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**AMENDMENTS TO THE IGF CODE AND DEVELOPMENT OF GUIDELINES
FOR ALTERNATIVE FUELS AND RELATED TECHNOLOGIES**

**Proposal to amend chapter 11 of the IGF Code concerning a water spray system for
fuel storage tank(s)**

Submitted by IACS

SUMMARY

Executive summary: This document proposes amendments to paragraphs 11.5.1, 11.5.2 and 11.5.3 of part A-1 of the IGF Code concerning a water spray system for fuel storage tank(s).

*Strategic direction,
if applicable:* 2

Output: 2.3

Action to be taken: Paragraph 16

Related documents: None

Introduction

1 This document proposes amendments to the International Code for Ships Using Gases or Other Low-flashpoint Fuels (IGF Code) (resolution MSC.395(95) concerning the nozzle spacing of a water spray system for fuel storage tanks in chapter 11 of part A-1 of the IGF Code.

Background

Paragraphs 11.5.1 and 11.5.2 of part A-1 of the IGF Code

2 Paragraph 11.5.1 of part A-1 of the IGF Code requires the installation of a water spray system for cooling and fire prevention of fuel storage tank(s) as follows:

"A water spray system shall be installed for cooling and fire prevention to cover exposed parts of fuel storage tank(s) located on open deck."

3 The IGF Code also requires the installation of a water spray system for the structures, such as accommodation and cargo control rooms, as stated in paragraph 11.5.2 of part A-1 of the IGF Code, as follows:

"The water spray system shall also provide coverage for boundaries of the superstructures, compressor rooms, pump-rooms, cargo control rooms, bunkering control stations, bunkering stations and any other normally occupied deck houses that face the storage tank on open decks unless the tank is located 10 metres or more from the boundaries."

4 IACS understands that the fuel storage tank(s) and boundaries need to be protected from the fire or heat by cooling. Water spray from the system flows on the surface of the tank and boundaries so that the heat does not impact the tank and boundaries.

5 The IGF Code requires the water spray system to cover exposed parts of the tanks and boundaries for cooling purposes but does not stipulate how the water spray nozzles are to be arranged to cover the fuel tank(s) and boundaries, i.e. the surface of the fuel tank is wetted by the water sprayed directly or by the rundown (flowing on the surface).

Discussion

6 Paragraph 11.3.2.2 of the IGC Code, as amended by resolution MSC.370(93), stipulates that the spacing of nozzles protecting the lower areas may take account of the anticipated rundown from higher areas for structure having vertical surface, as follows:

"On vertical surfaces, spacing of nozzles protecting lower areas may take account of anticipated rundown from higher areas. Stop valves shall be fitted in the main supply line(s) in the water-spray system, at intervals not exceeding 40 m, for the purpose of isolating damaged sections. Alternatively, the system may be divided into two or more sections that may be operated independently, provided the necessary controls are located together in a readily accessible position outside the cargo area. A section protecting any area included in 11.3.1.1 and .2 shall cover at least the entire athwartship tank grouping in that area. Any gas process unit(s) included in 11.3.1.3 may be served by an independent section."

7 IACS is of the view that there is no technical difference between the IGC Code and the IGF Code regarding the protection of a vertical surface.

8 Normally, the surface of the fuel tank is neither vertical nor horizontal, unlike the accommodation where its structure is made up of horizontal and vertical surfaces (figure 1). On the other hand, a curved surface allows water to flow on its surface, same as from the vertical surface, considering the anticipated rundown from higher areas, as required by paragraph 11.3.2.2 of the IGC Code, as follows:

"On vertical surfaces, spacing of nozzles protecting lower areas may take account of anticipated rundown from higher areas. Stop valves shall be fitted in the main supply line(s) in the water-spray system, at intervals not exceeding 40 m, for the purpose of isolating damaged sections. Alternatively, the system may be divided into two or more sections that may be operated independently, provided the necessary controls are located together in a readily accessible position outside the cargo area. A section protecting any area included in 11.3.1.1 and .2 shall cover at least the entire athwartship tank grouping in that area. Any gas process unit(s) included in 11.3.1.3 may be served by an independent section."



Figure 1: Illustration of a typical gas fuel storage tank arrangement

9 Therefore, IACS is of the opinion that for structures without clearly defined horizontal or vertical surfaces, the spacing of the nozzles protecting the lower areas may take account of the anticipated rundown from the higher areas.

10 In this connection, IACS considers that the nozzle spacing of the water spray system for fuel storage tank(s) and boundaries needs to be clarified by amending the IGF Code.

Paragraph 11.5.3 of part A-1 of the IGF Code

11 An application rate is required in paragraph 11.5.3 of part A-1 of the IGF Code as follows:

"The system shall be designed to cover all areas as specified above with an application rate of 10 $\ell/\text{min}/\text{m}^2$ for the largest horizontal projected surfaces and 4 $\ell/\text{min}/\text{m}^2$ for vertical surfaces."

12 IACS understands that the required application rate for the tank(s) should be of 10 $\ell/\text{min}/\text{m}^2$ for the largest horizontal projected surface. However, this application rate of 10 $\ell/\text{min}/\text{m}^2$ applies to the structures having a horizontal surface; it is not clear in the IGF Code whether the application rate of 10 $\ell/\text{min}/\text{m}^2$ may apply to the tank(s).

13 On the other hand, paragraph 11.3.2.1 of the IGC Code clearly defines the application rate for structures which, unlike in the IGF Code, do not have clearly defined horizontal and vertical surfaces, as follows:

"The system shall be capable of covering all areas mentioned in 11.3.1.1 to 11.3.1.8, with a uniformly distributed water application rate of at least 10 $\ell/\text{min}/\text{m}^2$ for the largest projected horizontal surfaces and 4 $\ell/\text{min}/\text{m}^2$ for vertical surfaces. For structures having no clearly defined horizontal or vertical surface, the capacity of the water-spray system shall not be less than the projected horizontal surface multiplied by 10 $\ell/\text{min}/\text{m}^2$."

14 In this connection, IACS is of the view that the IGF Code needs to be amended to clarify the application rate.

Proposal

15 Based on the discussion in paragraphs 2 to 14, IACS proposes the draft amendments to the IGF Code, as contained in the annex of this document, for consideration of the Sub-Committee.

Action requested of the Sub-Committee

16 The Sub-Committee is invited to consider the foregoing, the proposal in paragraph 15 and the draft amendments of the IGF Code as set out in the annex of this document, and take action, as appropriate.

ANNEX

DRAFT AMENDMENTS TO THE IGF CODE

The following amendments are proposed:*

"11.5 Regulations for water spray system

11.5.1 A water spray system shall be installed for cooling and fire prevention to cover exposed parts of fuel storage tank(s) located on open deck.

11.5.2 The water spray system shall also provide coverage for boundaries of the superstructures, compressor rooms, pump-rooms, cargo control rooms, bunkering control stations, bunkering stations and any other normally occupied deck houses that face the storage tank on open decks unless the tank is located 10 metres or more from the boundaries.

11.5.2bis On vertical surfaces and for structures having no clearly defined horizontal or vertical surface, spacing of nozzles protecting lower areas may take account of anticipated rundown from higher areas.

11.5.3 The system shall be designed to cover all areas as specified above with an application rate of 10 l/min/m² for the largest horizontal projected surfaces and 4 l/min/m² for vertical surfaces. For structures having no clearly defined horizontal or vertical surface, the capacity of the water-spray system shall not be less than the projected horizontal surface multiplied by 10 l/min/m²."

* Tracked changes are indicated using "grey shading" to highlight new insertions and "strikethrough" to highlight deletion of the text.