

SUB-COMMITTEE ON POLLUTION  
PREVENTION AND RESPONSE  
7th session  
Agenda item 21

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## ANY OTHER BUSINESS

### Comments on document PPR 7/21 relating to the proposed protocol for the verification of ballast water compliance monitoring devices

Submitted by IMarEST

#### SUMMARY

<i>Executive summary:</i>	This document presents technical comments on document PPR 7/21 submitted by IOC-UNESCO, ICES and ISO for consideration by the Sub-Committee
<i>Strategic direction, if applicable:</i>	1
<i>Output:</i>	1.25
<i>Action to be taken:</i>	Paragraph 16
<i>Related documents:</i>	MEPC 74/4/11, MEPC 74/INF.18, MEPC 74/18; PPR 6/4; PPR 7/21; resolution MEPC.300(72); BWM.2/Circ.42/Rev.1, BWM.2/Circ.61 and BWM.2/Circ.70

#### Introduction

1 This document is submitted in accordance with 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.1) and comments on document PPR 7/21 on "Proposed protocol for the verification of ballast water compliance monitoring devices" (IOC-UNESCO, ICES and ISO).

2 At MEPC 74, the Committee invited submission of concrete proposals for the development of a standard for verification of ballast water compliance monitoring systems to PPR 7 under the output "Urgent measures emanating from issues identified during the experience-building phase of the BWM Convention".

3 Document PPR 7/21, submitted by the Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO), the International Council for the Exploration of the

Sea (ICES), and the International Organization for Standardization (ISO) contains a proposed protocol. IMarEST supports the development of a protocol and appreciates this effort. IMarEST offers herein technical comments for consideration.

## Discussion

4 IMarEST notes that there are other ballast water compliance monitoring devices such as Total Residual Oxidant (TRO) sensors that are not covered by the scope of the proposed protocol. For clarity, the title of the proposed protocol could be revised and/or a statement could be added to indicate application only to verification of biological efficacy compliance monitoring devices (see paragraph 15.1 below).

5 The proposed protocol suggests that both laboratory and shipboard testing is required, and that laboratory testing utilizes prepared challenge water. While a robust evaluation of compliance monitoring devices is necessary, IMarEST suggests the scope of verification testing be balanced to avoid the unintended consequence of delaying availability of verified devices.

6 The "natural/ambient" scenario of shipboard testing seems appropriate for the envisioned use of compliance monitoring devices. However, each shipboard testing situation will be inherently different, and it is uncertain how comparable evaluations can be made across compliance monitoring devices. Shipboard testing is also likely to encounter practicality challenges similar to those experienced in ballast water management system (BWMS) type approval testing (i.e. aligning ship and scientific team schedules and locations, ship space limitations, cost, etc.).

7 Laboratory testing resolves some of these challenges by providing a more controlled testing environment. However, verification testing requirements, such as challenge water requirements, should be practical and attainable in a realistic timeframe (see paragraph 15.2 below).

8 Verification testing protocols of compliance monitoring devices should consider more than one BWMS technology (i.e. UV, chemical disinfection). Evaluating compliance monitoring devices with different BWMS technologies will help identify any potential device performance limitations and/or interferences (i.e. chemical additives used in the measurement method and/or BWMS chemical treatment substances) (see paragraph 15.3 below).

9 Paragraphs 1.4 and 3.2.3 of the proposed protocol recommend that verification of ballast water compliance monitoring devices should include "peer-review of specific test plans and final reports". A peer-review process presents the challenge of identifying qualified peers and might not be needed if a testing facility or organization is already qualified by an Administration (see paragraph 15.4 below).

10 The 'random selection' of one unit for verification, as stipulated in paragraph 1.5 of the proposed protocol, might be incompatible with technology that is under development. The assessment of prototype devices should be considered (see paragraph 15.5 below).

11 The term "efficacy" in paragraphs 1.0 and 2.0, which typically implies an ability to produce a desired or intended result, might be replaced with another term. The primary function of a monitoring device is to observe a result without altering it (see paragraph 15.6 below).

