

# GUIDELINES

## ON APPLICATION OF THE REQUIREMENTS OF INTERNATIONAL CONVENTION FOR THE CONTROL AND MANAGEMENT OF SHIPS' BALLAST WATER AND SEDIMENTS, 2004



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**Saint-Petersburg**

# **GUIDELINES ON APPLICATION OF THE REQUIREMENTS OF INTERNATIONAL CONVENTION FOR THE CONTROL AND MANAGEMENT OF SHIPS' BALLAST WATER AND SEDIMENTS, 2004**

The present version of the Guidelines on application of the requirements of International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004, has been approved in accordance with the established approval procedure and comes into force on 1 July 2024.

The present version is based on the version dated 01 June 2022 and Rule Change Notice No. 24-83070, taking into account the amendments and additions developed immediately before publication (refer to the Revision History).

**REVISION HISTORY<sup>1</sup>**

For this version, there are no amendments to be included in the Revision History.

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<sup>1</sup> With the exception of amendments and additions introduced by Rule Change Notices (RCN), as well as of misprints and omissions.

## **PART I. TECHNICAL SUPERVISION**

### **1 GENERAL**

#### **1.1 Application.**

**1.1.1** Provisions of these Guidelines shall apply during surveys of the ship and ship equipment for compliance with International Convention for the Control and Management, 2004 (hereinafter referred to as "the Convention") and IMO resolutions considering IMO and IACS unified interpretations.

**1.1.2** In compliance with Article 3 the Convention requirements specify that unless expressly provided otherwise in this Convention, this Convention shall apply to:

**.1** ships entitled to fly the flag of a Party; and  
**.2** ships not entitled to fly the flag of a Party, but which operate under the authority of a Party.

**1.1.3** In compliance with Article 3 this Convention shall not apply to:

**.1** ships not designed or constructed to carry ballast water;  
**.2** ships of a Party which only operate in waters under the jurisdiction of that Party, unless the Party determines that the discharge of ballast water from such ships would impair or damage their environment, human health, property or resources, or those of adjacent or other states;

**.3** ships of a Party that only operate in waters under the jurisdiction of another Party, subject to the authorization of the latter Party for such exclusion. No Party shall grant such authorization if doing so would impair or damage their environment, human health, property or resources, or those of adjacent or other states. Any Party not granting such authorization shall notify the Administration of the ship concerned that this Convention applies to such ship;

**.4** ships that only operate in waters under the jurisdiction of one Party and on the high seas, except for ships without an authorization granted according to [1.1.3.3](#), unless such Party determines that the discharge of ballast water from such ships would impair or damage their environment, human health, property or resources, or those of adjacent or other States;

**.5** any warship, naval auxiliary or other ship owned or operated by a State and used, for the time being, only on government non-commercial service. However, each Party shall ensure, by the adoption of appropriate measures not impairing operations or operational capabilities of such ships owned or operated by it, that such ships act in a manner consistent, so far as is reasonable and practicable, with this Convention; and

**.6** permanent ballast water in sealed tanks on ships, that is not subject to discharge;

**.7** provisions of the Convention are not applicable to the water in the hopper area of hopper dredgers in compliance with IMO BWM.2/Circ.32 (as such water is not covered by the "ballast water" definition in compliance with the Convention definitions and is used for operation process of the hopper dredges).

**1.1.4** With respect to ships of non-Parties to this Convention, Parties shall apply the requirements of this Convention as may be necessary to ensure that no more favourable treatment is given to such ships.

**1.1.5** Unless otherwise specified, the ballast water discharge shall be performed by the ballast water control and management in compliance with the provisions of the Annex to the Convention.

**1.1.6** For ships to which the Convention requirements of regulation B-3 of the Annex to the Convention or any other measures adopted by the Party in compliance with Article 2.3 (about more strict measures adopted by the Party) and Section C are applied, according to regulation A-3 of the Annex to the Convention these requirements shall not apply to:

**.1** uptake or discharge of ballast water and sediments necessary for the purpose of ensuring the safety of a ship in emergency situations or saving life at sea; or

**.2** accidental discharge or ingress of ballast water and sediments resulting from damage to a ship or its equipment:

**.2.1** provided that all reasonable precautions have been taken before and after the occurrence of the damage or discovery of the damage or discharge for the purpose of preventing or minimizing the discharge; and

**.2.2** unless the shipowner, company or officer in charge wilfully or recklessly caused damage; or

**.3** uptake and discharge of ballast water and sediments when being used for the purpose of avoiding or minimizing pollution incidents from the ship; or

**.4** uptake and subsequent discharge on the high seas of the same ballast water and sediments; or

**.5** discharge of ballast water and sediments from a ship at the same location where the whole of that ballast water and those sediments originated and provided that no mixing with unmanaged ballast water and sediments from other areas has occurred. If mixing has occurred, the ballast water taken from other areas is subject to ballast water management in compliance with the Annex to the Convention.

**1.1.7** For the ships for which the Convention requirements are applied in compliance with regulation A-4 of the Annex to the Convention the exemptions may be granted as follows:

**.1** a Party or Parties, in waters under their jurisdiction, may grant exemptions to any requirements to apply regulations B-3 or C-1 of the Annex to the Convention, in addition to those exemptions contained elsewhere in this Convention, but only when they are:

**.1.1** granted to a ship or ships on a voyage or voyages between specified ports or locations; or to a ship which operates exclusively between specified ports or locations;

**.1.2** effective for a period of not more than 5 years subject to intermediate review (survey);

**.1.3** granted to ships that do not mix ballast water or sediments other than between the ports or locations specified in [1.1.7.1.1.1](#); and

**.1.4** granted based on the Guidelines on risk assessment developed by IMO (refer to IMO resolution MEPC.162(56));

**.2** exemptions granted according to [1.1.7.1](#) shall not be effective until after communication to IMO and circulation of relevant information to the Parties;

**.3** any exemptions granted under this regulation shall not impair or damage the environment, human health, properly or resources of adjacent or other States. Any State that the Party determines may be adversely affected shall be consulted, with a view to resolving any identified concerns;

**.4** any exemptions granted under this regulation shall be recorded in the ballast water record book.

**1.1.8** According to regulation A-5 of the Annex to the Convention for pleasure craft solely intended for recreation or competition or craft intended primarily for search and rescue, less than 50 m in length overall, and with a maximum ballast water capacity of 8 m<sup>3</sup>, the Administration shall determine the equivalent compliance with this Annex to the Convention taking into account the Guidelines for Ballast Water Management Equivalent Compliance (G3) (refer to IMO resolution MEPC.123(53)).

**1.1.9** As to the requirements for ballast water management and control for ships according to IMO resolution MEPC.297(72), amendments to regulation B-3 of the Annex to the Convention have been adopted considering the following:

**.1** a ship constructed before 2009:

**.1.1** with a ballast water capacity of between 1,500 and 5,000 m<sup>3</sup>, inclusive, shall conduct ballast water management that at least meets the standard described in regulation D-1 or regulation D-2 of the Annex to the Convention until the renewal survey described in [1.1.9.10](#),

after which time it shall at least meet the standard described in regulation D-2 of the Annex to the Convention;

**.1.2** with a ballast water capacity of less than 1,500 or greater than 5,000 m<sup>3</sup> shall conduct ballast water management that at least meets the standard described in regulation D-1 or regulation D-2 of the Annex to the Convention until the renewal survey described in [1.1.9.10](#), after which time it shall at least meet the standard described in regulation D-2 of the Annex to the Convention;

**.2** a ship constructed in or after 2009 and before 8 September 2017 with a ballast water capacity of less than 5,000 m<sup>3</sup> shall conduct ballast water management that at least meets the standard described in regulation D-2 of the Annex to the Convention from the date of the renewal survey described in [1.1.9.10](#);

**.3** a ship constructed in or after 2009, but before 2012, with a ballast water capacity of 5,000 m<sup>3</sup> or more shall conduct ballast water management in accordance with [1.1.9.1.1.2](#);

