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MSC.1/Circ.1625
8 December 2020

UNIFIED INTERPRETATIONS OF THE IGC CODE (AS AMENDED BY RESOLUTION MSC.370(93))

1 The Maritime Safety Committee, at its 102nd session (4 to 11 November 2020), with a view to providing more specific guidance for the application of the relevant requirements of the *International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk* (IGC Code), as amended by resolution MSC.370(93), approved unified interpretations of the IGC Code prepared by the Sub-Committee on Carriage of Cargoes and Containers, at its sixth session, as set out in the annex.

2 Member States are invited to use the annexed unified interpretation as guidance when applying the relevant provisions of the IGC Code and to bring the unified interpretations to the attention of all parties concerned.

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ANNEX

**UNIFIED INTERPRETATIONS OF THE IGC CODE
(AS AMENDED BY RESOLUTION MSC.370(93))**

1 Tee welds in type A or type B independent tanks (paragraph 4.20.1.1)

1.1 Paragraph 4.20.1.1 is applicable to independent tanks of type A or type B, primarily constructed of plane surfaces. This includes the tank corners which are constructed using bent plating which is aligned with the tank surfaces and connected with in-plane welds.

1.2 The applicability of the expression "For dome-to-shell connections only" is clarified as follows:

.1 welded corners (i.e. corners made of weld metal) should not be used in the main tank shell construction, i.e. corners between shell side (sloped plane surfaces parallel to hopper or top side inclusive if any) and bottom or top of the tank, and between tank end transverse bulkheads and bottom, top or shell sides (sloped plane surfaces inclusive if any) of the tank. Instead, tank corners which are constructed using bent plating aligned with the tank surfaces and connected with in-plane welds should be used; and

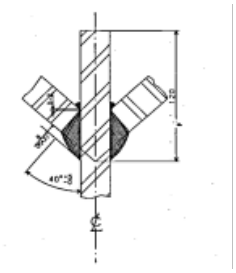
.2 tee welds can be accepted for other localized constructions of the shell such as suction well, sump and dome, where tee welds of full penetration type should also be used.

2 Welds of type C independent bi-lobe tank with centreline bulkhead (paragraph 4.20.1.2)

2.1 Paragraph 4.20.1.2 is applicable to type C independent tanks including bi-lobe tanks, primarily constructed of curved surfaces fitted with a centreline bulkhead.

2.2 The applicability of the expression "Other edge preparations" is clarified as follows:

Cruciform full penetration welded joints in a bi-lobe tank with centreline bulkhead can be accepted for the tank structure construction at tank centreline welds with bevel preparation subject to the approval of the Administration or recognized organization acting on its behalf, based on the results of the tests carried out at the approval of the welding procedure. (See example below.)



3 Outer duct in gas fuel piping systems (paragraphs 5.4.4 and 5.13.2.4)

3.1 The expression "design pressure of the outer pipe or duct" in 5.4.4 is:

.1 the maximum pressure that can act on the outer pipe or equipment enclosure after the inner pipe rupture as documented by suitable calculations taking into account the venting arrangements; or

.2 for gas fuel systems with inner pipe working pressure greater than 1 MPa, the "maximum built-up pressure arising in the annular space", after the inner pipe rupture, which should be calculated in accordance with paragraph 9.8.2 of the IGF Code as adopted by MSC.391(95).

3.2 The expression "maximum pressure at gas pipe rupture" in 5.13.2.4 is the maximum pressure to which the outer pipe or duct is subjected after the inner pipe rupture and for testing purposes it is the same as the design pressure used in 5.4.4.

4 Cargo sampling (paragraphs 5.6.5 and 18.9)

4.1 These requirements should only be applicable if such a sampling system is fitted on board. Connections used for control of atmosphere in cargo tanks during inerting or gassing up should not be considered as cargo sampling connections.

5 Cargo filters (paragraph 5.6.6)

5.1 Means to indicate that filters are becoming blocked and filter maintenance is required should be provided for fixed in-line filter arrangement and portable filter installations where dedicated filter housing piping is provided.

5.2 Where portable filters for fitting to manifold presentation flanges are used without dedicated filter housing, and these can be visually inspected after each loading and discharging operation, no additional arrangements for indicating blockage or facilitating drainage should be required.

6 Cargo piping insulation (paragraph 5.12.3.1)

6.1 The expression "a thermal insulation system as required to minimize heat leak into the cargo during transfer operations" means that properties of the piping insulation should be taken into consideration when calculating the heat balance of the containment system and capacity of the pressure/temperature control system.

6.2 The expression "cargo piping systems shall be provided with a thermal insulation system as required ... to protect personnel from direct contact with cold surfaces" means that surfaces of cargo piping systems with which personnel are likely to have contact under normal conditions should be protected by a thermal insulation, with the exception of the following examples:

.1 surfaces of cargo piping systems which are protected by physical screening measures to prevent such direct contact;

.2 surfaces of manual valves having extended spindles that protect the operator from the cargo temperature; and

.3 surfaces of cargo piping systems whose design temperature (to be determined from inner fluid temperature) is above minus 10°C.

