MARINO MATE™

BALLAST WATER MANAGEMENT SYSTEM

The best technology for marine ecosystem preservation

MARINOMATE™ BWMS provides the best solution with energy-efficiency and high performance ships ballast water treatment

KTM
KOREA TOP MARINE CO.,LTD

CONTENTS

“

KT MARINE, is a Maritime Company that provides valuable service, with a high emphasis on Safe Shipboard Operations and Protection of the Marine Environment.

”

01

Company Introduction

MARINOMATE™

01 Company Introduction

Company Name	KT MARINE CO.,LTD.	President	Capt. Bag, Og Yeol	Tel	+82-51-441-0692~3
Add	Rm. 1808, 60 Centumbuk-daero, Haeundae-gu, Busan, Korea (Jaesong-dong, Centum IS Tower)			Fax	+82-51-441-0695

History

2001.05	Established in Jungang-Dong Busan
2008.08	Moved the main office to Jeasong-Dong
2009.06	ISO 9001 & 14001 Approved
06	Selected as a Busan Leading Company
2010.08	selected BWMS as a new project
2011.03	Certification of INNO-BIZ, Venture company
05	Presentation of the 17th Annual Conference of the Sea
06	Lab – Scale install and testing for Basic Approval to IMO
06	Made and tested Lab-Scale BWMS for IMO Basic Approval
08	Established Land based-equipment for Final Approval to IMO (in Korea Maritime and Ocean University)
2014.10	Granted to Final Approval from IMO
2016.03	Granted to Type Approval from Goverment
11	BWMS granted to Approval from USCG-AMS