**.4** a ship constructed in or after 2012 and before 8 September 2017 with a ballast water capacity of 5,000 m<sup>3</sup> or more shall conduct ballast water management that at least meets the standard described in regulation D-2 of the Annex to the Convention from the date of the renewal survey described in [1.1.9.10](#);

**.5** a ship constructed on or after 8 September 2017 shall conduct ballast water management that at least meets the standard described in regulation D-2 of the Annex to the Convention;

**.6** the requirements of regulation B-3 of the Annex to the Convention do not apply to ships that discharge ballast water to a reception facility designed taking into account the IMO Guidelines developed for such facilities;

**.7** other methods of ballast water management may also be accepted as alternatives to the requirements specified in [1.1.9.1 – 1.1.9.5](#) and [1.1.9.8](#), provided that such methods ensure at least the same level of protection to the environment, human health, property or resources, and are approved in principle by the Marine Environment Protection Committee (MEPC);

**.8** a ship constructed before 8 September 2017 to which the renewal survey described in according to [1.1.9.10](#) does not apply (when the International Oil Pollution Prevention Certificate (IOPP Certificate) (form 2.4.5) is not required), shall conduct ballast water management that at least meets the standard described in regulation D-2 of the Annex to the Convention from the date decided by the Administration, but not later than 8 September 2024;

**.9** a ship subject to the requirements of [1.1.9.2](#), [1.1.9.4](#) or [1.1.9.8](#) will be required to comply with either regulation D-1 or regulation D-2 of the Annex to the Convention, until such time as it is required to comply with regulation D-2;

**.10** notwithstanding regulation E-1.1.2 of the Annex to the Convention, the renewal survey specified in [1.1.9.1.1](#), [1.1.9.1.2](#), [1.1.9.2](#) and [1.1.9.4](#) is:

**.1** the first renewal survey, as determined by MEPC in IMO resolution MEPC.298(72), on or after 8 September 2017 if:

**.1.1** this survey is completed on or after 8 September 2019; or

**.1.2** a renewal survey is completed on or after 8 September 2014 but prior to 8 September 2017; and

**.2** the second renewal survey, as determined by MEPC in IMO resolution MEPC.298(72), on or after 8 September 2017 if the first renewal survey on or after 8 September 2017 is completed prior to 8 September 2019, provided that the conditions of [1.1.9.10.1.2](#) are not met.

**1.1.10** In accordance with IMO resolution MEPC.298(72), the renewal survey specified in [1.1.9.10](#) according to regulation B-3 of the Annex to the Convention amended by IMO

resolution MEPC.297(72), is the renewal survey completed pursuant to regulation 6.1.2 of Annex I to MARPOL 73/78.

**1.2 Definitions and explanations.**

**1.2.1** For the purpose of these Guidelines the following definitions and explanations are used:

**Administration** means the Government of the State under whose authority the ship is operating. With respect to a ship entitled to fly under a flag of any State, the Administration is the Government of that State. With respect to floating platforms engaged in exploration and exploitation of the seabed and subsoil thereof adjacent to the coast over which the coastal State exercises sovereign rights for the purposes of exploration and exploitation of its natural resources, including Floating Storage Units (FSUs/FSOs) and Floating Production Storage and Offloading Units (FPSOs), the Administration is the Government of the coastal State concerned.

**Active substance** means a substance or organism, including a virus or a fungus, that has a general or specific action on or against harmful aquatic organisms and pathogens.

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

**Land-based Testing** means a test of the Ballast Water Management System carried out in a laboratory, equipment factory or pilot plant including a moored test barge or test ship to confirm that the BWMS meets the standards set by regulation D-2 of Annex to the Convention.

**Shipboard testing** means a full-scale test of a complete BWMS carried out on board a ship according to these Guidelines, to confirm that the system meets the standards (refer to regulation D-2 of the Annex to the Convention).

**Gross tonnage** means the gross tonnage calculated in accordance with the tonnage measurement regulations contained in Annex I to the International Convention on Tonnage Measurement of Ships, 1969 or any successor Convention.

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

**Secretary-General** means the IMO Secretary-General.

**Anniversary date** means the day and the month of each year corresponding to the date of expiry of the International Certificate for the Ballast Water Management.

**Viable organisms** means organisms and any life stages thereof that are living.

**Major conversion** means a conversion of a ship in accordance with regulation A-1 of the Annex to the Convention:

- .1 which changes its ballast water carrying capacity by 15 % or greater; or
- .2 which changes the ship type; or
- .3 which, in the opinion of the Administration, is projected to prolong its life by 10 years or more; or
- .4 which results in modifications to its ballast water system other than component replacement-in-kind. Conversion of a ship to meet the provisions of regulation D-1 of the Annex to the Convention shall not be deemed to constitute a major conversion for the purpose of Annex to the Convention.

**Segregated ballast** means the ballast water introduced into a tank which is completely separated from the cargo oil and fuel oil system and which is permanently allocated to the carriage of ballast or to the carriage of ballast or cargoes other than oil or noxious liquid substances.

Maritime Environment Protection Committee (MEPC) means IMO authority authorized to perform the basic and final approval of the active substances use in the BWMS.

Company means the shipowner or any other organization or person such as the manager, or the bareboat charterer, who has assumed the responsibility for operation of the ship from the owner of the ship and who on assuming such responsibility has agreed to take over all the duties and responsibilities imposed by the International Safety Management Code (ISM Code).

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

Control equipment means the installed equipment required to operate and control the ballast water treatment equipment.

Treatment rated capacity (TRC) means the maximum continuous capacity, in m<sup>3</sup>/h, for which the BWMS is type approved. It states the amount of ballast water that can be treated per unit time by the BWMS to meet the standard in regulation D-2 of the Annex to the Convention.

Sediments means matter settled out of Ballast Water within a ship.

Monitoring equipment means the equipment installed for assessment of the correct operation of the prototype ballast water treatment technology.

Ballast water treatment equipment means equipment that mechanically, physically, chemically, or biologically 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 treatment equipment may operate at the uptake or discharge of ballast water, during the voyage, or at a combination of these events.

Ballast water capacity means the total volumetric capacity of any tanks, spaces or compartments on a ship used for carrying, loading or discharging ballast water, including any multi-use tank, space or compartment designed to allow carriage of ballast water.

From the nearest land means from the baseline from which the territorial sea of the territory in question is established in accordance with international law except that, for the purposes of the Convention, "from the nearest land" off the north-eastern coast of Australia shall mean from a line drawn from a point on the coast of Australia in latitude 11°00' S, longitude 142°08' E to a point in latitude 10°35' S, longitude 141°55' E thence to a point latitude 10°00' S, longitude 142°00' E thence to a point latitude 9°10' S, longitude 143°52' E thence to a point latitude 9°00' S, longitude 144°30' E thence to a point latitude 10°41' S, longitude 145°00' E thence to a point latitude 13°00' S, longitude 145°00' E thence to a point latitude 15°00' S, longitude 146°00' E thence to a point latitude 17°30' S, longitude 147°00' E thence to a point latitude 21°00' S, longitude 152°55' E thence to a point latitude 24°30' S, longitude 154°00' E thence to a point on the coast of Australia in latitude 24°42' S, longitude 153°15' E.

Ballast Water Management Plan (BWM Plan) means the document referred to in regulation B-1 of the Annex to the Convention describing the ballast water management processes and procedures on board individual ships.

Constructed in respect of a ship means a stage of construction, according to regulation A-1 of the Annex to the Convention, where:

- .1 the keel is laid; or
- .2 construction identifiable with the specific ship begins; or
- .3 assembly of the ship has commenced comprising at least 50 t or 1 % of the estimated mass of all structural material, whichever is less; or
- .4 the ship undergoes a major conversion.

Preparation means any commercial formulation containing one or more active substances including any additives. This term also includes any active substances generated



onboard for purposes of ballast water management and any relevant products of transformation or reaction formed during treatment, and which in case of the discharge can create problems for the aquatic environment and human health.

