



# BWMS approval and beyond

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Working together  
for a safer world

# Ballast Water Management Systems and Installation

BWTS	INSTALLATION
<p>Various technologies :</p> <ul style="list-style-type: none"><li>Filter – Hydro cyclone</li><li>UV irradiation - UV advance Oxidisation</li><li>Electro catalyst - Electro chlorination</li><li>Chemical Injection – Ozone injection</li><li>Asphyxiation - low temp boiling – pH cracking</li><li>Plasma – Ultrasonic – Cavitation</li></ul> <p>Different combinations:</p> <ul style="list-style-type: none"><li>Filter – UV , Filter – UV – Ozone</li><li>Filter – Hydro cyclone – Electro chlorination</li><li>Asphyxiation – pH cracking - ultrasonic</li></ul>	<p>BWTS use or produce hazardous material:</p> <ul style="list-style-type: none"><li>Flammable – hydrogen Gas</li><li>Toxic - Hypochlorite, Ozone</li><li>Corrosive - Chlorine dioxide</li></ul> <p>BWTS installation on tankers:</p> <ul style="list-style-type: none"><li>Space categorisation</li><li>Connection with dangerous ballast Vs safe ballast</li></ul> <p>Retrofit for existing ships :</p> <ul style="list-style-type: none"><li>different skid configuration</li><li>Structural requirements</li><li>Stability &amp; watertight integrity</li></ul>



# LR rules... our approach

## SAFETY & RELIABILITY

GOAL

Rules and Regulations for Classification of Ships, January 2015  
Part 5, Chapter 25  
Ballast Water Treatment System & Installation  
Section 2  
Functional requirements

2.1 General

2.1.1 The emissions abatement plant is to be capable of operating at the maximum rated power of the combustion machinery to which it is connected. When the machinery installation is configured such that it is not intended to operate at the maximum rated power, the emissions abatement plant is to be capable of operating at the maximum rated power of the machinery to which it is connected. The maximum rated power of the machinery to which the emissions abatement plant is to be connected is to be stated on the Engine Approval or Pollution Prevention Certificate (PPC) of an approved certified engine using for vessels which are not subject to MARPOL Annex V.

2.1.2 Operation and maintenance of the emissions abatement plant is not to present a hazard to the ship's occupants or the environment.

2.1.3 Failure of the emissions abatement plant is not to present a hazard to the ship's occupants or any other hazard other than unburned emissions to the environment.

2.1.4 When the emissions abatement plant is connected to combustion machinery providing power for essential services, failure of or the inability to operate, the emissions abatement plant is not to prevent the combustion machinery from delivering sufficient power to those essential services to ensure the safe operation of the ship.

2.1.5 Any discharges to water from the emissions abatement plant are to be in accordance with the requirements of National and International Regulations, as applicable.

Section 3  
Performance requirements

3.1 General

3.1.1 The information required by this Section, the information required by Part 5, Chapter 15 and Chapter 16 of the Rules and Regulations for the Construction and Classification of Ships for the Carriage of Liquid Chemicals in Bulk, as applicable, and other information referred to in the Rules for Ships for Liquid Chemicals.

3.1.2 A description of the emissions abatement plant and the abatement technology used. This is to include details of the proposed combustion machinery operating configurations where using a common emissions abatement system for multiple related gas side streams and any limitations on the operation of combustion machinery connected to the emissions abatement system.

ShipRight  
Design and Construction

Additional Design Procedures

Annex 1  
ARBD Procedure - Ballast Water Treatment Systems (BWTS)

July 2015



Prescriptive requirements

Assessing Risk

Risk based solution



# IMO Type Approval process

1. Readiness evaluation - Review of design and construction  
Annex to Guidelines G8, Part 1, (G9 Basic approval)  
LR Rules Part 5, Ch 25
2. Testing of BWMS – Biological Efficacy (BE) and Environmental Testing (ETS)  
Annex to Guidelines G8, Part 2, Part 3  
IACS UR\_E10
3. Approval/Assessment - Evaluation of data and Reporting process  
Annex to Guidelines G8, Part 4, (G9 Final approval, BWM.2/Cir20)  
BWM.2/Circ.43(Annex 2 to G8), BWM.2/Circ.33



# Revised G8 , Resolution MEPC.279 (70)

- Intention was to make the TA guidelines more robust
- Increase the challenge level for type approval testing
- Annotation of the certificate with limitations , if any
- Introduce 5 day holding time for evaluating regrowth potential
- Recommend ship board testing for upper range of scaled models
- Standardise practise for test water augmentation
- Methodology for assessing the scale model approval.

