part of the Electrical Supply System

(Chapter II-1, Regulation 41.1.5)

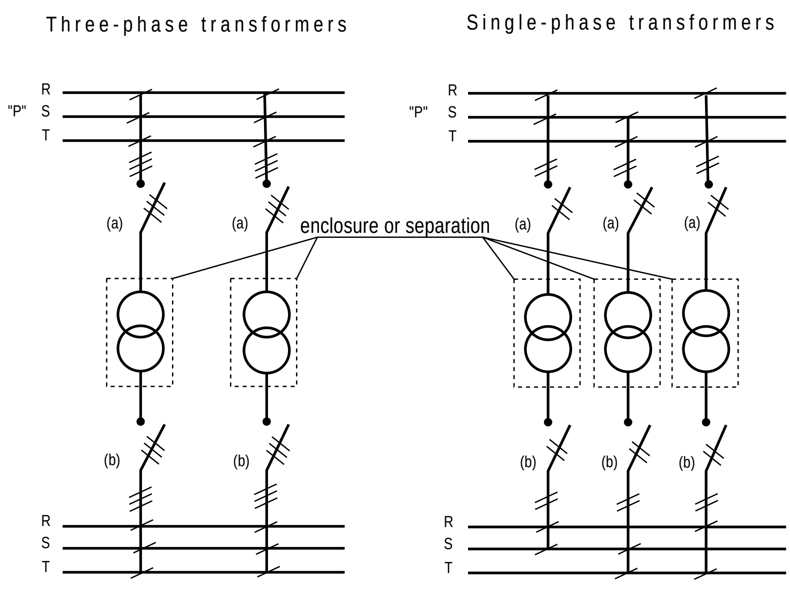
The number, capacity and arrangement of power transformers supplying auxiliary electrical systems are to be such that with any one transformer not in operation, the remaining transformer(s) is (are) sufficient to ensure the safe operation of those services necessary to provide normal operational conditions 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 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:



(a) switchgear and protection devices
(b) multipole isolating switch

TL- I SC109

Open Top Container Holds - Water Supplies

(Reg. II-2/19.3.1)

1 The water spray system required in paragraphs 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 allow simultaneous use of the water spray system plus four jets of water from hose nozzles.
(MSC/Circ. 1120)

TL- I SC110

Open Top Container Holds - Ventilation

(Reg. II-2/19.3.4)

(This recommendation is applied from 1 January 1996.)

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) ◀◀

TL- I SC111

Open Top Container Holds - Bilge Pumping

(Reg. II-2/19.3.5)

(This interpretation is applied from1 January 1996.)

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

◀◀

TL- I SC113 Emergency Towing Arrangements on Tankers - Prototype Test

(Resolution MSC . 35 (63), 2.10)

(This interpretation is applied from 1 January 1996.)

Text:

"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 x SWL.

Note: "Survey Guidelines - Emergency Towing Arrangements" is located in TL- G 40 (1995).

◄◄

TL- I SC122 Corrosion Prevention in Seawater Ballast Tanks

(Chapter II-1, Regulation 3-2)

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.

Note:

1. This interpretation is implemented not later than 1 July 1998.

2. This interpretation 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).

TL- I SC129 Fire Detection in Unmanned Machinery Spaces

(Reg. II-2/7.4)

This requirement applies to machinery spaces of category A.

Note:

1. This interpretation is applied 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 TL- PR 29.

TL- I SC134 Essential Services and Arrangements of Sources of Power, Supply, Control and Monitoring to the different Catergories of Essential Services (SOLAS Regulations II-1/40 & 41)

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

Note: 1.This interpretation is implemented from 1 January 2003.

▶

TL- I
SC137

Definition of High Speed Craft

(Chapter IX, Reg 1.8)

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/1.2 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/1.2 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.

- 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 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 TL- I 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)

10.3 Services for habitability in the paragraph 4 may be included in the automatic load shedding or other equivalent arrangement.

◄◄

TL- I
SC144

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

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 free-fall 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.

Note:

1. This interpretation is implemented from 1 January 2020, unless otherwise instructed by a Flag State.

TL- I

SC152 Use of emergency generator in port

(Chapter II-1, Regulations 42.1.4 and 43.1.4)

SOLAS Regulations II-1/42.1.4 and 43.1.4 read:

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.

Interpretations

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

Instructions* 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.

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

Note: This interpretation is implemented from 1 January 2000.

Provision of Detailed Information on Specific Cargo Hold Flooding Scenarios (SOLAS XII/9.3)

This Unified Interpretation is applicable only to bulk carriers which are constructed before 1 July 1999 but not capable of complying with SOLAS XII/4.2.

Where bulk carriers are shown to be not capable of complying with SOLAS XII/4.2 due to the design configuration of their cargo holds, SOLAS XII/9 permits relaxation from the application of regulations 4.2 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's 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 4.2. 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 4.2, 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/4.3 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 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 TL- R S 24), 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.

Note: This interpretation is implemented from 1 January 2001.

TL-I SC155

Lightweight check in lieu of inclining test

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.

Note:

1. This interpretation is implemented to ships that are contracted for construction, or to ships which commence conversions, before 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 TL-PR 29.

TL-I

SC155

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.

TL- I SC156

Doors in watertight bulkheads of cargo ships and passenger ships

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].

Footnote:

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

Note:

1. This interpretation is implemented from 1 January 2003.

2. This interpretation is applied 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 TL- PR 29.

1. Definitions

For the purpose of this interpretation 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.

Normally Open
May be left open provided it is always ready to be immediately closed.

Used
In regular use, may be left open provided it is ready to be immediately closed.

3.2 Type

Power operated, sliding or rolling[2]	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 applicable[3]) 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 degrees or the maximum angle of heel during intermediate stages of flooding, whichever is the greater.

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 bridge[4] 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, 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 Indication[5]

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.

Footnotes:

[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

[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)

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.

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

3.5 Alarms[5]

3.5.1 Failure of the normal power supply of the required alarms shall be indicated by an audible and visual alarm.

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 independent 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. This alarm is to be both audible and visible and shall be located on the central operating console 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”.

4. Fire Doors

Watertight doors may also serve as fire doors but need not be fire-tested notwithstanding the fire resistance of the division in which the watertight doors are fitted. However, such doors fitted above the bulkhead deck on passenger ships shall be tested to the FTP Code in accordance with the division they are fitted. 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 II-1/13.8.1 to 13.8.3 and from both sides of each door.

Footnotes:

[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)

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 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 [6].

For clarification purposes it shall be noted that even though these doors are covered by the text in this UI, in accordance with the practice of LL, SOLAS and MARPOL Conventions such hose testing usually is related to weathertight doors rather than to watertight doors.

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 following[7]

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

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.

Footnotes:

[6] Additionally, such doors may need to be pressure tested to a head as specified by a National standard or regional agreement

[7] 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

5.3.3 For doors on passenger ships which are normally open and 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 [8].

5.4 Hose Testing

5.4.1 All watertight doors shall be subject to a hose test in accordance with TL- R 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:

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

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 while 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-1/13.4, 13.5.1, 13.5.2,13.6, 13.7.1,13.8.1, 13.8.2, 22.1, 22.3 and 22.4	Norm. Closed	POS	Yes	Yes	Yes (local)	No	Certain doors may be left open, see SOLAS II-1/22.3 and IMO MSC.1/Circ.1564
	SOLAS II-1/13.9.1, 13.9.2, 14.2, 22.2 and 22.5	Perm. Closed	S, H	No	No	No	Yes	See Notes 3 + 4 + 6
(2)At or above	SOLAS II-1/17.1 and 22.3	Norm. Closed	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, 17-1.2, 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, 17-1.2, 17-1.3, 22.7 and 23.3 to 23.5	Perm. Closed	S, H	No	Yes	Yes (remote)	Yes	See Notes 1 + 3 + 4

<table>
<tr><th colspan="9">II. Cargo Ships</th></tr>
<tr><td rowspan="4">(1)Below</td><td>SOLAS II-1/13-1.2 and 22.3
MARPOL I/28.3
ICLL66+A.320
1988 Protocol to ICLL66
IBC, and IGC</td><td>Used</td><td>POS</td><td>Yes</td><td>Yes</td><td>Yes (local)</td><td>No</td><td></td></tr>
<tr><td>SOLAS II-1/13-1.3, 22.3 and 24.4</td><td>Norm. Closed</td><td>S, H</td><td>No</td><td>Yes</td><td>No</td><td>Yes</td><td>See Note 1</td></tr>
<tr><td>SOLAS II-1/13-1.4, 24.3, and 24.4</td><td rowspan="2">Perm. Closed</td><td rowspan="2">S, H</td><td rowspan="2">No</td><td rowspan="2">No</td><td rowspan="2">No</td><td rowspan="2">Yes</td><td rowspan="2">See Notes 3 + 4</td></tr>
<tr><td>SOLAS II-1/ 13-1.4, 13-1.5, 22.2, 24.3 and 24.4</td></tr>
<tr><td rowspan="3">(2)At or above</td><td>SOLAS II-1/13-1.2 and 22.3
MARPOL I/28.3
ICLL66+A.320
1988 Protocol to ICLL66
IBC, and IGC</td><td>Used</td><td>POS</td><td>Yes</td><td>Yes</td><td>Yes (local)</td><td>No</td><td>See Notes 2 + 5</td></tr>
<tr><td>SOLAS II-1/13-1.3, 22.3 and 24.4</td><td>Norm. Closed</td><td>S, H</td><td>No</td><td>Yes</td><td>No</td><td>Yes</td><td>See Note 1</td></tr>
<tr><td>SOLAS II-1/13-1.4, 13-1.5, 24.3 and 24.4</td><td>Perm. Closed</td><td>S, H</td><td>No</td><td>No</td><td>No</td><td>Yes</td><td>See Notes 3 + 4</td></tr>
</table>

Notes:

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

2. Under ICLL66, doors separating a main machinery space from a steering gear compartment may be hinged quick acting 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 to bulkhead deck or freeboard deck	1. Regulation	2. Frequency of Use while 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-1/15.9, 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, 17-1.2, 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, 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 quick acting or 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.

TL- I SC161 Timber deck cargo in the context of damage stability requirements

SOLAS Regulation II-1/5-1 reads:

1 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 The information should include:

.1 curves or tables of minimum operational metacentric height (*GM*) versus draught which assures compliance with the relevant intact and damage stability requirements, alternatively corresponding curves or tables of the maximum allowable vertical centre of gravity (*KG*) versus draught, or with the equivalents of either of these curves;

.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 stability information shall show the influence of various trims in cases where the operational trim range exceeds +/- 0.5% of L_s.

Note:

1. Implementation date 1 January 2001.

2. This interpretation is applied on ships contracted for construction on or after 1 January 2009. However, Members and Associate are not precluded from applying this interpretation 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 TL- PR 29.

4 For ships which have to fulfil the stability requirements of part B-1, information referred to in paragraph 2 are determined from considerations related to the subdivision index, in the following manner: Minimum required *GM* (or maximum permissible vertical position of centre of gravity *KG*) for the three draughts d_s, d_p and d_l are equal to the *GM* (or *KG* values) of corresponding loading cases used for the calculation of survival factor s_i. For intermediate draughts, values to be used shall be obtained by linear interpolation applied to the *GM* value only between the deepest subdivision draught and the partial subdivision draught and between the partial load line and the light service draught respectively. Intact stability criteria will also be taken into account by retaining for each draft the maximum among minimum required *GM* values or the minimum of maximum permissible *KG* values for both criteria. If the subdivision index is calculated for different trims, several required *GM* curves will be established in the same way.

5 When curves or tables of minimum operational metacentric height (*GM*) versus draught are not appropriate, the master should ensure that the operating condition does not deviate from a studied loading condition, or verify by calculation that the stability criteria are satisfied for this loading condition.

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 means sawn wood or lumber, cants, logs, poles, pulpwood and all other types of timber in loose or packaged forms;

timber deck cargo means a cargo of timber carried on an uncovered part of a freeboard or superstructure deck. The term does not include wood pulp or similar cargo;

timber load line means a special load line assigned to ships complying with certain conditions related to their construction set out in the LOAD LINE CONVENTION 1966 as amended by the 1988 Protocol or, where relevant, to the LOAD LINE CONVENTION, 1966 and used when the cargo complies with the stowage and securing conditions of the CODE OF SAFE PRACTICE FOR SHIPS CARRYING TIMBER DECK CARGOES, 1991 (Resolution A.715(17));

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 provisions of Chapters 3 and 4 of the CODE OF SAFE PRACTICE FOR SHIPS CARRYING TIMBER DECK CARGOES, 1991 (Resolution A.715(17)).

3. The height and extent of the timber deck cargo shall be in accordance with Chapter 3.2 of the CODE OF SAFE PRACTICE FOR SHIPS CARRYING TIMBER DECK CARGOES, 1991, 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.

TL- I SC163 Emergency fire pumps in cargo ships - sea suction and sea valve

(FSS Code, Ch. 12, 2.2.1.1)
(SOLAS Chapter II-2, Reg.10, 2.2.3.1)
(SOLAS Chapter II-2, Reg.10, 2.2.4.2)

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	16 mm	19 mm
0.27 N/mm^2	16 m^3/h	23.5 m^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.

Note:

1. This interpretation is implemented to ships contracted for construction on/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 TL- PR 29.

TL- I

SC168

Hydrants for dangerous goods

(SOLAS 2000 Amendments (MSC.99(73)), Reg.II-2/19.3.1.2)

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)

Note: This interpretation is implemented from 1 January 2003.

◄◄

TL- I SC171

Interpretation of the term "First Survey"

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.

