Certificate no.:
TAA00003R1

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Control and Monitoring System

with type designation(s)
BalClor BWMS (model range BC-150 to BC-8000)

issued to
SunRui Marine Environment Engineering Co., Ltd.
Qingdao, **China**

is found to comply with
DNV rules for classification – Ships Pt.6 Ch.5 Sec.21 Cyber security

Application:

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.
The Type Approval covers security capabilities in accordance with DNV security profile 1 (SP1) and IACS UR E27, subject to conditions stated in this certificate.

Issued at **Høvik** on **2025-10-14**
This Certificate is valid until **2027-10-13**.
DNV local unit: **Qingdao NB & CMC**

Approval Engineer: **Qitao Gan**

for **DNV**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to USD 300 000.

Product description

The main purpose of **SunRui Marine Environment Engineering Co.**'s **BalClor** Ballast Water Management System (BWMS) is to treat and manage the ballast water on board vessles via a combination of filtration, disinfection and neutralization process.

This type approval certificate covers cyber security capabilities of BalClor BWMS in accordance with **DNV security profile 1** (SP1) and **IACS UR E27**, for the models range from BC-150 to BC-8000, BSC-150 to BSC-8000, with the following components:

Component Description	*Type Designation /HW version*	*OS/Platform SW version*	*Application SW version*
Control Unit (PLC)	Mitsubishi IQ-R Series (R04)	v66 (v66 or newer)	PLC SW 1.1nnx revisions (1.115V or newer)
Control Panel (HMI)	Mitsubishi GT25/27 Series (GT2510)	AW (AW or newer)	HMI SW version 1.2nnx (1.265B or newer)
Network component: Firewall (FW)	MOXA EDR-8010 series	v5.y.z (5.10.72 or newer)	Moxa V3.14.z (3.14.0 or newer)
Industrial Computer (Switch/Gateway(GW))	MOXA MC1100 series	Debian 4.y.z (4.9.144-3.1 or newer)	Moxa v 2.0.z (2.0.0 or newer)

Approval conditions

The following documentation of the actual application is to be submitted for approval in each case:

- Reference to this Type Approval Certificate
- Inventory list
- System block diagram (topology)
- Report from test at manufacturer.

Any modifications in the system to be delivered compared with the type approved system covered by this certificate shall be documented and submitted for approval in each case.

Major changes of the type approved system affecting future deliveries shall be informed to DNV. If the changes are considered to affect functionality for which rule requirements apply, a new functional type test may be required, and the certificate may have to be renewed to identify the new version. Minor changes are covered by this type approval.

Application/Limitation

All hardware devices and accessible interfaces in the system shall be installed in areas with means to prevent unauthorised access and/or with physical access restrictions. The approval is valid when the internal network interface is connected to a trusted security zone.

Type Approval documentation

Tests carried out

All hardware and software versions were tested on Jun. 18th~19th 2025 at **SunRui** site in Qingdao, China, in accordance with requirements for DNV security profile 1 (SP1) for

- Cyber secure(Essential), ref. DNV-RU-SHIP Pt.6 Ch.5 Sec.21
- Cyber resilience of on-board systems and equipment, ref. IACS UR E27

Marking of product

The type designation and the manufacturer name and contact address shall be affixed visibly, legibly and indelibly to the product. In addition, the product shall be marked with:

- model name
- serial number
- power supply rating

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate
- Review documented evidence of adherence to Secure Development Lifecycle processes

A renewal assessment will be performed at renewal of the certificate.

Manufactured by:

SunRui Marine Environment Engineering Co., Ltd., Qingdao, Shandong Province, China
(contact: DNV local station in Qingdao)

END OF CERTIFICATE