CONTENTS

BALLAST WATER MANAGEMENT

1. REFERENCES

- ISO 14001
- "International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 (BWM Convention)[1]
- BWM.2/Circ.80/Rev.1 - 2024 Guidance on ballast water record-keeping and reporting

2. BALLAST WATER MANAGEMENT CONVENTION 2004

The overall purpose of the BWM Convention is to prevent the transport of invasive species from port/area A to port/area B and thus prevent the destruction of marine habitats.

2.1. The BWM convention entered into force on 08 September 2017.

Ships entitled to fly the flag of a Party to the Convention or calling a port of a State which is Party to the Convention, will need to comply D-2 Ballast Water Performance Standard (Ballast water treatment system).[2]

The BWMC requires vessel to carry an approved Ballast Water Management Plan, International BWM Certificate and Ballast Water Record Book.[3]

2.2. The Convention provides two ballast water discharge performance standards;

a. D1 Standard: Ballast water exchange by way of

i. At least 95% exchange; or

ii. Pumping through 3 times the volume of each tank.

b. D2 Standard: Ballast water treatment systems approved by the Administration.

Ballast Water Treatment System (BWTS), whereby ballast water discharged is made harmless related to invasive species. Existing vessels will have to comply with regulation D-2 (Discharge Performance Standard) by the implementation date.

[1] W 52 / 2017
[2] W 52 / 2017
[3] W 52 / 2017

2.3. The main requirements of the BWM Convention include the following principles:

2.3.1. D-1 standards (Ballast Water Exchange)[4] "Ballast water exchange complying with regulation D-1 of the Convention may only be conducted as a contingency measure subject to permission / instruction by the port state."

a. Under Regulation B-4 of Ballast Water Convention, all ships using ballast water exchange should: whenever possible, conduct ballast water exchange at least 200 nautical miles from the nearest land and in water at least 200 meters in depth, in cases where the ship is unable to conduct ballast water exchange as above, this should be as far from the nearest land as possible, and in all cases at least 50 nautical miles from the nearest land and in water at least 200 meters in depth.

b. Ships performing Ballast Water exchange shall do so with an efficiency of 95 per cent volumetric exchange of Ballast Water. For ships exchanging ballast water by the pumping through method, pumping through three times the volume of each ballast water tank shall be considered to meet the standard described.

c. Ship shall not be required to deviate from its intended voyage, or delay the voyage, in order to conduct ballast water exchange required as per paragraph a. Instead the vessel will be required to record the reasons why ballast water exchange was not conducted in accordance with regulation B-4.5. Reasons shall be recorded in Ballast water record Book.[5]The records will be subjected to FSC/PSC inspection.

d. Some countries like USA, some states in Black Sea etc have their own local ballast water regulations in place. Master shall obtain latest information on these requirements prior calling ports of such Coastal states.

e. In sea areas where the distance from the nearest land or the depth does not meet the parameters described in paragraph a, the Port State may designate areas, where a ship may conduct Ballast Water exchange.

f. Ballast Water Record Book which must be completed immediately after each ballast water operation

2.3.2. D-2 Ballast Water Performance Standard (Ballast water treatment system)[6]

a. Vessels fitted with ballast water treatment system and certified for D-2 standards shall always use the treatment system while ballasting / de-ballasting.

b. Ballast water exchange is not required for vessels fitted with ballast water treatment system. (However, Master shall consult clarification from the agents,

[4] W 52 / 2017 (Entire Section 2.3.1)
[5] W 18 / 2018
[6] W 52 / 2017 (Entire Section 2.3.2)

local Port Authorities and / or the Coastal state at the next port if ballast water exchange is still required.)

c. If ballast water treatment system fails to operate, Company shall be informed. Master shall inform port authorities and carry out ballast water exchange.

3. ONBOARD OPERATIONS

3.1. All Deck Officers should be familiar with the IMO requirement for the control and management of ship's ballast water to minimise the transfer of harmful aquatic organisms and pathogens. Reference should be made to the approved Ballast Water Management Plan, which is provided to each vessel.

3.2. The Chief Officer is the designated person in charge of ballast water management; however, the Master is responsible for the acceptance of the ballast management plan and approval of ballast exchange operations.

3.3. Master / Chief Officer shall ensure that exchange is carried out only as per the method specified in the approved ballast water exchange manual / International BWM Certificate.[7]. (On some vessels flow through method may not be permitted as per ballast water management plan).[8]

3.4. The use of the "Flow-through Method" can result in structural damage caused by over or under pressurisation of tanks. If this method is used all manhole covers should first be removed and ballast breather pipes checked for obstructions, to prevent over or under pressurisation of the tank. [9]

3.5. Throughout the ballasting operation adequate intact stability in accordance with the approved trim and stability booklet must be maintained, taking into account any added[10] free surface effect.

