GESAMP
Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection

GESAMP 40/5
21 August 2013
ENGLISH ONLY

40th session
Agenda item 5.2

PLANNING OF GESAMP ACTIVITIES:
REVIEW OF APPLICATIONS FOR 'ACTIVE SUBSTANCES' TO BE USED IN BALLAST WATER MANAGEMENT SYSTEMS

Report of the GESAMP Ballast Water Working Group (Working Group 34)

Background and introduction

1 The International Convention for the Control and Management of Ships' Ballast Water and Sediments, (BWM Convention) was adopted at IMO on 13 February 2004, in response to the increasing concern of the international community with regard to the transfer of invasive species in ships' ballast water. To date, 30 June 2013, 37 countries have ratified the BWM Convention, the required minimum is 30. These countries represent 30.32% of the required 35% of the world's tonnage, therefore, the second criterion has not yet been met. Nevertheless, there is good hope that the Convention will enter into force soon.

2 Within this framework, an approval procedure has been set up for those ballast water management systems which make use of an Active Substance or Preparation to comply with the Convention. The procedure consists of a two-step approach for granting Basic Approval and Final Approval. The approval is granted by the Marine Environment Protection Committee (MEPC) based on the advice provided by the GESAMP Ballast Water Working Group (WG 34). There is a third step, the Type Approval, but that is outside the remit of WG34.

3 The more general outline, scope and aim of the BWM Convention have been addressed in the report to GESAMP 35 (see document GESAMP 35/5/1) and will only be referred to here. The Terms of Reference of WG 34 have been added as annex 1 to this report. As the terms of reference of WG 34 have not changed, several parts of this report have been kept unchanged. As for the readability of the report these sections are kept in the report with apologies for the experienced reader.

4 This report focuses on the main activities of WG 34, which consistin the evaluation of several Ballast Water Management Systems (hereafter BWMS) and the further development of the Methodology of the Group, which has been accepted as a 'living' document. This means that the Methodology will be a discussion item at (almost) each meeting of the Group and changes and improvements are made, as appropriate (see below).

'Active Substances'

5 'Active Substances' are defined by the Convention as "substances or organisms, including a virus or a fungus that have a general or specific action on or against harmful aquatic organisms and pathogens" and the approval of systems using such substances is described in resolution MEPC.169(57) adopted in 2008. However, not only 'Active Substances' are evaluated by the WG 34. Also all other substances considered relevant are taken into account

in the evaluation report. The Procedure for approval of ballast water management systems that make use of Active Substances (G9) contained in resolution MEPC.169(57) under the BWM Convention distinguishes also 'Relevant Chemicals' and 'Other Chemicals'.

6 Therefore, WG 34's task is to evaluate the risks for the crew, the ships' safety, the risk for the public at large and the environmental safety of the BWMS. It is furthermore the intention of WG 34 to perform these evaluations in a consequent, consistent and transparent manner, which helps Administrations to prepare a concise dossier, containing all the necessary data. The Methodology, as developed by WG 34 in the course of its work process, serves as guidance in the evaluation.

7 WG 34 convened three times since GESAMP 39 to evaluate proposed BWMS and also held two stocktaking workshops to discuss items related to the Methodology. However, GESAMP 39 was held in the same week as the 22nd meeting of WG 34 and therefore was not yet reported to GESAMP. This meeting will now be included in this report. During these meetings, 14 BWMS were discussed and evaluated. Of these BWMS, six received a recommendation for Basic Approval and five received a recommendation for Final Approval. Two systems were denied a recommendation for Basic Approval and also one system was denied a recommendation for Final Approval. Both systems that were denied a recommendation for BA were considered not well enough developed. The working, control and monitoring of the neutralization process could not guarantee a safe and successful operation for the system that was denied FA. During its meeting in October 2012 and May 2013, MEPC endorsed the pending recommendations of WG 34 in all cases and granted the approvals accordingly. An overview of the systems evaluated in these meetings is presented in annex 2 to this report.

8 MEPC 65 was the first time WG 34 was able to clear the whole stock of BWMSs submitted for evaluation mainly due to the fact that the last meeting of WG 34 was extended to six days, to include a Saturday, instead of scheduling another meeting.

Methodology for information gathering and the conduct of work of WG 34

9 The evaluation Methodology of WG 34 has been determined to be a living document based on increasing experience in the evaluation of BWMS. During three Stock-Taking Workshops (STW) WG 34 further developed the Methodology by adding:

.1 quantitative methods for the evaluation of human risk assessment including exposure assessment for professionals and the general public;

.2 quantitative assessment of the environmental effects by using a specific ballast water model, MAMPEC 3.0 BW; and

.3 finalization of the first version of the database for 17 specific disinfection by-products (DBP) in which the physic-chemical data, the toxicological data and the environmental fate and effect data are included.

10 During MEPC 64 held from 1 to 5 October 2012 at IMO Headquarters, the corrosion issue, the final part of the Methodology, was discussed but no consensus could be reached with the partners on this topic, the corrosion society NACE International and the paint and ink producers association, IPPIC. At the time of writing, there is a final proposal on a complete text on corrosion. After discussion and decision making at the next Stock-Taking Workshop (STW5) the final text will be decided upon and offered for adoption at MEPC 66, to be held from 31 March to 4 April, 2014.

11 According to the proposal of GESAMP to hold a STW each year, which was endorsed by MEPC 62, WG 34 scheduled its fourth stock-taking workshop from 14 to 17 August 2012 in Busan (Korea). The report of this meeting is attached as annex 3, and the agenda as annex 4

to this report. GESAMP was represented at the workshop by Dr. Mike Huber who informed the participants of the wish of GESAMP for more consistency and transparency in the evaluations of BWMSs. At the request of GESAMP, WG 34 developed a glossary of terms and abbreviations for the evaluations of BWMS. This glossary is attached to this report as annex 7.

12 The meeting of GESAMP 40 will be held 16 months after GESAMP 39, from 9 to13 September, 2013. This falls one week before the 5th STW which WG 34 has already planned from 4 to 6 September 2013, to be held at IMO Headquarters in London. Consequently, it will not possible to include a meeting report at GESAMP 40. An oral presentation will be given by the chairman of WG 34 dealing with the main results. The last version of the agenda is attached to this report as annex 8.

Planning ahead

13 Although the deadline for the submission of BWMSs to MEPC 66 has not yet passed, WG 34 have already scheduled two meetings to accommodate future applications: BWWG 26 from 28 October to 1 November 2013 and BWWG 27 from 9 to 13 December 2013. It should be noted that the number of meetings depends on the number of submissions. Both meetings are foreseen to be held at IMO Headquarters in London.

Acknowledgement

14 The chairman of WG 34 is very thankful to all the members of GESAMP that took the time to critically review the work of WG 34. The quality of the work has been improved as a result from this peer review process, and the comments made were brought to the attention of the consultants involved in the drafting of the reports.

