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107th session  
Agenda item 6

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**DEVELOPMENT OF FURTHER MEASURES TO ENHANCE THE SAFETY OF SHIPS  
RELATING TO THE USE OF FUEL OIL**

**Comments on document MSC 107/6 regarding  
sample integrity and sample bottle size**

**Submitted by IBIA**

**SUMMARY**

*Executive summary:* This document proposes some modifications to the draft MSC-MEPC guidelines for the sampling of oil fuel to reflect practical considerations regarding sample integrity and sample bottle size.

*Strategic direction, 1  
if applicable:*

*Output:* 1.29

*Action to be taken:* Paragraph 13

*Related document:* MSC 107/6

1 This document is submitted in accordance with the provisions of paragraph 6.12.5 of the *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.4) and provides comments on document MSC 107/6.

**Background**

2 The Maritime Safety Committee, in its work to further enhance the safety of ships using conventional oil-based fuel oils (oil fuel) has developed further measures for flashpoint. At MSC 105, it was agreed to develop a joint MSC-MEPC circular to set up a common fuel sampling regime under SOLAS and MARPOL Conventions.

3 Annex 1 to document MSC 107/6 contains draft MSC-MEPC guidelines for the sampling of oil fuel which has been developed by the Correspondence Group on Development of Further Measures to Enhance the Safety of Ships Relating to the Use of Fuel Oil, henceforth referred to as "the Correspondence Group".

## Discussion

4 The intention of the draft MSC-MEPC guidelines is to allow a single ship-retained sample to be collected during bunkering for the purpose of confirming the oil fuel's conformity with SOLAS II-2/4.2.1 (minimum flashpoint requirement) as well as with MARPOL Annex VI (maximum sulphur limits). The Correspondence Group used existing sampling guidance under the MARPOL Convention, as set out in MEPC.182(59) as the basis for the development of a joint MSC-MEPC circular.

5 While developing the draft joint MSC-MEPC circular, the Correspondence Group discussed the size of the sample collected, noting that an additional test could consequently require more fuel. Arguments were presented to the Correspondence Group, citing information from fuel testing agencies, that the 400 ml minimum sample size cited in MEPC.182(59) is sufficient for both flashpoint and sulphur testing, and also a sufficient sample size to reseal and re-test if required. Nevertheless, as per paragraph 11 of document MSC 107/6, "the overwhelming majority of the Group agreed that the minimum size of sampling containers should be increased." It is possible that the discussion in the Correspondence Group conflated the required sample size with the size of the sampling container.

6 IBIA has a technical Working Group with participation from several individuals who are either currently working for, or have worked for, fuel testing agencies, and other fuel experts with experience from ship engine-rooms and technical departments at bunkering companies. In discussing the draft MSC-MEPC circular, these experts confirmed that a 400 ml sample size is more than sufficient to undertake tests for both flashpoint and sulphur. This sample size would also allow for retesting if the initial test goes wrong, as well as leaving a sufficient volume after resealing the sample and returning it to the ship in case the sample is subsequently required by another relevant authority for testing.

7 In checking the size of sample bottles readily available, the IBIA technical Working Group noted that the most common sample bottle sizes range from 750 ml to 1,000 ml, where 1,000 ml is the maximum sample bottle size due to limitations for the gross package volume allowed when sending samples as air freight. Moreover, even after running a full suite of standard ISO 8217 tests, a laboratory would typically use no more than 400 ml.

8 The IBIA technical Working Group also firmly made the point that, given that the flashpoint of a fuel is determined by volatile components that evaporate over time, testing for flashpoint needs to be carried out on fresh samples. As such, a joint MSC-MEPC sample would be of little use for flashpoint testing unless this is conducted very soon after bunkering.

9 With regard to the flash point test method, the sample container should be 85% to 95% full prior to any sample aliquot being taken to conduct the test. This should be taken into account when filling a sample bottle.

10 It needs to be understood that a sample can give an "off-spec" result for flashpoint if there has been even the slightest contamination with a low flashpoint product. Such fuels would not be inherently low flashpoint fuels, because the off-spec test result would be caused by volatile elements which evaporate quickly. In these cases, a second test would most likely confirm a higher flashpoint meeting the SOLAS requirement.

11 Contamination with such low flashpoint volatile elements may come from the pipeline used when loading the bunker tanker at the terminal. It could also come from the sampling equipment and primary sample container if these have been cleaned with a low flashpoint solvent between deliveries. To ensure this does not happen, there should be a clear reference in the sampling guidelines to prevent such incidents as they can result in a misleading flashpoint test result that does not reflect the actual flashpoint of the oil fuel as supplied.

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## Proposal

12 In light of the above discussion, IBIA proposes amendments to the draft MSC-MEPC sampling guidelines in annex 1 to document MSC 107/6, as follows:

.1 under paragraph 5: **Sampling and sample integrity**

5.2 Attention should be given to:

- .1 the form of set up of the sampler;
- .2 the form of the primary sample container;
- .3 the cleanliness and dryness of the sampler and the primary sample container prior to use, ensuring there are no traces of low-flashpoint solvents used to clean the equipment as this can contaminate the sample;
- .4 the setting of the means used to control the flow to the primary sample container; and
- .5 the method to be used to secure the sample from tampering or contamination during the bunker operation.

.2 under paragraph 7: **Retained sampling handling**

7.1 The retained sample container should be clean and dry.

7.2 Immediately prior to filling the retained sample container, the primary sample quantity should be thoroughly agitated to ensure that it is homogeneous.

7.3 The retained sample should be of sufficient quantity to perform the tests required but should not be less than 400 ml [600 ml / 750 ml]. The container should be filled to 90% ± 5% of capacity and sealed.

## Action requested of the Committee

13 The Committee is invited to consider the information in this document, the proposal in paragraph 12, and take action as appropriate.

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