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Proposed amendments to the Guidance for the commissioning testing of ballast water management systems (BWM.2/Circ.70) in relation to validating biological efficacy using indicative analysis

Submitted by ICS

SUMMARY

Executive summary: This document details issues relating to the current wording of the *Guidance for the commissioning testing of ballast water management systems (BWM.2/Circ.70)*, as invited by MEPC 74, and it provides proposals for amendments to BWM.2/Circ.70 to ensure that the regime for ballast water sampling and indicative analysis during commissioning testing is appropriate and aligns with the objectives as originally envisaged by the Committee

Strategic direction, if applicable: 1

Output: 1.25

Action to be taken: Paragraph 17

Related documents: BWM.2/Circ.70, BWM.2/Circ.42/Rev.1; resolution MEPC.252(67); resolution MEPC.279(70); MEPC 74/WP.11, MEPC 74/18 and MEPC 74/INF.18

Introduction

1 The Marine Environment Protection Committee (MEPC), at its seventy-third session (22 to 26 October 2018), approved *Guidance for the commissioning testing of ballast water management systems*, as set out in the annex to BWM.2/Circ.70.

2 Within the *Guidance for commissioning testing*, the purpose of commissioning testing is stated to be to validate the installation of a ballast water management system (BWMS) by demonstrating that its mechanical, physical, chemical and biological processes are working properly and that commissioning testing is not intended to validate the design of type-approved

BWMS that are approved by the Administration. With respect to biological efficacy and validation of compliance, paragraph 4.3 of the guidance states:

"the representative samples should be analysed for all size classes included in the D-2 standard using indicative analysis methods listed in table 3 of BWM.2/Circ.42/Rev.1";

3 At MEPC 74, ICS expressed concerns regarding the anomaly which has been created between expectations for the scope of indicative analysis to be carried out as part of commissioning testing and the scope of indicative analysis expected to be carried during an inspection by port State control (PSC) noting that the scope was expected to be the same, see paragraph 4 below. It can be seen from paragraph 2 above that indicative analysis for commissioning testing according to BWM.2/Circ.70 is expected to be conducted for all size classes, whereas there is no such requirement or expectation for the scope of indicative sampling and analysis for port State control stated in either the *Guidelines for port State control under the BWM Convention* contained in resolution MEPC.252(67) or in the *Guidance on ballast water sampling and analysis for trial use in accordance with the BWM Convention and Guidelines (G2)* detailed in the annex to BWM.2/Circ.42/Rev.1. The Ballast Water Review Group at MEPC 74, noting the concerns of ICS, recommended (see MEPC 74/WP.11, paragraphs 25 and 52.6) and the Committee agreed (see MEPC 74/18 paragraph 4.57) to invite submissions on any appropriate changes to BWM.2/Circ.70 in light of the draft amendments to regulation E-1.

Discussion

4 Recognizing the importance of the correct installation of a type approved ballast water management system (BWMS), the concept of conducting sampling and analysis as a part of the commissioning of a newly installed BWMS was introduced during the work carried out on the revision of the *Guidelines for approval of ballast water management systems (G8)* which led to the adoption of the *2016 Guidelines for approval of ballast water management systems (2016 Guidelines (G8))* through resolution MEPC.279(70). During the discussions pertaining to conducting indicative sampling and analysis as a part of commissioning testing, the following principles were understood:

- .1 The sampling and analysis conducted during commissioning should take the form of indicative sampling and analysis only.
- .2 The indicative sampling and analysis conducted should replicate the form of indicative sampling and analysis that would be envisaged to be conducted as part of the third stage of the four-stage inspection approach contained in the *Guidelines for port State control under the BWM Convention*, adopted through resolution MEPC.252(67). By aligning the form of indicative sampling and analysis used for commissioning with the form used by PSC then the test, if passed, would provide some confidence to the shipowner that a similar result would be obtained by PSC when the initial ballast water loaded following installation of the BWMS was discharged following treatment.
- .3 Indicative sampling and analysis during commissioning at the shipyard has the purpose of providing a relatively quick biological efficacy test of a newly installed BWMS and if on discharge the treated local waters fail indicative analysis, the ship is in the right location for the system manufacturer and the shipyard to investigate and correct the reason for the failure.

- .4 It was understood that local waters would be used and treated, replicating what will happen in reality when the ship loads ballast to sail to the first loading port after the system was installed. It was also accepted that there would be no requirements for augmentation of local waters uploaded as per type approval testing; therefore, if the indicative analysis was passed it was no guarantee of the effectiveness of the ballast water management system due to the uncertain nature of the uploaded waters in terms of numbers of organisms present.