Note:

1. This interpretation is implemented from, 31 December 2008.

TL- I
SC176

Fixed Local Application Fire Extinguishing System (Reg.II-2/10.5.6)

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.

Note:

1. This interpretation is implemented from 1 January 2004.

◄◄

TL- I
SC180

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))

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 SOLAS II-1/25 or bulk carriers subject to SOLAS XII/12, 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:

*****

Note:

1. TL is to implement this interpretation and its referenced standards for equipment approval requests received on or after 1 October 2003. Equipment, for which equipment approval requests were received before 1 October 2003 and which may not fully comply with this interpretation and its referenced standards, may be installed until 31 December 2003 for compliance with SOLAS XII/12.

2. This interpretation is implemented on ships contracted for construction on or after 1 January 2007.

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 TL- PR 29.

4. Refer to IMO MSC/Circ. 1176.

5. This interpretation 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. T

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.

*****

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.

*****

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: Electrical Equipment for Explosive Gas Atmospheres to a minimum requirement of EX(ib). Where a ship is designed only for the carriage of cargoes that cannot create 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 TL.

*****

Performance Standards, paragraph 3.3.2

3.3.2 Visual and audible alarms should conform to the Code on Alarms and Indicators, 1995, as may be amended, 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.

*****

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.

*****

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.

*****

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 (18h). 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.

*****

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.

Interpretation:

- TL- R E10 may be used as an equivalent test standard to IEC 60092-504.

- 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).

*****

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 TL.

*****

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 be installed in 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.

*****

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 sea water;

.3 grain particles and seawater; and

.4 aggregate (sand) particles and sea water.

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)

*****

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 practible, 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.

*****

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.

*****

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.TL is to ensure that any plans required for classification purposes have been appraised/approved as appropriate.

UI SC 181 BRIDGE DESIGN, EQUIPMENT ARRANGEMENT AND PROCEDURES

Withdrawn pending further development work

TL- I SC182 Bulk carriers not complying with SOLAS XII/9 as of 1 January 2004

(Chapter XII, Regulation 9)

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:

Bulk carriers subject to SOLAS XII/9 but which have not been brought into compliance with the regulation as of 1 January 2004 are to comply with SOLAS regulation XII/12 in accordance with the compliance schedule of that regulation (i.e not later than the date of the annual, intermediate or renewal survey of the ship to be carried out after 1 July 2004, whichever comes first).

Note:

1. This TL- I SC 182 is implemented from 1 January 2004.

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).

TL- I SC183 Endorsement of Certificates with the Date of Completion of the Survey on which they are Based

"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 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).

Note:

1. This TL- I SC183 is implemented from 1 March 2004.

TL- I SC189 High pressure oil fuel delivery lines on small engines

(SOLAS chapter II-2, regulations 15.2.9 and 15.2.12

(Resolution MSC.31(63))

Regulation

SOLAS Regulations II-2/15.2.9 and 15.2.12 under MSC.31(63) read:

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 375kW 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.

Note: This interpretation is implemented from 1 July 2004.

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°C 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.

TL-I SC 190

Interpretations TL-I SC 190 for Application of SOLAS Regulation II-1/3-6 (Res MSC.134(76)) and Technical Provisions on Permanent Means of Access (Res MSC.133(76))

Note:

1. This UI is to be applied from 1 July 2019.

SOLAS Reg.II-1/3-6

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.

Ref.

SOLAS Reg. IX/1 and the ESP Code as amended.

SOLAS Reg.II-1/3-6

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 (Observation):

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.

Ref.

SOLAS Reg. II-2/3.32 and the ESP Code.

SOLAS Reg.II-1/3-6

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:

- safe operation in ullage space in gas-free environment;
- 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.

SOLAS Reg.II-1/3-6

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.

SOLAS Reg.II-1/3-6

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.

SOLAS Reg.II-1/3-6

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.

SOLAS Reg.II-1/3-6

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

Ref.

Paragraph 19 of Annex to MSC/Circ.686.

SOLAS Reg.II-1/3-6

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.

SOLAS Reg.II-1/3-6

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.

SOLAS Reg.II-1/3-6

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.

Ref.

Paragraphs 9 of Annex of MSC/Circ.686.

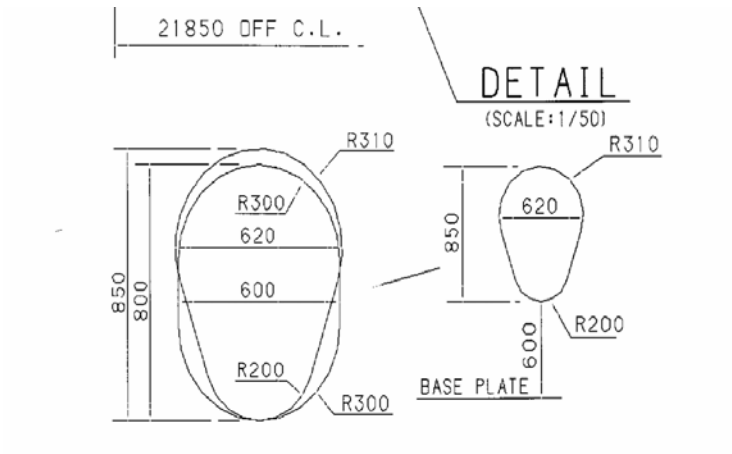
SOLAS Reg.II-1/3-6

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 x 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.

Ref.

Paragraphs 11 of Annex of MSC/Circ.686.

SOLAS Reg.II-1/3-6

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

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

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.

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.

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.

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.

Ref.

Paragraph 10 of Annex to MSC/Circ.686

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.

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.

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 70º. 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.

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

- 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.
- 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.
- 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.

Ref.

For vertical ladders: Paragraph 20 of Annex to MSC/Circ.686

For spiral stairways: AMSA Marine Orders Part 32, Appendix 17:

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

- 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.

- Interpretations 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 treads facilitate a safe grip.

- Interpretation 7) is introduced consistently with the requirement and the interpretation of TP 3.

Ref.

- Annex 1 to Resolution A.272(VIII)
- Australian AMSA Marine Orders Part 32, Appendix 17
- ILO Code of Practice “Safety and Health in Dockwork” – Section 3.6 Access to Ship’s Holds

Technical Provision, Resolution MSC.133(76)

7 No free-standing portable ladder shall be more than 5 m long.

Interpretation

N/A

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.

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.

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.

Ref.

Australian AMSA Marine Orders Part 32, Appendix 17

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.

Ref.

Paragraph 10 of Annex to MSC/Circ.686.

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

- 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.

- 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.

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.

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.

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

- 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.
- 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.
- 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.

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.

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.

Table 1 – Means of access for oil tankers, Resolution MSC.133(76)

2 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.

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.

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

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.

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.

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.

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.

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.

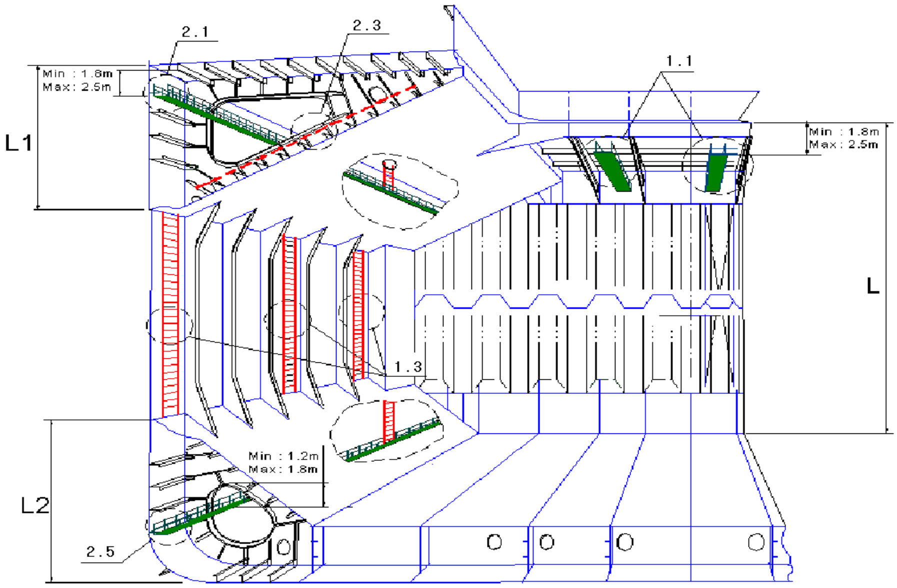


Table 2 – Means of access for bulk carriers, Resolution MSC.133(76)

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.

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.

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.

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.

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.

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.

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

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.

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

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).

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

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.

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

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.

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.

TL- I
SC 191

Interpretations TL- I SC 191 for the 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))

Note:

1. This interpretation is applied to ships contracted for construction from 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 about the date of ‘contract for construction’, refer to TL-PR 29.

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 resolution A.1049(27) (2011 ESP Code), as amended.

Ref.

SOLAS regulation IX/1 and resolution A.1049(27) (2011 ESP Code), as amended.

SOLAS regulation II-1/3-6, paragraph 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.

SOLAS regulation II-1/3-6, paragraph 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

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, refer to TL- G 91 "Guidelines for Approval/Acceptance of Alternative Means of Access".

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.

SOLAS regulation II-1/3-6, paragraph 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 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.

SOLAS regulation II-1/3-6, paragraph 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.

SOLAS regulation II-1/3-6, paragraph 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.

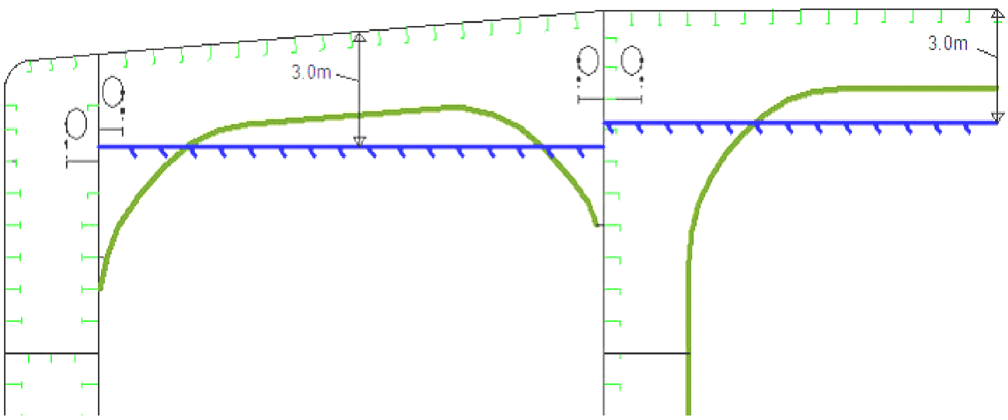
Interpretation

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 >1.5m 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 resolution A.1049(27) (2011 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).



SOLAS regulation II-1/3-6, paragraph 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 TL- G 90 “Ship Structural Access Manual”

SOLAS regulation II-1/3-6, paragraph 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: resolution A.1049(27) (2011 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.

SOLAS regulation II-1/3-6, paragraph 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.

Ref.

Paragraphs 9 of Annex of MSC/Circ.686.

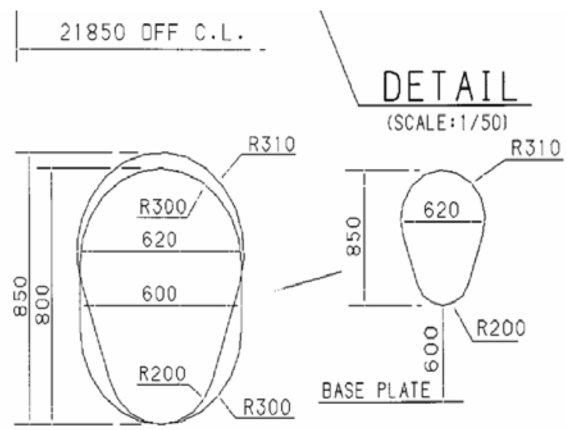
SOLAS regulation II-1/3-6, paragraph 5.2

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 x 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 include an opening with corner radii of 300 mm. An opening of 600mm in height x 800mm 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 11 of Annex of MSC/Circ.686.

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’s 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.

Technical Provision, resolution MSC.158(78), paragraph 1.4

1. Preamble

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).

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.

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.

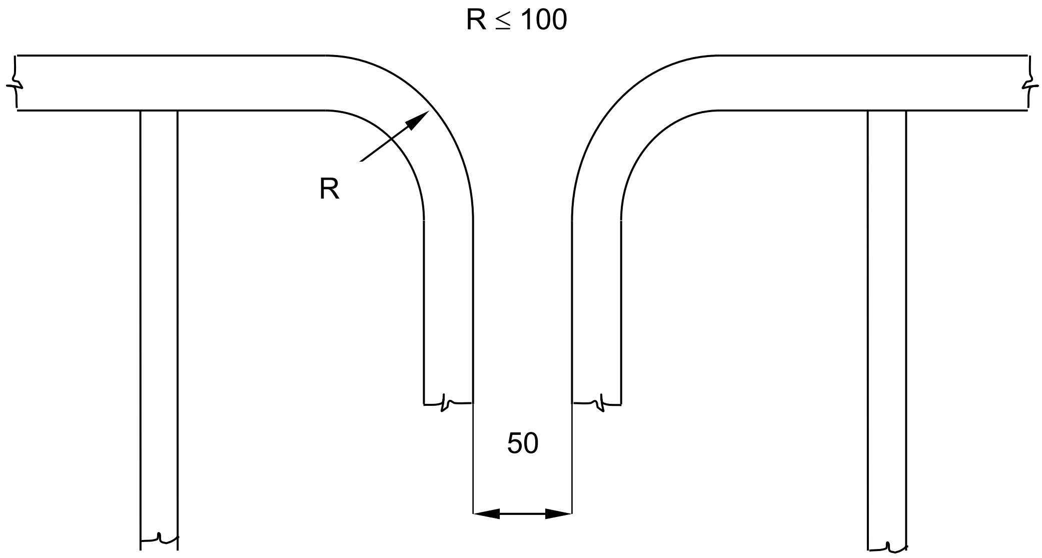
3. Discontinuous top handrails are allowed, provided the gap does not exceed 50 mm.

