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AMENDMENTS TO THE IGF CODE AND DEVELOPMENT OF GUIDELINES FOR LOW-FLASHPOINT FUELS

Comments on document CCC 6/3/2

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SUMMARY

Executive summary:	This document provides comments on CCC 6/3/2 regarding the validity of the proposals contained in the document including the assumptions contained in CCC 6/INF.6 that have been used to derive the technical evaluation of risk associated with the use of low-flashpoint diesel fuels
Strategic direction, if applicable:	2
Output:	2.3
Action to be taken:	Paragraph 19
Related documents:	MSC 98/23; CCC 4/3/5, CCC 4/INF.1; CCC 5/3/4, CCC 5/13/1; CCC 6/3, CCC 6/3/2 and CCC 6/INF.6

Introduction

1 This document is submitted in accordance with the provisions of paragraph 6.12.5 of the document on *Organization and method of work of the Maritime Safety Committee and the Marine Environment Protection Committee and their subsidiary bodies* (MSC-MEPC.1/Circ.5/Rev.1) and provides comments on the document CCC 6/3/2.

Background

2 MSC 98 reiterated the view of MSC 96 that the use of oil fuel with a flashpoint below 60ºC was limited to ships that complied with the IGF Code, except as otherwise permitted in SOLAS regulation II-2/4.2.1 and encouraged interested Member States and international organizations to submit proposals to the Sub-Committee on Carriage of Cargoes and Containers (CCC) with a view to developing specific requirements for low-flashpoint oil fuel, within the context of the IGF Code only (MSC 98/23, paragraph 22.33).

3 CCC 4/3/5 and CCC 4/INF.11 (Germany), contain a proposal for a course of action with respect to the use of low-flashpoint diesel in the context of amending the IGF Code and a study with respect to the use of low-flashpoint diesel. CCC 5/3/4 (China) proposes risk control requirements for the application of fuel oil with a flashpoint of not less than 55°C based on studies that China had conducted. CCC 5 decided to refer all three documents to the Correspondence Group on Development of Technical Provisions for the Safety of Ships using Low-flashpoint Fuels (CCC 5/13, paragraph 3.32.4).

4 The Correspondence Group on Development of Technical Provisions for the Safety of Ships using Low-flashpoint Fuels had a short discussion on a possible way forward to develop provisions for the use of low-flashpoint fuel oils on board ships and consequently requests this Sub-Committee to endorse its view to develop a new fuel-related chapter for inclusion in the IGF Code regarding the safety of ships using low-flashpoint fuel oils (CCC 6/3, paragraph 42.6).

5 Document CCC 6/3/2 (Austria et. al) presents an FSA study on safety-related issues for the potential use of low-flashpoint oil fuels as a marine fuel as well as draft amendments to the IGF Code to regulate the use of such fuels. Document CCC 6/INF.6 contains the full report of this FSA. The proposed draft amendments contained in annex 1 of CCC 6/3/2 are based on SOLAS II-2 regulation 4.2.1.3.

Discussion

6 MSC 98 noted the comment that ship engine-rooms were subject to temperatures above 50ºC on a regular basis in many regions around the world. Current grades of marine heavy fuel oil had flashpoints above 80ºC and had to be stored and processed at temperatures of above 75ºC to keep them pumpable and to aid in the removal of water. It would be highly dangerous to have a fuel with a flashpoint of 55ºC being stored and pumped around at 80ºC, particularly since catastrophic fires could start if the vapours of such fuels came into contact with an ignition source in an engine-room with an ambient temperature of 60ºC (MSC 98/23, paragraph 22.31.6).

7 The Correspondence Group on Development of Technical Provisions for the Safety of Ships using Low-flashpoint Fuels has noted the view that that, in real life, engine-room temperatures frequently reached 60°C, which should also be taken into account when discussing safety provisions for low-flashpoint fuel oils (CCC 6/3, paragraph 36).

8 The co-sponsors fully support the views highlighted in paragraphs 6 and 7 which state facts based on real life engine-room scenarios on board ships operating globally. Based on this understanding, it is considered paramount to use engine-room temperatures of equal to or more than 60 °C for any representative models of engine-rooms that are used for studies to demonstrate the consequences of operation with a fuel oil having a flash point of less than 60°C.

9 The final paragraph under the heading Executive Summary provided in annex 2 of document CCC 6/3/2 provides the outcome from analysis that "Via the CFD-simulations it could be demonstrated that even under worst case boundary conditions the likelihood for a flammable atmosphere inside the fuel tank or in the machinery space is not significantly increased by fuels with a lower flashpoint than 60°C."