5 To summarize, indicative sampling and analysis at the time of commissioning should be relatively quick in the same way that PSC indicative sampling and analysis should be relatively quick with no need for laboratory testing, the analysis should be of treated local waters (i.e. not augmented) and if the treated waters fail analysis it is understood that a problem exists and needs to be investigated and corrected, but it is also understood that passing the analysis does not prove the system is biologically effective due to the uncertain nature of the uploaded waters.

Additional background information relating to PSC indicative sampling and analysis scope and expectations

6 Paragraph 4.2 above refers to the *Guidelines for port State control under the BWM Convention*, which were adopted on 17 October 2014 through resolution MEPC.252(67). Through these Guidelines a four-stage approach to port State control inspections was adopted as detailed in section 2.1 of the Guidelines. Specifically, in paragraph 2.1.3 the third stage of the inspection approach as envisaged by the Organization is described as follows:

"the third stage – sampling is envisaged to occur during this stage of PSC which relies on indicative analysis, to identify whether the ship is meeting the ballast water management performance standard described in regulation D-2, or whether detailed analysis is necessary to ascertain compliance"

7 Paragraph 2.1.4 of the PSC Guidelines describes the fourth stage of the inspection approach, which is envisaged to be detailed analysis required as a result of negative results obtained from indicative analysis.

8 Paragraph 2.4 of the PSC Guidelines confirms the understanding in paragraph 7 above, as it states that with respect to indicative analysis "the time required to conduct the indicative analysis should not unduly delay the operations, movement or departure of the ship" and that "if the result of indicative analysis for the D-2 standard exceeds the D-2 standard by a threshold specific to the validated indicative analysis method being used as set out in the *Guidance on ballast water sampling and analysis for trial use in accordance with the BWM Convention and Guidelines (G2)* (BWM.2/Circ.42/Rev.1), a detailed analysis can be carried out". It is clear from paragraph 2.4 of the Guidelines that indicative analysis is intended to be quick and using a method which identifies probable failure to meet a parameter of the D-2 standard through indication of gross non-compliance against one or more parameters identified in the D-2 discharge standard.

9 It is clear from paragraphs 6, 7 and 8 above that the purpose of indicative analysis for port State control purposes is to quickly identify if the sampled ballast water is likely to be non-compliant with the D-2 standard. Actual compliance or not with the D-2 standard is subsequently confirmed through detailed analysis. These principles should similarly be applied to indicative sampling and analysis as part of commissioning testing and the *Guidance for the commissioning testing of ballast water management systems*, as set out in the annex to BWM.2/Circ.70, should reflect these principles to avoid the effective equivalent of detailed sampling and analysis being required.

Experience to date in applying the guidance in BWM.2/Circ.70

10 MEPC 74 approved the draft amendments to regulation E-1 of the BWM Convention to make the "commissioning test" of ballast water management systems mandatory. The amendments are expected to be adopted at MEPC 75 (April 2020) and enter into force by October 2021. In the interim, MEPC "urged Administrations to provide the recognized organizations, which acted on their behalf, with written and clear instructions in relation to the conduct of indicative analysis testing of BWMS at the time of their commissioning on board ships flying their flag, including what actions were to be taken in the event of this testing demonstrating non-compliance". Some Administrations have issued circulars using BWM.2/Circ.70 to support IMO's initiative for making the commissioning test mandatory to ensure that systems are correctly installed on board.

11 Important feedback to Administrations and to ICS relating to the application of BWM.2/Circ.70 so far has been that owners and operators are, as a result of the circular, being required to have conducted detailed NOT indicative analysis (i.e. including requiring sending ballast water samples to testing laboratories for detailed organism counts against the D-2 standard for all organism sizes). ROs involved have been advised by Administrations that this is a deviation from the original intent of BWM.2/Circ.70.

12 As a result of feedback the following clarifications have also been made to ROs:

- .1 For the purposes of conducting the commissioning test on board flagged ships, it is highlighted that with respect to "indicative analysis" as detailed in the BWM.2/Circ.42/Rev.1 "an indirect, indicative analysis may include measurements whose parameters do not provide a value directly comparable to the D-2 standard, including biological, chemical, or physical parameters (e.g. dissolved oxygen levels, residual chlorine levels, Adenosine triphosphate (ATP), nucleic acid, chlorophyll a, and that by variable fluorescence, etc.)";
- .2 In line with BWM.2/Circ.70 for the purposes of "commissioning test", the test shall be indicative in nature. This is to fulfil the intent of the commissioning tests in establishing that the systems are correctly installed on board. A direct measurement, which is directly comparable to the D-2 standard, may not be required, if this needs the ballast water sample to be sent to the lab. As such it is expected that the test shall be done on board and there should be no need for the samples to be taken to lab ashore; and
- .3 BWM.2/Circ.70, as it stands today, states that "the representative samples should be analysed for all size classes included in the D-2 standard using indicative analysis methods listed in table 3 of BWM.2/Circ.42/Rev.1", however, it is to be noted that the Administration accepts all methods of test as listed in BWM.2/Circ.42/Rev.1 and also accepts the indicative tools as listed in document MEPC 74/INF.18 (IMarEST). Those engaged to conduct the tests are to be accepted by our ROs and are to be independent of the manufacturer, i.e. the manufacturer cannot conduct the analysis of the samples. Indirect methods for the evaluation of organisms will be accepted, this may include methods estimating the total concentration of organisms without requiring incubation, such as ATP or similar.