Action requested of GESAMP

15 GESAMP is invited to review this document and comment, as it deems appropriate.

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ANNEX 1

TERMS OF REFERENCE FOR THE TECHNICAL GROUP (GESAMP-BWWG/ WG 34)

1 Consideration of development of necessary methodologies and information requirements in accordance with G9* for consideration by MEPC 56.

2 For Basic Approval, the Group should review the comprehensive proposal submitted by the Member of the Organization along with any additional data submitted as well as other relevant information available to the Group and report to the Organization. In particular, the Group should undertake:

.1 scientific evaluation of the data-set in the proposal for approval (see paragraphs 4.2, 6.1, 8.1.2.3, 8.1.2.4 of G9);

.2 scientific evaluation of the assessment report contained in the proposal for approval (see paragraph 4.3.1 of G9);

.3 scientific evaluation of the risks to the ship and personnel to include consideration of the storage, handling and application of the Active Substance (see paragraph 6.3 of G9);

.4 scientific evaluation of any further information submitted (see paragraph 8.1.2.6 of G9);

.5 scientific review of the risk characterization and analysis contained in the proposal for approval (see paragraph 5.3 of G9);

.6 scientific recommendations on whether the proposal has demonstrated a potential for unreasonable risk to the environment, human health, property or resources (see paragraph 8.1.2.8 of G9); and

.7 preparation of a Report addressing the above-mentioned aspects for consideration by MEPC (see paragraph 8.1.2.10 of G9).

3 For Final Approval, the Group should review the discharge testing (field) data and confirm that the residual toxicity of the discharge conforms to the evaluation undertaken for Basic Approval and that the previous evaluation of the risks to the ship and personnel including consideration of the storage, handling and application of the active substance remains valid. The evaluation will be reported to MEPC (see paragraph 8.2 of G9).

4 The Group shall keep confidential all data, the disclosure of which would undermine protection of the commercial interests of the applicant, including intellectual property.

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* G9 stands equivalent for MEPC 53/2/1 annex, as amended: Procedure for approval of ballast water management systems that make use of Active Substances (G9).

ANNEX 2

LIST OF BALLAST WATER MANAGEMENT SYSTEMS THAT MAKE USE OF ACTIVE SUBSTANCES IN ACCORDANCE WITH PROCEDURE (G9) SINCE GESAMP 37

Name of the System/Manufacturer	Brief description of the System	Date of Approval	Specifications
1. OceanDoctor BWMS Jiujiang Precision Measuring Technology Research Institute and the College of Marine Materials Science and Engineering of Shanghai Maritime University, China	Combination of filtration and disinfection with UV irradiation and photo-catalytic oxidation to produce the Active Substance in situ to treat the ballast water at uptake only.	Basic Approval, Recommended, October 2012	The system is not using only UV to disinfect the ballast water. Therefore, the Group considered this system as part of its remit.
2. JFE BallastAce BWMS JFE Engineering Corporation, Japan	Filtration, disinfection with Active Substance, the proprietary preparation Neo-chlor marine and neutralization. This system requires the storage op chemicals on-board.	Final Approval, Recommended, October 2012	Flag State Administration was invited to ensure that the recommendations contained in Annex 5 of the report of GESAMP-BWWG22 were verified prior to issuance of a Type Approval Certificate. The recommendations mainly focus on the performance of the correct corrosion studies.
3. Smart Ballast BWMS STX Metal Co., Ltd., Republic of Korea	Disinfection with Active Substance sodium hypochlorite formed by in situ electrolysis, followed by neutralization with sodium thiosulfate. This system requires the storage op chemicals on-board.	Final Approval, Recommended, October 2012	Flag State Administration was invited to ensure that the recommendations presented in Annex 6 of the report of the GESAMP-BWWG22 were verified prior to issuance of a Type Approval Certificate. The recommendations mainly focus on controlling the TRO dose and sufficient protection of the equipment for over-heating.
4. HS Ballast BWMS	Combination of in situ electrolysis using	Basic Approval, Recommended,	Flag State Administration was

Name of the System/Manufacturer	Brief description of the System	Date of Approval	Specifications
HWASEUNG R&A Co. Ltd., Republic of Korea	seawater to produce the Active Substance (hypochlorous acid) to treat the ballast water and neutralization of the remaining Active Substance with sodium thiosulfate during discharge. This system requires the storage op chemicals on-board.	October 2012	invited to ensure that the recommendations presented in Annex 4 of the report of the GESAMP-BWWG23 were verified prior to submission for Final Approval. The recommendations mainly focus on improvement of QA/QC for the WET tests and the performance of the corrosion studies.
5. GloEn Saver BWMS Panasia Co. Ltd., Republic of Korea	Combination of filtration followed by in situ electrolysis of a sidestream of the ballast water uptake to produce a concentrated stream of the Active Substance sodium hypochlorite and neutralization of the remaining Active Substance with sodium thiosulfate during discharge. This system requires the storage of chemicals on-board.	Basic Approval, Recommended, October 2012	The Flag State Administration was invited to ensure that the recommendations provided in Annex 5 of the report of the GESAMP-BWWG23 meeting were fulfilled prior to submission for Final Approval. The recommendations mainly focus on lowering the formation of bromoform.
6. DowPinnacle Ballast Water Management System Dow Chemical Pacific (Singapore) Pte. Ltd., India	Combination filtration followed by disinfection of the ballast water using injection treatment with Active Substance ozone and neutralization of the remaining Active Substance with sodium thiosulfate. This system requires the storage of chemicals on-board.	Basic Approval, Not Recommended, October 2012	The Flag State Administration was invited to further develop the system taking into account the review contained in Annex 6 of GESAMP-BWWG23. Several recommendations were included for the improvement of the system.
7. Peraclean Ocean (Sky system) Ballast Water Management System Nippon Yuka Kogyo Ltd. and Katayama Chemical Inc., Japan	Treatment with Preparation PERACLEAN Ocean containing Active Substances peracetic acid and hydrogen peroxide, followed by neutralization with sodium sulphite. This system requires the storage of chemicals	Final Approval, Not Recommended, May 2013	Flag State Administration was invited to ensure that the recommendations contained in Annex 4 of the report of GESAMP-BWWG24 were all taken into account were verified prior to issuance of a Type Approval

