

# The Little **Blue Book** on **Ballast Water**



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# Introduction

## The Convention

The Ballast Water Management Convention (BWMC) was adopted by IMO in 2004 and entered into force on the 8<sup>th</sup> September 2017. With a few exceptions it will apply to all ships in international trade beginning in 2017 and fully implemented in 2024.

### Ships not regulated by BWMC

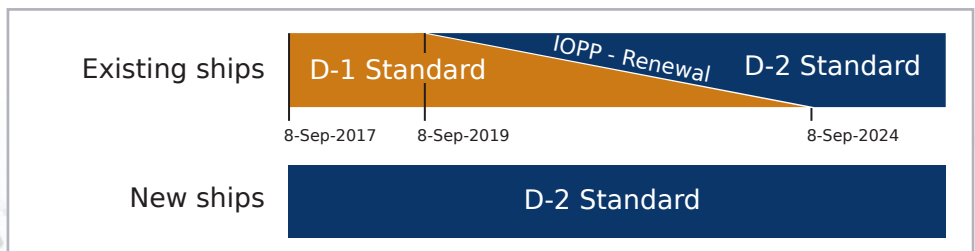
1. Ships without ballast water
2. Ships with sealed or permanent ballast water tanks
3. War ships, naval auxiliary and other government ships

The BWMC aims to end the transfer of non-indigenous species travelling in the ballast water to new aquatic ecosystems causing serious economic and environmental impacts.

All ships are required to have a ballast water management plan and those above 400 GT are subject to surveys. Compliance with the BWMC will typically entail mid ocean exchange of the ballast water (D-1) during the Convention's first years to be substituted by a stricter regime (D-2) at a point in time defined

by the ship's IOPP certificate. The D-2 discharge standard necessitate installation of a treatment system that removes or sterilizes organisms before the discharge of ballast water in the port of call. All new ships, i.e. keel laid after 8<sup>th</sup> of September 2024, must comply with D-2.

Ships < 400 GT must comply with D-2 at the latest on 8<sup>th</sup> of September 2024.



# Certificates & Documents

## The Certificates

If vessel is > 400 GT you must have one of the following certificates onboard:

International Ballast Water Management Certificate (IBWMC)	After BWMC enters into force this is the key certificate provided your flag state has ratified the Convention
Statement of Compliance	If your flag state has not ratified the Convention you are issued this document

## The Documents

You must have the following documents onboard:

An approved Ballast Water Management Plan (BWMP)	This document is ship specific and must now include BWMC relevant issues including compliance with D-1, D-2 or exception/exemption regime
A Ballast Water Record Book (BWRB)	This document must now include BWMC relevant issues and is the place to record accidental or exceptional discharges and the circumstances justifying them
Type approval Certificate for Treatment System	For the majority of vessels, this must be present once your vessel is subject to D-2 or a treatment system is installed prior to this. Does not apply if you are using an "Other method" or operate under an exception or exemption

## When calling the US

- Ballast Water Management Plan and Ballast Water Record Book;
- US type approval certificate for BWMS or
- Alternative Management System (AMS) or an
- Extension letter

# Ballast Water Exchange Standard D-1

Existing vessels shall apply the D-1 Ballast Water Exchange standard (BWE) until they must comply with the D-2 standard. The compliance standard is recorded in the IBWMC.

## Where can you perform BWE?

- ✓ 200 nautical miles from the nearest land whenever possible, but in all cases at least 50 nautical miles and in water at least 200 meters in depth
- ✓ In areas designated for ballast water exchange

## What is the idea of BWE?

- ✓ BWE provides at least 95% volumetric exchange of tank water and reduces the transfer of invasive species

## How is BWE performed?

**Sequential method:** The ballast water tank is first emptied and subsequently refilled with replacement ballast water.

**Flow-through method:** Replacement ballast water is pumped into a ballast tank and at least three times the tank volume is run through the overflow or other arrangements.

**Dilution method:** At least three times the tank volume of replacement ballast water is filled through the top of the ballast tank. The water is discharged in the bottom in the same speed and maintaining a constant level in the tank throughout the ballast exchange.

The BWMC states “A ship shall not be required to deviate from its intended voyage, or delay the voyage, in order to comply” with BWE. The Shipmaster can decide not to do an exchange due to:

- ✓ Heavy weather conditions
- ✓ Ships safety or stability in danger
- ✓ Extraordinary operational impracticality

**IMPORTANT:** Make an entry in the BWRB stating the reasons. If relevant, inform Port State Control (PSC) before arrival.