10 Table 8 in appendix G of the annex to the document CCC 6/INF.6 lists the assumptions related to the boundary conditions of the engine-room model that have been used to derive the outcome of the CFD analysis of simulated leakages. This table specifies that an air temperature of 20°C and a temperature of "other walls/components" of 45°C have been

assumed as boundary conditions. These assumptions do not reflect the reality for many ships operating in tropical areas especially in the summer. This issue is particularly sensitive for some ship types including oil tankers that have considerable steam generation and transfer systems in their engine-rooms thereby subject to much larger ambient temperatures. Therefore, the assumptions contained in the document CCC 6/INF.6 do not represent "worst case scenario" for engine-room operations and the statement provided in the executive summary as explained in paragraph 9 is not valid.

11 Paragraph 4 of the research report on Risk Analysis and Technical Requirements Study on Application of Low-flashpoint fuel on Ships that is referred to in document CCC 5/3/4 (China) states: "Based on the relevant research analysis and qualitative risk assessment it is concluded that the fire risk will be increased due to lower flashpoint limit reduced from 60°C to 55°C, largely because the low-flashpoint oil fuel is easier to producing flammable vapour or the vapour concentration will increase which will reach the lower explosive limit within a certain temperature range."

12 With respect to evaporation rates, the results of engine-room simulations provided in page 14 of annex 2 of document CCC 6/3/2 state that "The volume of these "plumes" is 8.5 l for diesel FP 60°C and, respectively, 44.2 l for FP 52°C". The volume of explosive gases produced by the fuel with a flashpoint of 52°C is therefore about five times more than that produced by the fuel with 60°C flashpoint. Similar figures can be derived from simulation results provided in section 5.2 of the annex of document CCC 4/INF.11 wherein the evaporation rate for low-flashpoint fuel is observed to be around 4 times more than that of the high-flashpoint fuel. These results demonstrate the criticality of situations where fuels are heated to temperatures that are close to their respective flashpoints.

13 The measures defined in SOLAS II-2 regulation 4.2.1.3 are only valid for engines and machines that are not located in machinery spaces of category A. It is therefore unclear how these provisions can be applicable or appropriate for situations where a low-flashpoint diesel fuel is to be used in machinery spaces of category A as proposed in annex 1 of document CCC 6/3/2.

14 Based on the issues elaborated in paragraphs 6 to 13, the co-sponsors question the validity of the FSA presented in document CCC 6/INF.6 and consequently consider the proposals contained in annex 1 of document CCC 6/3/2 to be a de facto reduction in the safety levels of ships and crew operating ships that use low-flashpoint diesel fuels with a flashpoint of 52°C or above and less than 60°C.

15 The FSA and the outcomes derived from the simulations as provided in documents CCC 6/3/2 and CCC 6/INF.6 are related to the use of low-flashpoint diesel. However, the proposed consequential amendments to the IGF Code as contained in annex 1 of document CCC 6/3/2 are specified for ships using oil fuels in general. The co-sponsors believe that this discrepancy needs to be clarified.

16 In addition, with regards to storage of these fuels, the co-sponsors wish to make reference to SOLAS regulation II-2/4.5 which requires oil tankers to inert their cargo tanks when having on board oil cargoes with a flashpoint temperature of 60 °C and below (also see SOLAS II-2/1.6.1 quoted below):

SOLAS regulation II-2/1.6.1 Application of requirements for tankers

> *6.1 Requirements for tankers in this chapter shall apply to tankers carrying crude oil or petroleum products having a flashpoint not exceeding 60°C (closed cup test), as determined by an approved flashpoint apparatus, and a Reid vapour pressure which is below the atmospheric pressure or other liquid products having a similar fire hazard.*

17 For consistency, risks assessment for possible auto ignition of hydrocarbons should be equally applicable whether the product is stored as a cargo or it is stored and used as fuel oil in a compartment with temperatures potentially higher than in the cargo tanks. Therefore, any possible amendment to the IGF Code should consider all these aspects.

Proposal

18 The co-sponsors recommend that the Sub-Committee in continuing its work on the draft development of guidelines for low-flashpoint fuel oils, take into account the need to ensure that all new requirements are to be based on verifiable technical evidence resulting from the consideration of realistic worst case scenarios where the model engine-rooms are subject to temperatures of at least 60°C.

Action requested of the Sub-Committee

19 The Sub-Committee is invited to note the discussion in paragraph 6 to 17, consider the proposal in paragraph 18 and take action as appropriate.