**Prototype Ballast Water Treatment Technology (PBWTT)** means any integrated system of ballast water treatment equipment in compliance with regulation D-4 of the Annex to the Convention participating in a programme for testing and evaluation with the potential of meeting or exceeding the ballast water performance standard specified in regulation D-2 of the Annex to the Convention including treatment equipment, all associated control equipment, monitoring equipment and sampling facilities. PBWTT may be a mechanical, physical, chemical, or biological unit process, either singularly or in combination that may or may not use active substances that remove, render harmless, or avoid the uptake or discharge of harmful aquatic organisms and pathogens within ballast water and sediments. PBWTT may operate at the uptake or discharge of ballast water, during the voyage or in any combination of these phases.

**Discharge of ballast water at the same location** means ballast water discharge at the same harbour, mooring or anchorage where the ballast water uptake was carried out (refer to 5.2 of the Guidelines (G3)).

**Certificate** means the International Ballast Water Management Certificate (form 2.5.4).

**Ballast Water Management System (BWMS)** means any system which processes ballast water such that it meets or exceeds the ballast water performance standard in regulation D-2 of the Annex to the Convention. BWMS includes ballast water treatment equipment, all associated control equipment, monitoring equipment and sampling facilities. BWMS may use processes of water treatment based on the mechanical, physical, chemical, or biological unit process, either singularly or in combination that may or may not use active substances that remove, render harmless, or avoid the uptake or discharge of harmful aquatic organisms and pathogens within ballast water and sediments.

**Ballast Water Management System (BWMS), installed on a ship** means the BWMS with the contractual delivery date or in the absence of such a date – the BWMS actual delivered to the ship with the actual date of delivery of the BWMS to the ship.

**Relevant chemicals** 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.

**Sampling facilities** refers to the means provided for sampling treated or untreated ballast water.

**Ballast Water Discharge** means the ballast water that would be discharged overboard.

**Ship** means a ship of any type whatsoever operating in the aquatic environment and includes submersibles, floating craft, floating platforms, FSUs/FSOs and FPSOs.

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

**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.

### **1.2.2 Abbreviations.**

IMO — International Maritime Organization.

MEPC — Maritime Environmental Protection Committee.

ISM Code — International Safety Management Code.

TRC — Treated Rated Capacity.

BWM Plan — Ballast Water Management Plan.

PBWTT — Prototype Ballast Water Treatment Technology.

Register, RS — Russian Maritime Register of Shipping.

BWMS — Ballast Water Management System.

BWMS Code — Code for Approval of Ballast Water Management Systems adopted by IMO resolution MEPC.300(72), as may be amended.

Guidelines (G2) — Guidelines for ballast water sampling (G2) adopted by IMO resolution MEPC.173(58).

Guidelines (G3) — Guidelines for ballast water management equivalent compliance (G3) adopted by IMO resolution MEPC.123(53).

Guidelines (G4) — Guidelines for ballast water management and development of ballast water management plans (G4) adopted by IMO resolution MEPC.127(53), as amended by IMO resolutions MEPC.306(73) and MEPC.370(80).

Guidelines (G5) — Guidelines for ballast water reception facilities (G5) adopted by IMO resolution MEPC.153(55).

Guidelines (G8) — Guidelines for approval of ballast water management systems (G8) adopted by IMO resolution MEPC.174(58) and MEPC.279(70).

Guidelines (G9) — Procedure for approval of ballast water management systems that make use of active substances (G9) adopted by IMO resolution MEPC.169(57).

Guidelines (G10) — Guidelines for approval and oversight of prototype ballast water treatment technology programmes (G10) adopted by IMO resolution MEPC.140(54).

Guidelines (G12) — Guidelines on design and construction to facilitate sediment control on ships (G12) adopted by IMO resolution MEPC.209(63).

## **2 APPROVAL OF BALLAST WATER MANAGEMENT PLAN**

### **2.1 Application.**

**2.1.1** In compliance with regulation B-1 of the Annex to the Convention each ship shall have and implement on board the BWM Plan.

**2.1.2** The BWM Plan shall be developed and approved by the Administration or recognized organization acting on its behalf in compliance with the Guidelines (G4).

**2.1.3** Upon authorization of the Administration (if any), the BWM Plan shall be subject to initial review and approval by the RS Head Office (RHO) or by the RS Branch Office.

**2.1.4** In compliance with IMO circular BWM.2/Circ.40 the MEPC decided that for practical reasons the BWM Plans approved in accordance with IMO resolution A.868(20), shall remain valid until the BWM Plans requires revision due to the installation of BWMS complying with regulation D-2 of the Annex to the Convention.

### **2.2 General.**

**2.2.1** The BWM Plan shall comply with regulation B-1 of the Annex to the Convention and IMO resolution MEPC.127(53), as amended by IMO resolution MEPC.306(73), shall be specific to each ship and shall at least:

.1 detail safety procedures for the ship and the crew associated with ballast water management as required by Convention;

.2 provide a detailed description of the actions to be taken to implement the ballast water management requirements and supplemental Ballast Water Management practices as specified in this Convention;

.3 detail the procedures for the disposal of sediments:

.3.1 at sea; and

.3.2 to shore;

.4 include the procedures for coordinating shipboard ballast water management that involves discharge to the sea with the authorities of the State into whose waters such discharge will take place;

.5 designate officer in charge of ensuring that the BWM Plan is properly implemented, contain provisions for familiarization procedure with the BWM Plans and provisions for training;

.6 contain the reporting requirements for ships provided for under this Convention; and

.7 be written in the working language of the ship. If the language used is not English, French or Spanish, a translation into one of these languages shall be included.

### **2.3 Documents submitted for the BWM Plan approval.**

**2.3.1** In addition to the instruments required by IMO resolution MEPC.127(53), as amended by IMO resolution MEPC.306(73), copies of the following documents shall be submitted for the BWM Plan approval:

.1 all valid Stability Booklets;

.2 loading manuals;

.3 arrangements of systems used during ballast replacement (drainage, water fire main, etc.);

.4 technical specifications of system for remote control of the ballast system components and ballast tanks level measuring system (if any).

### **2.4 Review and approval of the BWM Plan.**

**2.4.1** During review and approval of the BWM Plan the Register performs review and check of the submitted BWM Plan for compliance with IMO resolution MEPC.127(53), as amended by IMO resolution MEPC.306(73).

**2.4.2** The conclusion letter is issued based on the results of the review and approval. In case of the positive results of the submitted BWM Plans review the title page of the Plan is provided with stamp "Approved by Russian Maritime Register of Shipping under the authority

of Maritime Administration", refer to Section 8 of Part I "General regulations for technical supervision", Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships.

### **3 APPROVAL OF TYPE OF SHIP BALLAST WATER AND SEDIMENTS MANAGEMENT SYSTEMS**

#### **3.1 General.**

**3.1.1** This Section contains instructions for the RS surveyors relating to the process of BWMS type approval.

**3.1.2** Requirements of this Section are based on the requirements of the Convention, IMO resolutions MEPC.209(63), MEPC.174(58), MEPC.279(70) and the BWMS Code adopted by IMO resolution MEPC.300(72) and entered into force on 13 October 2019.

According to regulation D-3 of the Annex to the Convention adopted by IMO resolution MEPC.296(72), the BWMS installed on or after 28 October 2020 shall be approved in accordance with the BWMS Code, as may be amended, and the BWMS installed before 28 October 2020 shall be approved either in accordance with the Guidelines (G8) adopted by IMO resolution MEPC.174(58), or the 2016 Guidelines (G8) adopted by IMO resolution MEPC.279(70), or the BWMS Code, as may be amended. The word "installed" means the contractual date of the BWMS delivery to the ship. In the absence of such a date, the word "installed" means the actual date of the BWMS delivery to the ship. References to the Guidelines (G8) adopted by IMO resolution MEPC.174(58) and the 2016 Guidelines (G8) adopted by IMO resolution MEPC.279(70) in existing IMO instruments shall be read to mean references to the BWMS Code. The 2016 Guidelines (G8) adopted by IMO resolution MEPC.279(70) shall be revoked when the BWMS Code takes effect.