7 Type testing requirements for valves (paragraph 5.13.1.1.2)

7.1 The expression "Each type of valve…shall be certified to a recognized standard" means that:

.1 for pressure relief valves (PRVs) that are subject to IGC Code paragraph 8.2.5, the flow or capacity should be certified by the Administration or recognized organization acting on its behalf; and

.2 for other types of valves, the manufacturer should certify the flow properties of the valves based on tests carried out according to recognized standards.

8 Guidance for sizing pressure relief systems for interbarrier spaces (paragraph 8.1)

8.1 General

8.1.1 The formula for determining the relieving capacity given in section 2 is for interbarrier spaces surrounding independent type A cargo tanks, where the thermal insulation is fitted to the cargo tanks.

8.1.2 The relieving capacity of pressure relief devices of interbarrier spaces surrounding independent type B cargo tanks may be determined on the basis of the method given in section 2; however, the leakage rate should be determined in accordance with 4.7.2 of the IGC Code.

8.1.3 The relieving capacity of pressure relief devices for interbarrier spaces of membrane and semi-membrane tanks should be evaluated on the basis of specific membrane/semi-membrane tank design.

8.1.4 The relieving capacity of pressure relief devices for interbarrier spaces adjacent to integral type cargo tanks may, if applicable, be determined as for type A independent cargo tanks.

8.2 Size of pressure relief devices

8.2.1 The combined relieving capacity of the pressure relief devices for interbarrier spaces surrounding type A independent cargo tanks where the insulation is fitted to the cargo tanks may be determined by the following formula:

$$Q_{sa} = 3{,}4 \; . \; A_c \frac{\rho}{\rho_v} \sqrt{h} \quad (m^3/s)$$

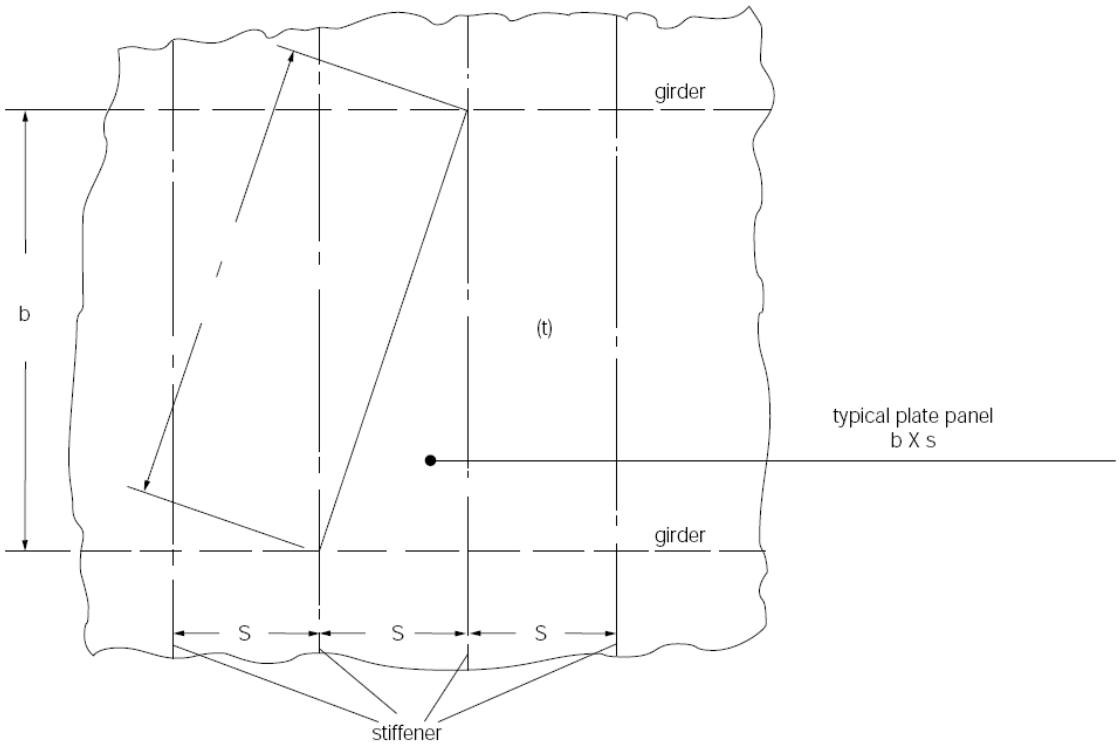
where:

Q_{sa} = minimum required discharge rate of air at standard conditions of 273 K and 1.013 bar

A_c = design crack opening area (m^2)

$$A_c = \frac{\pi}{4} \delta \; . \; 1 \; (m^2)$$

δ = max, crack opening width (m)
δ = 0.2t (m)
t = thickness of tank bottom plating (m)
l = design crack length (m) equal to the diagonal of the largest plate panel of the tank bottom, see sketch below.
H = max liquid height above tank bottom plus 10.MARVS (m)
ρ = density of product liquid phase (kg/m^3) at the set pressure of the interbarrier space relief device
ρ_v = density of product vapour phase (kg/m^3) at the set pressure of the interbarrier space relief device and a temperature of 273 K
MARVS = max allowable relief valve setting of the cargo tank (bar).



