**CCC7– 6th to 10th September 2021**

The seventh session of the Sub-Committee on Carriage of Cargoes and Containers (CCC 7) was held remotely from 6 to 10 September 2021.

***Amendments to the IGF code and development of guidelines for low-flashpoint fuels***

MSC 102 approved MSC.1/Circ.1621 on Interim guidelines for the safety of ships using methyl/ethyl alcohol as fuel.

CCC 6 agreed to re-establish the Correspondence Group on Development of Technical Provisions for the Safety of Ships Using Low-flashpoint Fuels.

***Draft interim guidelines for the safety of ships using fuel cell power installations***

CCC 7 has finalized the draft interim guidelines, taking into account their interim nature and the need to further review the guidelines after substantial experience was gained in their application.

***Definitions - Goal and functional requirements***

CCC 7 agreed to the definitions and Goal and functional requirements developed by the Correspondence Group. It has included additional definitions for fuel cells stacks and lower explosive limit (LEL).

***Fuel cell space concept and area classification***

In addressing missing provisions for the selection and arrangement of fuel cell stacks in zone 1 hazardous areas resulting from area classification as set out in 4.2 of the draft guidelines, CCC 7 agreed to the text in 2.1.1.3, which sets a fuel cell stack surface temperature limit of 300°C, i.e. the lowest surface temperature threshold of relevant fuels in accordance with standard ISO/IEC 80079-20-1:2017 to prevent auto-ignition.

As currently drafted, the Interim Guidelines in 2.1.1.3, 5.1.8.2, 5.8.8.1 and table 2 require the fuel cell power system to shut down automatically and to isolate and de-energize the affected fuel cell stack when the fuel cell stack surface temperature exceeds 300°C or the safety system detects a gas concentration of 40% of the lower explosion limit in the fuel cell space.

***Risks of ignition caused by electrical components***

All electrical equipment and wiring needed to be suitable for use in zone 1 hazardous environments, in accordance with relevant international standards (e.g. IEC 60079-series on area classification).

***Fire safety provisions***

CCC 7 recalled its earlier decision that SOLAS chapter II-2 should be applied for fuel cell spaces which, with the exceptions provided in SOLAS II-2, would require "A-60" class divisions.

***Establishment of the lower explosive limit for hydrogen***

CCC 7 had a lengthy discussion on defining the lower explosive limits for hydrogen concentrations in the context of hydrogen release from fuel cells (leaks) and the potential to build up explosive atmospheres. It considered resolution MSC.420 (97), table 3 (Comparison of physical properties of Hydrogen and Methane), which specified the Lower Flammability Limit (4% vol. fraction) and the Lower Detonation Limit for hydrogen (18.3%).

CCC 7 agreed to include a definition of LEL for determining the explosive limits in the draft interim guidelines.

***Gas or vapor detection***

It was agreed that two gas detectors should be required for redundancy reasons.

A proposal was made that fuel leakages should not only trigger an alarm but also be followed by an automatic shutdown of the fuel cell system.

But the sub-committee agreed that any leakage, regardless of the nature, should be detected by an alarm system and any action to be taken should be at the discretion of the crew as it depended on the nature of the cause.

***Alarms and safety action***

Following on from the agreed text in 2.1.1.3 which set the fuel cell stack surface temperature limit at 300°C, it was agreed that fuel cell stacks certified for hazardous zone 1, if any, were subject to the requirements of IEC 60079-series.

For the most common fuel cell stacks however, which were not certified as hazardous zone 1, CCC 7 agreed that setting arbitrary high alarm values approaching 300°C might be impracticable and required technical input from manufacturers; therefore, CCC 7 did not quantify a high value alarm but included a requirement in 5.7.7.1 and table 2 for safety actions to be taken when the fuel cell stack surface temperature exceeded 300°C.

***Development of guidelines for the safety of ships using hydrogen as fuel***

CCC 7 had for its consideration a proposal on development of guidelines for the safety of ships using hydrogen as fuel, which has met a great support.