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.

Ref.

Paragraph 10 of Annex to MSC/Circ.686

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.

Technical Provision, resolution MSC.158(78), paragraph 3.5

3.5 Permanent inclined ladders shall be inclined at an angle of less than 70º. 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.

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 3.0m 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 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.

Ref.

For vertical ladders: Paragraph 20 of the annex to MSC/Circ.686.

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.

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. Interpretations for vertical ladders are needed based upon the current standards of IMO, AMSA or the industry.

- Interpretations 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.

Ref.

- Annex 1 to resolution A.272(VIII).
- Australian AMSA Marine Orders Part 32, Appendix 17.
- ILO Code of Practice “Safety and Health in Dockwork” – Section 3.6 Access to Ship’s Holds.

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.

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 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.

3.11 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 x 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.

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.

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:

.1 ....omissis.....

.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.

.3 ....omissis.....

.4 ....omissis.....

.5 ....omissis.....

.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.

. 7 ....omissis.....

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.

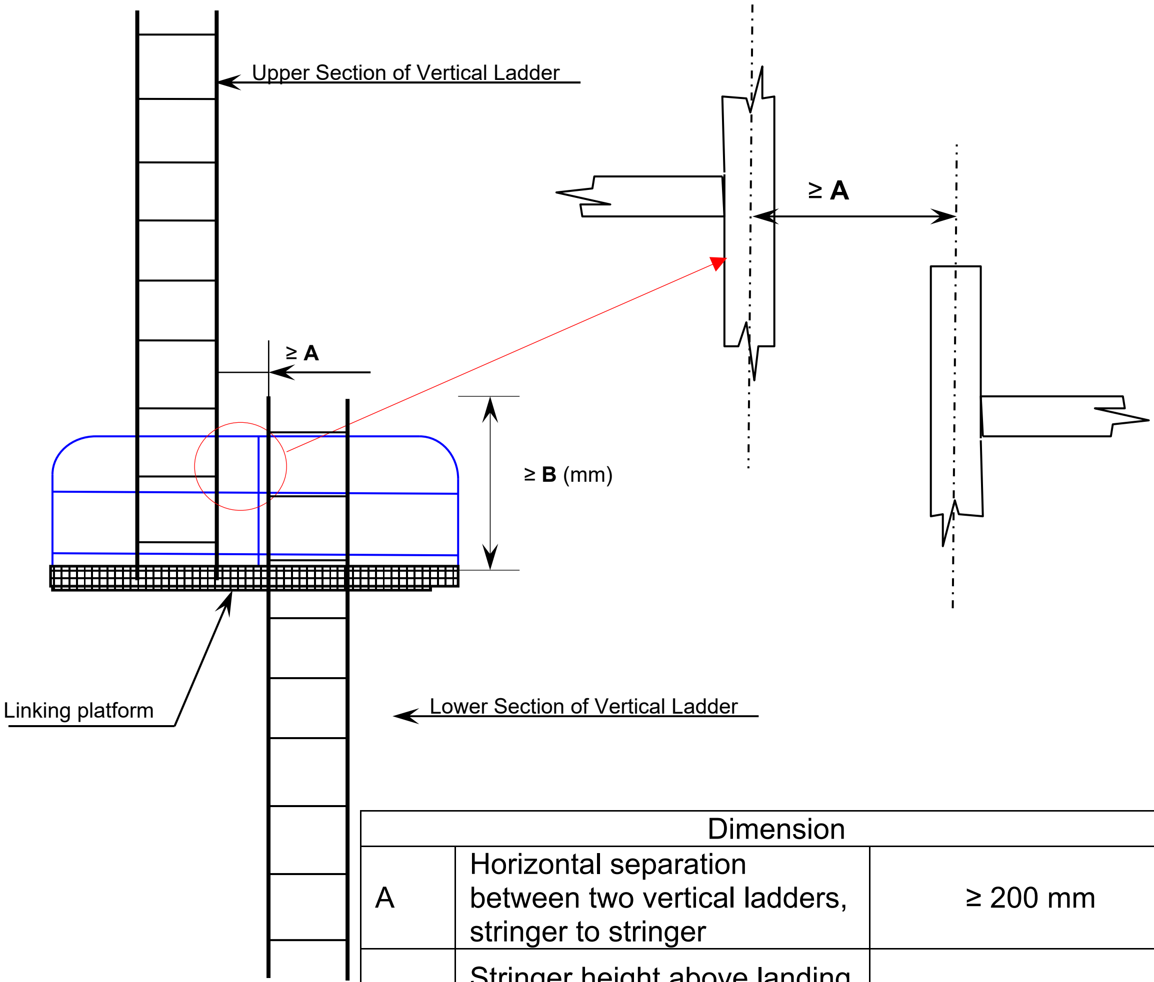
Technical Background

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 of resting platform is of 1000 mm (Technical Provision, resolution MSC.158(78), paragraph 3.3)		

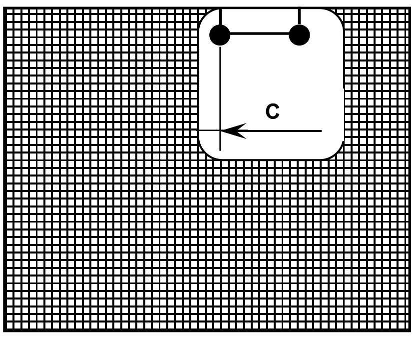
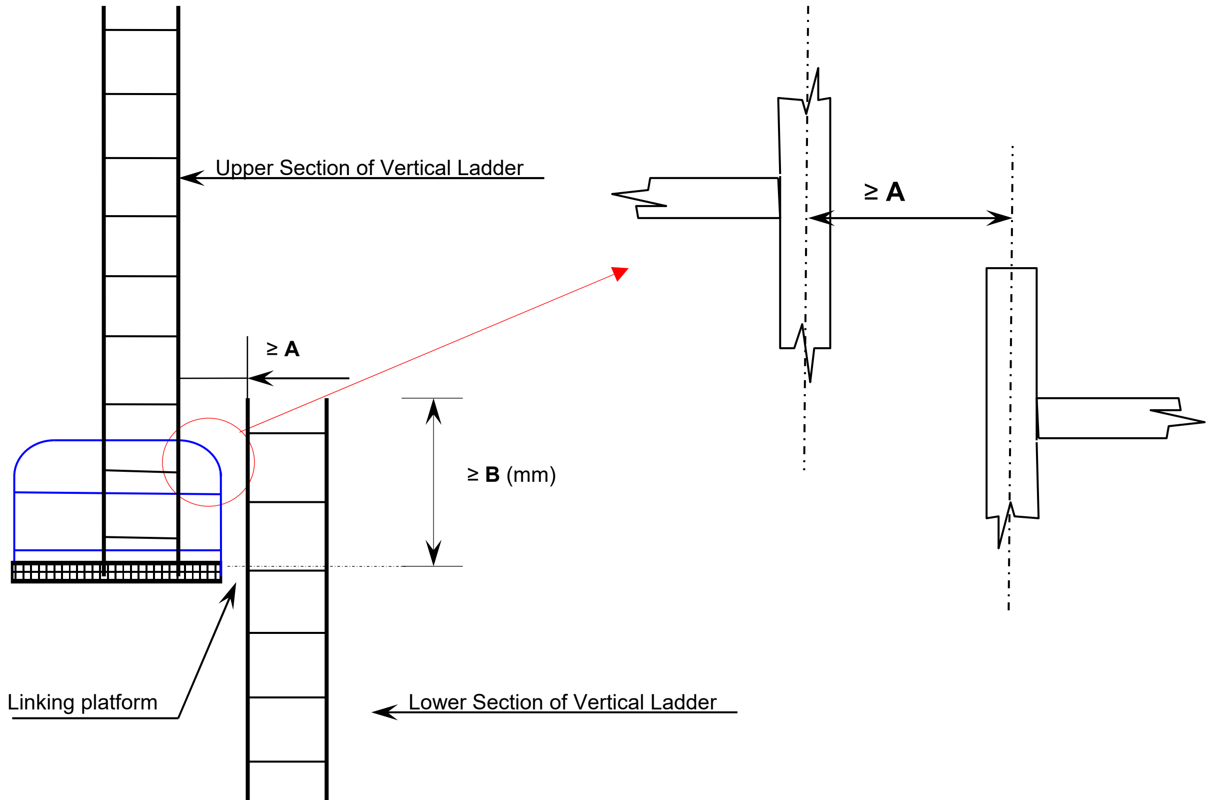
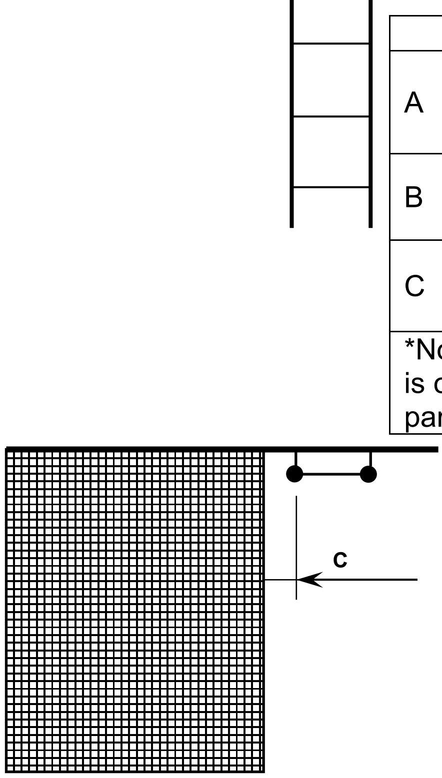


Figure "B"
Vertical Ladder – Side mount





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 of resting platform is of 1000 mm (Technical Provision, resolution MSC.158(78), paragraph 3.3)		

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”.

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.

Ref.

Paragraph 10 of the annex to MSC/Circ.686.

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.

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.

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”.

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.

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 falls 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.

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 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.

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.

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.

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 is also to be considered applicable to ore carriers.

Technical Background

Pragmatic arrangements of the MA are provided.

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.

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.

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 is also to be considered applicable to ore carriers.

Table 2 – Means of access for bulk carriers, resolution MSC.158(78), paragraph 1.6

Access to vertical structures

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.

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.

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.

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.

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.

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.

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.

TL- I SC197 Non-combustible cargoes (Reg.II-2/10.7.1.4)

Regulation II-2/10.7.1.4:

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.

Interpretation:

1. Non-combustible cargoes, such as materials listed in paragraph 1 of Annex 2 to the 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)

Note:

1. This interpretation is implemented from 1 July 2005.

TL- I SC203 Carriage requirements for shipborne navigational systems and equipment

Regulation

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)

Note:

1. This interpretation is applied on 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 TL- PR 29.

TL- I SC208 SOLAS XII/6.5.1 in terms of protection of cargo holds from loading/discharge equipment

(SOLAS regulation XII/6.5.1 and SLS.14/Circ.250)

Regulations

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 TL CSR for Bulk Carriers, are to comply with the following:

1. TL'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.

Note:

1. This interpretation is implemented from 1 July 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 TL- PR 29.

TL- I SC211

Protection of fuel oil

(Regulations II-2/3.6 and 4.5.1.1)

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.

Note:

1. This interpretation is implemented for ships contracted for construction on or after 1 July 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 TL- PR 29.

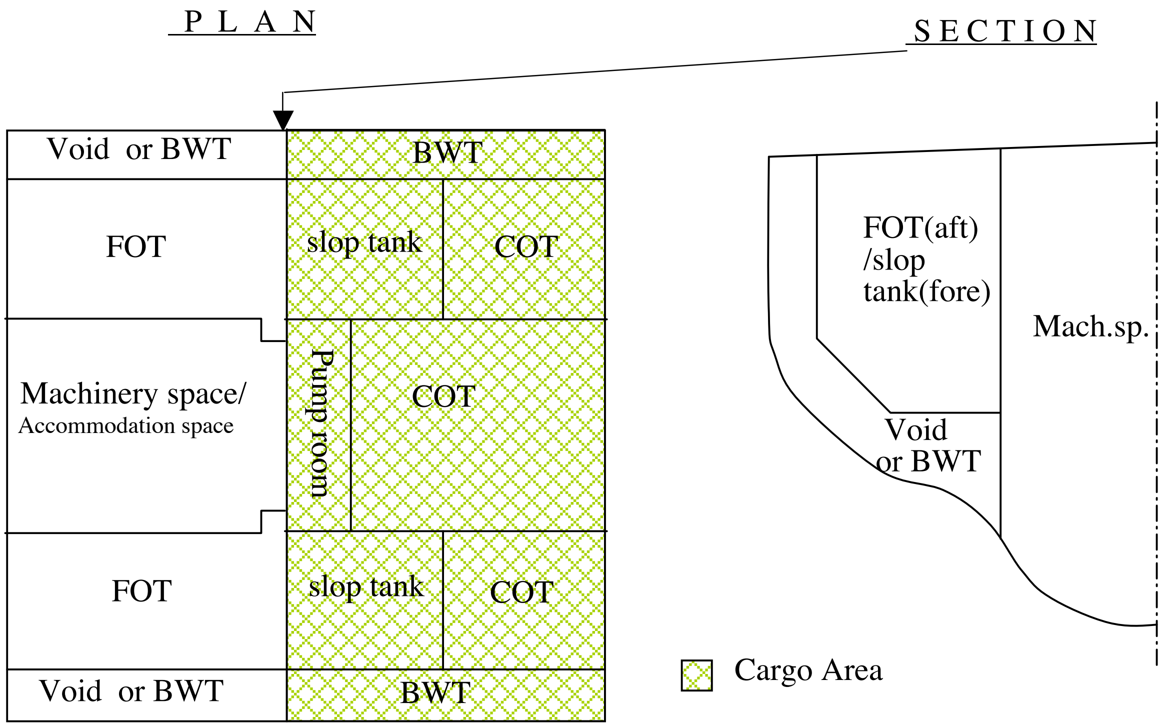


Figure 1

BWT ballast water tank

FOT Fuel oil tank

COT Cargo oil tank

TL- I SC213 Arrangements for remotely located survival craft

(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)

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.”