Business Area

BALLAST WATER MANAGEMENT SYSTEM (BWMS)	SHIP MANAGEMENT	MARINE SUPPLY	SHIP INSPECTION

02

Technology for Ballast Water Management System

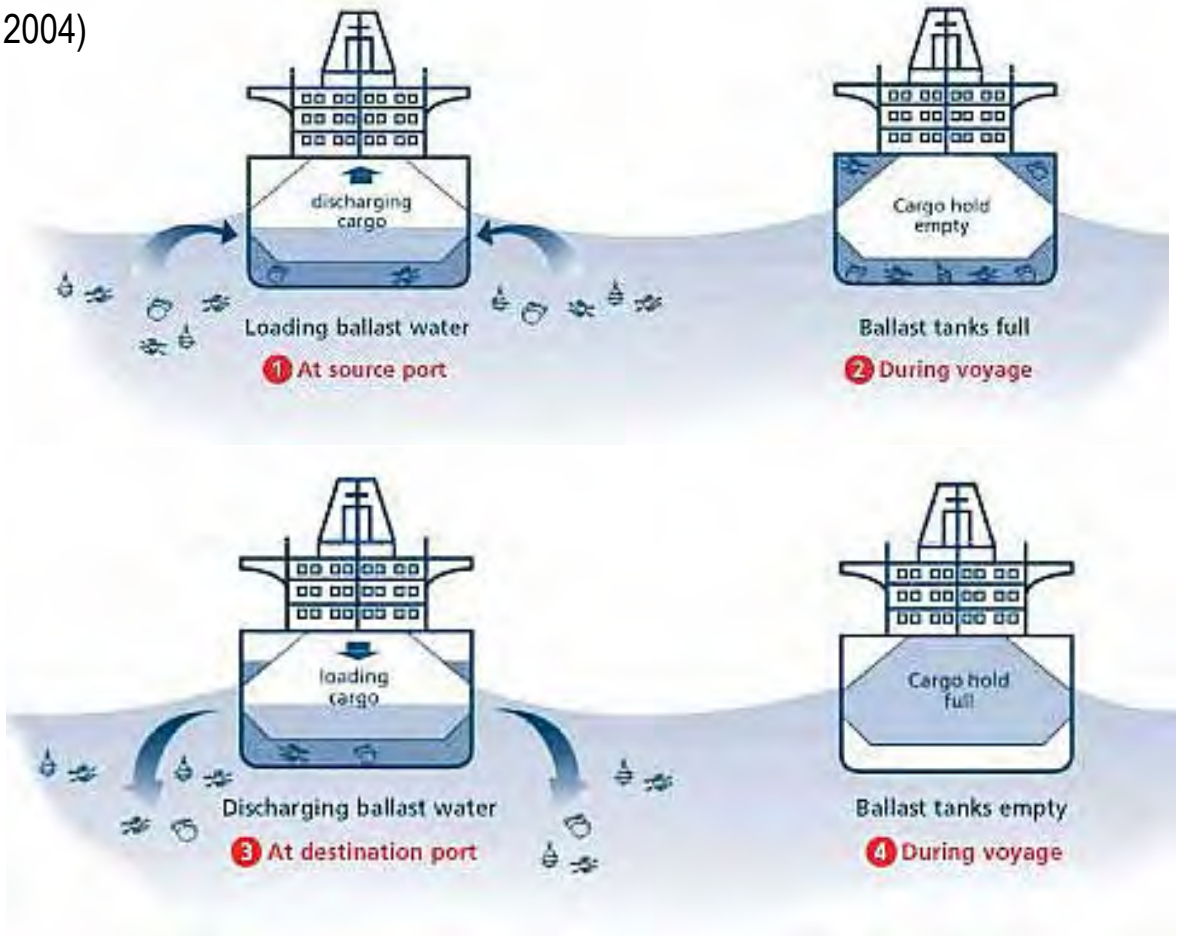
02

Technology for Ballast Water Management System

MARINOMATE™ BWMS It is the most efficient and most effective method of electrolysis among multiple methods of handling the vessel balance.

What is Ballast Water?

Ballast Water means water with its suspended matter taken on board a ship to control trim, list, draught, stability or stresses of the ship. (From BWM Convention, 2004)



02

Technology for Ballast Water Management System

MARINOMATE™ BWMS It is the most efficient and most effective method of electrolysis among multiple methods of handling the vessel balance.

Overview of BWMS

There are electricity electrolysis, ultraviolet ray projection (UV), ozone injection, chemical dosage, and various methods.

Electrolysis

- Disinfectant generated by direct electric current(DC) using anode and cathode electrode
- Microorganism removal directly by NaOCl, HOCl, OH-radical

Ultra Violet

- Damage and destruction of microorganism DNA in the UV-C(200~280nm, maximum efficiency is 254nm)

Ozone

- Microorganisms removal by oxidation directly as ozone produced by ozone generator

Chmical dosing

- Optimal dosing of disinfectant(H2O2, Cl2)

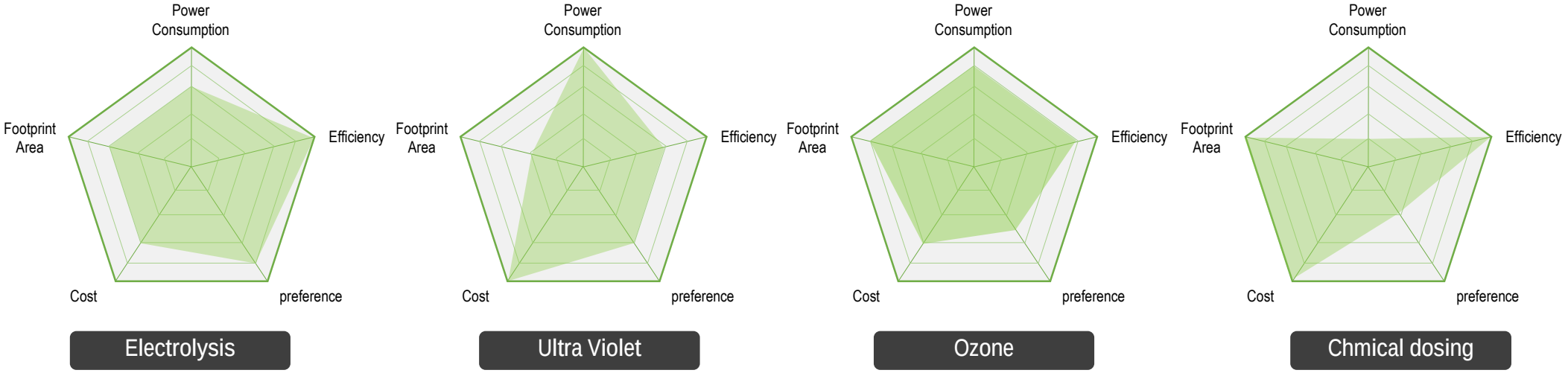
02

Technology for Ballast Water Management System

MARINOMATE™ BWMS It is the most efficient and most effective method of electrolysis among multiple methods of handling the vessel balance.