**BWE areas may change.** Consult your Safety Management System (SMS) or contact company responsible.

## Ballast Water Performance Standard D-2

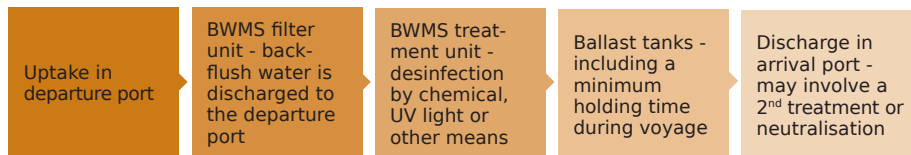
Once the vessel has to comply with the D-2 standard it must have onboard:

- ✓ IBWMC confirming compliance with D-2 standard
- ✓ A type approved BWMS installed
- ✓ An IMO type approval certificate
- ✓ An approved Ballast Water Management Plan
- ✓ Operational and safety manual for the BWMS
- ✓ An installation survey report to confirm compliance if type approval requires

Which treatment system is onboard?

- ✓ You must be familiar with the operational principles of the BWMS
- ✓ Understand the ballasting and de-ballasting procedure
- ✓ You must have a clear understanding of the limiting conditions for your BWMS, which are found in the type approval certificate
- ✓ Be observant of safety procedures, e.g.:
  - o Handling and storage of chemicals
  - o Crew safety and emergency procedures in event of spillage, fire or explosion
  - o First aid measures after contact with chemical
  - o Special cleaning procedures, handling of clean-up residues
  - o Risk assessment of specific treatment system

The ballast water treatment process for a typical in-line BWMS with a filter and a treatment unit. Some systems avoid the filter unit, some treat a second time on discharge and some include a neutralisation system for the discharge water. A few BWMS are in-tank systems that treat during voyage.



The IMO has decided that the first five years after BWMC entry into force is an “experience building phase” for the management of ballast water.

If a vessel operates under exception or exemption valid for certain locations no discharges are allowed if mixing with unmanaged ballast water and sediments from other areas has occurred.

# Preparation for Port State Control

## STAGE 1

### Initial inspection

PSC officer will:

- Inspect documentation (Certifications, BWMP and BWRB)
- Check that an officer has been appointed for the BWM on board
- Check familiarity of the responsible officer and crew with the BWMS
- Visual inspect overall condition of the ship, the equipment and arrangements detailed in the certificate BWMP and BWRB

## STAGE 2

### More detailed inspection

PSC officer will:

- Clarify whether detailed BWMP operational procedures are followed (safety, sediments, record keeping cross check)
- Check if BWM has been conducted according to the BWMP
- Check of BWMS operational record, including self-monitoring devices
- Follow up on bypass and emergency issues

PSC shall provide clear grounds for proceeding to next stage of inspection procedure

## Check List for Compliance with D-1 Standard

### 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 of incident/problems to PSC

### AT PORT

Necessary Documents:

- IBWMC stating compliance with D-1
- Approved Ballast Water Management Plan for D-1
- Updated Ballast Water Record Book

Be familiar with:

- Where are the sampling point(s) for ballast water
- Existence of ballast water exchange areas
- Optional: When is the installation planned (IOPP schedule)

# Preparation for Port State Control

## STAGE 3

### Indicative analysis

- Limited sample taking is expected
- Indicative analysis may involve the use of portable analytical instruments

## STAGE 4

### Detailed analysis

- Full verification of compliance may involve large scale sampling typically requiring specialists onboard assisting the PSC officer
- Samples for compliance testing are sent to laboratories onshore and analysis are time consuming

## Check List for Compliance with D-2 Standard

PRE-ARRIVAL check → same as D-1 except performing BWE

### AT PORT

#### Necessary Documents:

- IBWMC stating compliance with D-2
- Approved Ballast Water Management Plan for D-2
- Updated Ballast Water Record Book