Note:

1. This interpretation is implemented for ships contracted for construction on or after 1 January 2017.

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 TL- PR 29.

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 reg. III/31.1.4 shall be regarded as "remotely located survival craft" with regard to reg. 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 reg. 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; and

.3 an embarkation ladder or other means of embarkation enabling descent to the water in a controlled manner* as per reg.III/11.7.

.4 self-contained battery-powered lamps (i.e. luminaires) may be accepted as means of illumination for complying with reg. 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 under charge. When disconnected from the ship's power, the lamp shall give a minimum duration of 3 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 IP 55. The batteries for the subject lamps should comply with 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 reg. III/31.1.4 (remotely located survival craft), the embarkation station shall be so arranged that the requirements of reg. 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 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 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.

TL- I SC215

Embarkation Ladder

Regulation

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;

Note:

1. This interpretation is applied on ships contracted for construction on/after 1 July 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 TL- PR 29.

.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.

TL- I SC217

Nozzles installation for fixed water based local application fire-fighting systems for use in category A machinery spaces (MSC/Circ 913)

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 x D/2.

Sketches of acceptable arrangements are shown in the Annex.

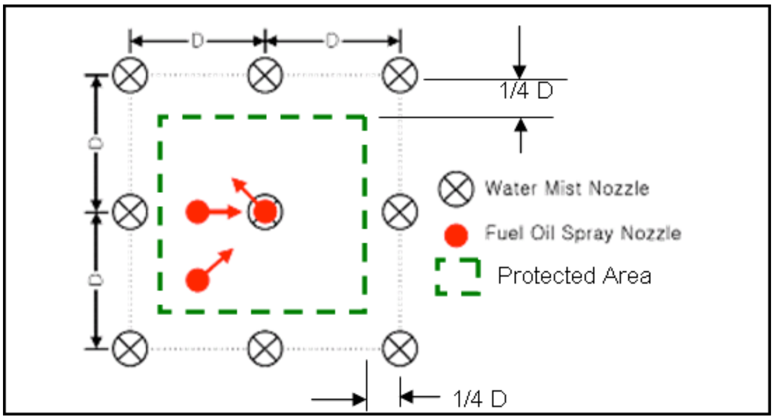
Note:

1. This interpretation is applied on ships contracted for construction on or after 1 April 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 TL- PR 29.

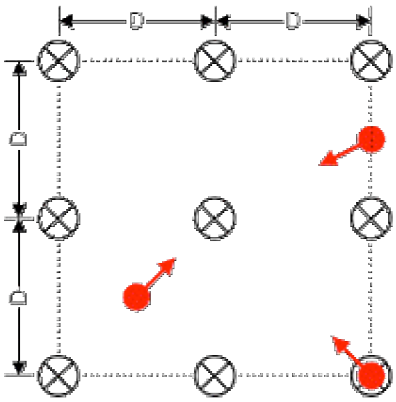
ANNEX

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.



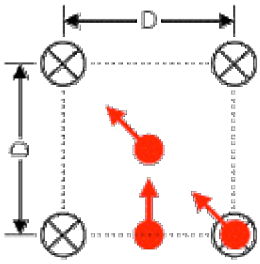
For this system, the outer nozzles should be installed outside of the protected area a distance of at least 1/4 of the maximum nozzle spacing.

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.

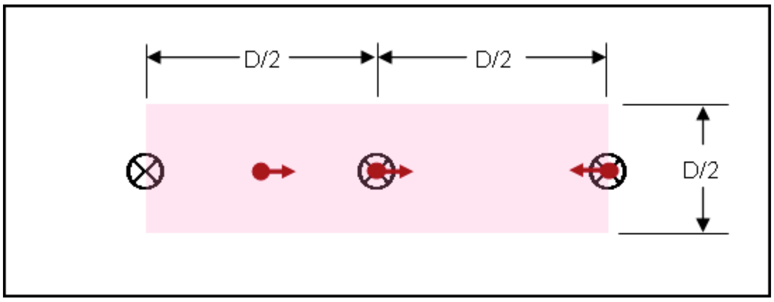
c. System (utilizing a 2 X 2 nozzle grid) that extinguishes fires referred to in 3.3.2.3 to 3.3.2.5



For this system, outer nozzles can be located either at the edge of the protected area or outside of the protected area.

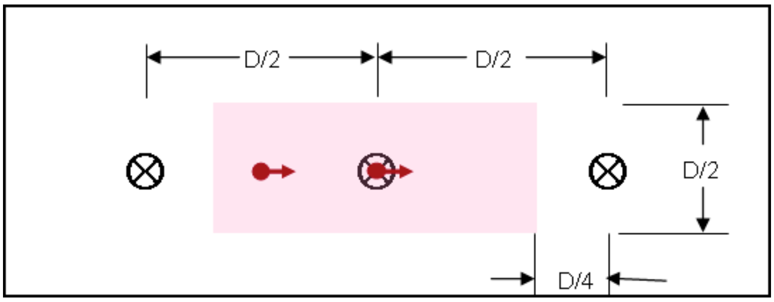
d. A single row of nozzles

i) System that extinguishes fires referred to in 3.3.2.3 to 3.3.2.5



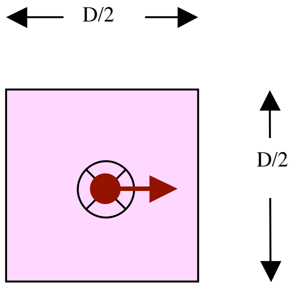
For this system, outer nozzles should be placed at least at the edge of the protected area.

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



TL- I SC218 Fire Testing of Equivalent Water-Based Fire Extinguishing Systems (IMO MSC/Circ.1165, Appendix B, 4.5.1)

Regulation (IMO MSC/Circ.1165, Appendix B, 4.5.1)

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.

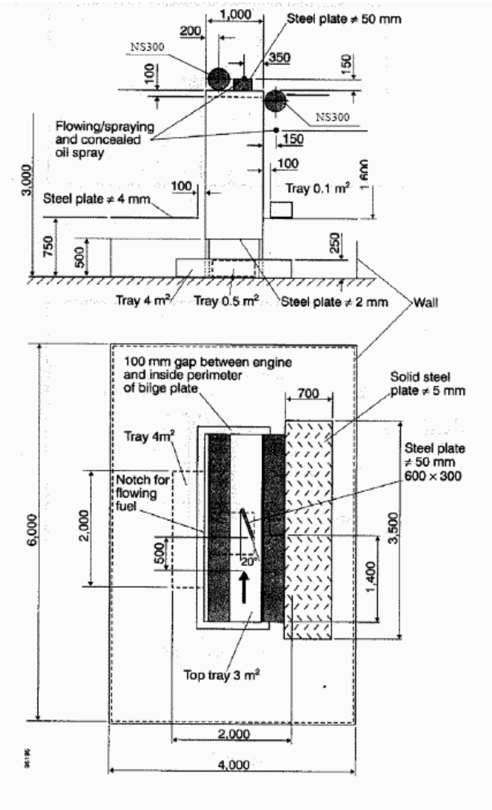


Figure 1

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.

Note:

This interpretation is applied by TL for systems approved on or after 1 July 2008.

TL- I SC219

Fire Testing of Equivalent Water-Based Fire Extinguishing Systems (IMO MSC/Circ.1165, Appendix B, 4.5.4.1)

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.

Note:

This interpretation is applied by TL for systems approved on or after 1 July 2008.

TL-I SC 220

Special requirements for ro-ro passenger ships

SOLAS regulation II-1/20-2.1 (SOLAS/CONF.3/46, Resolution 1) states:

"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)) states:

"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.

Note: This interpretation is to be implemented not later than 15 April 2008

TL- I SC223

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)

CONTENT

Note:

1. This interpretation is applied for ships for ships contracted for construction on or after 1 January 2014

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 TL - PR No. 29.

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.
…

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.

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. The Administration may, if it so requires, participate in the agreement process. Clear evidence of these inspections shall be reported and be included in the Coating Technical File (CTF) (see 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.

*****

*"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.

*****

"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.

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.

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.

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 interpretation.

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 TL- R 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 TL- G 87, section 2 (TL- G 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 m^3 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 TL- G 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 TL - R 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.

*****

"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.

PSPC 4 Table 1: 2 PSP (Primary Surface Preparation)

"2. PSP (Primary Surface Preparation)

2.1 Blasting and profile[6, 7]

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°C 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/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 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.

PSPC 4 Table 1: 3 SSP (Secondary Surface Preparation)

"3.2 Sa $2^1/_2$ 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 erection[6]

Butts St 3 or better or Sa $2^1/_2$ where practicable. Small damages up to 2% of total area: St 3. Contiguous damages over 25 m^2 or over 2% of the total area of the tank, 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.

*****

"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/m^2 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.

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.

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.

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.

PSPC 7 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.

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.

TL- I SC224 Measurement of Distances

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.

Note:

This interpretation is implemented from 1 April 2009.

TL- I SC226 Interpretations on the application of SOLAS regulations to conversions of Single-Hull Oil Tankers to Double-Hull Oil Tankers or Bulk Carriers

Reference table of the clarification of the applicability of SOLAS regulations

No.	Reg.	Title/Content	Note
1	II-1/1.3	Alterations and modifications of a major character	As amended by MSC.216(82)
2	II-1/3.2, 2 & 3.2, 4	Protective coatings of dedicated seawater ballast tanks in all types of ships and double-side skin spaces of bulk carriers	As amended by MSC.216(82)
3	II-1/3-6	Access to and within spaces in, and forward of, the cargo area of oil tankers and bulk carriers	As amended by MSC.194(80)
4	II-1/3-8	Towing and Mooring Equipment	As amended by MSC.194(80)
5	II-1/Part B & Part B-1	Subdivision and stability	As amended by MSC.216(82)
6	II-2/1.3	Repairs, alterations, modifications and outfitting	
7	III/1.4.2	Alterations and modifications of a major character	
8	III/31.1.8	Survival craft and rescue boats	
9	V/22	Navigation bridge visibility	
10	XII/4	Damage stability requirements applicable to bulk carriers	
	XII/5.1 & 5.2	Structural strength of bulk carriers	
	XII/6.1	Structural and other requirements for bulk carriers	
	XII/6.2	Structural and other requirements for bulk carriers	
	XII/6.3	Structural and other requirements for bulk carriers	As amended by MSC.216(82) Annex 1
	XII/6.4	Structural and other requirements for bulk carriers	As amended by MSC.216(82) Annex 1
	XII/7.1	Survey and maintenance of bulk carrier	
	XII/7.2	Survey and maintenance of bulk carrier	
	XII/8	Information on compliance with requirements for bulk carriers	
	XII/9	Requirements for bulk carriers not being capable of complying with regulation 4.3 due to the design configuration of their cargo holds	
	XII/10	Solid bulk cargo density declaration	
	XII/11	Loading instrument	
	XII/12	Hold, ballast and dry space water ingress alarms	
	XII/13	Availability of pumping systems	
	XII/14	Restrictions from sailing with any hold empty	

Note:

1. This interpretation is applied by TL when acting as recognized organizations, authorized by flag State Administrations to act on their behalf, unless otherwise advised, from 1 January 2014.

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.

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.

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.

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).

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.

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.

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.

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.

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.

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	

TL- I SC228 Machinery shutoff arrangements - Oil mist detector arrangements

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.

Note:

1. This interpretation is implemented for engines:

   i) when an application for certification of an engine is dated on or after 1 January 2010; or

   ii) which are installed in new ship for which the date of contract for construction is on or after 1 January 2010.

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 TL- PR 29."

TL- I SC233

LSA Code – lifeboat exterior colour

LSA Code item 1.2.2.6 as amended by MSC Res. 207(81)

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.

Notes:

1. This interpretation is implemented for approvals issued in accordance with SOLAS III/34 and the LSA Code from 1 July 2013.

TL- I SC235 Navigation bridge visibility to ship's side

(Chapter V, Regulation 22)

Regulation

SOLAS regulation V/22.1.6 reads:

"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;"

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 described in this regulation.

Interpretation

1. The requirements of SOLAS regulation V/22.1.6 are accomplished when:

    .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

    .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.

Notes:

1. This interpretation is applied on ships contracted for construction on or after 1 January 2011.

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 TL- PR 29.

3. Paragraphs 3 and 4 are amended to be in line with MSC.1/Circ.1350/Rev.1.

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/22.1.16, 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.