Consequently, the sub-committee agreed to instruct the Working Group on Amendments to the IGF Code and Development of Guidelines for Low-flashpoint Fuels to initiate the development of guidelines for the safety of ships using hydrogen.

***Development of guidelines for the safety of ships using ammonia as fuel***

CCC 7 noted that a new output on the development of non-mandatory guidelines for the safety of ships using ammonia as fuel has been submitted to MSC 104.

It agreed to hold the development of guidelines, while waiting for the decision of MSC 104 on this matter.

CCC 7 noted information provided by the observer of IACS that an ″Expert Group on safety aspects of new technologies and zero/ultra-low carbon fuels (EG/SAFTech)″ had been created.

Japan has proposed to collect safety information for the use of ammonia as part of the work by the correspondence group, if established, for the future development of guidelines for ships using ammonia as fuel.

***Interim guidelines to address safety provisions for ships using LPG fuels***

CCC 7 has tasked the Correspondence Group to pursue the work on this item. CCC 7 agreed to re-establish the intersessional Correspondence Group on Development of Technical Provisions for the Safety of Ships using Low-flashpoint Fuels.

***Amendments to the IGC and IGF codes to include high manganese austenitic steel and related guidance for approving alternative metallic material for cryogenic service***

MSC 102 approved MSC.1/Circ.1622 on Guidelines for the acceptance of alternative metallic materials for cryogenic service in ships carrying liquefied gases in bulk and ships using gases or other low-flashpoint fuels.

MSC 102 also approved MSC.1/Cir.1599/Rev.1 on Revised interim guidelines on the application of high manganese austenitic steel for cryogenic service.

CCC 7 agreed to the draft amendments to the IGC Code and to the draft amendments to the IGF Code with a view to approval by MSC 105.

CCC 7 also agreed to consequential amendments to MSC.1/Circ.1622 and to MSC.1/Circ.1599/Rev.1 with a view to approval by MSC 105.

CCC 7 had also for its consideration documents with a view to confirming continued successful operation on the M/V Green Iris by identifying the cause of the malfunction, any consequential damage to the high manganese austenitic steel tank and the procedures used to return the tank to full operational service, thus preventing reoccurrence.

The sub-committee evaluated the ammonia compatibility test with liquid ammonia provided by the Republic of Korea and noted that during the test, no post-weld stress relief heat treatment was conducted in accordance with section 17.12.3 of the IGC Code.

CCC 7 could not reach a conclusion whether post-weld stress relief heat treatment could be waived and agreed that post-weld stress relief heat treatment should be subject to the approval of the Administration.

It considered the additional test requirements incorporating a proposal by France. In doing so, it was agreed that this non-standard additional test procedure was required for qualification of new materials in ammonia service.

CCC 7 agreed to re-establish the Correspondence Group on Suitability of High Manganese Austenitic Steel.

***Amendments to the IMSBC Code and supplements***

CCC 7 agreed to the draft amendment 06-21 to the IMSBC Code, as prepared by E&T 33, with a view to finalization by E&T 35, with a view to submitting the draft amendment 06-21 to MSC 105 for consideration and adoption.

CCC 7 also had for its consideration the deliberations of E&T 33 regarding the proposed substance identification number for bulk cargoes, and in addition a proposal from China to move forward with the identification number for bulk cargoes, and also suggesting to further consider the rules for numbering, focusing on the specific reference of each part of the IMSBC Code.

CCC 7 agreed to refer this issue to E&T 36 for further consideration and invited interested Member States and international organizations to submit further proposals.

***Amendments (40-21) to IMDG Code***

MSC 102 had adopted amendments (40-20) to the IMDG Code by resolution MSC.477(102), which is expected to enter into force on 1 June 2022.

CCC 7 noted the discussions and deliberations of E&T 34 and agreed, in principle, to the draft amendment 41-22 to the IMDG Code.