#### Be familiar with:

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

#### Self-monitoring:

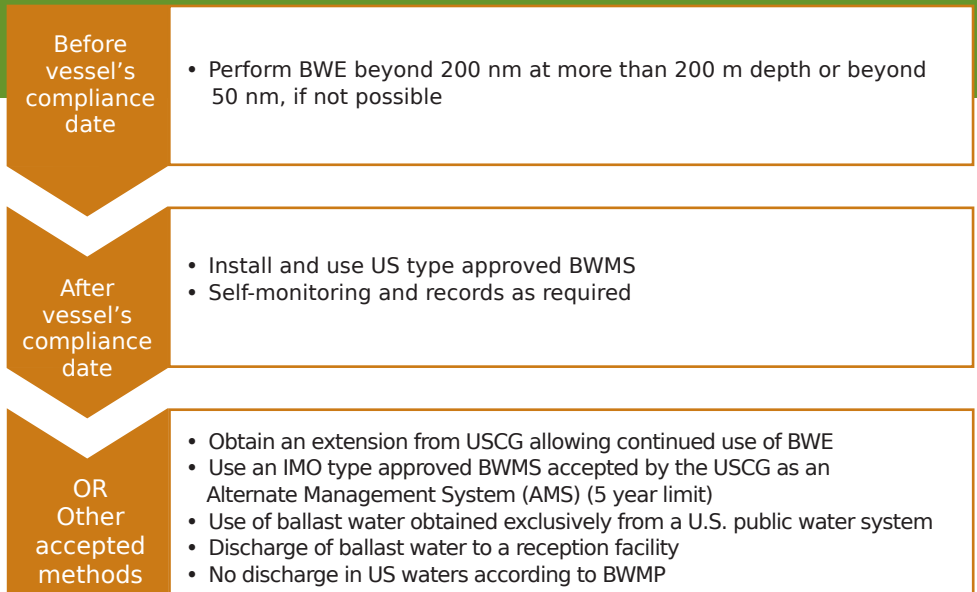
- Maintain and operate BWMS in accordance with maker's instructions and design limitations
- Check installed self-monitoring equipment. This will vary according to type of BWMS, and may include, e.g.:
 

<input type="radio"/> Power consumption	<input type="radio"/> Flow rate
<input type="radio"/> Filter back flush frequency	<input type="radio"/> pH, salinity
<input type="radio"/> Active substance dosage rate	<input type="radio"/> Temperature
<input type="radio"/> Neutralizer dosage rate	<input type="radio"/> Transmittance
<input type="radio"/> TRO (Total Residual Oxidant)	<input type="radio"/> UV Sensors

# US Requirements

At the entry into force of the BWMC the US is not a signatory to the Convention and has a separate national legislation on ballast water. The US Coast Guard (USCG) regulations are coupled to the scheduled drydocking date, but the discharge standards are similar to IMO requirements.

The USCG regulation is in force on BWE and a when a ship's compliance is due a BWMS must be installed or an other accepted method applied.



The USCG regulations also contain some additional requirements regarding a ship's operational procedures that go beyond the IMO's requirements.

- Maintain a BWMP covering US requirement (need not be approved)
- Submit a Reporting Form at least 24 hours before calling at an US port
- Plans for Management of Biofouling and Sediment must be available, e.g. in the BWMP, and records of ballast, sediment and fouling management must be kept

Additional requirements are found in the Vessel General Permit (VGP) for periodical sampling of the discharge:

- Calibration of sensors
- Sampling of biological indicators
- Sampling of residual biocides

The records of the periodical sampling must be retained onboard for 3 years.



# US Requirements

US requirements may change or be clarified. Always consult your SMS or contact company responsible prior to US calls.

## Check List for US Calls

PRE-ARRIVAL check → same as D-1

### Documentation

- Ballast Water Management Plan,
- Current extension letter granted to the vessel,
- Vessel certificates,
- Contracts and/or records verifying the date the vessel entered its last drydock,
- BWMS installation documents, and
- Vessel log books

If the vessel has NOT installed BWMS at original compliance date you must have onboard:

- Letter of extension of the vessel's compliance date, or
- If using an "other accepted method" formal documentation must be available, e.g. receipts from reception facility or public water utility

When vessel has installed a BWMS you must have onboard:

- Certificate for USCG approved BWMS or
- Acceptance by USCG of your IMO compliant BWMS as an AMS

When inspected you should demonstrate knowledge on the following in addition to that listed under IMO PSC:

- When next drydocking or the installation of a BWMS is scheduled,
- Expiration of extension and other permits

Other proper documentation that are all subject to evaluation during compliance assessments include crew knowledge, system installation, maintenance, and operation, and discharge quality.