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 TL- R E10;

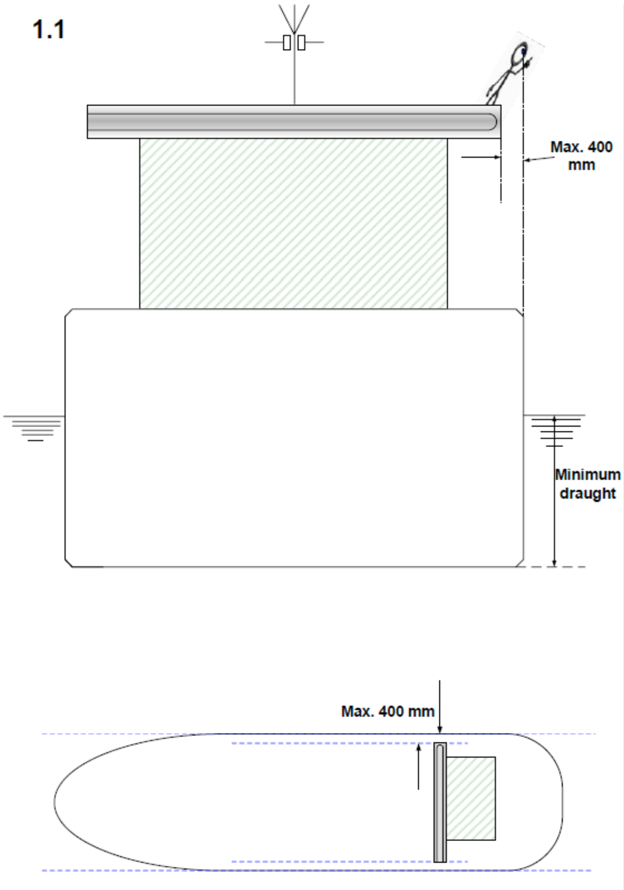
- the view provided by the remote camera system complies with the requirements of regulation V/22.1.6 and is also displayed at locations where the manoeuvring of the ship may take place;

- 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.

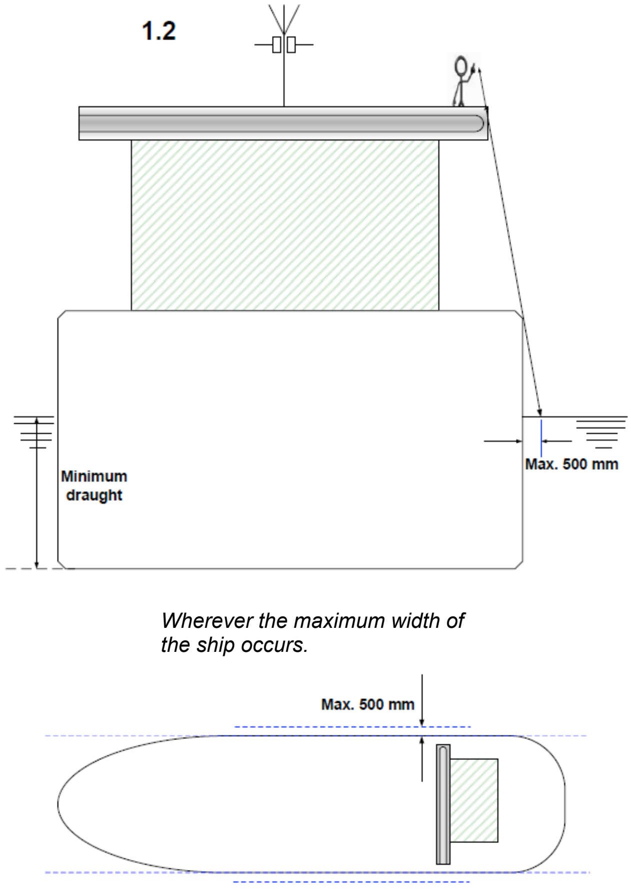
---

* - 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.

1.1


Max. 400
mm
Minimum
draught
Max. 400 mm

1.2


Max. 500 mm
Minimum
draught
Wherever the maximum width of
the ship occurs.
Max. 500 mm

TL- I SC239

Insulation with approved non-combustible materials (Reg. II-2/3.2.3)

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°C above the original temperature, nor will the temperature, at any one point, including any joint, rise more than 180°C 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.

Note:

1. This interpretation is implemented on ships contracted for construction on or after 1 January 2012.

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 TL- PR 29.

TL- I SC243 Access to controls for closing of ventilation of vehicle, special category and ro-ro spaces (SOLAS II-2/20.3.1.4.1)

Regulations

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.

Notes:

1. This interpretation is implemented 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 TL- PR 29.

TL- I SC244 Load testing of hooks for primary release of lifeboats and rescue boats

(IMO Res. MSC.81(70), Part 2, Ch. 5.3.4)

Regulation

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.

Notes:

1. This interpretation is implemented on ships the keels of which are laid from 1 January 2014.

TL- I SC245

Suction and discharge piping of emergency fire pumps, which are run through the machinery space (SOLAS II-2/10.2.1.4.1)

Regulation

SOLAS Ch. II-2 Reg. 10.2.1.4.1

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.

Notes:

1. This interpretation is applied on ships contracted for construction on or after 1 July 2012.

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 TL- PR 29.

TL- I SC247 Emergency exit hatches to open deck (SOLAS Reg. II-2/13.1)

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.

Notes

1. This interpretation is implemented on ships contracted for construction on or after 1 July 2012.

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 TL- PR 29.

TL- I SC248 Greatest Launching Height for a Free-Fall Lifeboat (LSA Code 1.1.4)

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 10^o and a list of up to 20^o 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 20^o 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 10^o and a list of up to 20^o 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."

Notes

1. This interpretation is implemented on ships contracted for construction on or after 1 July 2015.

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 TL- PR 29.

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

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.

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.

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"*.

TL-I SC 249 Implementation of SOLAS II-1, Regulation 3-5 and MSC.1/Circ.1379

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."

Unified Interpretations

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;

NOTE:

1. This Interpretation is to be implemented not later than 1 July 2013.

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 which contain asbestos 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

Note:

The above list is taken from IMO Resolution MEPC.197(62), Appendix 5, paragraph 2.2.2.1.

TL- I SC250 Fire-Extinguishing Arrangements in Cargo Spaces (Res. MSC.268(85), IMSBC Code)

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:

QUOTE

If the temperature of the cargo exceeds 55°C 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 spaces

UNQUOTE

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 spaces other than cargo spaces cannot be used for this purpose.

Note:

1. This interpretation is implemented from 1 July 2012.

TL- I SC252 Controls for releasing carbon dioxide and activating the alarm in the protected space (FSS Code 5.2.2.2)

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.

Notes

1. This interpretation is implemented on ships contracted for construction on or after 1 July 2012 .

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 TL- PR 29.

A single control for activation of the alarm is sufficient.

The “positive means” referred to in 2.2.2.1 for the correct sequential operation of the controls, is to be achieved by a mechanical and/or electrical interlock that does not depend on any operational procedure to achieve the correct sequence of operation.

TL- I SC254

Fall Preventer Devices (MSC.1/Circ.1392 and Circ.1327)

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

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.

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:

(i) Environment tests as set out in MSC 81(70) Part 1, Paragraphs 1.2.1 or equivalent.

(ii) 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.

(iii) Prototype test to a factor of safety of 6.

(iv) A factory acceptance test of 2.2 x SWL.

NOTE

This interpretation is implemented for the approval of FPDs submitted on or after 1 January 2013.

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.

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.

TL- I SC257 Pilot Transfer Arrangements (SOLAS V/23 as amended by Resolution MSC.308(88))

SOLAS V/23.3.3 (Pilot Transfer Arrangements):

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.

Notes:

1. This interpretation is implemented 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 TL- PR 29.

TL-I SC 258 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

Content

Notes:

1. This Interpretation is to be applied by TL 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 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 TL-PR 29.

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.

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 the Classification Society 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.

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.

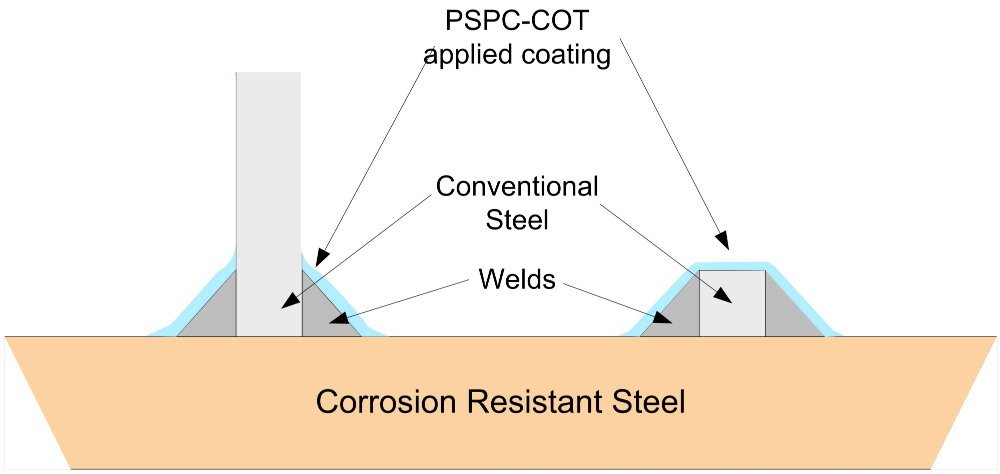


Fig. 3.3.1 Range of coating when work attachments are welded to corrosion resistant steel

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.

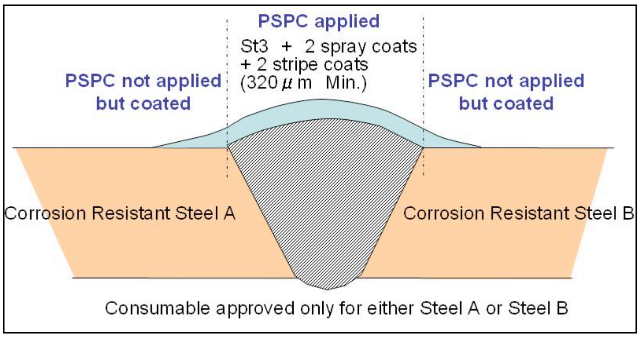


Figure 3.4.1

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)),

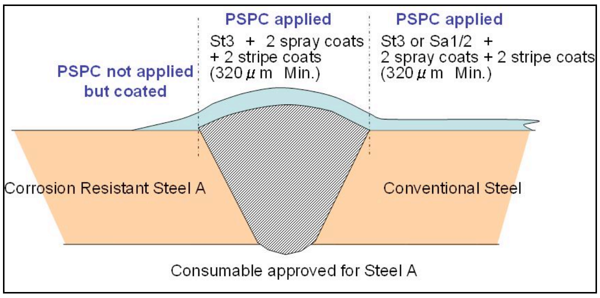


Figure 3.4.2

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.

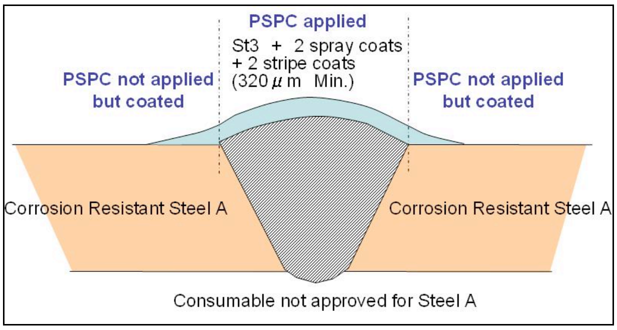


Figure 3.4.3

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.

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.

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

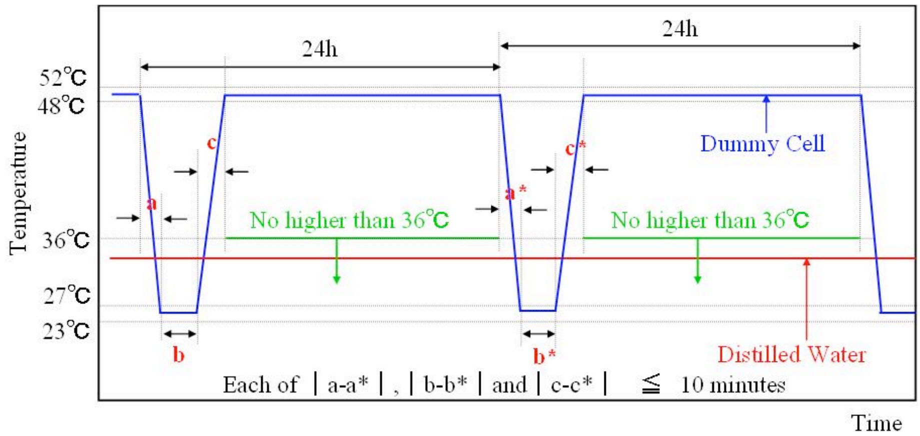


Figure App 1 - Schematic view of temperature controlling accuracy of specimens and distilled water during corrosion test

(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.

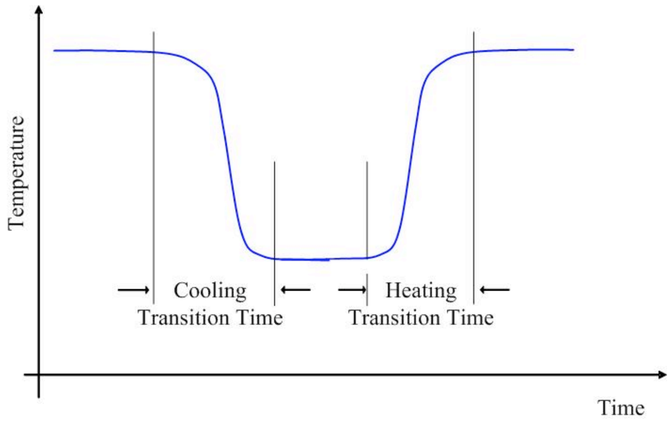


Figure App 2 - Transition time definition

(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 0.05 mm/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 x S x D)/10

Y= (0.05 x S x 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 20 mm. 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.