12 Paragraph 2.1 of the proposed protocol defines the accuracy of a compliance monitoring device as "...the closeness of a measured value to the true, known or agreed to reference standard...". The protocol might also consider devices designed to identify whether

a ballast water sample meets the relevant section of the D-2 standard by assigning a binary (pass or fail) classification. In such cases, the protocol might consider what is required to identify 'compliant' or 'non-compliant' samples. This approach is discussed by First et al. (2018): "linearity between the microscopy-based method and the compliance devices, especially along a large range of organism concentrations, would not be suitable for establishing performance criteria. Concentrations well below or above the limit for this size class (10 living organisms mL<sup>-1</sup>) would be easily categorized as meeting or exceeding discharge standard and their values do not need to be well constrained and pinpointed".

13 Consideration of pass/fail compliance monitoring devices would also appear to align with the definition of "indicative analysis" provided in BWM.2/Circ.42/Rev.1, which includes "...measurements whose parameters do not provide a value directly comparable to the D-2 standard..." (see paragraph 15.7 below).

14 Paragraphs 2.4 and 4.7.1 of the proposed protocol describe three tests to determine the reliability of a compliance monitoring device during verification testing. While documenting the ability to retrieve data from a device and uninterrupted operation during the testing period would be valuable, it could prove challenging to achieve comparable reliability assessments across devices because they will have differing operational functions and patterns. In practice, compliance monitoring devices will likely be used intermittently and may only operate for a short period of time during compliance monitoring events. This use pattern is different from that of machinery or instrumentation that will run continuously or for extended periods of time, or that is critical to the operation of a ship, where a reliability assessment is necessary. It is suggested that the performance of a compliance monitoring device over the verification testing period be documented as general information only (see paragraph 15.8 below).

## Recommendations

15 The following recommendations are presented for consideration:

- .1 The type of ballast water compliance monitoring devices the proposed protocol applies to could be clarified by revising the title to "Proposed protocol for the verification of ballast water biological efficacy compliance monitoring devices". Paragraph 1 of the proposed protocol could also be amended as follows: "The purpose of this protocol is to serve as the basis for a standard to verify the efficacy performance of ballast water biological efficacy compliance monitoring devices...". Addition of the following statement to paragraph 1 could also be considered: "The scope of this protocol does not include performance verification of compliance monitoring devices intended to measure physical/chemical parameters (i.e. Total Residual Oxidant (TRO) sensors) that are not used to assess biological efficacy."
- .2 Suggest balancing the scope of verification testing (i.e. proposal for both laboratory and shipboard testing, prepared challenge water) to provide a robust assessment that avoids inadvertent delays in availability of verified compliance monitoring devices.
- .3 Verification testing of compliance monitoring devices should include more than one BWMS technology (i.e. UV, chemical disinfection).
- .4 Consider amending paragraph 1.4 to:
  - "4 all verification of ballast water compliance monitoring devices should be conducted by an independent, third-party testing facility

or organization, as acceptable to the relevant Administration, and include appropriate quality assurance/quality control~~and include peer review of specific test plans and final reports;~~ and"

- .5 Consider deleting the phrase "randomly selected" in paragraph 1.5.
- .6 Consider changing the term "efficacy" to "performance" in paragraphs 1.0 and 2.0.
- .7 Consider updating the accuracy definition in paragraph 2.1 to incorporate the concept of "pass/fail" as an indicator of compliance, which is used by some compliance monitoring devices. For these devices, the protocol may consider including the information required to distinguish 'compliant' or 'non-compliant' results.
- .8 Consider amending paragraph 2.4 as follows:

"Reliability – The ability to maintain integrity or stability of the compliance monitoring device and data collection ~~over time~~ during the verification testing period. ~~Reliability of instruments should be determined~~ General observations of instrument reliability may be documented as additional information about compliance monitoring device performance in two ways from the data collected during ~~all laboratory and shipboard testing~~ the verification testing period. First, comparisons ~~should~~ could be made of the.... Second, the percentage of time ... calibration or repair ~~should~~ could be reported. Comments on the physical condition of the device ... ~~should also be recorded~~ could also be documented. Instruments ~~should~~ must be tested and used according to the manufacturers' instructions for calibration, operation, and maintenance throughout the verification test..."

#### **Action requested of the Sub-Committee**

16 The Sub-Committee is invited to consider the comments provided in this document and take action as appropriate.

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