Requirements of Parts II "Hull", IV "Stability" and VIII "Systems and Piping" of the Rules for the Classification and Construction of Sea-Going Ships may be used by the organizations recognized by the Register, designers, ship builders, shipowners and ship operators at the stage of the ballast water and sediments management systems design and approval.

**3.1.3** The BWMS approval procedure includes supervision for testing as per scope sufficient to prove that the system design, equipment and adjustments ensure meeting the requirements of the specified standard (refer to regulations D-1 to D-4 of the Annex to the Convention), and upon installation on board the ship BWMS approval procedure shall ensure meeting the requirements of Convention regulations.

The BWMS type approval procedure shall be carried out in compliance with Section 5 of the BWMS Code (refer to IMO resolution MEPC.300(72)).

**3.1.4** The BWMS approval for compliance with the specified standard shall be performed for the specific ballast water capacities, flow rates, salinity or temperature regimes, or other limiting conditions or circumstances as appropriate, based on the submitted documented its compliance with all requirements of the specified standard based on the tests. Tests carried out under supervision of the representatives of another Administration or recognized organization acting on its behalf can be considered.

**3.1.5** Prior to approval by the Administration or recognized organization acting on its behalf in compliance with the Guidelines (G8), the BWMS that make use of active substances shall be subject to the IMO approval (basic or final approval) in compliance with the Guidelines (G9).

**3.1.6** Type approval of BWMS based on new technologies under regulation D-4 of the Annex to the Convention shall be performed based on the type tests of the reviewed technology under the RS-approved programme which requirements and approval procedure are specified in [Section 3](#) of Part I "Technical Supervision" of these Guidelines and further test results approval by MEPC.

### **3.2 Documents submitted for BWMS type approval.**

**3.2.1** The documentation submitted for BWMS type approval in compliance with Section 5 of the BWMS Code (refer to IMO resolution MEPC.300(72)) shall include at least the following:

- .1 description and diagrammatic drawings of the BWMS;
- .2 operation, maintenance and safety manual;
- .3 description of hazards identified;
- .4 description of environmental and public health impacts; and
- .5 system design limitations.

**3.2.2** In addition to the documentation specified in [3.2.1](#), documentation submitted by an applicant for type approval of BWMS that make use of active substances in compliance with regulation D-3 of the Annex to the Convention shall include the evidences that the BWMS has been granted the IMO approval in compliance with the Guidelines (G9).

**3.2.3** In addition to the documentation specified in [3.2.1](#), documentation submitted by an applicant for type approval of BWMS in compliance with regulation D-4 of the Annex to the Convention shall include the evidences that the approval procedure of PBWTT programme has been carried out in compliance with the Guidelines (G10).

### **3.3 Prototype Ballast Water Treatment Technology Programme (PBWTT programme).**

According to regulation D-4 of the Annex to the Convention the PBWTT programme shall be approved by the Administration or by the Register on its behalf in compliance with the Guidelines (G10). The intention of regulation D-4 is to provide opportunities to test and evaluate promising ballast water treatment technologies aboard ships with the potential to meet or exceed the performance standards specified in regulation D-2 of the Annex to the Convention.

The PBWTT programme shall contain the following three main steps:

- .1 programme application, submission and approval;
- .2 installation survey and Statement of Compliance; and
- .3 performance evaluations and reporting.

The Guidelines (G10) include general recommendations on design and construction, technical procedures for overall performance testing and evaluation, procedures for the issue of a Statement of Compliance in accordance with regulation D-4 of the Annex to the Convention and Administration oversight responsibilities.

### **3.4 Supervision for BWMS testing.**

In compliance with type approval procedure of BWMS the Administration or RS acting on its behalf shall supervise its testing that shall be carried out in compliance with the procedures specified in [Appendices 1 to 4](#) to these Guidelines.

Sampling and analysis shall be performed by the authorized organizations (laboratories) approved by national bodies assigned by the Administration.

### **3.5 Approval and certification procedure for BWMS type approval in compliance with IMO resolution MEPC.174(58).**

**3.5.1** During BWMS type approval the applicable requirements of Part I "General Regulations for Technical Supervision" and Part II "Technical Documentation" of the Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships shall be followed.

On behalf of the Administration the Register shall issue Type Approval Certificate of BWMS (form 2.5.5) for specified application for which the BWMS is approved (for specific ballast water capacities, flow rates, salinity or temperature regimes, or other limiting conditions or circumstances as appropriate) based on the BWMS satisfactory compliance with all test requirements specified in the [Appendices](#) to these Guidelines and those required by the Guidelines (G8).

**3.5.2** The approval shall take the form of a Type Approval Certificate of BWMS (form 2.5.5), specifying the main particulars of the apparatus and any limiting conditions on its usage necessary to ensure its proper performance. A copy of the original test results of the BWMS shall be attached to such a Certificate. The Type Approval Certificate of BWMS shall be issued acting on behalf of the Administration for the specific application for which the BWMS is approved, e.g., for specific ballast water capacities, flow rates, salinity or temperature regimes, or other limiting conditions or circumstances, as appropriate.

A copy of the Type Approval Certificate of BWMS shall be carried on board ships fitted with such a system at all times.

**3.5.3** The Register acting on behalf of the Administration may issue the Type Approval Certificate of BWMS based on tests previously conducted under the supervision of another Administration. Such a Certificate shall identify that it was issued by the Administration based on a Type Approval Certificate previously issued by another Administration that supervised conduction of the tests on the BWMS. A copy of the original test results shall be attached to the Type Approval Certificate of BWMS.

**3.5.4** During type approval of BWMS the documents about information reporting on type approved BWMS required by IMO resolution MEPC.228(65) shall be issued and then submitted to the Administration on which behalf the type approval has been carried out for the subsequent submission to IMO.

**3.6 Approval and certification procedures for BWMS type approval in compliance with the BWMS Code (refer to IMO resolution MEPC.300(72)).**

**3.6.1** During BWMS type approval in compliance with the BWMS Code the provisions of approval and certification procedure specified in Section 6 of the BWMS Code shall be followed.

**3.6.2** Upon authorization of the Administration the Register shall issue Type Approval Certificate of BWMS (form 2.5.5.1).

## **4 SHIPS SURVEYS FOR BALLAST WATER MANAGEMENT**

### **4.1 Types of surveys.**

**4.1.1** Ships of 400 gross tonnage and above to which the Convention applies, excluding submersibles, floating craft, floating platforms, FSUs/FSOs and FPSOs, in compliance with regulation E-1 of the Annex to the Convention shall be subject to surveys specified below:

**.1** an initial survey before the ship is put in service or before the Certificate required under regulation E-2 or E-3 is issued for the first time. This survey shall verify that the ballast water management plan required by regulation B-1 and any associated structure, equipment, systems, fitting, arrangements and material or processes comply fully with the requirements of this Convention. This survey shall confirm that a commissioning test has been conducted to validate the installation of any ballast water management system by demonstrating that its mechanical, physical, chemical and biological processes are working properly, taking into account the guidelines developed by IMO (IMO circular BWM.2/Circ.70/Rev.1);

**.2** a renewal survey at intervals specified by the Administration, but not exceeding five years, except where regulations E-5.2, E-5.5, E-5.6 or E-5.7 of the Annex to the Convention are applicable. This survey shall verify that the BWM Plan required by regulation B-1 of the Annex to the Convention and any associated structure, equipment, systems, fitting, arrangements and material or processes comply fully with the applicable requirements of the Convention;

**.3** an intermediate survey within three months before or after the second Anniversary date or within 3 months before or after the third Anniversary date of the Certificate, which shall take the place of one of the annual surveys specified in [4.1.1.4](#). The intermediate surveys shall ensure that the equipment, associated systems and processes for ballast water management fully comply with the applicable requirements of the Convention and are in good working order. Such intermediate surveys shall be endorsed on the Certificate issued under regulation E-2 or E-3 of the Annex to the Convention;

