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DEVELOPMENT OF A SAFETY REGULATORY FRAMEWORK TO SUPPORT THE REDUCTION OF GHG EMISSIONS FROM SHIPS USING NEW TECHNOLOGIES AND ALTERNATIVE FUELS

Proposed amendments to the definition of low-flashpoint fuel and consequential amendments to SOLAS chapter II-1 and the IGF Code

Submitted by China, Republic of Korea, United Kingdom and IACS

SUMMARY

Executive summary:	This document proposes amendments to the definition of "low-flashpoint fuel" in SOLAS regulation II-1/2.29 and consequential amendments to SOLAS chapter II-1 and the IGF Code
Strategic direction, if applicable:	3
Output:	3.8
Action to be taken:	Paragraph 13
Related documents:	MSC 109/22, MSC.109/WP.9; resolutions MSC.391(95), MSC.392(95); MSC.422(98); MSC.458(101); MSC.475(102); MSC.524(106); MSC.551(108) and MSC.567(109)

Background

1 MSC 109 considered documents MSC 109/6 (United Kingdom) and CCC 10/10/3 (IACS) to clarify the application of the International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code) to gas fuels, and approved the draft amendments to SOLAS chapter II-1, as set out in annex 4 of document MSC 109/22/Add.1 (MSC 109/22, paragraph 6.27), hereinafter referred to as "the draft amendments", with a view to adoption at MSC 110.

2 The draft amendments to SOLAS chapter II-1 introduce a new definition of "gaseous fuel" as "any fluid used as fuel which: has a vapour pressure exceeding 0.28 MPa absolute at a temperature of 37.8°C; or is completely gaseous at 20°C at a standard pressure of 101.3 kPa". The draft amendments also replace the term "low-flashpoint fuels" in the title of part G of SOLAS chapter II-1, SOLAS regulations II-1/56 and 57 with "gaseous fuels or low-flashpoint fuels" and replaces "low-flashpoint gaseous fuels" in SOLAS regulation II-1/56.4.2 with "gaseous fuels".

3 The draft amendments have made significant progress in clarifying the applicability of the IGF Code to all gaseous fuels regardless of flash-points and harmonizing the scope of application between SOLAS chapter II-1 and the IGF Code. China fully supports the draft amendments.

4 The delegation of China made oral intervention in both the plenary and the Working Group on Development of a Safety Regulatory Framework to Support the Reduction of GHG Emissions from Ships Using New Technologies and Alternative Fuels, hereinafter referred to as "WG on GHG Safety", proposing that the definition of "low-flashpoint fuel" should also be amended to delete "gaseous fuels" from the definition; and the relevant terms throughout SOLAS chapter II-1 and the IGF Code should be amended accordingly (MSC 109/WP.9, paragraph 17). The proposal has received some support or sympathy. In this context, the Committee invited interested Member States and international organizations to submit a formal proposal regarding amendments to the definition of "low-flashpoint fuel" in SOLAS regulation II-1/2.29, which should include detailed consequential amendments to SOLAS chapter II-1 and the IGF Code, to a future session of the Committee (MSC 109/22, paragraph 6.28).

Discussion

5 SOLAS regulation II-1/2.29 defines low-flashpoint fuel as gaseous or liquid fuel having a flashpoint lower than otherwise permitted under regulation SOLAS regulation II-2/4.2.1.1, where "having a flashpoint lower than otherwise permitted under SOLAS regulation II-2/4.2.1.1" modifies both gaseous and liquid fuel. The title of the IGF Code is International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code), in which "low-flashpoint" does not modify "gases". This is the root cause of the inconsistency in relation to scope of applicability between SOLAS and the IGF Code.

6 The definition of "flashpoint" in SOLAS regulation II-2/3.24 is as follows:

> "Flashpoint is the temperature in degrees Celsius (closed cup test) at which a product will give off enough flammable vapour to be ignited, as determined by an approved flashpoint apparatus".

According to the definition, it is clear that the flashpoint of a fuel is tested by closed cup method. However, the flashpoint of a gaseous fuel cannot be so tested. Therefore the concept of low-flashpoint fuel is not suitable for gaseous fuels. The best solution is to amend the definition of "low-flashpoint fuel" to clarify that low-flashpoint fuel refers to liquid fuel only.

7 The co-sponsors have identified the necessary consequential amendments to part A and F of SOLAS chapter II-1 and the IGF Code concerning the two terms, namely "gaseous fuel" and "low-flashpoint fuel". The revised text in part G of SOLAS chapter II-1, as contained in the draft amendments, needs no revision. The consequential amendments ensures consistency in scope of application between SOLAS chapter II-1 and the IGF Code, without causing inappropriate consequences.

Proposal

8 The definition of "low-flashpoint fuel" in SOLAS regulation II-1/2.29 is proposed to be amended as follows:

> "Low-flashpoint fuel means ~~gaseous or~~ liquid fuel having a flashpoint lower than otherwise permitted under regulation II-2/4.2.1.1".

9 The definition of "IGF Code" in SOLAS regulation II-1/2.28 is proposed to be amended as follows:

> *"*IGF Code means the International Code of Safety for Ships using Gases or ~~other~~ Low-Flashpoint Fuels as adopted by the Maritime Safety Committee of the Organization by resolution MSC.391(95), 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".