Name of the System/Manufacturer	Brief description of the System	Date of Approval	Specifications
	on-board.		Certificate. The recommendations mainly focus on safe provisions for the chemicals on-board and insufficient control of the MADC by the current measurement technique.
8. AQUARIUS EC Ballast Water Management System Wärtsilä Water Systems Limited, The Netherlands	Disinfection with Active Substance sodium hypochlorite formed by in situ electrolysis, followed by neutralization with sodium bisulfite. This system requires the storage of chemicals on-board.	Final Approval, Recommended, May 2013	The Flag State Administration was invited to ensure that the recommendations provided in Annex 5 of the report of the GESAMP-BWWG24 meeting were fulfilled prior to issuing a Type Approval Certificate. The recommendations focus on safety precautions for ballast water personnel.
9. Van Oord Ballast Water Management System Van Oord B.V., The Netherlands	Disinfection with pre-treated water (typically drinking water) in combination with secondary treatment with Active Substance sodium hypochlorite, followed by neutralization with sodium bisulfite. This system requires the storage of chemicals on-board.	Basic Approval, Recommended, May 2013	The Flag State Administration was invited to ensure that the recommendations provided in Annex 6 of the report of the GESAMP-BWWG24 meeting were fulfilled prior to issuance of a Type Approval Certificate. The recommendations focus on the monitoring of the dose of the Active Substance and the neutralizer and the safety precautions of the manual operations of the system. Further the Group considered that the risks of this system were minor in view of the limited amounts and suggested that the system already met the requirements for Final Approval.
10. Redox AS BWMS REDOX Maritime	Combination of filtration and disinfection with low	Basic Approval, Recommended, October 2012	Flag State Administration was invited to ensure that

Name of the System/Manufacturer	Brief description of the System	Date of Approval	Specifications
Technologies AS, Norway	pressure UV irradiation and Active Substance ozone to treat the ballast water at uptake and discharge.		the recommendations presented in Annex 4 of the report of the GESAMP-BWWG25 were verified prior to submission for Final Approval. The recommendations mainly focus on improvement of QA/QC for the WET tests and the performance of the corrosion studies.
11. EcoGuardian BWMS Hanla IMS Co. Ltd., Republic of Korea	Combination of sedimentation filtration and in situ electrolysis using seawater to produce the Active Substance to treat the ballast water. This system requires the storage of chemicals on-board.	Final Approval, Recommended, May 2013	The Flag State Administration was invited to ensure that the recommendations provided in Annex 5 of the report of the GESAMP-BWWG25 meeting were fulfilled prior to submission for Final Approval. The recommendations mainly focus on controlling the TRO dose.
12. Blue Zone BWMS SUNBO INDUSTRIES Co. Ltd., DSEC Co. Ltd., and the Korean Institute of Machinery & Material (KIMM), Republic of Korea	Disinfection with ozone as Active Substance in the form of micro-bubbles and neutralisation with sodium thiosulfate. This system requires the storage of chemicals on-board.	Basic Approval, Recommended, May 2013	Flag State Administration was invited to ensure that the recommendations presented in Annex 6 of the report of the GESAMP-BWWG25 meeting were verified before application for Final Approval. The recommendations focus on sufficient mitigation measures for human exposure and the performance of the corrosion studies.
13. OceanDoctor Hanla IMS Co. Ltd., Republic of Korea	Combination of sedimentation filtration and in situ electrolysis using seawater to produce the Active Substance to treat the ballast water.	Final Approval, Recommended, May 2013	Flag State Administration was invited to ensure that the recommendations presented in Annex 7 of the report of the GESAMP-BWWG25 meeting were verified before issuing a Type Approval Certificate. The recommendations

Name of the System/Manufacturer	Brief description of the System	Date of Approval	Specifications
			focus on the performance of the corrosion studies.
14. HyCator BWT Reactor System HyCa Technologies Pvt. Ltd., India	Disinfection with Active Substance sodium hypochlorite formed by in situ electrolysis, followed by cavitation and neutralization with sodium thiosulfate. This system requires the storage of chemicals on-board.	Basic Approval, Not Recommended, May 2013	Flag State Administration was invited to ensure that the recommendations presented in Annex 8 of the report of the GESAMP-BWWG25 meeting were verified before a new application for Basic Approval. The recommendations focus on further developing the BWMS before a new submission for Basic Approval.

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ANNEX 3

HARMFUL AQUATIC ORGANISMS IN BALLAST WATER

The Fourth Stocktaking Workshop on the activity of the GESAMP-Ballast Water Working Group

Introduction

1 Regulation D-3.2 of the Ballast Water Management Convention (BWM Convention) provides that ballast water management systems which make use of Active Substances to comply with the Convention shall be approved by IMO in accordance with the "Procedure for approval of ballast water management systems that make use of Active Substances (G9)". Since 2006, this task of approval has been performed by the Marine Environment Protection Committee based on the independent advice provided by the GESAMP-Ballast Water Working Group (GESAMP-BWWG).

2 MEPC 58 agreed that additional time should be allocated to the GESAMP-BWWG to take stock of the experience achieved and to discuss the lessons learned and the general aspects related to the evaluation process, without the pressure of having to review specific submissions. Such stocktaking workshops were conducted in January and October 2009 and in April 2011, their outcome being reported to MEPC 59, MEPC 60 and MEPC 62, respectively.

3 In considering the report of the Third Stocktaking Workshop, the Marine Environment Protection Committee at its sixty-second session noted the outcome of the Workshop contained in document MEPC 62/2/14 (Secretariat) and endorsed the proposal of the GESAMP-BWWG to conduct the stocktaking meetings on a yearly basis.

Fourth Stocktaking Workshop on the activity of the GESAMP-Ballast Water Working Group

4 The Fourth Stocktaking Workshop on the activity of the GESAMP-Ballast Water Working Group was held in Busan, the Republic of Korea from 14 to 17 August 2012 under the chairmanship of Mr. Jan Linders. The Vice-Chairman of the GESAMP, Dr. Michael Huber, was also present. The agenda, as adopted by the Workshop, is set out in annex 1.

5 In addition to making significant progress in providing tools for optimizing the work of the GESAMP-BWWG as outlined below, the Workshop provided the members of the GESAMP-BWWG with a unique opportunity to gain practical knowledge of shipboard conditions and of operational aspects regarding the use of ballast water management systems installed on ships during visits of two major shipyards. The visits, which included inspections of the engine-rooms of two new-buildings, were perceived as an eye opener by the participants and provided them with first-hand information on the challenges of installing ballast water management systems on board and on the complexity of operating such systems in real life situations.

Updated Methodology for information gathering and conduct of work of the GESAMP-BWWG

6 An overview of the changes to the Methodology for information gathering and conduct of work of the GESAMP-BWWG agreed at MEPC 63 and subsequently disseminated as BWM.2/Circ.13/Rev.1, was presented to the Workshop. The Workshop noted that the scientific justifications for some of the newly included elements in the updated Methodology were still missing. It was agreed to include the necessary scientific justifications for elements not

contained in the Procedure for approval of ballast water management systems that make use of Active Substances (G9) next time the Methodology is revised.

7 The Workshop also noted that some inconsistencies remain between the Methodology and circulars BWM.2/Circ.28 and BWM.2/Circ.37. It was agreed to bring these inconsistencies, set out in annex 2, to the attention of MEPC for consideration and action as appropriate.

