



Design Appraisal Document

Lloyd's Register EMEA
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Date
07 November 2023

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HPC 1710336/46753-23/JW/JM

**MACHINERY GENERAL DESIGN APPRAISAL
BALLAST WATER TREATMENT SYSTEM
MANUFACTURER: NORWEGIAN GREENTECH AS
TYPE DESIGNATION: NGT BWMS (DL1-BK273 TO D5XL18-BK750, DL1-BWT80 TO D5XL24-BWT500)**

VALID UNTIL 6 NOVEMBER 2028

1. The documents listed in paragraph 1 of the appendix have been examined for compliance with **Part 5, Chapters 12 and 25, Part 6 Chapter 1&2 of the Rules and Regulations for the Classification of Ships, July 2023** and are assigned an appraisal status as indicated, in accordance with the following conditions:-

2. Details

2.1 System Details

Description:	Filtration and UV Ballast Water Management System
Type:	NGT BWMS (models DL1-BK273 to D5XL18-BK750 and DL1-BWT80 to D5XL24-BWT500)
Design pressure:	1.5 bar .. 10 bar

2.2 Treatment Rated Capacity and limitations

According to IMO Type Approval Certificate TAP000028V Rev. 3.

3. Comments

3.1 The intended installation location of the NGT BWMS models onboard ship is to be suitable and in compliance with the requirements for such location. Its connection into the ship's system, including the electrical system, is to be shown on the ship's plans to be submitted for approval.

3.2 The NGT BWMS Ex is to be installed in accordance with any conditions of safe use mentioned in the equipment's Ex safety certification documents.

3.3 Components of NGT BWMS outside the scope of supply from Norwegian Greentech AS are to be of type complying with Lloyd's Register Rules for Ships Part 5 and submitted for approval prior to installation.

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- 3.4 Installation survey and commissioning is to be conducted for each installation onboard ship, in accordance with IMO Res MEPC.300(72) Section 8 and Lloyd's Register specific survey requirements.
- 3.5 By-pass valve is to be provided by shipyard as shown on approved P&IDs in the Appendix.
- 3.6 It is noted that stainless steel pipes ND 125 and ND 150 are provided with nominal thickness less than required by Part 5, Chapter 12, Table 12.10.1. Acceptance of this thickness based on EN ISO 1127 has been specially considered.
- 3.7 This Machinery Design Appraisal Document does not cover statutory aspects.
- 3.8 The validity of this Machinery General Design Appraisal expires as shown above respectively change of Rules requirements, whichever comes first.
- 3.9 The changes to the software are to be carried out in accordance with the software quality plan. Any software changes are to be uniquely identified, a record of changes to the system since the original issue (and their identification) is to be maintained and made available to the attending Surveyor on request.
- 3.10 The NGT BWMS Control Cabinet and the UV Control Cabinet, however, must always be located in non-hazardous areas. The UV chamber (with pressurisation system), the filter, the flow meter, valves and sensors of the Ex version of the NGT BWMS model D5XL16-BK750 were found to be suitable for installation and use in hazardous area Zone 2. For other NGT BWMS models, a valid Ex-certificate issued by a notified/recognized Certification Body must be provided for the UV chamber model of the selected NGT BWMS model. Installations in a hazardous area are to be approved in each case.



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LR031.2022

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Appendix

1. The documents listed below have been examined

Document No.	Rev.	Title	Status	Date
DW0050-11-02	-	Dimensional Drawing	SI	07/11/2023
DW0100-11-02				
DW0200-11-02				
DW0210-11-02				
DW0300-11-02				
DW0400-11-02				
DW0410-11-02				
DW0415-11-02				
DW0420-11-02				
DW0500-11-02				
DW0600-11-02				
DW0610-11-02				
DW0700-11-02				
DW0800-11-02				
DW0810-11-02				
DW0900-11-02				
DW0910-11-02				
DW01000-11-02				
DW01010-11-02				
DW01100-11-02				
DW01110-11-02				
DW01200-11-02				
DW01210-11-02				
DW01300-11-02				
DW01310-11-02				
DW01400-11-02				
DW01410-11-02				
DW01500-11-02				
D1100-13-01	A			

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Document No.	Rev.	Title	Status	Date
PW0050	-	P&ID	A	07/11/2023
PW0100				
PW0200				
PW0210				
PW0300				
PW0400				
PW0410				
PW0415				
PW0420				
PW0500				
PW0600				
PW0610				
PW0700				
PW0800				
PW0810				
PW0900				
PW0910				
PW1000				
PW1010				
PW1100				
PW1110				
PW1200				
PW1210				
PW1300				
PW1310				
PW1400				
PW1410				
PW1500				
P1100	A	P&ID NTG BWMS D5XL16-BK750	A	14/10/2023