Documentation and records related to VGP: Any vessel greater than 300 GT or more than 8 m<sup>3</sup> ballast tank must submit Notice Of Intent to EPA to discharge in compliance with VGP.

If the installed BWMS stops operating properly during a voyage, or the vessel's BWMS method is unexpectedly unavailable, the vessel owner/operator must report the problem to the nearest Captain of the Port as soon as practicable. Vessel owners/operators are encouraged to include "contingency plans" in the BWMP.

# Deficiencies

## Detainable deficiencies

Non-exhaustive list of deficiencies that may warrant detention by the PSC:

- Absence of an IBWMC, a BWMP or a Record Book;
- indication of substantial lack of correspondence with IBWMC and BWMP;
- the designated officers or crew are not familiar with essential BWM procedures including operation of BWMS and associated equipment;
- no BWM procedures have been implemented on board;
- no designated officer has been nominated;
- the ship has not complied with the BWMP for management and treatment of ballast water or fails compliance by sampling; or
- ballast water has been discharged other than in accordance with the regulations of the BWMC

## If possible avoid taking Ballast Water

In shallow water

In vicinity of sewage out-falls or dredging operations

In areas with toxic phytoplankton blooms (harmful algae blooms such as Red tides)

Where tidal flushing is poor or where the incoming or outgoing tide is known to be turbid

At night when bottom dwelling organisms may rise up in the water column

Near a known outbreak of diseases communicable through ballast water (e.g. cholera)

## Common BWMS hiccups and malfunctions

Design limitations are violated (can be found on the type approval)

Filter clogging and excessive backflushing

Power shortage or failure

Consumables depleted

Poor performance due to infrequent use, e.g. valves leaking

Equipment failure or underperformance

## Acceptable reasons

The Master is ultimately responsible and decides what necessitates a by-pass or uptake or discharge of BW not managed according to BWMP. Reasons include:

- Measures to ensure the safety of the ship or life at sea
- Damage to the ship or equipment
- Avoiding or minimizing pollution from the ship
- Uptake and discharge of ballast water in the same location

It is paramount to

- Document discrepancies in the Record Book
- Contact the company responsible
- Inform PSC in arrival port

# Glossary

**AMS:** Alternate Management System

**BW - Ballast Water:** Water with its suspended matter taken on board a ship to control trim, list, draught, stability or stresses of the ship

**BWE:** Ballast Water Exchange

**BWMC:** Ballast Water Management Convention

**BWMP - Ballast Water Management Plan:** Document describing the ballast water management process and procedures implemented on board individual ships

**BWMS - Ballast Water Management System:** Any system which processes ballast water such that it meets or exceeds the ballast water performance standard in regulation D-2. The BWMS includes ballast water treatment equipment, all associated control equipment, monitoring equipment and sampling facilities

**BWRB:** Ballast Water Record Book

**BWRF:** Ballast Water Reporting Form

**Captain of the Port:** The Coast Guard officer designated by the Commandant to command a Captain of the Port Zone


**Exemption:** An exemption may be 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

**IBWMC:** The International Ballast Water Management Certificate

**Non-indigenous species:** Any species outside its native range. Whether transported intentionally or accidentally by humans or transported through natural processes, some become invasive species

**PSC:** Port State Control

**Sediments:** Matter settled out of ballast water within a ship

 **USCG Extension:** US Coast Guard can grant an extension to a vessel's compliance date

The Little Blue Book on Ballast Water was initiated by Danish Shipping and developed by LITEHAUZ through a donation from the Danish Maritime Fund.

This brochure is a guideline on the various aspects of implementing the Ballast Water Convention and is intended to be used by the vessels' masters, officers and the shore based personnel involved in the implementation.

A number of members of Danish Shipping sponsored parts of the work and supplied artwork.



Version 01 Sept. 2017

#### Disclaimer

Nothing in this guideline exonerate any master, officer or shore-based person from following Company procedures, e.g. SMS and Ballast Water Management Plan. In the event of special circumstances that may raise doubt on which procedures there should be followed, the Company appointed responsible person ashore should always be consulted prior to such an operation. At the same time it should be emphasised that according to the ISM Code § 5.2, the master has the over-riding authority and the responsibility to make decisions with respect to safety and pollution prevention.