Comments and suggestions by GESAMP

8 GESAMP presented their observations with regard to the improvement of the GESAMP-BWWG reports, mainly related to consistency, presentation and layout. Some of the observations, such as the inconsistency in predicted no-effect concentrations (PNEC) used, are already being addressed by the GESAMP-BWWG, others would be taken into account in its future reports.

Limitations for ballast water management systems using fresh and/or cold water

9 The Workshop agreed that a number of factors, such as temperature, salinity and alkalinity, affect the chemical reactions in the aquatic environment. A scientific explanation of the various environmental factors that influence the chemical reactions may simplify the application of the risk assessment on the use of Active Substance.

10 Guidelines (G8) require testing in two different salinities (more than 10 PSU apart) for the determination of the residual chemicals and ecotoxicity to the aquatic environment, without consideration of water temperature. The Workshop agreed that the test results of chemical analysis with fresh water, brackish water and marine water would be needed to evaluate the safe use of ballast water management systems (BWMS) properly and remained concerned by the fate of DBPs at extreme water temperatures.

11 This agenda item could not be completed due to time limitations. The Workshop recognized the need to consider the matter further at the next Stocktaking Workshop with a possibility of proposing amendments to the Methodology.

CMR substances in treated ballast water

12 The Workshop agreed that carcinogenicity, mutagenicity and reproductive toxicity properties (CMR) of Active Substances and Relevant Chemicals measured in the treated ballast water will have to be assessed as part of the T criterion of the Persistence, Bioaccumulation and Toxicity (PBT) assessment.

13 The Workshop also agreed that, as a first tier assessment, the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS) will be used to identify and prioritize CMRs. In addition, a Derived Minimal Effect Level (DMEL) risk reference value will have to be identified for Active Substances and Relevant Chemicals (e.g. disinfection by-products, DBPs) found to be carcinogens or mutagens and a Derived No-Effect Level (DNEL) value will be set for the reprotoxicants as reprotoxicity is a threshold hazardous property.

Validity criteria for ecotoxicity testing of microalgae

14 Algae are generally considered as the most sensitive species in ecotoxicity tests with treated ballast water. The GESAMP-BWWG had recognized that adverse effects of treated water on algal growth are frequently reported in proposals submitted for Basic Approval and/or Final Approval.

15 Procedure (G9) provides that ecotoxicity tests should be conducted in accordance with internationally accepted test methods. The most popular test methods used by applicants in algal

ecotoxicity test are OECD TG No. 201, ASTM E1218-04E1, US EPA-821-R-02-013, and ISO 10253. During its evaluations, the GESAMP-BWWG has found that the validity criteria for algal ecotoxicity testing are often not met. The most commonly failed criteria are related to the culture of algae, such as 16-fold growth rate in the control test, a mean coefficient of variation (mCV) higher than 35 per cent and increase of pH value with more than 1.0 unit.

16 The Workshop agreed that proper validation criteria are needed for algal ecotoxicity tests for appropriate evaluation of ecotoxicity of treated water. The validity criteria for algal growth tests, as outlined in Guideline OECD TG 201, should be recommended to the applicants. If other guidelines are used, the calculation of mean coefficient of variation (mCV), as required by the Methodology, should be included in the validity criteria.

Database of chemicals most commonly associated with treated ballast water

17 The Workshop recalled that, when carrying out risk assessments on ballast water management systems, it had noted that there were many chemical by-products which were commonly found, irrespective of the technology used in the system. The Database of 18 chemicals most commonly associated with treated ballast water (the Database) was created in order to provide a consistent basis for the risk assessment of all ballast water management systems submitted for Basic and Final Approval to the MEPC.

18 The Workshop agreed that the Database should contain the physical, chemical, toxicological and ecotoxicological properties of chemicals produced by BWMS. Whilst recognizing that, in some cases, there were many variations of the above properties cited in the open literature, the Workshop recalled that the GESAMP-BWWG had evaluated each of them and selected the most relevant to store in the Database as a basis for consistent risk assessment.

19 The Workshop further agreed:

.1 to collect, collate and review the data on 17 additional chemical by-products identified in application dossiers so that a complete Risk Assessment of each system may be carried out consistently and effectively. The additional chemicals were identified using a priority setting method;

.2 for chemicals which are reported as "not detected", the concentration of the chemical should be deemed to be the detection limit of that chemical and used as a basis for determining the Risk Assessment (i.e. do not ignore such chemicals), while recommending that applicants should strive to obtain detection limits of at least 0.01 µg/L;

.3 to review the data on all chemical groups included in the original 18 substances and make estimations for missing data so that the Predicted No Effect Concentrations (PNEC) within a group are not distorted because of the application of widely differing Assessment Factors;

.4 to use the highest recorded concentration of any given chemical, whether before or after neutralization, as a basis for Risk Assessment;

.5 to give special attention to the group of halonitriles in order to satisfy the GESAMP-BWWG that the correct PNEC values are used in Risk Assessment; and

.6 that in order to measure the effects of the BWMS on the chemical composition of the treated ballast water, it was not appropriate to subtract control data from the test data as it had been noted that contaminated water often masked the results making accurate analyses very difficult.

20 Having discussed the progress of the development of the Database, the Workshop agreed to make it available for MEPC 65 with respect to the 18 chemicals that have been the subject of data review by the GESAMP-BWWG.

MAMPEC calculations by the GESAMP-BWWG

21 The predicted environmental concentrations (PEC) of disinfection by-products and Relevant Chemicals are to be calculated by the applicant using the MAMPEC model. During the evaluation of the application dossier, the GESAMP-BWWG recalculates the data provided by the applicant to match the results provided. This is sometimes a lengthy process as the MAMPEC input data and the calculation processes are not always well provided or explained by the applicant. The Database developed by the GESAMP-BWWG is also considered when recalculating the MAMPEC results.

22 To facilitate the MAMPEC recalculation, a guidance document was developed for the consideration of applicants. It addresses the minimum data to be provided and in what format the data may be presented by the applicant. The MAMPEC guidance document is set out in annex 3.

TRO sensors

23 The monitoring of oxidants, relevant for the production of DBPs, in ballast water after application of Active Substances is important to reduce risks to the environment and human health. The concentration of Active Substance in discharged water should be measured quickly and reliably to maintain it under the Maximum Allowable Discharge Concentration (MADC) of Active Substance by reliable monitoring.

24 The Workshop considered in detail the main methods used by applicants to measure Total Residual Oxidants (TRO) i.e. colorimetry by DPD, amperometry and oxidation reduction potential. The Workshop concluded that measuring and defining specific Active Substances in seawater is very difficult, especially if the Active Substance is an oxidant, and noted that data from online monitoring should be compared with calibrated data from a test laboratory. The Workshop agreed that further discussion is needed before recommending a preferred measuring method for TRO.