**.4** an annual survey within 3 months before or after each Anniversary date, including a general inspection of the structure, any equipment, systems, fittings, arrangements and material or processes associated with the BWM Plan required by regulation B-1 of the Annex to the Convention to ensure that they have been maintained in compliance with the Convention provisions, and the ship remains prepared for navigation, and is not hazardous for the environment, people health, property or resources, and remains satisfactory for the service for which the ship is intended. Such annual surveys shall be endorsed on the Certificate issued under regulation E-2 or E-3 of the Annex to the Convention;

**.5** an additional survey, either general or partial, according to the circumstances, shall be made after a change, replacement, or significant repair of the structure, equipment, systems, fittings, arrangements and material necessary to achieve full compliance with the Convention. The survey shall be such as to ensure that any such change, replacement, or significant repair has been effectively made, so that the ship complies with the requirements of the Convention. When an additional survey is undertaken for the installation of any ballast water management system, this survey shall confirm that a commissioning test has been conducted to validate the installation of the system by demonstrating that its mechanical, physical, chemical and biological processes are working properly, taking into account the guidelines developed by IMO (IMO circular BWM.2/Circ.70/Rev.1);

**.6** an occasional survey whenever an accident occurs to a ship or a defect is discovered which substantially affects the ability of the ship to conduct ballast water management in compliance with the Convention to determine whether a survey as required by [4.1.1.1 — 4.1.1.1.5](#) is necessary.



**4.1.2** The Administration shall establish appropriate measures for ships that are not subject to the provisions of [4.1.1](#) in order to ensure that the applicable provisions of this Convention are complied with.

**4.1.3** After completion of any survey in compliance with [4.1.1.1 to 4.1.1.6](#), no change shall be made in the structure, equipment, fittings, arrangements or material associated with the BWM plan required by regulation B-1 of the Annex to the Convention and covered by the survey, unless approved by the Administration, except the direct replacement of such equipment or fittings.

**4.2 Technical documentation.**

**4.2.1** During initial surveys of the ships after construction for compliance with the Convention it is necessary to verify documentation for compliance with Section 17 of the Guidelines on Technical Supervision of Ships under Construction (as applicable for the procedure performed).

In addition to the above mentioned the ship shall be checked for the availability of the following documentation:

.1 approved BWM Plan complying with regulation B-1 of Annex to the Convention;  
.2 Ballast Water Record Book that can be electronic registration system taking into account IMO resolution MEPC.372(80), and at least containing information specified in Appendix II to the Annex to the Convention (taking into account IMO resolution MEPC.369(80) as amended). The record Book is maintained and stored in compliance with regulation B-2 of Annex to the Convention. The electronic record book can also be used for ships that are still using the D-1 standard (refer to resolution MEPC.371(80);

.3 installation commissioning procedure and a written report confirming satisfactory operation of the ballast water treatment equipment in accordance with the requirements of IMO circular BWM.2/Circ.70/Rev.1 during commissioning testing based on research techniques specified in 4.8 of Part 4 of Annex to BWMS Code, or methods specified in Table 3 of the document BWM.2/Circ.42/Rev.2;

.4 documentation with regard to:  
provisions of IACS unified requirement (UR) M74 (Rev.1 May 2016) available on IACS web-site ([www.iacs.org.uk](http://www.iacs.org.uk)), applicable for BWMS installed in ships contracted for construction on or after 1 January 2017, in the absence of a contract, during review and approval of the technical documentation on ships requested for review on or after 1 January 2017; or  
provisions of IACS UR M74 (Rev.2 June 2021) available on IACS web-site ([www.iacs.org.uk](http://www.iacs.org.uk)), applicable for BWMS installed in ships contracted for construction on or after 1 July 2022, in the absence of a contract, during review and approval of the technical documentation on ships requested for review on or after 1 July 2022.

**4.2.2** The availability of the documentation in compliance with [4.2.1](#), excluding [4.2.1.3](#), as well as the following documentation shall be checked during Certificate renewal surveys, intermediate and annual surveys:

.1 valid Certificate of the ballast water management and complete set of the previous survey reports;

.2 documentation on board confirming performance of the applicable procedures for ballast water and sediments management in compliance with the approved BWM Plan;

.3 absence of the documentation confirming the unapproved amendments in design, equipment, arrangements, devices or materials, excluding direct replacement of such equipment or arrangements;

.4 absence of the overdue or unfulfilled requirements of the Convention.

**4.3 Issued certificates.**

**4.3.1** On behalf of the Administration, and upon results of the initial surveys or renewal surveys, as well as on the results of the ballast water management systems survey the Register shall issue the following documents:

**.1** International Ballast Water Management Certificate (form 2.5.4) shall be issued to all ships that have the right to sail under the state flag of the Convention Party with 400 gross tonnage and above, excluding submersibles, floating craft, floating platforms, FSUs/FSOs and FPSOs, and performing voyages to ports or to the offshore terminals under jurisdiction of other Convention Parties. Validity period of the International Certificate is specified in regulation E-5 of Annex to the Convention.

During installation of BWMS and prior to issue of the International Ballast Water Management Certificate (form 2.5.4), the procedure shall be performed in compliance with Section 8 of IMO resolution MEPC.174(58), MEPC.279(70) or the BWMS Code (depending on the IMO resolution the equipment has been approved), and the commissioning testing involving sample collection shall be conducted in accordance with the requirements of IMO circular BWM.2/Circ.70/Rev.1. When performing installation commissioning, firms engaged in sampling and analysis of ballast water and verification of the self-monitoring equipment during commissioning testing of ballast water management systems shall meet the requirements under Section 18 of Annex 1 to IACS UR Z17 (Rev.16 Aug 2021) "Procedural Requirements for Service Suppliers" available on IACS web-site ([www.iacs.org.uk](http://www.iacs.org.uk)), which are implemented in Section 9 "Recognition of Service Suppliers" of Part I "General Regulations for Technical Supervision" of the Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships.

**.2** Type Approval Certificate of Ballast Water Management System (form 2.5.5 or 2.5.5.1) shall be issued for all system types following type approval in compliance with the Convention and [Section 3](#), Part I "Technical Supervision" of these Guidelines. The validity of the Certificate shall not exceed 5 years.

For BWMS that make use of the active substances or preparations it is provided that these systems can be subject to the cancellation procedure of the type approval, and the Type Approval Certificate of BWMS shall become invalid prior to expiration of the Certificate validity period.

**.3** for the ships that do not require the International Ballast Water Management Certificate (form 2.5.4), the Certificates may be issued in compliance with 1.11, Part III "Survey of Ships in compliance with International Conventions, Codes, Resolutions and Rules for the Equipment of Sea-Going Ships" of the Guidelines on Technical Supervision of Ships in Service. Validity period of these Certificates is specified in 1.7 Part III "Survey of Ships in compliance with International Conventions, Codes, Resolutions and Rules for the Equipment of Sea-Going Ships" of the Guidelines on Technical Supervision of Ships in Service.

## **PART II. DESIGN, EQUIPMENT AND DEVICES OF SHIPS FOR BALLAST WATER AND SEDIMENTS MANAGEMENT**

### **1 GENERAL**

**1.1** Ballast system, including the BWMS shall comply with the applied requirements of Part II "Hull", Part IV "Stability", Part VIII "Systems and Piping", Part IX "Machinery", Part XI "Electrical Equipment", Part XV "Automation" of the Rules for the Classification and Construction of Sea-Going Ships, as well as regulations D-1 — D-4 of the Annex to the Convention.

For ships contracted for construction on or after 1 January 2017, in the absence of a contract, during review and approval of the technical documentation on installation of BWMS in ships requested for review on or after 1 January 2017, the provisions of IACS Unified Requirement (UR) M74 (Rev.1 May 2016) available on IACS web-site ([www.iacs.org.uk](http://www.iacs.org.uk)), shall be considered.

