
BEMA Position Statement on Application of the BWM Convention - Experience Building Phase BWMS Operation in Ports with Challenging Water Quality

The upcoming 76th session of the Marine Environment Protection Committee (MEPC) will consider a proposed Ballast Water Management (BWM) circular on the application of the BWM Convention to ships operating at ports with challenging water quality (MEPC 76/4). Several flag States and industry stakeholders have submitted comments and relevant information on the proposed circular (MEPC 76/4/4, MEPC 76/4/5, MEPC 76/4/6, MEPC 76/4/7, and MEPC 76/4/8). The Ballastwater Equipment Manufacturers' Association (BEMA) has prepared this document to present technical information and considerations from the treatment system manufacturer and system component supplier perspectives.

Executive Summary

- Selection of a quality ballast water management system (BWMS) that is suitable for and aligned with a ship's operational profile and anticipated voyage patterns remains a critical foundational aspect of proper ballast water management.
 - If an inappropriate BWMS is selected, the chances that owners will experience operational challenges increase significantly.
- When installed, operated and maintained according to the BWMS manufacturers' specification, operation of a type approved BWMS is expected to result in ballast water discharges that are compliant with international discharge standards.
- Situations where BWMS will reach a design operational limitation(s) due to challenging water quality can be reasonably anticipated during global implementation of the BWM Convention.
- Guidance to facilitate ship operations is needed to support crews in such situations and when use of contingency measures may be needed.
- BWMS manufacturers should have an active role in supporting crews in such situations, and particularly when a determination is made that bypassing the BWMS is required. The technical expertise and operational experiences of the BWMS manufacturer is often overlooked.
- Operating a BWMS in water quality conditions that are near or outside the BWMS design limitations is not the same as "BWMS failure". A BWMS has warnings and alarms to protect the BWMS equipment and/or ship, and triggering of these set points demonstrates proper BWMS operation as designed.
- Bypassing a BWMS should be implemented only after reasonable attempts to facilitate BWMS operation have been exhausted. Consideration should also be given that water quality conditions can change within a port over a short period of time (i.e., seasonal or tidal changes), that can result in successful BWMS operation that may have previously experienced challenges.

- Reliance upon ballast water exchange (BWE) as the primary contingency measure requires consideration of potential operational, safety and environmental consequences.
- Introduction of untreated ballast water and sediments into ballast tanks can result in:
 - potential compliance risks for the ship
 - additional burden for crew to handle deviations from approved ballast water management practices with port and flag State control
 - potential environmental harm via release of insufficiently treated ballast water / sediments
- BEMA endorses the need for the derivation of appropriate contingency measures that are vessel, BWMS and situation specific. Such contingency measures should form an integral part of the flag-approved ballast water management plan (BWMP).
- Revising the existing IMO contingency measures guidance (BWM.2/Circ.62) to reflect common practices and experiences gained during implementation, rather than developing new guidance specific to contingency measures to be used in ports with challenging water quality, may offer a practical and efficient way forward.

Background

In 2019, the Marine Environment Protection Committee (MEPC) adopted Resolution MEPC.290(71) establishing the experience-building phase (EBP) associated with the 2004 *International Convention for the Control and Management of Ships' Ballast Water and Sediments* (BWM Convention, or Convention) to allow the MEPC to monitor and improve the BWM Convention.

The EBP aims to consider any challenges that may arise during the implementation phase that were not foreseen at the time of the adoption of the BWM Convention. BEMA is committed to supporting implementation of the Convention and the EBP by observing progress, sharing technical expertise through engagement with all stakeholders, and the publication of industry positions, articles and white papers.

BEMA and its Members are keen to ensure that BWMS installed on ships trading worldwide are installed correctly, and operate reliably and safely. BWMS equipment will deliver compliant and reliable performance when installed, maintained and operated in accordance with the maker's OMSM and managing ballast water in accordance with the Type Approval. BEMA Members and industry experts acknowledge that there are real-world circumstances where the normal operation of a BWMS may be impacted by the prevailing environmental conditions, or a BWMS becomes unavailable due to a BWMS component malfunction or inadequate operation / maintenance, which can result in a scenario where water to be discharged from a ship may not be compliant with the standards. In such cases, the IMO has approved *Guidance on contingency measures under the BWM convention*, BWM.2/Circ.62, which should be followed.