9 Emergency fire pump (paragraphs 11.2 and 11.3.4)

9.1 In paragraph 11.3.4 the term "fire pumps" where not qualified by the word "emergency" refers to the fire pumps required in accordance with SOLAS regulation II-2/10.2.2.2.2.

9.2 If all the fire pumps mentioned in paragraph 1 above supplying the water spray system (for covering the superstructures and deckhouses) are disabled due to a fire in any one compartment, then the emergency fire pump should be sized to cover:

.1 the water spray system for the boundaries of the superstructures and deckhouses, and lifeboats, liferafts and muster areas facing the cargo area, (as per paragraph 11.3.4); and

.2 two fire hydrants (as per paragraph 11.2).

9.3 When the ship is also fitted with a total flooding high expansion foam system protecting the engine-room (to comply with SOLAS regulations II-2/10.4.1.1.2 and 10.5.1.1) and the emergency fire pump is intended to supply sea water to this system, then the emergency fire pump should also be sized to cover the foam system for dealing with an engine-room fire, when the main fire pumps are disabled.

9.4 On the basis of the principle of dealing with one single fire incident at a time, the emergency fire pump does not need to be sized to cover all three systems in 2 and 3 above (i.e. water spray, hydrants and foam) at the same time and should only need to be sized to cover the most demanding area and required systems, as follows:

.1 the foam system + two hydrants; or

.2 the water spray system + two hydrants; whichever is greater.

10 Fire pumps used as spray pumps (paragraph 11.3.4)

10.1 In cases where the emergency fire pump is used to meet this requirement, its capacity, in addition to being capable of maintaining two jets of water as required by paragraph 12.2.2.1.1 of the FSS Code, should be increased taking into account the spray application rates stated in paragraph 11.3.2.1, but limiting coverage to boundaries of normally manned superstructures and deckhouses, survival crafts and their muster areas.

10.2 The expression "one of the fire pumps or emergency fire pump" is related to fire pumps required by SOLAS regulation II-2/10.2.2 installed outside the space where spray pump(s) are located.

10.3 The expression "fire in one compartment" means a compartment provided with A-class boundaries in which is located the fire pump(s), or the source of power of the fire pump(s), serving the water-spray system in accordance with paragraph 11.3.3.

11 Level indicators for cargo tanks (paragraph 13.2.2)

11. 1 In order to assess whether or not only one level gauge is acceptable in relation to the aforesaid sentence, the expression "can be maintained" means that any part of the level gauge other than passive parts can be overhauled while the cargo tank is in service.

Note: passive parts are those parts assumed not subject to failures under normal service conditions.

12 Inhibition of cargo pump operation and opening of manifold ESD valves with level alarms overridden (table 18.1, note 4 and paragraph 13.3.7)

12.1 In applying the second sentence of note 4 of table 18.1, a hardware system such as an electric or mechanical interlocking device should be provided to prevent inadvertent operation of cargo pumps and inadvertent opening of manifold ESD valves.

13 Oxygen deficiency monitoring equipment in a nitrogen generator room area (paragraph 13.6.4)

13.1 Two oxygen sensors should be positioned at appropriate locations in the space or spaces containing the inert gas system, in accordance with paragraph 15.2.2.4.5.4 of the FSS Code, for all gas carriers, irrespective of the carriage of cargo indicated by an "A" in column "f" in the table in chapter 19 of the Code.

14 Integrated systems (paragraph 13.9.3)

14.1 The expression "integrated system" means a combination of computer-based systems which are used for the control, monitoring/alarm and safety functions required for the carriage, handling and conditioning of cargo liquid and vapours and are interconnected in order to allow communication between computer-based systems and to allow centralized access to monitoring/alarm and safety information and/or command/control.

Referenced guidelines

MSC/Circ.891 – *Guidelines for the onboard use and application of computers*

2.1 Computer
A programmable electronic device for storing and processing data, making calculations, or any programmable electronic system (PES), including mainframe, mini-computer or micro-computer.

2.2 Computer-based system
A system of one or more computers, associated software, peripherals and interfaces.

2.3 Integrated system
A combination of computer-based systems which are interconnected in order to allow centralized access to sensor information and/or command/control.

15 Suitable pressure relief system for air inlet, scavenge spaces, exhaust system and crank case (paragraph 16.7.1.4)

15.1 Suitable pressure relief system for air inlet manifolds, scavenge spaces and exhaust system should be provided unless designed to accommodate the worst-case overpressure due to ignited gas leaks or justified by the safety concept of the engine. A detailed evaluation regarding the hazard potential of overpressure in air inlet manifolds, scavenge spaces and exhaust system should be carried out and reflected in the safety concept of the engine.

15.2 In the case of crankcases, the explosion relief valves, as required by SOLAS regulation II-1/27.4, should be considered suitable for the gas operation of the engine. For engines not covered by SOLAS regulation II-1/27.4, a detailed evaluation regarding the hazard potential of fuel gas accumulation in the crankcase should be carried out.