For ships contracted for construction on or after 1 July 2022, in the absence of a contract, during review and approval of the technical documentation on installation of BWMS in ships requested for review on or after 1 July 2022, the provisions of IACS UR M74 (Rev.2 June 2021) available on IACS web-site ([www.iacs.org.uk](http://www.iacs.org.uk)), shall be considered.

**1.2** All ships specified in 3 to 5 of regulation B-3 of the Annex to the Convention shall without harm to safety or operational efficiency be designed and built such that to minimize inlet and undesirable catching of sediments, to make easier sediments removal, and to ensure safe access for sediments removal, and their sampling considering the Guidelines (G2).

**1.3** Ships specified in regulation B-3.1 of the Annex to the Convention, as far as this can be ensured, shall comply with [1.1.1](#).

## **2 TECHNICAL REQUIREMENTS FOR BALLAST SYSTEM IN COMPLIANCE WITH REGULATION D-1 OF THE ANNEX TO THE CONVENTION**

**2.1** It is recommended to use these requirements considering design features of ships and applied safety requirements without prejudice for their operation characteristics.

**2.2** Ballast systems operated in compliance with regulation D-1 of the Annex to the Convention shall comply with the following requirements:

**.1** shall be operable;

**.2** comply with requirements of 8.7 Part VIII "Systems and piping" of the Rules for the Classification and Construction of Sea-going Ships;

**.3** if the ship has control and/or registration equipment for all operations with the ballast water, and data are automatically registered by the equipment, then they shall be in the format that can be easily stored on board, and quickly presented to the inspecting authorities and authorized organizations;

**.4** the ballast water sampling shall be performed in compliance with [Section 6](#) of this Part and the Guidelines (G2);

**.5** design of the sea chests shall be such that to minimize sediments accumulation. For this purpose, upper, as well as lower sea chests shall be provided.

**2.3** For the ballast system of ships operated in compliance with regulation D-1 of the Annex to the Convention it is recommended to provide piping for ballast water transfer from the ship to the reception facilities from both sides. The drainage branch pipes shall be installed in easy for hoses connection places, have identification plates, and blank flanges.

### **3 TECHNICAL REQUIREMENTS FOR BWMS IN COMPLIANCE WITH REGULATION D-2 OF THE ANNEX TO THE CONVENTION**

This Section shall detail the general technical requirements which a BWMS shall meet, and requirements for the control and monitoring equipment.

#### **3.1 General technical requirements for BWMS.**

**3.1.1** BWMS operated in compliance with regulation D-2 of the Annex to the Convention shall comply with the following requirements:

**.1** BWMS shall have approved suitable equipment for the ballast water treatment ensuring the ballast water discharge in compliance with regulation D-2 of the Annex to the Convention.

If such equipment for the ballast water treatment makes use of the active substances or preparations, then their storage and use on board shall be performed in the compliance with the Manual approved by the Administration only. The Manual shall specify the proper measures of for storage, application, mitigation, and safe handling of the active substances or preparations to mitigate any hazards introduced thereby.

**.2** in case of any failure compromising the proper operation of the BWMS, audible and visual alarm signals shall be given in all stations from which ballast water operations are controlled;

**.3** all working parts of the BWMS that are liable to wear or to be damaged shall be easily accessible for maintenance.

The routine maintenance of the BWMS and troubleshooting procedures shall be clearly defined by the manufacturer in the operating and maintenance manual. All maintenance and repairs shall be recorded;

**.4** the ballast water treatment equipment shall be provided with simple and effective means for its operation and control. It shall be provided with a control system that shall be such that the services needed for the proper operation of the ballast water treatment equipment are ensured through the necessary automatic arrangements;

**.5** to avoid interference with the BWMS, the following items shall be included:

**.5.1** every access of the BWMS in all cases, except for maintenance defined by the manufacturer in the operating manual, shall require the breaking of a seal;

**.5.2** if applicable, the BWMS shall be so constructed that a visual alarm is always activated whenever the BWMS is in operation for purposes of cleaning, calibration, or repair, and these events shall be recorded by the control equipment;

**.5.3** in the event of an emergency, suitable by-passes or overrides to protect the safety of the ship and personnel shall be installed; and

**.5.4** any by-pass of the BWMS shall activate an alarm, and the bypass event shall be recorded by the control equipment;

**.6** facilities shall be provided for checking the performance of the BWMS components that take measurements and registration in compliance with the manufacturer's instructions.

A calibration certificate certifying the date of the last calibration check shall be retained on board for inspection purposes.

Only the manufacturer or persons authorized by the manufacturer shall perform the accuracy checks.

#### **3.2 Additional requirements for equipment used for the ballast water treatment for oil tankers.**

**3.2.1** The ballast water treatment equipment shall, if intended to be fitted in the dangerous areas of the oil tankers, comply with the relevant safety regulations for such areas.

Any electrical equipment that is part of the BWMS installed in the explosion dangerous areas of the oil tankers shall be certified as explosion-proof and suitable for use in such areas.

Any moving parts, which are fitted in the explosion dangerous areas of the oil tankers, shall be arranged so as to avoid the formation of static electricity.

**3.3 Requirements for control and monitoring equipment.**

**3.3.1** The BWMS that make use of active substances shall incorporate control equipment that automatically monitors and adjusts necessary treatment dosage of active substance and maximum permissible transfer concentration within the approved criteria or other parameters of the BWMS of the ship, which while not directly effecting treatment, are nonetheless required for proper administration of the necessary treatment.

**3.3.2** The control equipment shall incorporate a continuous self-monitoring function during the period in which the BWMS is in operation.

**3.3.3** The monitoring equipment shall record the proper functioning or failure of the BWMS.

**3.3.4** To facilitate compliance with regulation B-2 of the Annex to the Convention, the control equipment shall also be able to store data for at least 24 months, and shall be able to display or print a record for official inspections as required.

In the event the control equipment is replaced, means shall be provided to ensure the data recorded prior to replacement remains available on board for 24 months.

**3.3.5** It is recommended that simple means be provided aboard ship that are part of the control equipment to check on the following:

- drift by measuring devices repeatability;
- repeatability of the control equipment devices;
- the ability to re-zero the control equipment meters.

#### **4 TECHNICAL REQUIREMENTS FOR BWMS IN COMPLIANCE WITH REGULATION D-3 OF THE ANNEX TO THE CONVENTION**

##### **4.1 General.**

**4.1.1** To comply with the Convention the BWMS that makes use of or generates active substances, relevant chemicals or free radicals during the ballast water treatments shall safe in terms of the ship, its equipment and the personnel, and shall comply with the following requirements.

**4.1.2** The requirements shall not cover the procedure for approval of the active substances and preparations that make use viruses or fungi for use in BWMS.

##### **4.2 Technical requirements.**

**4.2.1** General technical requirements, which BWMS shall meet to receive the type approval in compliance with regulation D-3 of the Annex to the Convention, and which include the technical requirements for BWMS in compliance with regulations D-2 of the Annex to the Convention, shall continuously ensure the ship ballast water discharge complying with the quality standard specified in regulation D-2 within the entire service life of the ship.

**4.2.2** BWMS operation can be based on the following principles:

**.1** active substances and preparations may be added to the ballast water or be generated in the BWMS.

BWMS description shall include a chemical identification and description of the active substance or preparation even if generated on board.

A chemical identification shall be provided for any relevant chemicals.

Data of the active substances and preparations shall include information on the properties or actions of the preparation including any of its components.

BWMS shall not contain or use dangerous substances not approved for use by IMO.

However, if the ballast water is still toxic at the time of discharge into the environment, the organisms in the receiving water may suffer unacceptable harm. Both the active substance or preparation as well as the ballast water discharge shall be subjected to toxicity testing in order to protect the receiving environment or human health from toxic effects due to the discharges. Toxicity testing is needed to determine if an active substance or preparation can be used and under which conditions the potential of harming the receiving environment or human health is acceptably low;

**.2** any system which makes use or generates the active substances, relevant chemicals or free radicals during the treatment process to eliminate organisms in order to comply with the Convention shall receive IMO final approval in compliance with the Guidelines (G9).

