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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 46096.2-2025

**Ships and marine technology - Ballast water management
systems(BWMS) - Part 2: Risk assessment and risk reduction of
BWMS using electrolytic methods
(English Translation)**

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document is Part 2 of GB/T 46096 "Ship and Marine Technology Ballast Water Management System". GB/T 46096 has been published the following sections.

--- Part 2: Risk assessment and risk reduction for electrolysis ballast water management systems.

This document is equivalent to ISO 23314-2:2021 "Ships and marine technology - Ballast water management systems - Part 2: Ballast water management systems by electrolysis" Risk Assessment and Risk Reduction in Management Systems.

Introduction

The electrolysis ballast water management system (BWMS) treats ballast water through a combination of filtration (if applicable), electrolysis and neutralization to meet to meet the D-2 standard of the International Maritime Organization (IMO) Ballast Water Management Convention, or the port state administration [such as the U.S. Coast Guard (USCG)] Ballast Water Discharge Standard (BWDS) requirements.

During ballasting, the BWMS treats the ballast water by filtering (if applicable) and injecting active substances (such as sodium hypochlorite) produced by an electrolysis process.

The volatile substances can be generated by electrolysis directly in the ballast main line (main line electrolysis) or by electrolysis in a smaller branch line (from the ballast main line).

The active substances in the ballast water are calculated as total residual oxides (TRO).

BWMS ensures that ballast water treatment reaches the discharge limit by adjusting the TRO concentration in the ballast main line.

Before being discharged overboard, the wastewater must be neutralized and monitored to ensure that the concentration of residual active substances entering the receiving environment is acceptable. The treatment process is shown in Figure 1.

illustrate.

Processing procedures;

Feedback signal.

Figure 1 Overview of electrolytic BWMS

GB/T 46096 "Ships and marine technology - Ballast water management systems" is

intended to consist of one part.

--- Part 2: Risk assessment and risk reduction of electrolysis ballast water management systems.

The system provides risk assessment and risk reduction procedures to minimize the risk factors in the design of electrolysis ballast water management systems.

The risk that comes.

Ships and Marine Technology Ballast Water Management System Part 2: Ballast water management systems using electrolysis Risk Assessment and Risk Reduction

1 Scope

This document provides requirements and recommendations for designers of electrolysis ballast water management systems to document risk assessments throughout the equipment life cycle.

and risk reduction process to support its approval by the competent authorities and classification societies for use on board ships.

This document is based on the principles of safety and environmental protection, and is intended to identify and minimize the risks posed by hazards in the design of electrolysis ballast water management systems.

GB/T 15706-2012 provides guidance on risk assessment and risk reduction procedures. Risks to be considered include. personnel health and safety, the marine environment of ships, and the installation, operation, maintenance and structural integrity of ships.

This document does not address the specific requirements for active substances, related chemicals and/or other chemicals generated or used in electrolysis ballast water management systems.

Risk assessment methods for corrosion effects, toxicity and ecotoxicity, developed by the IMO Joint Group of Experts on the Scientific Aspects of Marine Environment Protection (GESAMP) the Ballast Water Management System (BWVG) conducted an assessment of the Ballast Water Management System (BWMS) using active substances in accordance with the IMO GESAMP Assessment Methodology.

Evaluate.

This document does not address the risks associated with end-of-life disposal of BWMSs.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document.

GB/T 15706-2012 Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010, IDT)

3 Terms and Definitions

The terms and definitions defined in GB/T 15706-2012 and the following apply to this document.

active substance

Substances or organisms, including viruses or fungi, that have general or specific beneficial or adverse effects on harmful aquatic organisms and pathogens.

NOTE: For electrolysis (3.8) ballast water management systems (3.3), it refers to the reaction products produced by electrolysis for ballast water treatment.

[Source. IMO G9]

Ballast water

Water with suspended matter added to a ship to control heel, trim, draft, stability or stresses.

A system that can treat ballast water to meet or exceed the Ballast Water Management Convention D-2 ballast water discharge performance standards.

Note 1: The ballast water management system includes the ballast water treatment equipment, all related control equipment, the system piping arrangement specified by the manufacturer, control and monitoring equipment and