It instructed E&T 35 to finalize the draft amendments (41-22) to the IMDG Code, with a view to adoption at MSC 105 in 2022.

CCC 7 agreed, in principle, to the draft consequential amendments to the Revised Emergency Response Procedures for Ships Carrying Dangerous Goods (EmS Guide), emanating from draft amendment 41-22, and referred the amendments to E&T 35 for finalization, with a view to approval at MSC 105.

***Loss of containers***

MSC 103 agreed to include in its post-biennial agenda an output on "Development of measures regarding the detection and mandatory reporting of containers lost at sea that may enhance the positioning, tracking and recovery of such containers", assigning the CCC Sub-Committee as the coordinating organ, in association with the NCSR.

E&T 31 proposed to CCC 6 a set of new requirements for data loggers and tracking devices on containers not carrying dangerous goods, which would have become a new provision 5.5.4.1 of the IMDG Code. One component of the E&T 31 proposal was a requirement that such devices be of a "certified safe type".

In response to the request made by CCC 6, ISO's consideration of a definition of "certified safe type" was undertaken by ISO Technical Committee 104 (Freight Containers); Sub-Committee 4 (Identification and Communication); and Working Group 2 (Automated Equipment Identification for containers and container related equipment).

An ad hoc working group was created. The initial ad hoc working group included six of the major tracking device providers (Nexxiot, Globe Tracker, Traxens, Emerson, Orbcomm, BoxPlus).

The final ISO paper “recommendations for the definition of certified safe type for container data loggers and tracking devices” recommends that three sets of criteria be used to define a "certified safe type" container data logger or tracking device, dependent on whether the device is affixed to a tank container, a dry cargo container or a reefer container.

It also recommends that the three sets of criteria should apply irrespective of whether the device is permanently affixed to the container or is a single-trip-only device.

BIC, BIMCO, ICS and WSC underlined that a number of factors must be considered when determining the starting date regarding when ocean carriers and other owners and users of container data loggers and tracking devices should be required to only use devices in conformity with the criteria proposed by ISO, amended as appropriate, or any other criteria that may be included in the IMDG Code to determine whether a container device can be deemed to be of a "certified safe type".

The criteria proposed by ISO could become mandatory would be when amendment 41-22 to the IMDG Code enters into force.

This would normally occur on 1 January 2024 and with the traditional 1-year voluntary compliance period starting on 1 January 2023.

However, the ISO document states that "it is anticipated that devices in compliance with the criteria set out in this paper could reach the market 36 months from approval of the criteria by the competent IMO bodies".

The abovementioned associations recommended the following dates regarding from which date container devices must be in conformity with the "certified safe type" criteria proposed by ISO, amended as appropriate:

1 Fixed and single-trip devices on non-reefer containers should be required to comply with the new criteria from 1 January 2026;

2 Single-trip devices on reefer containers should be required to comply with the new criteria from 1 January 2026; and

3 Fixed devices on reefer containers should be required to comply with the new criteria as soon as possible after 1 January 2026, but in no case later than 1 January 2030.

Germany raised a question proceeding from SOLAS regulation II-2/19, paragraph 3.2, which requires electrical equipment fitted in enclosed cargo spaces to be of a certified safe type for the use in the dangerous environments to which it may be exposed.

This requirement applies to cargo spaces where explosives of class 1, flammable gases of class 2.1 and liquids having a flashpoint of 23°C or less (in classes 3, 6.1 and 8) are carried.

This consideration, should also apply to mobile sources of ignition which might be present in electrical equipment attached to a cargo transport unit.

It cannot be avoided that cargo transport units equipped with a data logger or tracking device are loaded in a cargo space together with other cargo transport units which carry the mentioned dangerous goods.

CCC 7 encouraged interested Member States and international organizations to submit further proposals to CCC 8, and agreed to refer the standard abovementioned to E&T 35 for further consideration.