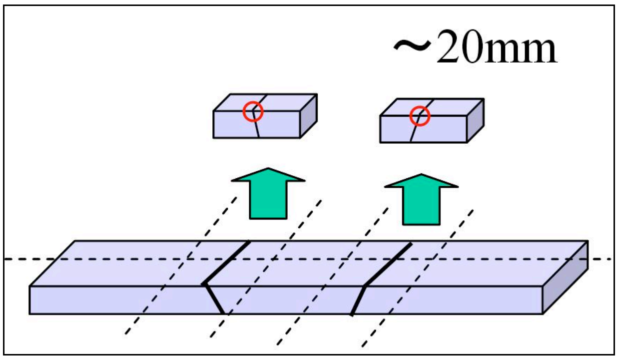


Figure App 3 - Sectioning plan

(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.

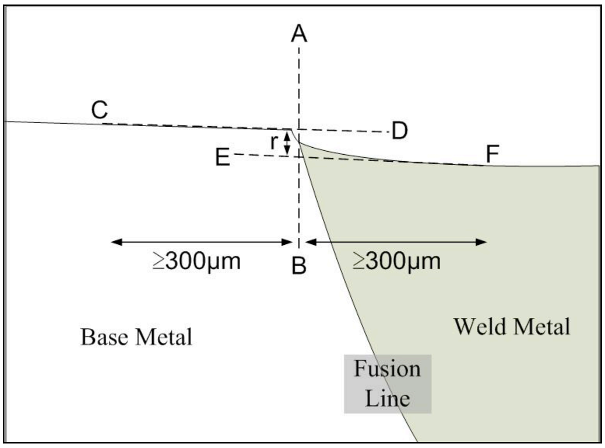


Figure App 4 - Determination of corrosion depth on photomicrograph

(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.

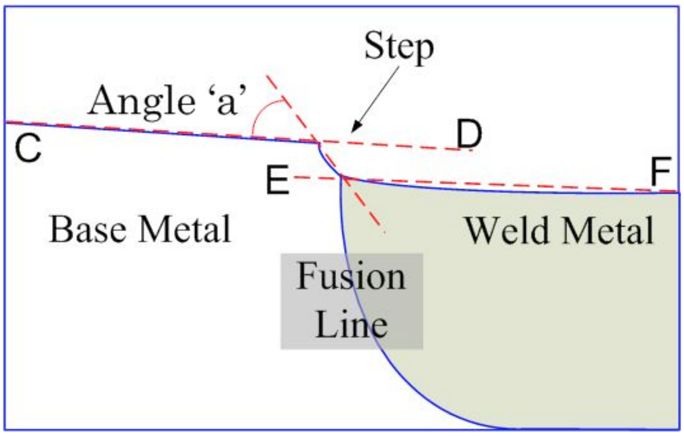


Figure App 5 - Calculation of step angle

(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.

TL- I SC259 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)

CONTENT

Note:

1. This interpretation is implemented on ships contracted for construction on or after 1 July 2014.

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 TL- PR 29.

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.

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.

*****

"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.

*****

"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.

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.

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.

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 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 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 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.

*****

"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.

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°C 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]

≤ 50 mg/m² 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-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.

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.

*****

"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/m^2 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.

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.

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.

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.

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.

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.

TL- I SC262 Fixed Foam Fire Extinguishing Systems, Foam-generating Capacity (FSS Code / CHAPTER 6 / 3.2.1.2 and 3.3.1.2 as amended by Res. MSC.327(90))

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.

Notes

1. This interpretation is implemented 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 TL- PR 29.

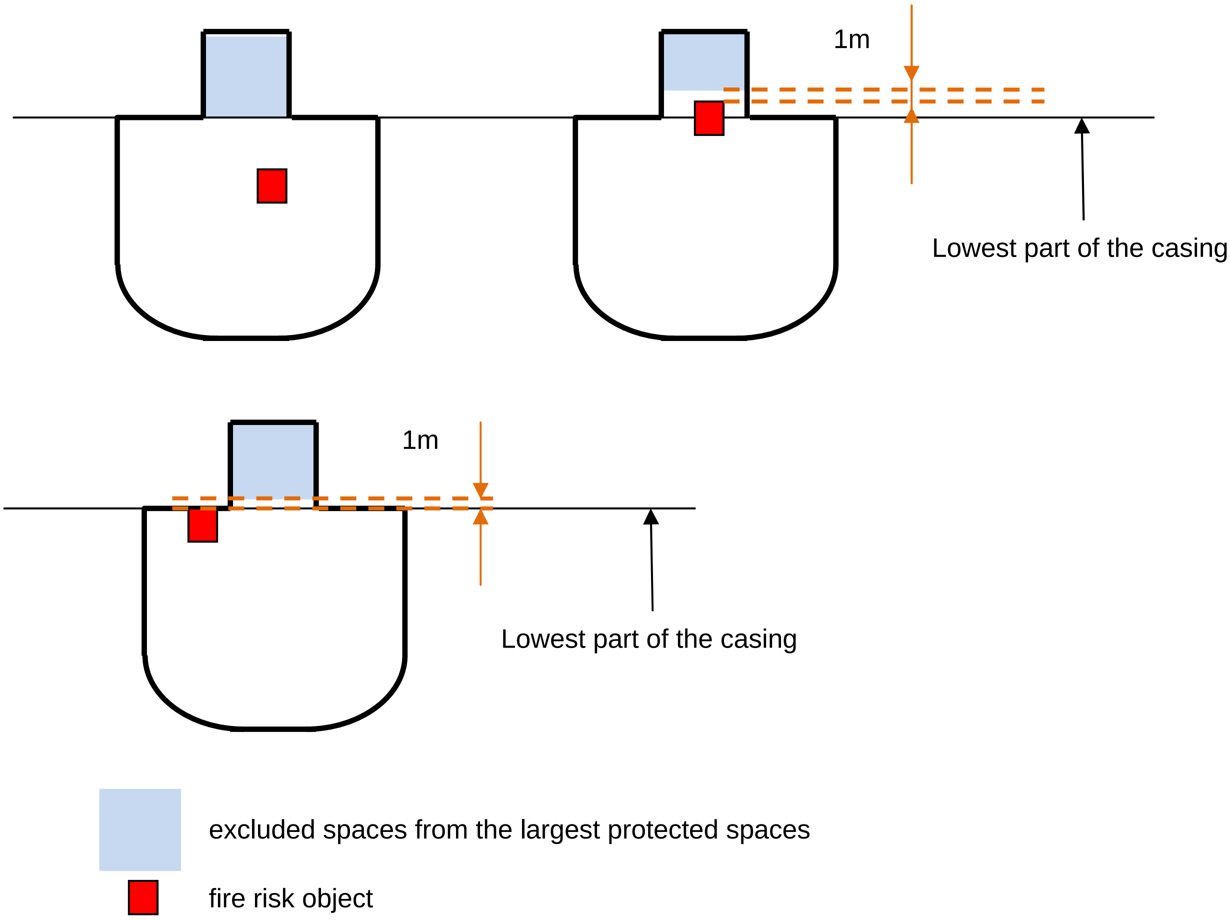
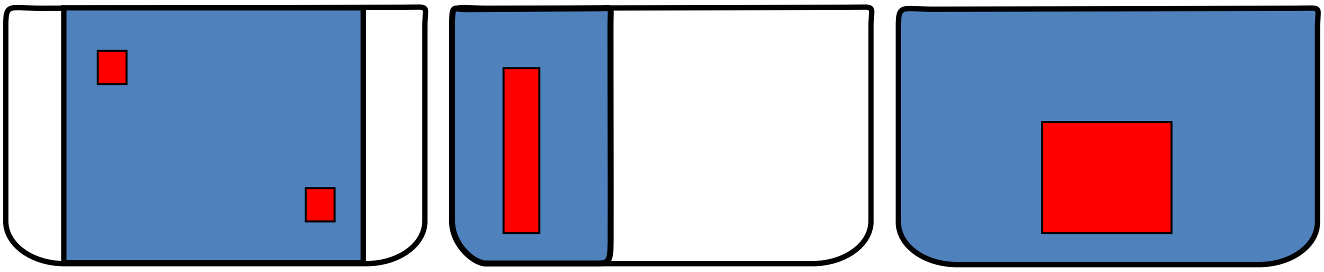


Figure 1
Machinery space including a casing



Machinery space of category A, largest protected space

fire risk object

Figure 2
Machinery space not including a casing

TL- I SC265 Code of safe practice for cargo stowage and securing – Annex 14

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.

Interpretation - See Table, Dimensions B, J, K1.

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;

Interpretation - See Table, Dimensions C1, C2, C3.

6.2.2.2. The width of the lashing positions should preferably be 1,000 mm, but not less than 750 mm.

Interpretation - See Table, Dimensions A, GL, GT, I, K.

NOTE:

1. This interpretation is implemented 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.

6.2.2.3. The width of permanent lashing bridges should be:

.1. 750 mm between top rails of fencing; and

Interpretation - See Table, Dimension F.

.2. a clear minimum of 600 mm between storage racks, lashing cleats and any other obstruction.

Interpretation - See Table, Dimension F1.

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) see footnote, 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 - For the upper tier of a lashing bridge, lights at the port and starboard extremities are generally adequate.

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.