10 Paragraphs 1, 2.1, 3.1, 3.2 and the chapeau of paragraph 3.4 in regulation 55 in part F of SOLAS chapter II-1 are proposed to be amended as follows:

> **"Part F**
> ***Alternative design and arrangements***
>
> **Regulation 55**
> ***Alternative design and arrangements***
>
> 1 **Purpose**
>
> The purpose of this regulation is to provide a methodology for alternative design and arrangements for machinery, electrical installations and gaseous or low-flashpoint fuel storage and distribution systems.
>
> 2 **General**
>
> 2.1 Machinery, electrical installations, ~~and~~ gaseous or low-flashpoint fuel storage and distribution systems design and arrangements may deviate from the requirements set out in parts C, D, E or G, provided that the alternative design and arrangements meet the intent of the requirements concerned and provide an equivalent level of safety to this chapter.
>
> 3 **Engineering analysis**
>
> The engineering analysis shall be prepared and submitted to the Administration, based on the guidelines developed by the Organization* and shall include, as a minimum, the following elements:
>
> .1 determination of the ship type, machinery, electrical installations, gaseous or low-flashpoint fuel storage and distribution systems and space(s) concerned;
>
> .2 identification of the prescriptive requirement(s) with which the machinery, electrical installations, ~~and~~ gaseous or low-flashpoint fuel storage and distribution systems will not comply;
>
> .4 determination of the performance criteria for the ship, machinery, electrical installation, gaseous or low-flashpoint fuel storage and distribution system or the space(s) concerned addressed by the relevant prescriptive requirement(s):"

* Refer to the *Guidelines on alternative design and arrangements for SOLAS chapters II-1 and III* (MSC.1/Circ.1212) and the *Guidelines for the approval of alternatives and equivalents as provided for in various IMO instruments* (MSC.1/Circ.1455).

11 The proposed consequential amendments to the IGF Code are set out in the annex (additions and deletions are shown in grey shading).

12 It should be noted that those in part A-1, B-1 and C-1 of the IGF Code need no revision, as the opening sentences of the three parts state:

> "Fuel in the context of the regulations in this part means natural gas, either in its liquefied or gaseous state".

Action requested of the Committee

13 The Committee is invited to consider the proposals in paragraphs 8 to 12 and to take action as appropriate.

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ANNEX

DRAFT AMENDMENTS TO INTERNATIONAL CODE OF SAFETY FOR SHIPS USING GASES OR OTHER LOW-FLASHPOINT FUELS (IGF CODE)

1 Amend the title of the IGF Code as follows:

"INTERNATIONAL CODE OF SAFETY FOR SHIPS USING GASES OR ~~OTHER~~ LOW-FLASHPOINT FUELS (IGF CODE)"

2 Amend section 1 on preamble as follows:

"1 PREAMBLE

The purpose of this Code is to provide an international standard for ships using gas or low-flashpoint fuel, other than ships covered by the IGC Code.

The basic philosophy of this Code is to provide mandatory provisions for the arrangement, installation, control and monitoring of machinery, equipment and systems using gas or low-flashpoint fuel to minimize the risk to the ship, its crew and the environment, having regard to the nature of the fuels involved.

Throughout the development of this Code it was recognized that it must be based upon sound naval architectural and engineering principles and the best understanding available of current operational experience, field data and research and development. Due to the rapidly evolving new fuels technology, the Organization will periodically review this Code, taking into account both experience and technical developments.

This Code addresses all areas that need special consideration for the usage of the gas or low-flashpoint fuel. The basic philosophy of the IGF Code considers the goal-based approach (MSC.1/Circ.1394). Therefore, goals and functional requirements were specified for each section forming the basis for the design, construction and operation.

The current version of this Code includes regulations to meet the functional requirements for natural gas fuel. Regulations for other gases or low-flashpoint fuels will be added to this Code as, and when, they are developed by the Organization.

In the meantime, for other gases or low-flashpoint fuels, compliance with the functional requirements of this Code must be demonstrated through alternative design.

The term "gas fuel" and "gaseous fuel" in the IGF Code should be considered having the same meaning as "gas" as defined in paragraph 2.2.18".

PART A

2 GENERAL

2.2 Definitions

3 Amend paragraph 2.2.18 and 2.2.28 as follows:

"2.2.18 *Gas* means any ~~a~~ fluid used as fuel which:

.1 ~~having~~ has a vapour pressure exceeding 0.28 MPa absolute at a temperature of 37.8°C; or "

.2 is completely gaseous at 20°C at a standard pressure of 101.3 kPa.

"2.2.28 *Low-flashpoint fuel* means ~~gaseous or~~ liquid fuel having a flashpoint lower than otherwise permitted under paragraph 2.1.1 of SOLAS regulation II-2/4"

2.3 Alternative design

4 Amend paragraph 2.3.1 and the chapeau of paragraph 2.3.2 as follows:

"2.3.1 This Code contains functional requirements for all appliances and arrangements related to the usage of gases or low-flashpoint fuels. "

"2.3.2 Fuels, appliances and arrangements of gas or low-flashpoint fuel systems may either: "

4 GENERAL REQUIREMENTS

4.2 Risk assessment

5 Amend paragraph 4.2.1 as follows:

"4.2.1 A risk assessment shall be conducted to ensure that risks arising from the use of gases or low-flashpoint fuels affecting persons on board, the environment, the structural strength or the integrity of the ship are addressed. Consideration shall be given to the hazards associated with physical layout, operation and maintenance, following any reasonably foreseeable failure".

PART D

6 Amend paragraph 19.2 as follows:

"19.2 Functional requirements

Companies shall ensure that seafarers on board ships using gases or ~~other~~ low-flashpoint fuels shall have completed training to attain the abilities that are appropriate to the capacity to be filled and duties and responsibilities to be taken up, taking into account the provisions given in the STCW Convention and Code, as amended".