**4.2.3** BWMS shall use automatic adjustment of the active substances and preparations supply.

The manufacturer's instructions for use of the active substances and preparations shall include information relating their expected use and application. Concentration of the active substances in BWMS, rules for preparation prior to the injection to the ballast water, and minimum permissible concentration of the active substances shall be also described in the BWMS manufacturer's instructions.

Rules for preparation on board shall be developed and submitted considering the existing IMO Codes and Guidelines.

The procedure for ballast water treatment shall comply with the specified minimum permissible concentrations of the active substances and minimum discharge force, if available.

The system shall ensure that maximum dosage and maximum allowable discharge concentration are not exceeded at any time.

**4.2.4** BWMS shall be provided with measures ensuring the safe on-board handling and storage of the chemicals to treat ballast water, using existing IMO conventions, codes and guidelines.

The instructions shall describe conditions of the proper storage and treatment with consequences of decomposition and loss of chemical activity during storage, they shall be included in the manufacturer's instructions.



## **5 REQUIREMENTS FOR SAMPLING FACILITIES**

**5.1** The BWMS shall be provided with sampling facilities so arranged in compliance with the Guidelines (G2) to collect representative samples of the ship's ballast water.

**5.2** Sampling facilities, whenever practicable to do so, shall be installed in the BWMS discharge line near the discharge point.

## **6 TECHNICAL REQUIREMENTS FOR BWMS COMPONENTS FOR SEDIMENTS CONTROL AND REMOVAL**

**6.1** The requirements are common for BWMS designed in compliance with regulations D-2 to D-4 of the Annex to the Convention, and, to the extent practicable, regulations D-1, to ensure safety and to minimize inlet and undesirable catching of sediments, to make easier sediments removal, and to ensure safe access for sediments removal, and their sampling in compliance with regulation B-5 of the Annex to the Convention.

These requirements cover spaces designed to carry the ballast water of ship BWMS, and shall comply with the Guidelines (G12) and this Section.

**6.2** Ballast water tanks and their internal structures shall be designed to avoid the accumulation of sediment in a ballast tank. When designing ballast tanks the provisions of the Guidelines (G12) shall be taken into account.

**6.3** When practical, equipment to remove suspended matter at the point of uptake shall be installed.

**TEST AND PERFORMANCE SPECIFICATIONS FOR APPROVAL OF BALLAST WATER MANAGEMENT SYSTEMS IN COMPLIANCE WITH THE BWMS CODE**

The requirements of Part 2 of the Annex to the BWMS Code shall be applied during BWMS approval in compliance with the BWMS Code (refer to IMO resolution MEPC.300(72)).

**SPECIFICATION FOR ENVIRONMENTAL TESTING FOR APPROVAL OF BALLAST WATER MANAGEMENT SYSTEMS IN COMPLIANCE WITH THE BWMS CODE**

The requirements of Part 3 of the Annex to the BWMS Code shall be applied during BWMS approval in compliance with the BWMS Code (refer to IMO resolution MEPC.300(72)).

**SAMPLE ANALYSIS METHODS FOR DETERMINATION OF BIOLOGICAL CONSTITUENTS  
IN BALLAST WATER APPROVED IN COMPLIANCE WITH THE BWMS CODE**

The requirements of Part 4 of the Annex to the BWMS Code shall be applied during BWMS approval in compliance with the BWMS Code (refer to IMO resolution MEPC.300(72)).

## PRACTICAL RECOMMENDATIONS REGARDING SAMPLING TECHNIQUES AND PROCEDURES FOR USE DURING ASSESSING THE COMPLIANCE WITH CONVENTION

(Guidelines (G2))

### 1 SAMPLING FROM THE BALLAST WATER DISCHARGE LINE

**1.1** The advantage in sampling the biota present in the ballast water discharge line is that this is most likely to accurately represent the concentration of substances and organisms in the actual discharge, which is of primary concern in assessing compliance with the discharge regulations.

**1.2** The disadvantages of this method are that, on most ships, in-line sampling shall be carried out in the engine room, where space may be limited, and operations with the sampled water volume may be impeded.

**1.3** In order to undertake an accurate measurement on the organism concentration in the ballast water, it is recommended to install an "isokinetic" sampling facility. Isokinetic sampling is intended for the sampling of water mixtures with secondary immiscible phases (i.e. sand or oil) in which there are substantial density differentials. Since most organisms are relatively neutrally buoyant, true isokinetic sampling is unnecessary. However, it may be useful for describing and determining geometric parameters of sampling facilities. Isokinetic sampling is necessary to ensure that a sample contains the same proportions of the various organisms as the flow stream being sampled. During isokinetic sampling the sampling arrangement does not alter the profile or velocity of the flowing stream at the moment or point at which the sample is separated from the main flow stream. During isokinetic sampling the sampling arrangement does not alter the profile or the flow velocity at any moment of time or at the sampling point from the main flow stream. To achieve isokinetic sampling conditions, the sampling arrangement shall separate a subsection of the main flow so that not to discourage water flow at the sampler entry port and to ensure water entry only in the cross-section of the sampler opening. In other words, flow streams in the main flow of the pipe shall not diverge or converge as they approach the opening of the sampler.

#### **1.4 Technical specifications for design of in-line sampling facilities.**

**1.4.1** Through computational fluid dynamics modelling, it has been shown that the isokinetic diameter calculation can provide guidance for sizing of sample ports for sampling of organisms. Simulations showed that flow transitions from the main stream were best for sample port diameters between 1,5 and 2,0 times the isokinetic diameter. Ports sized in this range had smooth transitions and pressure profiles that allowed for direct sampling without the need of a pump to ensure sample collection. The isokinetic sample port diameter shall therefore be determined generally according to the following equation:

$$D_{iso} = D_m \sqrt{Q_{iso}/Q_m},$$

where  $D_{iso}$  and  $D_m$  = diameters of the sample port opening and the main flow in the discharge line, respectively; and  
 $Q_{iso}$  and  $Q_m$  = respective volumetric flow rates through the two pipes. It is recommended that sample port size be based on the combination of maximum sample flow rate and minimum ballast flow rate that yields the largest isokinetic diameter.

**1.4.2** The opening of the sampling pipe shall be chamfered to provide a smooth and gradual transition between the inside and outside pipe diameters.

**1.4.3** The length of the straight sampling pipe section facing into the flow may vary, but generally shall be not less than one diameter of the sampling pipe. The sampling arrangement shall be oriented so that its opening is facing upstream, and the sampling pipe section with the sampling port is parallel to the flow direction as well as concentric to the discharge pipe that may require sampling pipes to be L-shaped if installed along a straight section of discharge pipe.

**1.4.4** The need to be able to service the pipe of the sampling arrangement shall be provided, taking into account the safety of ship. The sampling pipe shall be retrievable or in a system that can be isolated from the discharge pipe. It is recommended that samplers be designed to be removed between sampling intervals or can be cleaned prior to sampling.

**1.4.5** The sample pipe and all associated parts of the sampler that come into contact or near proximity with the ballast piping shall be constructed of galvanically compatible materials and generally corrosion resistant. Any corrosion of the sampling system will affect sample flow rates and potentially sample representativeness.

**1.4.6** If flow control is required, ball, gate and butterfly valve types shall be avoided as they may cause organism mortality. For flow control, it is recommended that diaphragm valves or similar valve types be used to minimize sharp velocity transitions. Ball valves shall be applied in such a manner that they are either fully open or fully closed.

**1.5 Technical specifications for installation of a sample point in the ballast water discharge line.**

**1.5.1** The sample taken shall be removed from the main pipeline at a location where the flowing stream at the sample point is representative of the contents of the stream. The sample facility shall be placed at a point where the flow in the main pipe is fully mixed and fully developed.