3.6. Permissible seagoing strength limits of shear forces and bending moments must be maintained throughout the ballast operation in accordance with the approved loading manual.

3.7. The effect of sloshing in partly filled ballast tanks or ballast holds[11] may, under certain conditions, be of sufficient magnitude to cause structural damage to the tank. Ballasting should not take place when the vessel is pitching or rolling heavily or to an extent that sloshing may cause structural damage. Cognisance should be taken of any excessive GM resulting in a "stiff ship" condition that will contribute to heavy rolling.

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[7] W 23 / 2020
[8] W 37 / 2017
[9] W 52 / 2017
[10] W 18 / 2018
[11] W 18 / 2018

3.8. The timing of the ballast exchange should be planned to take place in the most favourable weather area on route taking into account weather forecasts.

3.9. Common sense dictates that no ballast water exchange should be undertaken when heavy weather/high seas are expected. The reason should be recorded in Ballast Water Record Book and agent is informed prior arrival.[12]

3.10. Minimum forward draft should be within any limits imposed by the Administration, Class or the loading manual, and must be sufficient to prevent the ship from slamming or losing steerage in the prevailing weather conditions. The after draft should always be sufficient to fully immerse the propeller.

3.11. Wave-induced hull vibrations may occur during ballast exchange operations and can usually be avoided by an alteration in course and/or speed.

3.12. Ballast water exchange operations should if necessary be curtailed when weather conditions deteriorate unfavourably, or a pump failure or loss of power etc. occurs. Ballast tanks should be restored to a ballast condition that is safe for the prevailing weather conditions.

3.13. Care must be taken to avoid excessive list throughout the ballast exchange operation.

3.14. All ballast operations must be logged. Ballast water reporting forms must be completed and submitted when required and in accordance with national and local regulations.

3.15. The Master shall request information from agents concerning local Ballast Water Management requirements[13]

4. CHECK FOLLOWING FOR COMPLIANCE WITH D-1 STANDARD[14]

4.1. Pre-Arrival

- Perform Ballast Water Exchange in due time and record in BWRB.
- Check national requirements of the arrival port.
- Check if you need to send a Reporting Form before arrival.
- If relevant, send pre-arrival note if unable to comply ballast water exchange/problems to agent.

[12] W 52 / 2017
[13] W 18 / 2018
[14] W 37 / 2017 (Entire Section 4)

4.2. At Port, Necessary Documents

- IBWMC stating compliance with D-1.
- Approved Ballast Water Management Plan for D-1.
- Updated Ballast Water Record Book.
- For US Calls, additionally current extension letter granted to vessel, applicable for the vessel not fitted with the Ballast water treatment system[15].

4.3. Be familiar with

- Where are the sampling point(s) for ballast water tank.
- Existence of ballast water exchange areas.

5. CHECK FOLLOWING FOR COMPLIANCE WITH D-2 STANDARD (APPLICABLE FOR VESSELS EQUIPPED WITH BWTS)[16]

5.1. At Port, Necessary Documents

- IBWMC stating compliance with D-2.
- Approved Ballast Water Management Plan for D-2.
- Updated Ballast Water Record Book.
- Type approval certificate.
- BWTS operation and safety manual.
- Installation survey report to confirm compliance.

5.2. Be familiar with

- The system installed, its type and technical characteristics.
- System requirements, e.g. service intervals, consumables.
- BWTS's capacity.
- Sampling procedure.
- Considerations regarding auxiliary power requirements from the BWTS.
- Safety procedure mentioned in the operation manual.

[15] W 23 / 2020
[16] W 37 / 2017 (Entire Section 5)

5.3. Self-monitoring

- Maintain and operate BWTS in accordance with maker's instructions and design limitations.
- Check installed self-monitoring equipment. This will vary according to type of BWTS, and may include, e.g.:
  - Power consumption, Filter back flush frequency, Active substance dosage rate.
  - Neutralizer dosage rate, TRO (Total Residual Oxidant), Flow rate, pH, salinity.
  - Temperature, Transmittance, UV Sensors.

6. INOPERABLE BALLAST WATER TREATMENT SYSTEM

Vessel must maintain the Ballast water treatment system in accordance with manufacturers specifications.[17]

A malfunction of the BWMS due to a technical problem or a ballasting operation carried out outside of the system's performance (e.g. UV intensity or TRO is too low) results in the treated ballast water to not be compliant with the D-2 standard.[18]

To prevent unnecessary downtime in port, as well detentions and financial penalties by the PSC, the following steps shall be taken:[19]

- Master shall inform all crew regarding the failure of ballast water treatment system[20].
- Master shall inform Company regarding the failure of ballast water treatment system[21] .
- Company will provide guidance or seek technician advise to rectify the system at the earliest opportunity.[22]
- The vessel shall prepare a proposal for contingency measures and a repair plan.[23]
- The proposed contingency measure is to be submitted by the vessel to the PSC in the port of destination, and the port state shall agree to proposed actions (ref. IMO guidance circular BWM.2/Circ.62).[24]