***UI of paragraphs 11.3.4 and 11.3.7 of the IGC Code (MSC.370(93))***

CCC 7 had for its consideration a draft unified interpretation of paragraphs 11.3.4 and 11.3.7 of the IGC Code.

Views expressed considered that it would be more appropriate that the proposals in this draft UI be addressed by an amendment to the IGC Code.

Sub-Committee agreed not to procced with the draft UI and invited IACS to make a submission to CCC 8.

In the same way, INTERTANKO tabled a proposal of a draft unified interpretation on the provision of gas detection on gas-fired internal combustion engines contained in paragraph 16.7.3.3 of the IGC Code.

CCC 7 noted the views expressed that although the intention of the draft UI, particularly the draft interpretations on paragraph 16.7.3.3 of the IGC Code, to address the inconsistence of the requirements between the IGC and IGF Codes could be supported, it would be more appropriate that the proposals in this draft UI be addressed by an amendment to the IGC Code.

Sub-Committee agreed not to procced with the draft UI and invited interested Member States and international organizations to work together, with a view to making a submission to CCC 8.

CCC 7 endorsed the draft MSC circular on amendment to MSC.1/Circ.1625 on Unified interpretations of the IGC Code, and invited MSC 105 to approve it.

MSC102, in considering the draft MSC circular on unified interpretation of the IGC Code, noted the concerns expressed regarding the draft unified interpretation of the term ″duct″.

MSC102 instructed the CCC Sub-Committee to further consider the draft unified interpretation of the term ″duct″ and invited interested Member States and international organizations to submit further comments and proposals to CCC7.

The draft UI of paragraphs 5.4.4 and 5.13.2.4 of the IGC Code on the outer duct in gas fuel piping systems is drafted as follows:

*"The expression "duct" in 5.4.4 and 5.13.2.4 should mean to include the equipment enclosure required in 16.4.3.1 and 16.4.3.2 (e.g. GVU enclosure) as well as the structural pipe duct intended to contain any release of gas from inner pipe or equipment. The term "structural pipe duct" should mean an outer duct forming part of structure such as hull structure or superstructure or deck house, where permitted, other than gas valve unit rooms.*

*The gas valve unit rooms should be:*

*.1 gastight toward other enclosed spaces;*

*.2 equipped with mechanical exhaust ventilation having a capacity of at least 30 air changes per hour and arranged to maintain a pressure less than the atmospheric pressure; and*

*.3 able to withstand the maximum built-up pressure arising in the room in case of a gas pipe rupture, as documented by suitable calculations taking into account the ventilation arrangements."*

CCC7 agreed that the above interpretation should apply to new ships only.

***Correspondence groups established by CCC7***

1. Correspondence group to deal with safety of ships using low-flashpoint fuels

*Terms of reference:*

* Consider how best to proceed with the development of draft amendments to the IGF Code to address safety provisions for ships using low-flashpoint oil fuels;
* Further develop interim guidelines to address safety provisions for ships using LPG fuels;
* Finalize the draft UI regarding part A-1, paragraph 9.2.2 of the IGF Code;
* Develop draft amendments to paragraph 9.3.1 of the IGF Code ;
* Prepare draft amendments to paragraphs 4.2.2 and 8.4.1 to 8.4.3 of the IGF Code and draft amendments to part A-1, paragraphs 5.12.1, 6.9.1.1, 9.8.1, 9.8.2, 9.8.4 and to part C-1, paragraph 18.4.1.1.1, of the IGF Code;
* Initiate the development of guidelines for the safety of ships using hydrogen as fuel ;
* Collect information on the safe use of ammonia as fuel.

1. Correspondence Group on Suitability of High Manganese Austenitic Steel

*Terms of reference:*

* Consider test results to be carried out in accordance with the additional test requirements, to evaluate it for qualification of high manganese austenitic steel for ammonia service;
* Consider the acceptability of the test results and decide if MSC.1/Circ.1599/Rev.1 was to be further amended to include ammonia.