Evaluation of BWMS making use of UV

25 The Workshop recognized that no standardized approach had been established for how to deal with applications for BWMS using exclusively UV-light as a means to render potentially harmful aquatic organisms and pathogens harmless.

26 The Workshop concluded that the evaluation of a BWMS that only uses UV-light should be limited to a short summary, a short statement on the completeness of the dossier, a short description of the system itself, a conclusion that it was not appropriate to apply Procedure (G9) and a recommendation that the Committee invite the respective Administration to consider the BWMS in accordance with the provisions of the Guidelines (G8). Chapters on the risks to the ship, human health and the environment are not necessary.

27 The Workshop recalled that BWMS using UV-treatment in combination with chemical treatment may involve some form of Active Substance (e.g. plasma or ozone). Therefore, these systems should be considered BWMS that make use of Active Substances and should be evaluated according to Procedure (G9). Thus, they should be subject to a complete and comprehensive evaluation by the GESAMP-BWWG in accordance with the Methodology for information gathering and conduct of work of the GESAMP-BWWG.

Development of a glossary

28 The Workshop developed a detailed glossary of terms and definitions as well as a list of abbreviations and acronyms to be attached to the future reports of the GESAMP-BWWG to MEPC.

Future activities

29 The Workshop recommended that the Fifth Stocktaking Workshop should be held in the autumn of 2013, at a date to be decided later, for the consideration of the several important items, which had to be postponed due to time constraints and any other aspects related to the Methodology for information gathering and conduct of work of the GESAMP-BWWG.

Action requested of the Committee

30 The Committee is invited to consider this document and decide as appropriate.

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ANNEX 4

ANNEX 1 to MEPC 65/2/8 (ANNEX 3)

AGENDA

FOURTH STOCKTAKING WORKSHOP ON THE ACTIVITY OF THE GESAMP-BALLAST WATER WORKING GROUP
Busan, Republic of Korea
from 14 to 17 August 2012, starting at 9:00 a.m.

1 Adoption of the agenda

2 Methods of work (including housekeeping)

3 Outcome of MEPC 63

.1 Corrosion issue – (Paper for info only)

.2 Amended Methodology

.3 Additional scientific classifications regarding the Methodology as appropriate

.4 Availability of the database

4 GESAMP comments and suggestions regarding the evaluation of the Disinfection By-Products

5 BWMS using fresh and/or cold water (residual toxicity, different salinities, degradation rates, limitation)

6 CMR substances in treated ballast water (equivalent concern for the T criterion) of PBT assessment

7 Validity criteria for ecotoxicity testing of microalgae

8 Structure of risk assessments – Human health and environment

.1 Human health
.2 Environment

9 Use of the chemicals database in the evaluations

10 MAMPEC calculations by the Group

11 TRO sensors, types and others

12 Evaluation of UV-systems

13 Development of Glossary

14 Any other business

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ANNEX 5

ANNEX 2 to MEPC 65/2/8 (ANNEX 3)

IDENTIFIED INCONSISTENCIES BETWEEN CIRCULARS BWM.2/CIRC.28 AND BWM.2/CIRC.37 AND THE METHODOLOGY FOR INFORMATION GATHERING AND CONDUCT OF WORK OF THE GESAMP-BWWG (BWM.2/CIRC.13/REV.1)

Paragraph	**BWM.2/Circ.28**	**Comment**
5.3	For issuance of the Type Approval Certificate, the Administration should set the following requirements and provisions: .1 the validity of the approval should be revisited as appropriate; .8 all accidents (e.g. accidental exposure, leakage) related to the BWMS should be reported;	Such information is not required in the current Methodology.
Paragraph	**BWM.2/Circ.37**	**Comment**
3.2.2	Name, CAS number, concentration (if applicable: intended minimum and maximum application concentration), purity and identification of impurities (by chemical name and CAS number).	No mention of minimum or maximum concentration in Procedure (G9) or the Methodology.
3.2.3	Information on all analysed substances, even if the analytical results were below the detection limits, is desired here. All substances in the treated ballast water that were detected above the detection limit are regarded as Relevant Chemicals and should be evaluated. Chemical analysis results should be accompanied by a specification of the applied Active Substance concentration, test conditions, characteristics of the test water (temperature (T), pH, salinity, TOC, DOC, TSS), sampling time, handling and storage of samples before analysis, and analytical method. If chemical analyses were performed during more than one test run, the number of test runs should be stated and results should be reported either in the form of mean values ± standard deviation or minimum/maximum concentrations measured or individual measurements for each test run. Analytical results should be provided for both treated and control samples. Reasoning should be provided, based on the documented state of knowledge, on which basis the selection of substances for inclusion in the chemical	No such description in Procedure (G9) or the Methodology.

	analysis was made, taking into account the chemical reactivity of the Active Substance and other components of the respective system. For instance, for chlorination systems, a minimal set of potentially relevant substances can be found in document MEPC 59/2/13. A more extensive list can be found in Annex II of the final report of the R&D-project "Proposal for a harmonized Emission Scenario Document on ballast water discharge" (MEPC 62/INF.19).	
3.2.4	Information on all Other Chemicals (like cleaning agents, chemicals for neutralization, etc.) should be included here.	Cleaning agents and chemicals for neutralization are not classified as other chemicals in Procedure (G9) or the Methodology
3.3.5	It would be desirable to assess sediment toxicity tests or, if these are not available, assess the toxicity using established national or international methods such as the equilibrium partitioning method (EPM) according to the "Technical Guidance Document on Risk Assessment" (TGD) to the European Biocides Directive (Directive 98/83/EC).	No such provisions in Procedure (G9) or the Methodology.
3.5.5	The BCF, for example, could be calculated with the *formulae* 74 and 75 of the TGD (see 3.3.5) using the log K_{ow}.	No such provision in Procedure (G9) or the Methodology.
3.6.18	If water of different sources was mixed or any additives were added to natural test water to achieve the given salinity, this should be specified.	No such provision in Procedure (G9) or the Methodology.
3.6.19	If any additives were added to natural test water to achieve the given concentrations, these should be specified.	No such provision in Procedure (G9) or the Methodology.

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ANNEX 6

ANNEX 3 to MEPC 65/2/8 (ANNEX 3)

MAMPEC METHODOLOGY

1 INTRODUCTION

1.1 The predicted environmental concentrations (PEC) of disinfection by-products (DBP) and Relevant Chemicals are to be calculated using the MAMPEC model. During the dossier evaluation, the GESAMP-BWWG (the Group) recalculates the data provided by the applicant to match the results provided. This is sometimes a lengthy process as the MAMPEC input data and the calculation processes are not always well provided or explained.

2 OBJECTIVE

2.1 This guidance document was prepared with the aim to ease the MAMPEC recalculation of the Group based on the data provided by the applicant.