The MEPC agreed revised Guidelines (G8) should be made mandatory and renamed as "Code for approval of ballast water management systems"



# Installation approval – Section 7 & 8 of the Revised G8

- Installation Survey and Commissioning procedure, following Type Approval Administration issuing IBWMC should verify the following documents on board,
  - Copy of Type Approval document
  - OM&S manual
  - BWMP
  - Installation specification , and
  - Installation commissioning procedure
- Administration issuing IBWMC should verify that,
  - The BWMS in conformity with the relevant type approval certificate and its installed in accordance with the installation specifications
  - There was an understanding to verify installed BWMS complies with the performance standards describe in regulation D-2



# Revised G8 BWMS compliance schedule

- The revised G8 guidelines will take effect as follows:

- For new approval of the systems:

The guidelines will be in effect from the day of the adoption (28 Oct 2016)

Ballast Water Management Systems (BWMS) approved after 28 October 2018 should meet the revised G8 Guidelines (Resolution MEPC.279 (70))

- For new installation onboard ships:

BWMS installed\* on or after 28 October 2020 should meet the new G8 guidelines.

BWMS installed\* prior to 28 October 2020 should be approved taking into account either existing G8 guidelines or preferably revised G8 guidelines.

*\*BWMS installed means contractual delivery date to the ship or, in the absence of a contractual delivery date, the actual delivery of the equipment to the ship*



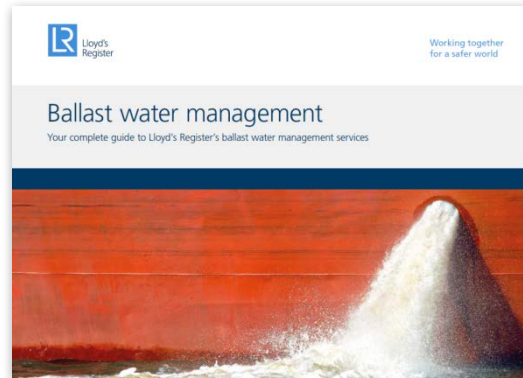
# What you suppose to do?

- 1 • Understand your obligations under the convention
- 2 • Ensure crew is adequately trained in BWM operations
- 3 • Manage ballast and sediments in accordance with the Convention
- 4 • Follow the procedures in the approved BWMP
- 5 • Maintain the Ballast Water Record Book up to date
- 6 • Ensure required surveys are carried out within permitted range dates
- 7 • Operate and maintain equipment in accordance with manufacturer's instructions
- 8 • Monitor the treatment system performance





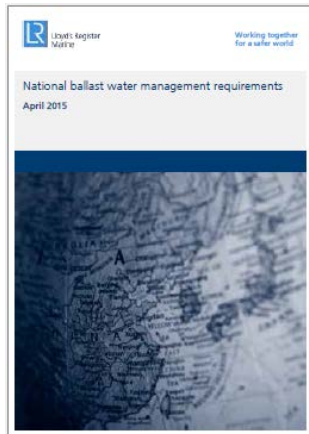
For support and resources visit our website  
[www.lr.org/bwm](http://www.lr.org/bwm)



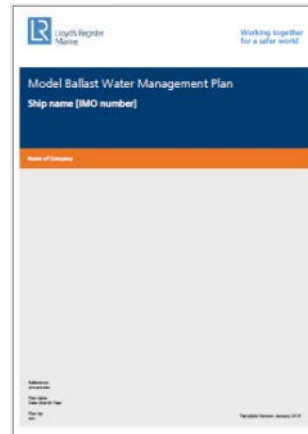
A complete guide to Lloyd's Register's ballast water management services



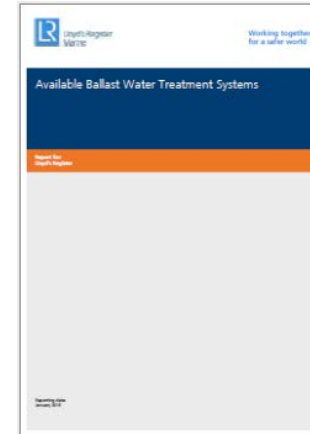
Understanding Ballast Water Management – Guidance for Shipowners and Operators



National Ballast Water Management Requirements



Model Ballast Water Management Plan



Available Ballast Water Treatment Systems



Ballast Water Management Awareness Training Factsheet

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