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Document No.	Rev.	Title	Status	Date
DW0050	-	Bill of Materials	SI	07/11/2023
DW0100				
DW0200				
DW0210				
DW0300				
DW0400				
DW0410				
DW0415				
DW0420				
DW0500				
DW0600				
DW0610				
DW0700				
DW0800				
DW0810				
DW0900				
DW0910				
DW1000				
DW1010				
DW1100				
DW1110				
DW1200				
DW1210				
DW1300				
DW1310				
DW1400				
DW1410				
DW1500				
D1100	C			
D5XL24.3050 Ec Us3 NW400 PN10 Q200	01	D5XL24.3050 Ec Us3 NW400 PN10 Q200	SI	07/11/2023
D5XL22.3050 Ec Us3 NW400 PN10 Q200	01	D5XL22.3050 Ec Us3 NW400 PN10 Q200	SI	07/11/2023
D5XL20.3050 Ec Us3 NW400 PN10 Q200	01	D5XL20.3050 Ec Us3 NW400 PN10 Q200	SI	07/11/2023
D5XL16.3050 EX Ec Us3 NW400 PN10 Q200	00	D5XL16.3050 EX Ec Us3 NW400 PN10 Q200	SI	07/11/2023

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Document No.	Rev.	Title	Status	Date
EW3400-04-1800	A	Control cabinet wiring diagram	A	
EW3410-04-1800				
EW3420-04-1800				
EW3430-04-1800				
EW3440-04-1800				
EW3450-04-1800				
EW3460-04-1800				
EW3470-04-1800				
EW3480-04-1800				
EW3490-04-1800				
EW3500-04-1800				
EW3510-04-1800				
EW3520-04-1800				
EW3530-04-1800				
EW3540-04-1800				
EW3550-04-1800				07/11/2023
EW3560-04-1800				
EW3570-04-1800				
EW3580-04-1800				
EW3590-04-1800				
EW3600-04-1800				
EW3610-04-1800				
EW3620-04-1800				
EW3630-04-1800				
EW3640-04-1800				
EW3650-04-1800				
EW3660-04-1800				
EW3670-04-1800				
E3560-04-1800_EX	A	NTG BWMS D5XL16-BK750	A	07/11/2023
CW3100-04-0700	A	BWMS Control Cabinet Electrical drawing	A	07/11/2023
CW3200-04-0700	A	BWMS Control Cabinet Electrical drawing	A	07/11/2023

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Document No.	Rev.	Title	Status	Date
CW3300-04-0700	A	BWMS Control Cabinet Electrical drawing	A	07/11/2023
C3300-04-0700_EX	A	BWMS Control Cabinet Electrical drawing	A	07/11/2023
20.3050_440V_60Hz_L5 00 RA22-RIMO_V2_R00		Electrical drawings UV units	A	07/11/2023
22.3050_440V_60Hz_L5 00 RA22-RIMO_V2_R00		Electrical drawings UV units	A	07/11/2023
24.3050_440V_60Hz_L5 00 RA22-RIMO_V2_R00		Electrical drawings UV units	A	07/11/2023
16.3050_440V_60Hz_L5 R02 RA22-RIMO_CA65_V2		Electrical drawings UV units Ex	A	07/11/2023

2. The documents listed below have been considered together with the submitted documents in the appraisal

Document No.	Rev.	Title
OSMM	F	Operation, Safety & Maintenance manual
GM_EX2_NGT	1.0.0	UV Manual
TAP000028V	3	IMO Type Approval Certificate



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Document No.	Rev.	Title
TSW0050	-	Technical Specification
TSW0100		
TSW0200		
TSW0210		
TSW0300		
TSW0400		
TSW0410		
TSW0415		
TSW0420		
TSW0500		
TSW0600		
TSW0610		
TSW0700		
TSW0800		
TSW0810		
TSW0900		
TSW0910		
TSW1000		
TSW1010		
TSW1100		
TSW1110		
TSW1200		
TSW1210		
TSW1300		
TSW1310		
TSW1400		
TSW1410		
TSW1500		
TS1100 - D5XL16-BK750 EX	B	Technical Specification

3. Documents not mentioned above are not required for appraisal or as supporting documentation and have not been retained.

Appraisal Status Key

- A Approved – provided the arrangements are to the surveyor's satisfaction
SI Retained as supporting documentation for information only

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