3 PEC

3.1 MAMPEC

The applicants are asked to use:

.1 the ballast water version of MAMPEC (MAMPEC-BW) version 3.0 or the latest available version;

.2 the GESAMP-BWWG model harbour as available in MAMPEC-BW 3.0 (use "load" function); and

.3 the GESAMP-BWWG standard ballast water discharge scenario of 100,000 m^3/d.

3.2 Compound description

3.2.1 Use the "load" function in MAMPEC to check if the compound's properties are already included. Should this be the case, these properties should be used without any changes. In case the applicant requires changing the compound properties, these changes should be explained in the dossier and a reason should be provided as to why this is needed.

3.2.2 The applicant is asked to consider possible degradation of the compound and provide a reason for the degradation values used. If the temperature situation in paragraph 3.4 is considered relevant, the degradation rate should be adjusted to the temperature chosen by applying a Q_{10}-factor of 2.2 (see http://www.efsa.europa.eu/en/efsajournal/doc/622.pdf).

$$DT_{50T1} = DT_{50T2} \cdot Q_{10}^{\frac{T_2 - T_1}{\Delta T}}$$

Where:

ΔT = 10 (°C or K);
DT_{50T1} = half-life (d) at the wanted temperature (T1);
DT_{50T2} = half-life (d) at the known temperature (T2);
Q_{10} = factor (2.2) indicating the degree of temperature dependency.

3.2.3 The physical and chemical properties of 18, typically observed Relevant Chemicals, are included in the MAMPEC-BW version 3.0. If the compound's properties are not yet included in the MAMPEC-BW version 3.0, the applicant should use its own data and fill out all properties by defining a new substance.

3.2.4 To facilitate the calculation of PEC values, the applicant may focus on the substances that have been found in the treated ballast water in concentrations above the detection limit.

3.3 Emission

3.3.1 The emission of the compound needs to be entered into the MAMPEC-BW model and these data should be calculated at best based upon the results from the applicant's WET test (table 1).

Table 1: Compound emission input for MAMPEC calculations

Compound name	Maximum concentration of compound during land-based WET tests (µg/L)	Discharge scenario (g/d) with 100,000 (m^3/d) ballast water
…		
…		

3.3.2 A very conservative approach may be applied, i.e. to base the PEC calculations upon the maximum compound concentration of all measurements during the tests. In consequence, considering that a worst-case scenario is to be used, the highest measured values should be used, no matter at which day during the tests they were observed, not taking into account the values found in control water.

In cases where a (TRO) neutralization step is applied, the applicant may provide:

.1 a PEC calculation using the highest measured concentration of the Relevant Chemicals **prior** to neutralization as a worst-case scenario; and

.2 may perform a second PEC calculation using species concentrations **after** neutralization as in the intended operation of the BWMS.

3.4 Environment

3.4.1 For the definition of the harbour scenario, the GESAMP-BWWG harbour scenario should be selected using the "load" function without changing any of the parameters indicated. A separate calculation may be performed with another harbour dimension, temperature or salinity if an indication exists that the behaviour of the substance changes under different (climatic) conditions. In such a case, the degradation rate of the substance as used under paragraph 3.2 should be changed to the same temperature as defined for the harbour.

ANNEX 7

GLOSSARY OF TERMS AND DEFINITIONS WITH LIST OF ABBREVIATIONS AND ACRONYMS

1 GLOSSARY OF TERMS AND DEFINITIONS

Abiotic degradation is the degradation of a substance via purely physical or chemical mechanisms.

Acceptable (or tolerable) daily intake (ADI or TDI) is the estimate of the amount of a substance in food and drinking water which can be ingested daily over a lifetime by humans without appreciable health risk. Expressed in milligrams per kilogram of body weight.

Active Substance (AS) means a substance or organism, including a virus or a fungus that has a general or specific action (chemical or biological) on or against harmful aquatic organisms and pathogens.

Acute (eco)toxicity is the ability of a substance to cause adverse effects within a short period following exposure.

Administration means the government of the state under whose authority the ship is operating.

Aerobic conditions are those using molecular oxygen for respiration or metabolism.

Anaerobic conditions are those where reduction prevails.

Assessment factor (AF) is the factor employed in (eco)toxicological assessments for extrapolation of data from a set of experimental organisms (or trophic level) in order to derive the required value.

Ballast water means water with its suspended matter taken on board a ship to control trim, list, draught, stability or stresses of the ship.

Ballast water management means mechanical, physical, chemical and biological processes – either singularly or in combination – to remove, render harmless, or avoid the uptake or discharge of harmful aquatic organisms and pathogens within ballast water and sediments.

Ballast Water Management Convention (the Convention) means the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004.

Ballast water management system (BWMS) means any system which processes ballast water such that it meets or exceeds the ballast water performance standard in the Convention. The BWMS includes ballast water treatment equipment, all associated control equipment, monitoring equipment and sampling facilities.

Ballast water tank is any tank, hold or space used for the carriage of ballast water.

Basic Approval (BA) means the preliminary approval of Active Substances and the ballast water management system that uses them in order to comply with the Ballast Water Management Convention. Basic Approval should confirm that the available information does not indicate possible unacceptable adverse effects or a potential for unreasonable risk to environment, human health, property or resources. This should include consideration of

potential risks associated with the Active Substance during full-scale deployment on commercial ships when possible.

Bioaccumulation (B) is the progressive increase in the amount of a substance in an organism or tissue which occurs because the rate of intake exceeds the organism's ability to remove the substance.

Bioconcentration is the process leading to a higher concentration of a substance in an organism than in environmental media to which it is exposed.

Bioconcentration Factor (BCF) is the ratio between the concentration of a substance in an organism or tissue and the concentration in the environmental medium (usually water) at apparent equilibrium.

Biodegradation is the conversion or breakdown of the chemical structure of the substance catalysed by enzymes, resulting in loss of biological activity.

Chronic (eco)toxicity is the capacity for a substance to produce adverse effects following longer term exposure or to produce effects which persist.

Control sample is that from a test to which no substance was applied.

Degradation is the process by which a substance is broken down to simpler structures through biodegradation or abiotic mechanisms.

Dissipation time 50% (DT_{50}) is the time required for one-half the initial quantity or concentration of a substance to dissipate from a system. Formerly known as the half-life of a substance.

DPD method is the colorimetric analytical method based on use of the reagent DPD (N,N-diethyl-p-phenylenediamine) where oxidants such as chlorine react with DPD causing a deep-purple colour to form with an intensity proportional to the oxidant concentration. The oxidant concentration (mg/L) in the test water is then determined as the absorbance of light in a colorimetric flow cell.

Exposure is the concentration or amount of a substance that reaches the target organism, usually expressed in numerical terms of concentration, duration and frequency.