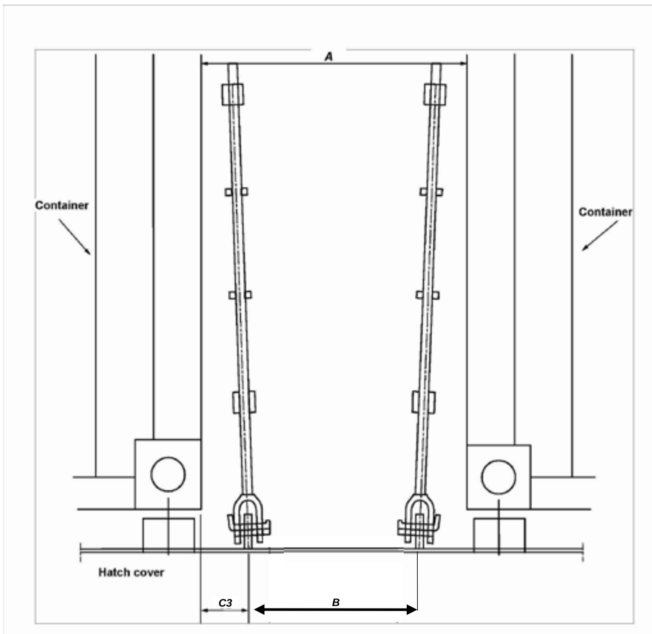


Figure 1

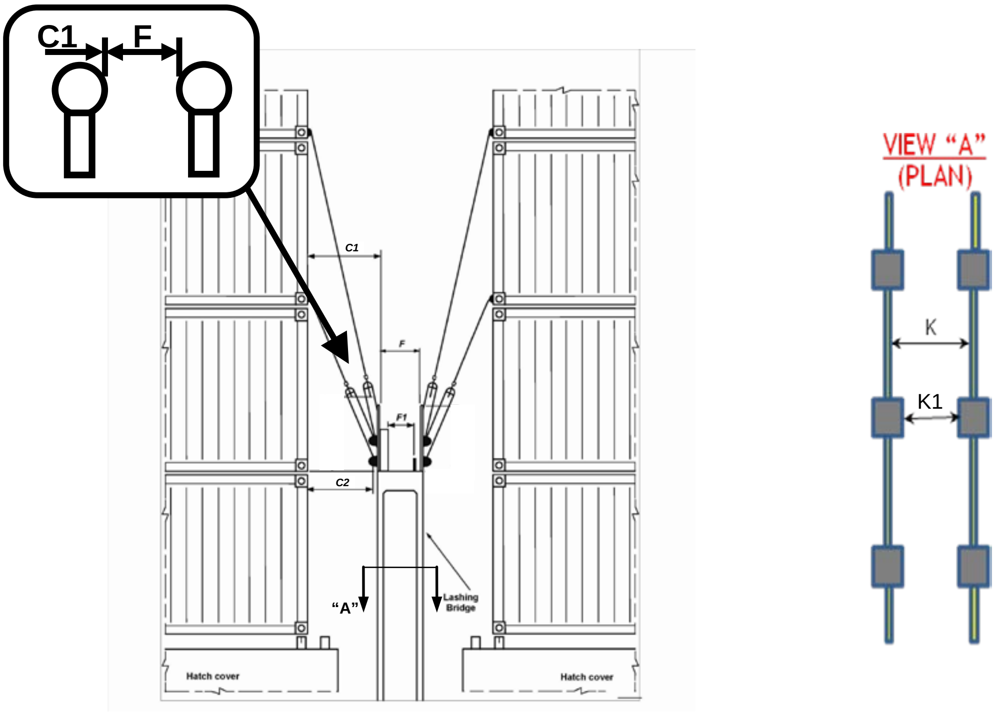


Figure 2

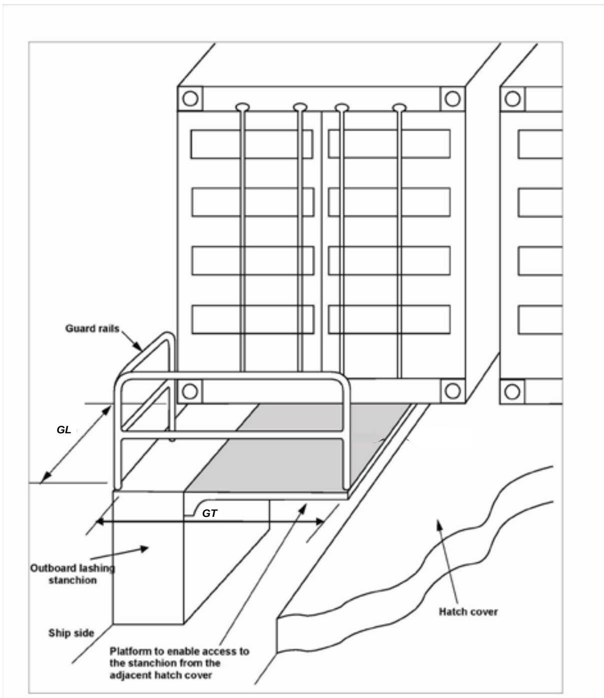


Figure 3

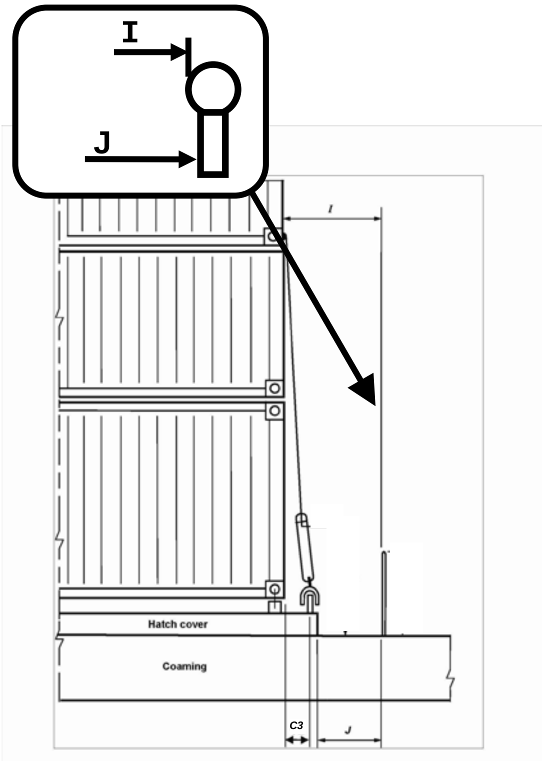


Figure 4

TL- I SC266 Revised guidelines for cargo securing manual and code of safe practice for cargo stowage and securing - scope of application

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.

NOTE:

1. This interpretation is implemented 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.

TL- I SC267

Implementation of the requirements relating to lifeboat release and retrieval systems (LSA Code Paragraph 4.4.7.6 as amended by resolution MSC.320(89))

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

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.

Where stainless steel having a Pitting Resistance Equivalent Number (PREN = 1 • %Cr + 3.3 (%Mo + 0.5 • %W) + 16 • %N) of 22 or more is chosen, such stainless steel do not need to be subjected to ISO 9227:2012 or other equivalent recognized national standard.

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.

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.

NOTE:

1. This interpretation is implemented for approvals issued in accordance with SOLAS III/34 and the LSA Code on or after 1 January 2017.

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.

Austenitic stainless steels 201, 304, 321, 347 are susceptible to pitting and crevice corrosion, and therefore unsuitable for these applications.

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.

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).

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.

TL-I SC274 Hazardous area classification in respect of selection of electrical equipment, cables and wiring and positioning of openings and air intakes

SOLAS II-1/45.11

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 IEC 60092-502, 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.

Note:

1. This Interpretation is implemented from 1 January 2017.

ANNEX 1 - Summary of Discrepancies on the Hazardous Area Classification Issues among SOLAS/IBC/IGC and IEC 60092-502

No.	Title	SOLAS	IBC	IGC	IEC 60092-502:1999
1	Hazardous area and classification on open deck from the cargo tank ventilation outlet for small flow by thermal variations	Within 5m radius; SOLAS Reg. II-2/11.6.2.2. Reference is made to TL-I SC70 “Cargo tank vent systems and selection of electrical equipment”.			Within 4.5m radius; IEC 60092-502, 4.2.2.7 and 4.2.3.1. Zone 1: open areas on deck within a 3m radius. Zone 2: additional 1.5m beyond Zone 1; IEC 60092-502, 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 5m; SOLAS Reg. II-2/11.6.2.2.	At least 10m; IBC Code 8.3.4.2. At least 15m; IBC Code 15.12.1.3 (although toxicity not flammability).	At least 10m; IGC Code 8.2.10 and 2014 amended IGC Code 8.2.11.2. 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; IGC Code 8.2.10 and 2014 amended IGC Code 8.2.11.1.	At least 6m; IEC 60092-502, 4.2.2.7, 4.2.3.1 and 8.2.5.
3	The separation distance of the nearest air intakes for non-hazardous	At least 10m; SOLAS Reg. II-2/4.5.3.4.1.3. At least 10m; For tankers	At least 10m; IBC Code 12.1.5. At least 15m; IBC Code	At least 10m; IGC Code 12.1.6.	At least 11.5m; IEC 60092-502, 4.2.2.8, 4.2.3.2 and 8.2.5.

No.	Title	SOLAS	IBC	IGC	IEC 60092-502:1999
	spaces from the tank vent outlets for cargo loading, discharging and ballasting	constructed on or after 1 January 2017 as per Res. MSC.392(95) SOLAS amendments of Reg. II-2/11.6.2.2 referring back to II-2/4.5.3.4.1.	15.12.1.3 (although toxicity not flammability).	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; 2014 amended IGC Code 8.2.11.1. All other vent outlets connected to the cargo containment system: at least 10m; 2014 amended IGC Code 8.2.11.2.	
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; IBC Code 12.1.5.	At least 10m; IGC Code 12.1.6. Ventilation ducts, air intakes and exhaust outlets serving artificial ventilation systems shall be positioned in accordance with recognized standards*; 2014 amended IGC Code 12.1.5. * IEC60092-502(1999)	At least 6m; IEC 60092-502, 4.2.2.7, 4.2.3.1 and 8.2.5.

No.	Title	SOLAS	IBC	IGC	IEC 60092-502:1999
5	Hazardous area and classification on open deck from the cargo shore connection or spillage coaming		Within the coaming required by 3.7.7 or within a 3m radius beyond the coaming; IBC Code 3.7.8. It should be noted that 3.7.8 only applies to stern or bow loading arrangements.	Within 3m radius; IGC Code 3.8.6. It should be noted that 3.8.6 of the pre-2014 Code only applies to stern or bow loading arrangements. Within 3m beyond the spillage coaming up to a height of 2.4m above the deck; 2014 amended IGC Code 1.2.24.15.	Within 4.5m radius; IEC 60092-502, 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, 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; SOLAS Reg. II-2/4.5.2.2. Note: SOLAS Reg. II-2/4.5.2.2 does not categorize the space as hazardous or non-hazardous.	IBC Code 3.2.3.		The intent of a minimum distance of 1.5m from the boundaries of any hazardous area is to be followed; IEC 60092-502, 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); SOLAS Reg. II-2/4.5.2.	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); IBC Code 3.2.3.	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); IGC Code 3.2.4 and 2014 amended IGC Code 3.2.4.1.	At least 1.5m from the boundaries of any hazardous area; IEC 60092-502, 8.2.5.

No.	Title	SOLAS	IBC	IGC	IEC 60092-502:1999
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; SOLAS Reg. II-2/4.5.2.1. 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 superstructure or deckhouse. (This distance need not exceed 5m); SOLAS Reg. II-2/4.5.2.1. Reference is made to TL-I SC120 "Access to forecastle spaces on tankers; SOLAS regulations II-2/4.5.2.1 and 4.5.2.2, IBC Code paragraph 3.2.3 and IGC Code paragraph 3.2.4".	Access doors to forecastle spaces containing source of ignition shall not face the cargo area; IBC Code 3.2.3. Reference is made to TL-I SC120 "Access to forecastle spaces on tankers; SOLAS regulations II-2/4.5.2.1 and 4.5.2.2, IBC Code paragraph 3.2.3 and IGC Code paragraph 3.2.4".	Access doors to forecastle spaces containing source of ignition shall not face the cargo area; IGC Code 3.2.4. Accesses to forecastle spaces containing sources of ignition may be permitted through a single door facing the cargo area, provided the doors are located outside hazardous areas as defined in chapter 10; 2014 amended IGC Code 3.2.4.4. Reference is made to TL-I SC120 "Access to forecastle spaces on tankers; SOLAS regulations II-2/4.5.2.1 and 4.5.2.2, IBC Code paragraph 3.2.3 and IGC Code paragraph 3.2.4".	The forecastle spaces installed the access doors facing the cargo area shall be designated as the hazardous area of Zone 2; IEC 60092-502, 4.2. See also IEC 60092-502, 4.2.3.6 as commented in item 18 below.

No.	Title	SOLAS	IBC	IGC	IEC 60092-502:1999
9	Ventilation of cargo pump rooms (cargo handling spaces on chemical and gas carriers)	20 air changes/hour; SOLAS Reg. II-2/4.5.4.1 and MSC.1/Circ.1321, Pt. IV, Ch. 3, Para. 1.1.	30 air changes/hour; IBC Code 12.1.3. 45 air changes/hour; IBC Code 15.17 (toxic).	30 air changes/hour; IGC Code 12.1.2 and 2014 amended IGC Code 12.1.3.	Spaces containing sources of release: 30 air changes/hour; IEC 60092-502, 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 IBC Code 12.2. 8 air changes/hour; spaces not normally entered IBC Code 12.3 (16 air changes/hour if portable).		Spaces not containing sources of release: 6 air changes/hour; IEC 60092-502, 8.1.3.
11	Concentration of gas implying that space is non-hazardous (alarm limits)	10% LFL (Lower Flammable Limit) for cargo pump rooms in tankers; SOLAS Reg. II-2/4.5.10.1.3. 30% LFL for all ballast tanks and void spaces of double-hull and double-bottom spaces adjacent	10% LFL for cargo pump room; IBC Code 11.1.1.7 (Res. MSC.219(82)), clarifying that SOLAS regulation II-2/4.5.10 applies, in which case “hydrocarbon gases” are replaced by “flammable vapours”.	Alarms should be activated for flammable products when the vapour concentration reaches 30% of the lower flammable limit, for the spaces of 13.6.7 of the Code; IGC Code 13.6.10. 30% LFL for the spaces	30% LFL; IEC 60092-502, 8.4.2. Note: The requirement of the standard applies to spaces protected by over-pressure.

No.	Title	SOLAS	IBC	IGC	IEC 60092-502:1999
		to the cargo tanks in oil tankers of 20,000 tonnes deadweight and above; SOLAS Reg. II-2/4.5.7.3 and FSS Code Ch.16/2.2.3.3.		specified in 13.6.2 of the amended Code; 2014 amended IGC Code 13.6.15.	
12	Fan monitoring (air lock)			Monitoring of current or power in the electrical supply is accepted; IGC Code 3.6.4 (IMO MSC/Circ.406). Where spaces are protected by pressurization, the ventilation shall be designed and installed in accordance with recognized standards*; 2014 amended IGC Code 3.6.2. * 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.	Motor running or rotating fan monitoring device is not accepted; IEC 60092-502, 8.4.3.

No.	Title	SOLAS	IBC	IGC	IEC 60092-502:1999
13	Tanks for heated cargo	Tanker requirements apply to tankers carrying cargo with FP below 60°C; SOLAS Reg. II-2/1.6.1. For petroleum cargoes with FP of 60°C and above only deck foam requirements apply; SOLAS Reg. II-2/1.6.4. Hazardous zone classification and electrical installation shall be complied with IEC 60092-502(1999); SOLAS Reg. II-1/45.11.	Follows SOLAS principle related to flashpoint, however the IBC Code considers non-flammable (NF) products and products with a flashpoint of 60°C and above, in a different way (11.1.2 & 11.1.3); In the case of a heated cargo, carriage conditions might need to be established and the requirements for cargoes having a flashpoint not exceeding 60°C applied; IBC Code 10.1.6.		When carrying cargoes heated to temperature within 15°C of their flash point, hazardous zone classification for tankers carrying cargoes with FP not exceeding 60°C applies; IEC 60092-502, 4.3.2 referring back to 4.2.
14	Classification of cargo pump room	Hazardous zone classification and electrical installation shall be complied with IEC 60092-502(1999); SOLAS Reg. II-1/45.11.		IGC Code 1.3.17.7 2014 amended IGC Code 1.2.24.6.	IEC 60092-502, 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).

No.	Title	SOLAS	IBC	IGC	IEC 60092-502:1999
15	Discontinuation of ventilation for long periods		Spare parts shall be carried for each type of ventilation fan required onboard; IBC Code 12.1.9.	Spare parts shall be carried for each type of ventilation fan required onboard; IGC Code 12.1.10. 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; 2014 amended IGC Code 12.1.8.	IEC 60092-502, 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; IGC Code 3.7.4, 2014 amended IGC Code 3.7.5.	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.

