

Ballast Water Treatment



Ballast water management system (BWMS)

Ballast water management system (BWMS) refers to any system which processes ballast water for the purposes of meeting or exceeding the ballast water performance standard in regulation D-2. A BWMS includes ballast water treatment equipment, all associated control equipment, piping arrangements as specified by the manufacturer, control and monitoring equipment, and sampling facilities.

United States Coast Guard (USCG)

The United States Coast Guard (USCG) has established regulations and guidelines to prevent the introduction and spread of aquatic nuisance species. The USCG's final rule was published on 23 March, 2012 in the Federal Register, and it became effective on 21 June, 2012. The final rule applies to all ships calling at US or Canadian ports and planning to discharge ballast water. It requires these ships to carry out ballast water exchange or treatment in addition to sediment management.

Port state control (US and Canada)

Once the BWM Convention enters into force, ships may be subject to inspections by port states to determine whether they comply with the BWM Convention's requirements.

USCG regulations: Submission of a report to the USCG Captain of the Port (COTP) is required 24 hours before arrival at a US or Canadian port. The ship must provide the COTP with access to the vessel in order to take samples of ballast water and sediment, examine documents, and make other enquiries to assess compliance with USCG requirements.

Type approval certificate (TAC)

A type approval certificate (TAC) is issued by a classification society to approve ballast water treatment systems in accordance to IMO rules. For example, Alfa Laval PureBallast 3 is type approved by DNV GL.

BWM Convention

The International Convention for the Control and Management of Ships' Ballast Water and Sediments (Ballast Water Management Convention or BWM Convention) is a 2004 international maritime treaty requiring signatory flag

states to ensure that ships flagged by them comply with standards and procedures for the management and control of ships' ballast water and sediments. The Ballast Water Management (BWM) Convention is applicable to new and existing ships of at least 400 gross tonnages that are designed to carry ballast water.

Flag state obligation

Flag States mainly focus on the implementation phase of ballast water management for ships. This includes the approval process of any ballast water management system, oversight of prototypes, and preparation of guidance for national fleets and for the safety of ballast water management operations. They can delegate the responsibility for type approved ballast water management systems to Recognized Organizations (RO's)/Classification Societies. The approval of installation of systems on board, including issuance of International Ballast Water Management Certificate (IBWMC), can also be delegated. Flag states are further responsible for monitoring their Recognized Organization's performance. Additionally, the flag states are obligated to investigate accidents and any breach of relevant regulations and apply sanctions.

D-2 standard (ballast water performance standard)

The D-2 standard specifies the maximum amount of viable organisms allowed to be discharged, including specified indicator microbes harmful to human health. From the date of entry into force of the BWM Convention, all ships must conform to at least the D-1 standard, and all new ships must conform to the D-2 standard.

Revised G8

The IMO G8 guidelines define the type approval process for ballast water treatment systems under IMO legislation. Originally defined in 2005, they underwent a critical revision in 2016. That revision enters into force on 28 October, 2020.

Ultraviolet Transmittance (UVT)

Ultraviolet Transmittance (UVT) is a measurement of the amount of ultraviolet light that passes through a ballast water sample compared to the amount of light that passes through a pure water sample. The UV light in question is commonly at wavelengths of 254 nm, due to the disinfecting effect this has on the water. The measurement is expressed as a percentage, % UVT.

Holding time (hold time)

Holding or hold time is the interval between the completion of ballast water uptake and the start of ballast water discharge. Under IMO legislation, no holding time is required for vessels with UV-based ballast water treatment systems.

System Design Limitations (SDL)

System Design Limitations (SDL) refers to the water quality and operational parameters of a BWMS, in addition to the required type approval testing parameters that are important to its operation. For each such parameter, the SDL denotes a low and/or a high value for which the BWMS is designed to achieve the performance standard of regulation D-2. The SDL should be specific to the processes being employed by the BWMS and should not be limited to parameters otherwise assessed as part of the type approval process. The SDL should be identified by the manufacturer and validated under the supervision of the administration in accordance with these guidelines.

Treatment Rated Capacity (TRC)

Treatment Rated Capacity (TRC) refers to the maximum continuous capacity expressed in m³/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 ballast water performance standard in regulation D-2.

Salinity

Saline water (more commonly known as salt water) is water that contains a high concentration of dissolved salts (mainly sodium chloride). The salt concentration is usually expressed in parts per thousand (permille, ‰) or parts per million (ppm).

Ultraviolet intensity (UVI)

Ultraviolet intensity (UVI) expresses the total amount of light reaching a sensor within a given system, such as a ballast water treatment system.

Active Substance

An active substance is 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.