Final Approval (FA) means the approval of a ballast water management system using an Active Substance or Preparation to comply with the Convention and includes an evaluation of the whole effluent toxicity (WET) tests performed as part of the land-based Type Approval process in accordance with the Guidelines for approval of ballast water management systems (G8). The review does not include the re-evaluation of efficacy testing results conducted by Administrations under the Guidelines (G8). The Final Approval should confirm that previous evaluations of risks to ship, crew and the environment including storage, handling and application of Active Substances or Preparations remain valid and the concerns expressed during the Basic Approval process have been addressed, as well as that the residual toxicity of the discharge conforms to the evaluation undertaken for Basic Approval.

GESAMP is the IMO/FAO/UNESCO-IOC/WMO/IAEA/UN/UNDP/UNEP/UNIDO Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection, an advisory and multi-disciplinary body consisting of specialized experts nominated by the sponsoring agencies. Experts working for the GESAMP act independently in their individual capacity.

GESAMP-Ballast Water Working Group (GESAMP-BWWG), also being referred to as the Group means the Technical Group consisting of independent experts acting in their individual capacity that review the proposals for approval of ballast water management systems that make

use of Active Substances submitted by the Administration and report, through the GESAMP, to MEPC. When reviewing the proposals, the Group should take account of any other relevant data as well as other relevant information submitted to it, or the Group is aware of, because of its members' expertise.

Good Laboratory Practice (GLP) is the formalised process and conditions under which laboratory studies on substances are planned, performed, monitored, recorded, reported and audited. Studies performed under GLP are based on relevant regulations (e.g. OECD, USEPA) and are designed to assure the reliability and integrity of the studies and resulting data.

Harmful aquatic organisms and pathogens (HAOP) means aquatic organisms or pathogens which, if introduced into the sea including estuaries, or into fresh water courses, may create hazards to the environment, human health, property or resources, impair biological diversity or interfere with other legitimate uses of such areas.

Hazard is the set of inherent properties of a substance which gives potential for adverse effects, and depending on the level of exposure.

Limit of detection (LOD) is the lowest concentration of a substance where positive identification can be achieved with a specific method of analysis. Sometimes referred to as MDL: Minimal Detection Limit.

Limit of quantitation (or quantification) (LOQ) is the lowest concentration of a substance where positive identification and quantitative measurement can be achieved with a specific method of analysis. Normally, LOQ is 3 times the LOD.

Limit of reporting is the practical limit of substance determination at or above the LOQ – and may depend on laboratory, equipment, techniques, reagents etc. Sometimes referred to as PQL: Practical Quantification Limit.

Margin of Safety (MOS) is the ratio of the highest estimated or actual level of exposure to a substance and the toxic threshold level.

Median effective/lethal concentration/dose (EC_{50}, LC_{50}, LD_{50}) is the statistically derived concentration/dose of a substance expected to produce a certain effect/kill 50% of test organisms in a given population under defined conditions.

No observable/adverse effect concentration/level (NOEC, NOEL, NOAEC, NOAEL) is the highest concentration or amount of a substance that causes no observable/adverse biological effect to the target organism.

Organization means the International Maritime Organization (IMO).

Other Chemical (OC) means any other substances, other than the Active Substance(s) or Relevant Chemicals, potentially associated with the system either intentionally or resulting from the treatment of ballast water.

Partition/sorption coefficient is the ratio of the concentrations of a substance in solution in two phases which are in equilibrium. (see K_d, K_{oc}, K_{ow}, P_{ow}).

Persistence (P) is the residence time of a substance in a defined environmental compartment such as soil, marine water, fresh water etc.

Predicted environmental concentration (PEC) is the predicted concentration of a substance within an environmental compartment such as marine water.

Predicted no-effect concentration (PNEC) is an estimated no observable effect concentration for an aquatic species based on extrapolated experimental data.

Preparation means any commercial formulation containing one or more Active Substances including any additives. This term also includes any Active Substances generated on board for purposes of ballast water management and any Relevant Chemicals formed in the ballast water management system that makes use of Active Substances to comply with the Convention.

Quantitative structure-activity relationship (QSAR) is the association between the physico-chemical properties of a substance and its biological effects such as (eco)toxicity.

Redox (oxidation-reduction) potential (ORP) is the electrical potential indicating the relative activity of oxidised and reduced chemical species. It is a measure of the extent to which oxidising or reducing chemical species are present in an environmental medium.

Relevant Chemical (RC) means transformation or reaction products that are produced during and after employment of the ballast water management system in the ballast water or in the receiving environment and that may be of concern to the ship's safety, aquatic environment and/or human health.

Risk is the probability of any defined hazard occurring from exposure to a substance under specific conditions. Risk is a function of the likelihood of exposure and the likelihood to produce adverse effects.

Sampling point is that place in the ballast water piping where the sample is taken.

Sediments means matter settled out of ballast water within a ship.

Ship means a vessel of any type whatsoever operating in the aquatic environment.

Theoretical maximum daily intake (TMDI) is a prediction of the maximum daily intake of a substance based on the assumption of levels in food and average daily consumption of foodstuffs per person. TMDI is expressed in milligrams per person.

Toxicity (T) is the adverse effect of a substance on an organism.

Treatment rated capacity (TRC) is the maximum continuous capacity expressed in cubic metres per hour for which the BWMS is Type Approved.

Trophic level is the grouping together of functionally similar organisms based on similarities in the patterns of food production and consumption amongst the different organisms.

Type Approval is granted to a BWMS that meets a minimum set of regulatory, technical and safety requirements. Generally, Type Approval is required before a system is allowed to be sold in a particular country.

2 LIST OF ABBREVIATIONS AND ACRONYMS

<	less than
≤	less than or equal to
>	greater than
≥	greater than or equal to
µg	microgram
A	Algae
ADD	Average daily dose
ADI	Acceptable daily intake
AF	Assessment factor
AIS	Aquatic invasive species
AS	Active Substance(s)
ASTM	American Society for Testing and Materials
B	Bioaccumulation
BA	Basic Approval
BCF	BioConcentration Factor
BMD	Benchmark dose
b.p.	Boiling point
bw	Body weight
BW	Ballast water
BWMS	Ballast water management system
BWWG	Ballast Water Working Group
C	Crustacea
°C	degree Celsius (Centigrade)
CAS	Chemical Abstracts Service
cc	cubic centimeter
CEC	Cation exchange capacity
CIP	Cleaning In Place
CMR	Carcinogenicity, mutagenicity and reproductive toxicity
CO(P)C	Chemical(s) of (potential) concern
d	day(s)
DBP	Disinfection by-product(s)
DMEL	Derived Minimal Effect Level
DNEL	Derived No-Effect Level
DO	Dissolved oxygen
DOC	Dissolved organic carbon
DPD	N,N-diethyl-p-phenylenediamine
DT_{50}	Dissipation time 50%
EC_{50}	Effect concentration, 50% (median effective concentration)
EHC	Environmental health criteria
EHS	GESAMP Evaluation of Hazardous Substances Working Group
EPI	Estimation Program Interface
EU	European Union
EUSES	European Union System for the Evaluation of Substances
F	Fish
FA	Final Approval

