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PEOPLE'S REPUBLIC OF CHINA**

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**Ships and marine technology - Ballast water management
systems (BWMS) - Computational physical modelling and
calculations on scaling of UV reactors**

船舶与海上技术 压载水管理系统（BWMS）紫外反应器的比例缩放数值模拟与计算

(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 equivalent to ISO 23152:2021 "Ships and marine technology - Ballast water management systems (BWMS) - Proportion of UV reactors Scaling Numerical Simulation and Computation. The following minimal editorial changes were made to this document.

--- Added the unit expression of rated processing capacity (see 3.28).

1 Scope

This document specifies a methodology for the computational modelling of ultraviolet (UV) reactors designed for ultraviolet ballast water management systems (UVBWMS).

Computational modeling was used to calculate the UV equivalent reducing dose (RED) and to compare the calculated RED of the scaled reactor to that of the basic reactor.

The RED is determined by the dose response of a given microorganism.

Note: The International Maritime Organization (IMO) requires validation of calculation models.

Using computational models to simulate physical UV reactors requires validation of the model (i.e., that the model operates as expected and reflects the correct physical constraints).

The model developed based on this document is intended to validate simulated but not tested scaling. The simulation was validated based on test data of a base model UV reactor in the product line.

The entire UVBWMS usually includes other processing devices, such as filters. This document does not consider the impact of external subsystem performance changes on the entire Impact of BWMS.

2 Normative references

This document has no normative references.

3 Terms and definitions

The following terms and definitions apply to this document.

3.1

A repository of cell lines and cultured microorganisms used for research

3.2 Base model

A UV Ballast Water Management System (UVBWMS) as defined in the BWMS Code that has successfully completed onshore testing (3.30) Model.

Note: Base models typically have a low-range TRC (3.28).

3.3 Basereactor

UV reactor (3.41) of the basic model (3.2).

3.4 Biodosimetry

The biological response was measured as a proxy for the UV dose (3.34).

3.5

Numerical methods and algorithms for solving and analyzing problems involving fluid flows.