13 With reference to the list of currently available ballast water indicative analysis instruments provided by IMarEST in document MEPC 74/INF.18, it is noted that a total of 12 indicative analysis instruments that can detect organisms in the D-2 standard were identified but only one instrument detects all three size classes, four instruments detect two size classes, and seven instruments detect one size class.

Conclusions

14 The current wording of the *Guidance for the commissioning testing of ballast water management systems*, as set out in the annex to BWM.2/Circ.70, and the expectation contained in paragraph 4.3 of BWM.2/Circ.70 that samples should be analysed for all classes in the D-2 standard, i.e. size classes: $\geq 50 \mu\text{m}$, $\geq 10 \mu\text{m}$ and $\leq 50 \mu\text{m}$ and indicator microbes combined with the success criteria specified in paragraph 5 of the circular that "validation is successful if the analysis indicates that the discharge sample does not exceed the D-2 standard" has led, see paragraph 11 above, to detailed sampling and analysis being unreasonably imposed on shipowners. This imposition is partly due to the lack of single pieces of indicative analysis equipment which can analyse for all three classes and due to those conducting the testing interpreting incorrectly and contrary to BWM.2/Circ.42/Rev.1, that for acceptable successful validation, methods of indicative analysis cannot be accepted if they do not provide a value directly comparable to the D-2 standard.

15 The expectation contained in paragraph 4.3 of BWM.2/Circ.70 that samples should be analysed for all classes in the D-2 standard has produced a disparity to what is the expected scope of indicative analysis for a commissioning test as opposed to a PSC test. Additional requirements have been created for the analysis as part of commissioning testing compared with PSC testing, see paragraphs 6 to 9 above. This disparity is, ICS considers, contrary to the intentions of the Organization at the time of introducing indicative analysis as a concept as described in paragraphs 4 and 5 above. The result is that, having installed at great expense type approved BWMSs and having supported indicative analysis as part of a commissioning test, in line with the form expected of indicative analysis for PSC, it is now seen that, through the implementation of BWM.2/Circ.70 as currently worded, an unfortunate new regime of sampling and analysis is being applied to ships in the form of time consuming and expensive analysis.

Proposals

16 To address the issues identified in this submission resulting from the current wording of BWM.2/Circ.70 and to ensure that the analysis regime for ballast water sampling and analysis during commissioning testing aligns with that envisaged by the Organization when the concept was supported by consensus, the following amendments to paragraphs 4.3 and 5 of the circular are proposed:

.1 Paragraph 4.3 is amended to read:

"3 the representative samples should be analysed for ~~all size classes included~~ at least one of the size classes $\geq 50 \mu\text{m}$ or $\geq 10 \mu\text{m}$ and $\leq 50 \mu\text{m}$ as specified in the D-2 standard using indicative analysis methods listed in table 3 of BWM.2/Circ.42/Rev.1; and"

.2 Paragraph 5 is amended to read:

"5 The validation is successful if ~~the indicative analysis, including indirect indicative analysis,~~ indicates that the discharge sample does not exceed the D-2 standard sampled and analysed ballast water is likely to be compliant with the D-2 standard and the self-monitoring equipment indicates correct operation. Indirect, indicative analysis may include measurements

whose parameters do not provide a value directly comparable to the D-2 standard, including biological, chemical, or physical parameters (e.g. dissolved oxygen levels, residual chlorine levels, adenosine triphosphate (ATP), nucleic acid, chlorophyll a, and that by variable fluorescence, etc.). Indicative analysis equipment used should be to the satisfaction of the flag Administration of the ship."

Action requested of the Sub-Committee

17 The Sub-Committee is invited to:

- .1 consider the contents of this document and the proposals made in paragraph 16 in relation to amendments to the *Guidance for the commissioning testing of ballast water management systems*, as set out in the annex to BWM.2/Circ.70; and
- .2 take action as deemed appropriate.