Further, BEMA agrees and advocates that specific contingency measures appropriate for the specific ship and BWMS are included in the approved Ballast Water Management Plan (BWMP), as noted in BWM.2/Circ.62 and Resolution MEPC.306(73). Information submitted by INTERTANKO in MEPC 73/INF.8 and by IMarEST in MEPC 73/4/8 offer guidance on contingency measures from the ship operational experiences and technical perspectives, thus laying the

foundations for the development of ship- and BWMS- specific contingency plans that can be integrated within a BWMP. These documents and the experience of BEMA Members provide information and identify actions from practical implementation that can be used to improve the Convention where deemed appropriate, per the goals of the EBP.

There are circumstances where a BWMS in proper working order is unable to deal with the ambient ballast water being pumped onboard due to the physical characteristics, such as high total suspended solids (TSS) concentrations and / or turbidity. The submission by Liberia et al (MEPC 76/4) highlights the necessity to establish guidance for operational scenarios where a ship encounters challenging water quality. BEMA is in full agreement with the intent “...to provide to all stakeholders including Member States and shipowners a clear understanding of the Committee's expectations, in terms of ballast water management requirements for ships operating at ports with challenging water quality.”

Challenging Water Quality

There is a need to establish a clear definition of “challenging water quality”. This definition is, however, complicated by several factors, some of which are presented here. First, different water quality parameters that may be found in each port a ship calls on can contribute to what makes a certain water source ‘challenging’. Second, different BWMS technologies and configurations exhibit different operational limits. Third, each ship has differing operational profiles and demands. BEMA would highlight that BWMS with or without filters and treatment based on physical processes rather than chemical action behave differently when experiencing the same challenge conditions. As stated in paper MEPC 76/4/4 submitted by China, “...*challenging water quality, it means generally that the BWMS installed on board the ship cannot treat ballast water properly to meet the D-2 standard due to the challenging water exceeding the SDLs of the BWMS or the ship's operation limitation.*” BEMA agrees in part with the above quoted statement. Certainly, exceeding the stated BWMS SDLs can contribute to operational issues; however, BEMA notes that SDLs do not account for all BWMS operational limitations. Water quality parameters such as TSS which are tested at specified levels during the type approval process are not necessarily an SDL defined by a BWMS manufacturer and may not be documented on a type approval certificate. Additionally, laboratory analysis is needed to accurately quantify a parameter such as TSS and cannot be determined by casual observation. Therefore, the relevant information may not be readily available to allow a crew member to properly determine that a port location has challenging water quality as defined by something such as a TSS concentration. BEMA would also like to clarify that not all BWMS technologies are challenged by TSS or turbidity as stated in MEPC 76/4/4. BEMA agrees with the statement in MEPC 76/4/4 that water temperature and salinity are not challenging water quality indicators, as also referenced by Norway in MEPC 76/4/6 for salinity. BEMA suggests these parameters should not fall under the umbrella of challenging water quality because they are BWMS SDLs that would be known in advance. As such, they should not be considered challenging water quality indicators insofar as they should not create an unknown or unexpected challenge to a BWMS. BEMA encourages owners to select a BWMS appropriate for the ship, to know the stated BWMS SDLs and have predetermined actions in place to address.

When environmental conditions are at, or are above, the design operational limitations of a BWMS and the system has difficulty in meeting operational demand in a particular situation, BEMA notes that this does not constitute a “BWMS failure”. The temporary inability of a BWMS to operate at

full capacity should not be deemed as a BWMS failure, as alarm conditions in such situations actually demonstrate that a BWMS is operating exactly as designed. Further, challenging water quality conditions may be temporary and caused by seasonal, tidal, or other activities occurring in a particular location (i.e., a tug operating next to the ship causing increased TSS that can contribute to BWMS filters becoming overloaded). Therefore, BEMA does not support an approach of using reports of challenging water quality in a particular location as a basis for pre-determining that a BWMS would need to be bypassed in that same location each time a ship will ballast there.

It is worth highlighting that there is no single BWMS technology that is suitable for all ships and it is therefore advisable that shipowners select a BWMS based on criteria that include, but are not limited to, ship size and type, operational and voyage profiles, and climatic conditions in order to select an optimum technology for their ship. BEMA would strongly recommend that shipowners engage with BWMS suppliers directly to discuss their requirements and to thoroughly evaluate different technologies.