[17] W 18 / 2018
[18] W 50 / 2019
[19] W 50 / 2019
[20] W 50 / 2019
[21] W 50 / 2019
[22] W 18 / 2018
[23] W 50 / 2019
[24] W 50 / 2019

6.1. Contingency Plan

Contingency measure means a process undertaken on a case-by-case basis after a determination that ballast water to be discharged from a ship is not compliant, in order to allow ballast water to be managed such that it does not pose any unacceptable risks to the environment, human health, property and resources.[25]

In case of failure of ballast water treatment system, the ship should consider the following as possible contingency measures[26]

- Master shall inform port authorities and agents regarding inoperable ballast water treatment system.
- D-1 is the obvious alternative option. However vessel is not allowed to discharge ballast water without the permission of the Port Authority and the flag state administration.[27] Ballast water exchange shall be carried out in accordance with a method acceptable to the port State. The ship and the port State should consider the potential disruption to the cargo handling operation plan of the ship and the potential impact to relating parties including port operators and cargo owners.[28]
- The flag administration is to be notified about the agreement between vessel and port state and be provided with the repair plan and date of repair.[29]
- Ship staff shall adhere to the actions predetermined in the[30] ballast water management plan .
- Ship staff shall adhere to record keeping and reporting provisions.
- Company shall provide rectification plan with maker's email as evidence to Port state control authorities and flag state and endeavour to do its best to correct malfunction of the Ballast Water Management system as soon as possible.[31]

Company will consider other options of discharging ballast as per facilities available in the port of call. This may include discharging to appropriate shore-based reception facilities or operational actions, such as modifying sailing or ballast water discharge schedules, internal transfer of ballast water or the retention of ballast water on board the ship. The ship in consultation with the port State should consider any safety issues and avoid possible undue delays[32]. A statement that any malfunction and use of alternative management method shall be recorded in the BW Record Book.[33]

[25] W 50 / 2019
[26] W 50 / 2019
[27] W 50 / 2019
[28] W 50 / 2019
[29] W 50 / 2019
[30] W 50 / 2019
[31] W 50 / 2019
[32] W 50 / 2019
[33] W 50 / 2019

7. USCG (CFR requirements)[34]

Ship staff shall be aware of the CFR requirements regarding Ballast water management system

The Master shall ensure that operations in U.S. waters are carried out in accordance with regulations in Title 33 Code of Federal Regulations (CFR) 151

The Master shall ensure the following practices as per CFR - 151.2050 (Additional requirements-nonindigenous species reduction practices) are being followed.

a. Avoid the discharge or uptake of ballast water in areas within, or that may directly affect, marine sanctuaries, marine preserves, marine parks, or coral reefs.
b. Minimize or avoid uptake of ballast water in the following areas and situations:
    i. Areas known to have infestations or populations of harmful organisms and pathogens (e.g., toxic algal blooms).
    ii. Areas near sewage outfalls.
    iii. Areas near dredging operations.
    iv. Areas where tidal flushing is known to be poor or times when a tidal stream is known to be turbid.
    v. In darkness, when bottom-dwelling organisms may rise up in the water column.
    vi. Where propellers may stir up the sediment.
    vii. Areas with pods of whales, convergence zones, and boundaries of major currents.
c. Clean the ballast tanks regularly to remove sediments. Sediments must be disposed of in accordance with local, State, and Federal regulations.
d. Discharge only the minimal amount of ballast water essential for vessel operations while in the waters of the United States.
e. Rinse anchors and anchor chains when the anchor is retrieved to remove organisms and sediments at their places of origin.
f. Remove fouling organisms from the vessel's hull, piping, and tanks on a regular basis and dispose of any removed substances in accordance with local, State and Federal regulations.
g. Maintain a ballast water management (BWM) plan that has been developed specifically for the vessel and that will allow those responsible for the plan's implementation to understand and follow the vessel's BWM strategy and comply with the requirements of this subpart. The plan must include—
    i. Detailed safety procedures.

[34] W 18 / 2018 (Entire Section 7)

ii. Actions for implementing the mandatory BWM requirements and practices.

iii. Detailed fouling maintenance and sediment removal procedures.

iv. Procedures for coordinating the shipboard BWM strategy with Coast Guard authorities.

v. Identification of the designated officer(s) in charge of ensuring that the plan is properly implemented.

vi. Detailed reporting requirements and procedures for ports and places in the United States where the vessel may visit; and

vii. A translation of the plan into English, French, or Spanish if the vessel's working language is another language.

h. Train the Master, operator, person in charge, and crew on the application of ballast water and sediment management and treatment procedures.

i. When discharging ballast water to a reception facility in the United States, discharge only to reception facilities that have an NPDES permit to discharge ballast water.