FAC	Free Available Chlorine
g	gram
Guidelines G8	Guidelines for approval of ballast water management systems.
Procedure G9	Procedure for approval of ballast water management systems that make use of Active Substances (G9), as revised, adopted by resolution MEPC.169(57) in April 2008
GESAMP	IMO/FAO/UNESCO-IOC/WMO/IAEA/UN/UNDP/UNEP/UNIDO Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection
GESAMP-BWWG	GESAMP-Ballast Water Working Group
GHS	UN Globally Harmonized System of Classification and Labelling of Chemicals
GLP	Good laboratory practice
GUI	Graphic user interface
h	hour(s)
HAA	Haloacetic acid(s)
HAN	Haloacetonitrile(s)
HAOP	Harmful aquatic organisms and pathogens
HES	Human exposure scenario
HMI	Human machine interface
IARC	International Agency for Research on Cancer
IC_{50}	Inhibition concentration, 50%
ICSC	International Chemical Safety Card(s)
IMDG	International Maritime Dangerous Goods (Code)
IMO	International Maritime Organization
IPCS	International Programme on Chemical Safety
IRIS	Integrated Risk Information System
ISO	International Organization for Standardization
IUCLID	International Uniform ChemicaL Information Database
IUPAC	International Union of Pure and Applied Chemistry
K_d	Sorption coefficient
kg	kilogram
K_{oc}	Organic carbon/water sorption coefficient
K_{ow}	n-octanol/water partition coefficient (also P_{ow})
K_p	Sorption coefficient for ionic substances
L	liter
LADD	Lifetime average daily dose
LC_{50}	Lethal Concentration, 50%
LD_{50}	Lethal Dose, 50%
LEL	Lower explosive limit
LLNA	Local lymph node assay
LOAEL	Lowest Observed Adverse Effect Level
LOD	Limit of Detection
LOEC	Lowest Observed Effect Concentration
LOEL	Lowest Observed Effect Level
Log P_{ow} or log K_{ow}	Logarithm of the n-octanol/water partition coefficient
LOQ	Limit of quantitation (or quantification)

M	Mollusc
MADC	Maximum Allowable Discharge Concentration
MAMPEC	Marine Antifoulant Model for PEC calculation
MAMPEC-BW	Marine Antifoulant Model for PEC calculation for Ballast Water
MARPOL	International Convention for the Prevention of Pollution from Ships
MDL	Minimal detection limit
MEPC	Marine Environment Protection Committee
mg	milligram
ml	milliliter
MOS	Margin of safety
m.p.	Melting point
MRR	MOS/MOSref
MSDS	Material safety data sheet(s)
NA	Not applicable or not available
ND	Not detected
ng	nanogram
NOAEC	No Observed Adverse Effect Concentration
NOEC	No Observed Effect Concentration
NOAEL	No Observed Adverse Effect Level
NOEL	No Observed Effect Level
NTP	United States National Toxicological Programme
OC	Other Chemical(s)
OECD	Organisation for Economic Co-operation and Development
OEL	Occupational Exposure Level
ORP	Oxidation-reduction (redox) potential
P	Persistence
PBT	Persistence, Bioaccumulation and Toxicity
PEC	Predicted Environmental Concentration
PEL	Permissible Exposure Limit
PLC	Programmable Logic Control
PNEC	Predicted No Effect Concentration
POC	Particulate organic carbon
P_{ow}	n-octanol/water partition coefficient (also K_{ow})
PPE	Personal protective equipment
PQL	Practical quantification limit
PSC	Port State Control
PSPC	IMO Performance Standard for Protective Coatings
PSU	Practical salinity unit
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
QSAR	Quantitative Structure-Activity Relationship
RC	Relevant Chemical(s)
RCR	Risk Characterization Ratio
SOLAS	The International Convention for the Safety of Life at Sea
T	Toxicity
TDI	Tolerable daily intake

THM	Trihalomethane(s)
TLV	Threshold Limit Value
TMDI	Theoretical maximum daily intake
TOC	Total Organic Carbon
TRC	Treatment rated capacity
TRO	Total Residual Oxidant
TSS	Total suspended solids
UN	United Nations
USEPA	United States Environmental Protection Agency
UV	Ultraviolet
VOC	Volatile organic compound
WET	Whole Effluent Toxicity test(s)/testing
WHO	World Health Organization
wt	Weight

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ANNEX 8

AGENDA

FIFTH STOCKTAKING WORKSHOP ON THE ACTIVITY OF THE GESAMP-BALLAST WATER WORKING GROUP
London, UK
from 4 to 6 September 2013, starting at 9:00 a.m.
Draft Agenda STW5 of GESAMP-BWWG

1. Adoption of the agenda
2. Introduction and ways of working during the meeting (including house-keeping)
3. Scientific explanations (point 6 of MEPC 65/2/8)
4. Structure of the risk assessment, Environment. Discussion paper already available (paper 8 2-1, Structure ENV RA Revised).
5. Corrosion taking into account the latest developments, such as the discussion paper to BLG 17/6, the results of BLG 17 and further new developments.
6. Inconsistencies between Methodology and Circ. BWM.2/Circ.28 and BWM.2/Circ.37 (point 7 and Annex 1 MEPC 65/2/8)
    - 6.1 General
    - 6.2 Human Health
    - 6.3 Recent
7. Preparation of a scoping document on 'The relevance of the production of DBPs against other inputs of DBPs in the aquatic environment'
8. Next version of the data base
9. Temperature and salinity effects (point 11 of MEPC 65/2/8)
    - 9.1 The effects of the degradation rate of AS in BW tank, including the rate of neutralization and Q10 approach.
    - 9.2 The effects of the production amounts of RCs in BW tank.
    - 9.3 The effects of the fate of RCs in receiving water. Need for new ESD? Use harbour or surrounding area for HH and environment?
10. Limitations for normal use of the BWMS (temperature, salinity, alkalinity, others (paragraph 16 of MEPC 64/WP.8)).
11. Recommending a preferred measuring method for TRO (point 24 of MEPC 65/2/8), invitation to Hach and HF Scientific?
12. Requirement to list amendments used to meet ballast testing challenge conditions
13. Addition of new tests to saline samples
    - 13.1 Add Mutatox luminescent bacteria assay test to required test list
    - 13.2 Replace current fish test with a test that includes embryo stage (OECD 212 or EPA 1005.0)
14. Require the inclusion of a non-diatom algal species
15. Higher tier testing
    - 15.1 Toxicity Identification Evaluations (TIEs)
    - 15.2 Micronucleus assay
16. Reuse or recycling (MEPC 65/2/8, Annex 1, point 4.1)

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