



Design Appraisal Document

Lloyd's Register EMEA
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Date
15 March 2018

Please quote this reference number on all future communications
HPC1710336/36681-18/TM/JB/AC (ENS 37314-18/JW)

MACHINERY GENERAL DESIGN APPRAISAL
BALLAST WATER TREATMENT SYSTEM
MANUFACTURER: MMC GREEN TECHNOLOGY AS

VALID UNTIL 14 MARCH 2023

1 The document(s) listed in paragraph 1 of the appendix has/have been examined for compliance with **Part 5, Chapters 12, 13 and 25 of the Rules and Regulations for the Classification of Ships, July 2017** and is/are assigned an appraisal status as indicated, subject to satisfactory resolution of the following matters:

2. Details

2.1 System Details

Type:	Mechanical filtration and ultra-violet treatment
Flow meter:	Euromag MUT 2200EL
Automatic Filter:	Boll & Kirch Filterbau GmbH 6.18.2, 6.18.3
Backflush pump:	DESMI ESL Monobloc
UV chamber:	DL2.1500, D4XL10.3000, DLX6-1500
Main control cabinet:	MMC BWMS
UV power and control cabinet:	DL2.1500, D4XL10.3000, DLX6-1500
UV controller:	Lambda 3, Lambda 5
Design temperature:	-2 °C .. +50 °C
Design pressure:	1 bar .. 10 bar

FINAL ACCEPTANCE OF ACTUAL ITEM(S) DEPEND(S) ON SATISFACTORY SURVEY AND TESTING

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2.2 Treatment Rated Capacity

Model	Treatment Rated Capacity [m ³ /h]
MMC BWMS model 50	5 – 50
MMC BWMS model 100	10 – 100
MMC BWMS model 150	10 – 150
MMC BWMS model 300	10 – 300
MMC BWMS model 370	20 – 370
MMC BWMS model 450	30 – 450
MMC BWMS model 500	20 – 500
MMC BWMS model 600	20 – 600
MMC BWMS model 750	40 – 750
MMC BWMS model 1000	40 – 1000
MMC BWMS model 1400	40 – 1400

3. Machinery Aspects

- 3.1 Installation in the ship including by-pass and isolation arrangement, fresh water supply, compressed air supply, ventilation and drain and back flush connection is to be in accordance with the according P&ID system and the manufacturer's installation instructions. **AQS**
- 3.2 The MMC Ballast Water Treatment System is to be installed in a by-pass to the ship's main ballast water system in compliance with Part 5, Chapter 25, 11.3 of the Rules for Ships. **AQS**
- 3.3 By-pass and isolation valves mentioned in 3.1 are to comply with Part 5, Chapter 12, 6.1.3 and 6.1.4 of the Rules for Ships. **AQS**
- 3.4 Thickness of pipes used in the MMC Ballast Water Treatment System are to be in compliance with Part 5, Chapter 12, section 2, Table 12.2.4 and/or section 10, Table 12.10.1 of the Rules for Ships. **AQS**

4. Electrical Aspects

- 4.1 It is understood that the Ballast water treatment system is installed and operating in non-hazardous areas.
- 4.2 It has to be verified to the local surveyor satisfactory, that the by-pass arrangement, mentioned in item 3.1., is controlled by an approved ballast management system. **AQS**

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5. General Aspects

- 5.1 The HAZOP is not part of this design appraisal and is to be reviewed and accepted by LR.
- 5.2 The ship specific installation of the ballast water treatment system is to be approved on a case by case basis by the design support office responsible for plan approval of the vessel piping system.
- 5.3 The validity of this Machinery General Design Appraisal expires as shown above respectively change of Rules requirements, whichever comes first.


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LR031.1.2015.12
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Appendix

1. The document(s) listed below has/have been examined

Document No.	Rev.	Title	Status	Date
P1369	A	MMC BWMS 50 m ³ /h Piping & Instrumentation Diagram	A	15/03/2018
P1460	-	MMC BWMS 100 m ³ /h Piping & Instrumentation Diagram	A	15/03/2018
P1100	A	MMC BWMS 300 m ³ /h Piping & Instrumentation Diagram	A	15/03/2018
P1372	A	MMC BWMS 370 m ³ /h Piping & Instrumentation Diagram	A	15/03/2018
P1218	B	MMC BWMS 450 m ³ /h Piping & Instrumentation Diagram	A	15/03/2018

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Document No.	Rev.	Title	Status	Date
P1490	-	MMC BWMS 600 m ³ /h Piping & Instrumentation Diagram	A	15/03/2018
P1359	A	MMC BWMS 750 m ³ /h Piping & Instrumentation Diagram	A	15/03/2018
P1312	A	MMC BWMS 1000 m ³ /h Piping & Instrumentation Diagram	A	15/03/2018
P1373	A	MMC BWMS 1400 m ³ /h Piping & Instrumentation Diagram	A	15/03/2018
Unnumbered	-	Technical Specification MMC BWMS 50m ³ /h	SI	15/03/2018
Unnumbered	-	Technical Specification MMC BWMS 100m ³ /h	SI	15/03/2018
Unnumbered	-	Technical Specification MMC BWMS 150m ³ /h	SI	15/03/2018
Unnumbered	-	Technical Specification MMC BWMS 300m ³ /h	SI	15/03/2018
Unnumbered	-	Technical Specification MMC BWMS 370m ³ /h	SI	15/03/2018
Unnumbered	-	Technical Specification MMC BWMS 450m ³ /h	SI	15/03/2018
Unnumbered	-	Technical Specification MMC BWMS 500m ³ /h	SI	15/03/2018
Unnumbered	-	Technical Specification MMC BWMS 600m ³ /h	SI	15/03/2018
Unnumbered	-	Technical Specification MMC BWMS 750m ³ /h	SI	15/03/2018
Unnumbered	-	Technical Specification MMC BWMS 1000m ³ /h	SI	15/03/2018
Unnumbered	-	Technical Specification MMC BWMS 1400m ³ /h	SI	15/03/2018
Q-36716	F	Butterfly valve lug type	SI	15/03/2018
Q-36719	B	Butterfly valve lug type	SI	15/03/2018
E1061-1000	-	Electrical Drawing Control Cabinet MMC BWTS 150- 300 m ³ /h	A	15/03/2018
E1061-1700	-	Electrical Drawing Control Cabinet MMC BWTS 500 m ³ /h	A	15/03/2018
10_3000_L5_440 V_60Hz_Ec	-	Electrical Drawing UV Light cabinet	A	15/03/2018

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

Document No.	Rev.	Title
Unnumbered	0	Operation and Maintenance Manual
Unnumbered	0	Installation and Operation Manual
Unnumbered	-	Response to LR comments 23.02.2018
Unnumbered	0	HAZOP summary report
Unnumbered	00	Functional description
Unnumbered	-	System description

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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 |
| AQS | Details to be submitted by the client to the local surveyor's Office responsible for surveying the building and the arrangements verified in accordance with the Rule/Regulations requirements by the surveyor. |
| SI | Retained as supporting documentation for information only |

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