Contingency Measures

Liberia et al (MEPC 76/4) promotes the use of ballast water exchange plus ballast water treatment (BWE+BWT) in situations where a BWMS faces operational challenges. BEMA considers that the use of BWE+BWT could be an acceptable contingency measure but cautions against developing 'blanket' guidance that promotes the bypass of a BWMS as a first measure when a ship enters a port area where challenging water qualities may potentially be present. Noting that a BWMS is Type Approved (e.g., IMO statutory approval), the BWMS therefore cannot be subject to an abstract bypass unless the system is prevented from normal operation and rendered ineffective by local and / or technology specific prevailing conditions. BEMA therefore highlights that any guidance developed should promote that a system can be bypassed only if BWMS operation is rendered impossible, after all options to successfully operate the BWMS have been exhausted. When a BWMS is bypassed, the reasons must be fully documented and recorded in the Ballast Water Record Book and validated with the BWMS self-monitoring equipment (refer to Resolution MEPC.300(72), Part 5).

Shipowners and crew are recommended to have familiarity with the BWMP, the BWMS and the steps to be taken in situations where a BWMS is not able to operate prior to encountering ports that may have challenging water conditions. In cases where a ship is in challenging water conditions that cause BWMS operational challenges, BEMA suggests that the following initial steps could be implemented to attempt successful BWMS operation:

1. Consult the BWMP to review the approved and pre-determined contingency measures;
2. Consult the BWMS OMSM to determine if any steps can be taken to optimize the BWMS in the particular situation; and
3. Consult with the BWMS manufacturer to seek support to optimize BWMS operation.

Ideally, and through increasing the role of the BWMS manufacturer in cases where BWMS operational challenges arise, parties should seek opportunities for successful ballast water treatment, versus bypassing a BWMS as a first step. BEMA also notes that if bypassing the BWMS is necessary, this may only need to be a temporary contingency measure. For instance,

and as noted previously, high sediment loads may be a temporary condition and normal BWMS operation may be achieved when environmental conditions change.

Risks of Bypassing Ballast Water Treatment

Any bypass of the BWMS introduces untreated ballast water in the ballast tanks. This water is frequently laden with a high TSS load creating increased potential for sediment build up in the ballast tanks and favourable environments for organisms to become established. These can be difficult to treat and can introduce potential future compliance risks for the vessel operator. Accumulated sediments in tanks add costs for shipowners as they must be cleaned and disposed of in an environmentally acceptable manner as the sediments are considered industrial waste.

Performing BWE is not without significant operational and safety risks, as extensively reviewed in the *ABS guide for Ballast Water Exchange, June 2020*. The flow through method of BWE is not suitable for all BWMS and vessels, and unacceptable for chemical systems. The sequential BWE method is just as challenging for any ship and “...entails completely emptying ballast tanks of the coastal waters and refilling with open-ocean water. Emptying of certain tanks may lead to significantly reduced stability, higher vessel structural stresses, high sloshing pressures and/or reduced forward drafts which may then increase the probability of bow slamming” (ABS, 2020).

BWE must be conducted in accordance with Regulation B-4 and the ship operator must liaise with the port State for guidance on local provisions and due consideration of Regulation A-3.5. BEMA concurs with the concern of environmental risk as a result of BWE near coastal areas as highlighted by Norway in MEPC 76/4/6 “*Proceeding with exchange near coastal areas could result in environmental harm, and/or non-compliance with local or regional regulations.*” Additionally, multiple BWE operations lead to additional environmental consequences such as air emissions and can increase burden on the OPEX budget as per IMarEST MEPC 73/4/8.

Summary

There is a need for clear direction when a ship encounters a port with challenging water quality that has documented impacts on successful BWMS operation. However, to avoid turning back important progress with BWM Convention implementation and collection of accurate data during the EBP, BEMA suggests that there are technical and practical aspects that require due consideration in developing such guidance. BEMA welcomes any opportunities to provide input to the EBP or to support Administrations with a need for technical information related to the ballast water treatment industry. As detailed above, key points include:

- The expectation is that every BWMS operation delivers compliance in accordance with Regulation D-2.
- BEMA agrees that clear direction should be made available in order to support ship operators in rare cases when a BWMS is unable to treat local water.
- BEMA would encourage owners to engage with system manufacturers to ensure that a quality BWMS that meets their operational profile is selected.
- BEMA fully supports the need for the inclusion of BWMS technology specific and ship specific contingency measures within BWMPs.

- BEMA proposes that a BWMS is only bypassed if there is a fully documented reason. Bypass should be sanctioned once the specific system on a specific ship cannot treat ballast water due to exceedance of operational limitations, and reasonable attempts to facilitate BWMS operation have been exhausted.
- BEMA endorses the need for the derivation of appropriate contingency measures that are vessel, BWMS and situation specific. Such contingency measures should form an integral part of the Flag approved BWMP.

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