**1.5.2** The sampling point shall be installed in a straight part of the discharge line as near to the ballast water discharge overboard as practicable. The sampling facility shall be positioned such that a representative sample of ballast water is taken. It is recommended that the position of the sample point is established using methods such as computational fluid dynamics.

## **2 SAMPLING FROM BALLAST WATER TANKS**

**2.1** In-tank sampling may be appropriate for assessing regulation D-1 of the Annex to the Convention compliance. There may be circumstances when in-tank sampling to provide an indication of compliance or non-compliance with the ballast water performance standard of regulation D-2 of the Annex to the Convention may be found appropriate. Regulation D-2 of the Annex to the Convention compliance shall be assessed at ballast water discharge, whenever this is possible.

### **2.2 Manholes.**

**2.2.1** Sampling of ballast water via manholes allows direct access to ballast tanks.

**2.2.2** The disadvantages of this type of sampling access include the need for opening and closing manholes and hatches. Further, overlaying cargo may prevent access for sampling. Also, hatches and horizontal openings inside tanks are not aligned one below the other, which means that although the tank may have three or more decks, only the top deck may be accessible for sampling. Further, in some ships, access hatches and vertical openings are on the side of the tank and thus are not accessible unless the tank is empty. Another disadvantage is ladders and platforms may inhibit access to the full depth of the tank. Sampling from some certain parts of the ballast water tank may result in a lack of representation of the whole ballast water discharge.

**2.2.3** Samples shall be collected using scientific sampling equipment including plankton nets and pumps, as appropriate, for the sampling and analytical method intended for use.

**2.2.4** Whenever possible samples shall be taken from multiple water depths inside the ballast tank.

**2.2.5** When employing plankton nets:

**.1** the sample shall be taken in a vertical net haul from the deepest sampling point accessible in the tank;

**.2** all plankton nets shall be lowered to the maximum accessible depth inside the ballast tank and retrieved at a speed of approximately 0,5 m/s; and

**.3** multiple vertical net hauls may be needed to meet the required sample volume. The water volume sampled may be measured by flow meters in the opening of the net or by noting the sampling depth and net opening diameter.

**2.2.6** When employing pumps:

**.1** pump intake pipes shall be lowered to multiple depths (if possible) for different samples to obtain a vertical sample; and

**.2** the water volume sampled may be measured by flow meters in the hose or by using larger containers to measure the pumped water volume.

### **2.3 Sounding pipes or air pipes.**

**2.3.1** Sampling by sounding pipes, when available, could be appropriate due to accessibility. However, there are some limitations when using this point to test for compliance. The use of sounding pipes will be more effective when the ship's sounding pipes are perforated along their length, ensuring better mixing of ballast water and that within the sounding tube. However, care must be taken if initial water samples from a sounding pipe indicate no or insufficient exchange even though the ship's records document otherwise. Experience has shown that in some cases water within unperforated sounding pipes is not affected during an exchange.

**2.3.2** Samples shall be collected using sampling equipment, as appropriate.

### **2.4 Use of pumps.**

**2.4.1** Pumps of various types may be used to sample via sounding or air pipes.

**2.4.1.1** The use of pumps may be limited, when the vertical distance from the pump to the water level in tank exceeds 10 m.



**2.4.1.2** Pump intake pipes shall be lowered to multiple depths (if possible) for different samples to obtain a vertical sample. The water volume sampled may be measured by flow meters in the hose or by using larger containers to measure the pumped water volume.

**2.4.2** In principle, intrinsically safe pumps shall be used in all circumstances.

**2.4.3** Pumps that do not contribute to the mortality of organisms shall be preferred.

### 3 SAMPLE DATA FORM

**3.1** The following minimum information is recommended for sample documentation:

Table 3.1

Sampling date	
Particulars of ship	<b>Name of ship:</b> Distinctive number or letters Port of registry: Gross tonnage: IMO number: Date of construction: Ballast water capacity:
Identification of sampled tank <sup>1</sup>	
Type and position of sampled tank <sup>1</sup>	
Capacity of sampled tank <sup>1</sup>	(m <sup>3</sup> )
Type of ballast water management undertaken	(type of exchange or treatment)
Make of ballast water management system	
Date of ballast water management undertaken	
Sample identification code	(including number of replicate)
Sample type	(larger, smaller plankton, microbes)
Sampling techniques used	net (including depth of vertical net haul, net opening size, mesh size) pumps (including sampling depth, pumping capacity, in l/min) bottle (including sampling depth, bottle capacity, in l) specify other sampling technique, if used
Sampling time/start	
Sampling end time	
Origin of water sampled <sup>1</sup>	(lat/lon/port)
Type of sampling access point	
Location of sampling access point	
Water volume sampled	(by volume)
In case sample is concentrated on board specify filter or net sizes (if applicable)	(µm)
Preservative (if used)	
Transport to laboratory	cooling container, dark storage, etc.
Sample results	
<sup>1</sup> If appropriate.	

Other information as necessary shall be included in the table.

#### **4 HEALTH AND SAFETY ASPECTS**

**4.1** As shipboard and port State control procedures on health and safety aspects already exist there is no need to develop new procedures for the purpose of ballast water sampling. In general, ship procedures, especially for entry into enclosed spaces, shall be followed if more stringent than national regulations. However, the following paragraphs provide some additional guidance.

**4.2** Worker health and safety shall be a primary consideration during all the sampling operations as ships and ports are hazardous environments in which to work. Any sampling operation shall be undertaken after consideration of the specific risks associated with the ballast water being sampled. Appropriate personal protective equipment connected with the work shall be worn as necessary.

**4.3** In the event sampling involves entry into confined spaces, Recommendations for entering enclosed spaces aboard ships (resolution IMO A.864(20)) and relevant IACS recommendations on confined space safe practice ([www.iacs.org.uk](http://www.iacs.org.uk)), and standard industry practice on man entry into enclosed spaces shall be consulted (e.g. International Safety Guide for Oil Tankers and Terminals (ISGOTT)).

**4.4** All electrical equipment, including torches, shall be intrinsically safe for use on board ships when required. Safety limitations on the use of mobile telephones, etc., shall always be observed. Standard industry practice on the use of electrical equipment including mobile telephone shall be consulted (e.g., ISGOTT).

**4.5** All electrical equipment to be used aboard shall be checked to ensure that it is intrinsically safe. Pumps in particular shall be fitted with waterproof junctions at the point where the electrical lead passes into the pump body and all plugs shall be waterproof with rubber casings. If there is any doubt about an electrical supply or equipment aboard a ship, advice from the ship's master or a member of the port company electrical staff shall be sought.

## **5 MAINTENANCE, STORAGE, LABELLING AND TRANSPORTATION**

**5.1** Samples shall be handled and stored as appropriate for the intended analytical method. The sample collection data form and chain of custody record shall be kept with each individual sample.

**5.2** Sample Sealing: tape shall be used to seal the sample jar lid to the jar.

**5.3** Sample data forms: prior to the beginning of the sampling programme, a suitable set of recording forms based on [Section 4](#) shall be designed which incorporate all the sample information required to meet the aims of the programme. Details of each sample shall be entered on the forms as soon as practicable.

**5.4** Labelling of sample containers: each sample container shall be labelled by, e.g. using a waterproof permanent marker and additional vegetal paper which may be deposited inside the sample container, if appropriate. The information recorded shall include but not be limited to the date, ship name, sample identification code, tank numbers and preservative if used. Codes may be used for some of these details as long as they are included on the sample data forms.

Russian Maritime Register of Shipping

**Guidelines on Application of the Requirements of International Convention  
for the Control and Management of Ships' Ballast Water and Sediments, 2004**

FAI "Russian Maritime Register of Shipping"

7, Litera A, Millionnaya Ulitsa,

St. Petersburg, 191181

Russian Federation

[www.rs-class.org/en/](http://www.rs-class.org/en/)