Vessel shall comply with USCG reporting and record keeping requirements as per 33 CFR 151 in timely manner before vessel's call at U.S. ports.

An inoperable BWMS/BWTS must be reported only to the local COTP, NOT to the USCG Environmental Standards Division, National Ballast Information Clearinghouse (NBIC) or any other entity.

If Vessel that has passed its compliance date and has inoperable BWMS, the Master must obtain approval from the COTP first if the vessel intends to use Ballast Water Exchange.

If a vessel is calling at multiple US ports in different COTP zones, reports should be made to each COTP via email. When the ports of call are known, contact details for each COTP can be obtained from ECM or local agents.

8. BALLAST WATER RECORD BOOK CODES[35]

Refer to BWM.2/Circ.80/Rev.1 - 2024 Guidance on ballast water record-keeping and reporting

Note:

i. For any operation, Entries should be made separately for each ballast water tank (Tank wise entries).

[35] W 50 / 2019 (Entire Section 8)

ii. Additionally include depth of water, density, temperature of water , Pump or by Gravity (List pumps used / Pump number), Pump starting time, Pump stopping time, initial volume, final volume, total volume exchanged etc for each entry (as applicable).[36]

iii. Also the exact time and position of the start and stop times of ballast water operations for each tank should be recorded.

iv. Ballast water record book shall be retained on board for (5) years after the last entry has been made.[37]

9. BWTS INOPERABLE DUE TO DESIGN LIMITATIONS[38]

BWTS may not operate in a port where water is muddy/dirty. When ballast water introduced in the system is such that UV intensity falls below the complaint limit (refer type approval certificate of the BWTS), the treated water will not be compliant to the standard as required. In such case, the BWTS will indicate an alarm of low UV intensity and the system may shut down automatically (depending upon the make of the unit). Some BWTS may continue operating with low UV Intensity alarm.

For example, DESMI BWTS alarm text is: “UV-Intensity too low – system operating out of approved range”. Operation can continue but the system is operating outside its pre-approved range.

Where the water quality doesn’t seem to be dirty and system triggers UV Intensity low alarm, refer maker’s manual for checking and cleaning the sensor.

When BWTS is not operated due to design limitations (e.g. low UV intensity, non-compliant water), Master shall ensure following is carried out:

- Make an entry in Ballast water record book of BWTS alarm and alternative Ballast Water Management used in port.
- Inform the design limitation alarm of BWTS and ballast water intake bypassing the system to Port Authority / USCG COTP and office.
- Minimize the ballast water intake complying with the stress, stability, bridge visibility, propeller immersion and the port minimum draft requirements.
- Mid-ocean ballast water exchange in accordance with regulation B-4 to meet the standard in regulation D-1 through the BWTS after reviewing the stress and stability of the vessel.
- Inform proposed Ballast Water Management to destination Port Authority / USCG COTP

The discharge of ballast water after above ballast water management in jurisdiction of a port state is subject to approval by its concerned Authorities.

[36] W 23 / 2020
[37] W 23 / 2020
[38] W 44 / 2021 (Entire Section)

10. BALLAST MANAGEMENT IN PORTS WITH HIGH LOADING RATES[39]

There are many ports where the loading rates are very fast and vessel has to complete the de-ballasting and stripping operations well in time prior to the completion of loading operations so that the vessel is not delayed in port.

Weather permitting, vessels shall arrive these ports with minimum ballast ensuring compliance with the stress, stability, bridge visibility, propeller immersion and the port minimum draft requirements.

The vessel shall upon berthing and completion of the draft survey, immediately commence the de-ballasting operations.

Refer to the De-ballasting guide located in MEMO / CARGO OPERATIONS section for further guidance.

11. BALLAST WATER CHECK FOR OIL CONTAMINATION[40]

The water ballast tanks adjacent to the fuel oil tanks shall be checked for oil contamination prior to discharge and during voyage. The result shall be entered in the port log prior discharge. It is impractical to sight the surface of the water or sampling the water from the double bottom ballast tanks due to their location and construction. In this scenario until practical solution of sampling the water is established, the following procedures shall be complied with for the water ballast adjacent to fuel oil tanks to establish that water is uncontaminated before discharge:

- . The Chief officer shall ensure that the ballast tanks are sampled for oil contamination by using oil finding paste , using cloth attached to sounding tape , sense of smell etc.
- The adjacent fuel oil tanks shall be sounded using water finding paste.

Any oil contamination in the ballast tank or water ingress in the fuel tank shall be reported to Chief Officer and ballast from the contaminated tank shall not be discharged into sea .

The vessel shall have sufficient oil finding paste / water finding paste onboard.

[39] W 34 / 2020 (Entire Section)
[40] W 52 / 2022 (Entire Section)