No.	Title	SOLAS	IBC	IGC	IEC 60092-502:1999
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, 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; SOLAS Reg. II-2/4.5.2. Reference is made to TL-I SC120 “Access to forecastle spaces on tankers; SOLAS regulations II-2/4.5.2.1 and 4.5.2.2, IBC Code paragraph 3.2.3 and IGC Code paragraph 3.2.4”.	Reference is made to TL-I SC120 “Access to forecastle spaces on tankers; SOLAS regulations II-2/4.5.2.1 and 4.5.2.2, IBC Code paragraph 3.2.3 and IGC Code paragraph 3.2.4”.	Reference is made to TL-I SC120 “Access to forecastle spaces on tankers; SOLAS regulations II-2/4.5.2.1 and 4.5.2.2, IBC Code paragraph 3.2.3 and IGC Code paragraph 3.2.4”.	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, 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, 4.2.2.11.

No.	Title	SOLAS	IBC	IGC	IEC 60092-502:1999
20	Hazardous zone in way of P/V-breaker	SOLAS Reg. II-2/4.6.2.2: at least 5m. SOLAS Amend Reg. II-2/11.6.2.2 as per Res. MSC.392(95): at least 10m for tankers constructed on or after 1 January 2017.			10m from a cargo gas outlet intended for the passage of large volumes of gas or vapour mixture during cargo loading; IEC 60092-502, 4.2.2.8 & 4.2.3.2 based on TL-I SC140, otherwise 4.5m from a P/V breaker which does not release large volumes of gas or vapour locally; IEC 60092-502, 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; IBC Code 12.1.8.	To be located outside ducts; IGC Code 12.1.9. 2014 amended IGC Code 12.1.7.	IEC 60092-502; 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 at least 4% of the length (L)	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	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

No.	Title	SOLAS	IBC	IGC	IEC 60092-502:1999
		deckhouse facing the cargo area. This distance need not exceed 5m; SOLAS Reg. II-2/4.5.2.1. Refer to II-2/4.5.2.2 for permitted access doors to main cargo control stations and service spaces and to wheelhouse doors and windows.	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; IBC Code 3.2.3.	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; IGC Code 3.2.4. 2014 amended IGC Code: 3.2.4.1 and 3.2.4.2 (same requirements, except the amended Code uses “shall” instead of “should”).	considered as Zone 2 and a Zone 1 space except where 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, 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, 8.1.4. Note: SOLAS and Codes refer to permitted openings of spaces, while the IEC standard defines hazardous areas.

No.	Title	SOLAS	IBC	IGC	IEC 60092-502:1999
23	Protection by over-pressure			IGC Code 12.1.4. 2014 amended IGC Code 12.1.4.	Protection by over-pressure where a non-hazardous space has openings into a hazardous space; IEC 60092-502, 8.4.
24	Air locks			IGC Code 3.6. 2014 amended IGC Code 3.6.	IEC 60092-502, 4.1.5.3.
25	Earthed distribution systems and hull return systems	Earthed 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; SOLAS Reg. II-1/45.4.1. The hull return system of distribution shall not be used for any purpose in a tanker; SOLAS Reg. II-1/45.3.1.			Distribution systems: Distribution systems shall comply with the provisions of IEC 60092-201. 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, 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

No.	Title	SOLAS	IBC	IGC	IEC 60092-502:1999
		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 provided the circulation current does not exceed 30 mA under the most unfavourable conditions. SOLAS Reg. II-1/45.3.2.			systems; − impressed current cathodic protective systems; IEC 60092-502, 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, 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); SOLAS Reg. II-1/45.11.	IBC Code Chapter 10: IEC 60092-502(1999).	IGC Code 1.3.17.8. 2014 amended IGC Code 1.2.24.9.	The cargo tanks, including all ballast tanks with cargo tank area; IEC 60092-502, 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).

TL- I SC276 Escape from machinery spaces on passenger ships

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.

Note:

1. This interpretation is applied 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 TL- PR 29.

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).

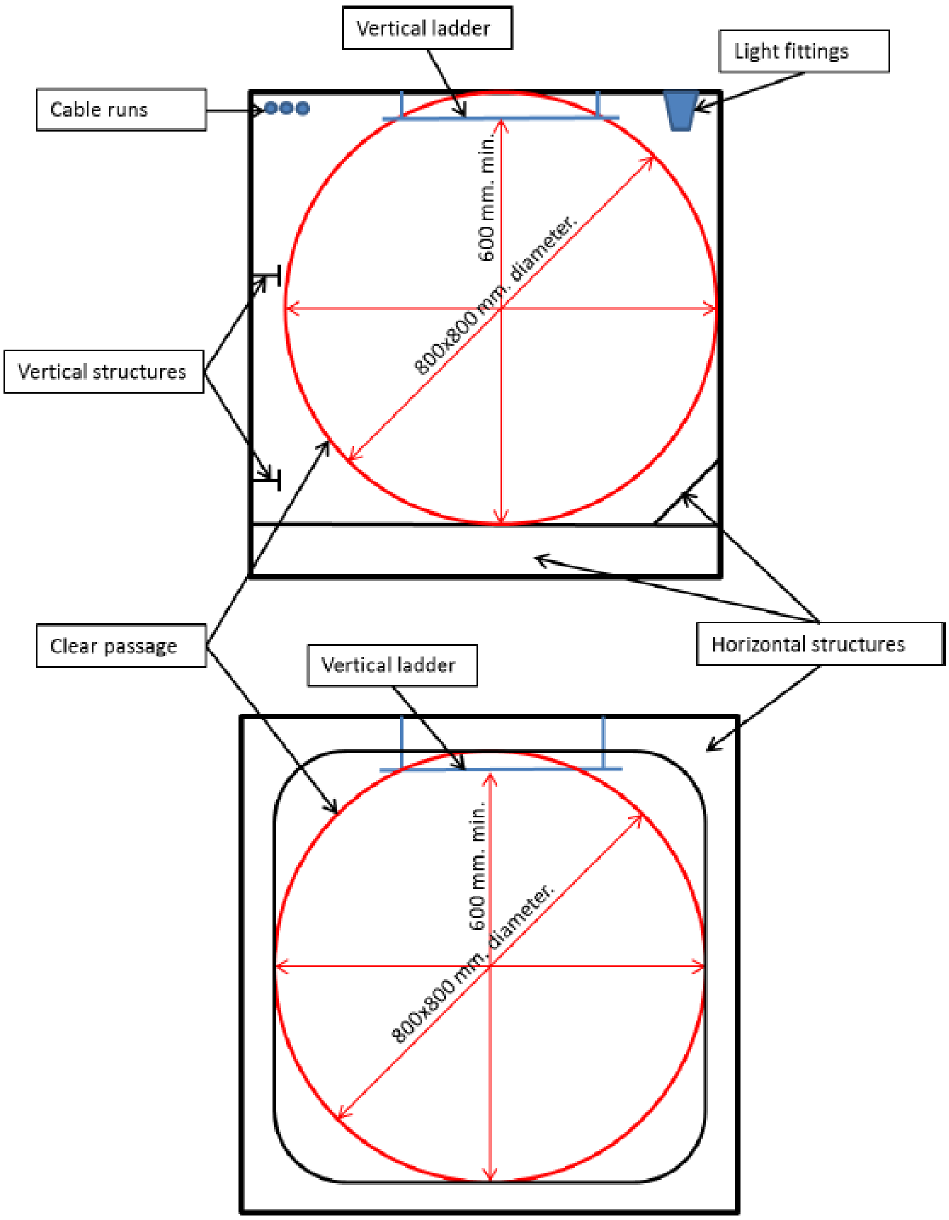

Vertical ladder
Light fittings
Cable runs
600 mm. min.
800x800 mm. diameter.
Vertical structures
Clear passage
Horizontal structures
Vertical ladder
600 mm. min.
800x800 mm. diameter.

Figure 1

TL- I SC277

Escape from machinery spaces on cargo ships

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.

Note:

1. This interpretation is applied 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 TL- PR 29.

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).

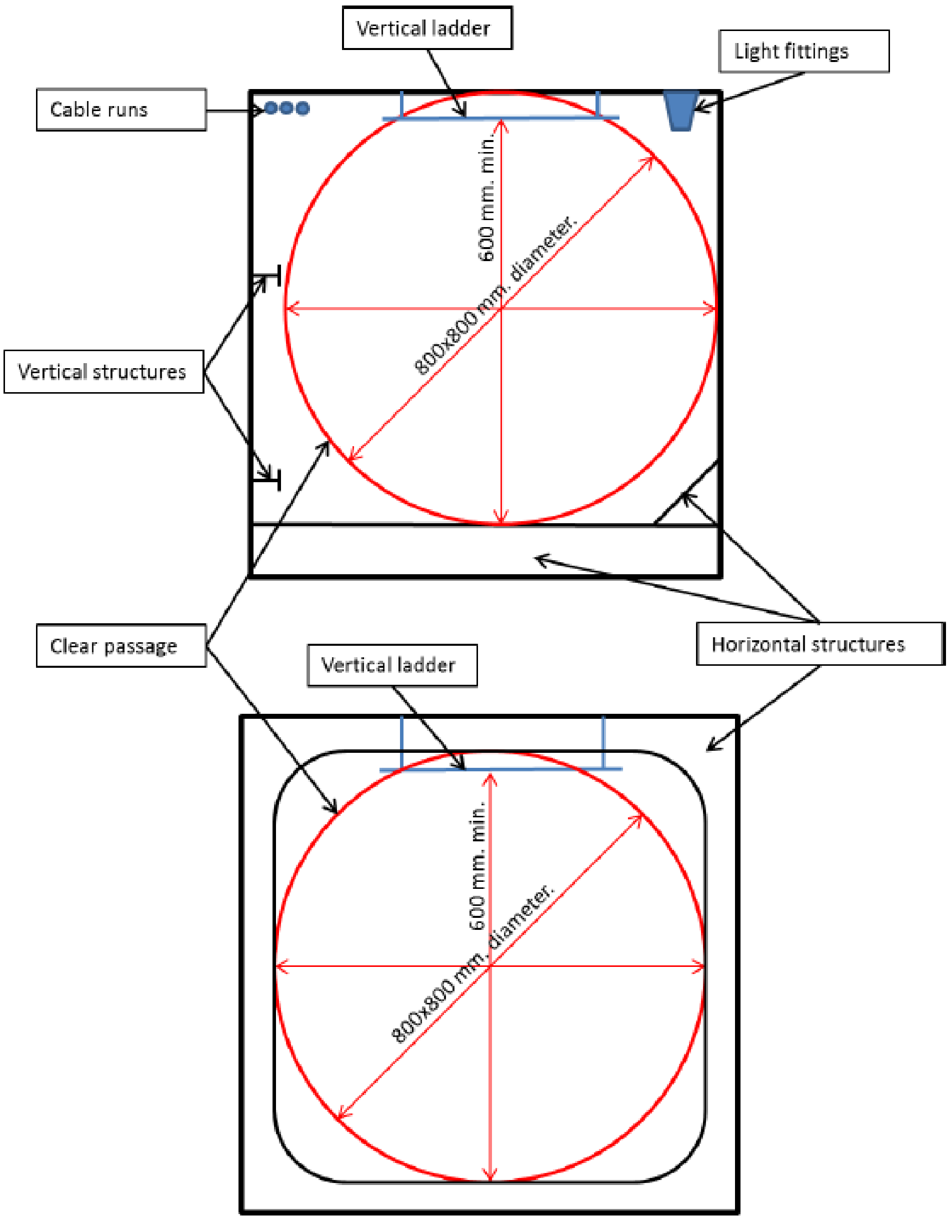

Vertical ladder
Light fittings
Cable runs
600 mm. min.
800x800 mm. diameter.
Vertical structures
Clear passage
Vertical ladder
Horizontal structures
600 mm. min.
800x800 mm. diameter.

Figure 1

TL- I SC279

Annual testing of VDR, S-VDR, AIS and EPIRB

- **SOLAS regulation V/18.8 - Annual performance test of Voyage Data Recorder (VDR) and Simplified Voyage Data Recorder (S-VDR)**
- **SOLAS regulation V/18.9 - Annual performance test of Automatic Identification System (AIS)**
- **SOLAS regulation IV/15.9 - Annual test of EPIRB**

The SOLAS 74 as amended at regulation V/18 paragraph 8 reads:

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.

Moreover the annex to MSC.1 Circ./1222 at paragraph 3 expects:

3 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.

Note:

1. This TL-I is to be applied when acting as recognized organization, authorized by flag State Administrations to act on their behalf, unless otherwise advised, from 1 July 2017.

The SOLAS 74 as amended at regulation V/18 paragraph 9 reads:

SOLAS regulation V/18.9

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.

Moreover the annex to MSC.1 Circ./1252 at paragraph 3 expects:

3 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.

The SOLAS 74 as amended at regulation IV/15 paragraph 9 reads:

SOLAS regulation IV/15.9

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.

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.

TL- I
SC284

Automatic shutdown of the inert gas system and its components parts

FSS Code Chapter 15.2.2.2.2 reads:

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

Note:

1. This interpretation is to be applied on ships contracted for construction on or after 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 TL-PR 29.

TL-I SC285

Operational status of valves to cargo tanks

FSS Code Chapter 15.2.2.3.2.2 reads:

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.

Note:

1. This interpretation is to be applied on ships contracted for construction on or after 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 TL-PR 29.

TL-I SC 286

Operational status of the inert gas system

FSS Code Chapter 15.2.2.4.1 reads:

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.

Note:

1. This Interpretation is to be implemented for ships contracted for construction on or after 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 TL-PR 29.

TL-I SC287

Low pressure audible alarm system

FSS Code Chapter 15.2.2.4.5 reads:

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.

Note:

1. This interpretation is to be applied on ships contracted for construction on or after 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 TL-PR 29.

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.

TL-I

SC 288

Carriage of Dangerous Goods – Required Air Changes

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.

Note:

1. This interpretation is to be applied on ships contracted for construction on or after 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 TL-PR 29.