Comparison graph to BWMS technology

There are electricity electrolysis, ultraviolet ray projection (UV), ozone injection, chemical dosage, and various methods.



Item	Electrolysis	Ultra Violet	Ozone	Chmical dosing
Power Consumption	Middle	Very High	High	Small
Footprint Area	Middle	Small	Large	Very Large
Cost	Middle	Very Expensive	Middle	Expensive
Efficiency	Very Good	Middle	Good	Very Good

02

Technology for Ballast Water Management System

MARINOMATE™ BWMS It is the most efficient and most effective method of electrolysis among multiple methods of handling the vessel balance.

Principle Technology for BWMS

The ballast water is pumped into the plankill pipe™ unit of MARINOMATE™ BWMS from the sea chest using a ballast pump.
The plankill pipe™ unit shocks and damages to aquatic organisms by physical collision and turbulence. Damaged organisms are effectively disinfected by the Total Residual Oxidants (TRO) generated from the electrolyzer unit and will not be able to regrowth by residual chlorine in the ballast tank.

The electrochemical disinfection reactions are as below.
During electrolysis of sea water, chlorine (Cl2) is produced at the anode.

$$2H_2O \rightarrow O_2 + 4H^+ + 4e^-$$

$$2Cl^- \rightarrow Cl_2 + 2e^-$$

At the cathode, hydrogen (H2) is generated.

$$2H_2O + 2Na^+ + 2e^- \rightarrow 2NaOH + H_2$$

The overall reaction of the electrolysis is as below.

$$2Na^+ + 2Cl^- + 2H_2O \rightarrow 2Na^+ + 2OH^- + Cl_2 + H_2$$

02

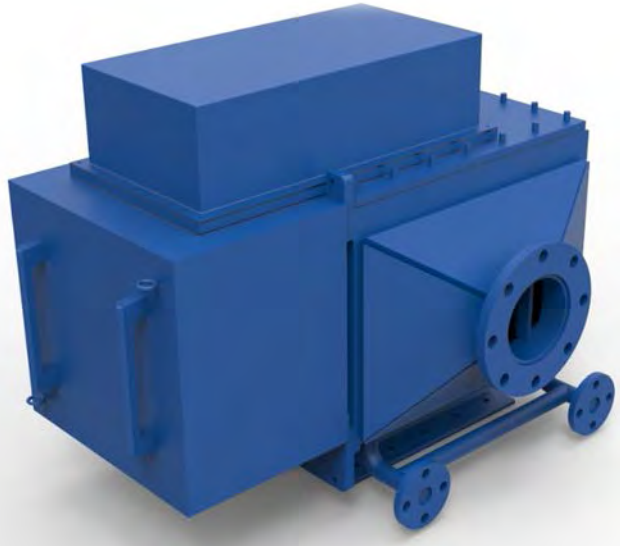
Technology for Ballast Water Management System

MARINOMATE™ BWMS It is the most efficient and most effective method of electrolysis among multiple methods of handling the vessel balance.

Principle Technology for BWMS

Chlorine (Cl2) reacts immediately with water to produce hypochlorous acid (HOCl) and hypochlorite (OCl-) which have oxidizing power to microorganisms. Also, hypochlorous acid (HOCl) exists in a pH-dependent and dissociates slightly into hydrogen (H+) and hypochlorite ion (OCl-). The term “free available chlorine” is used to refer to the sum of the concentrations of hypochlorous acid (HOCl) and hypochlorite ion (OCl-)

$$Cl2 + NaOH \rightarrow NaOCl + H+ + Cl-$$
$$Cl2 + H2O \rightarrow HOCl + H+ + Cl-$$
$$HOCl \leftrightarrow OCl- + H+$$



150TON / Electrolyzer Unit

02

Technology for Ballast Water Management System

MARINOMATE™ BWMS It is the most efficient and most effective method of electrolysis among multiple methods of handling the vessel balance.

Principle Technology for BWMS

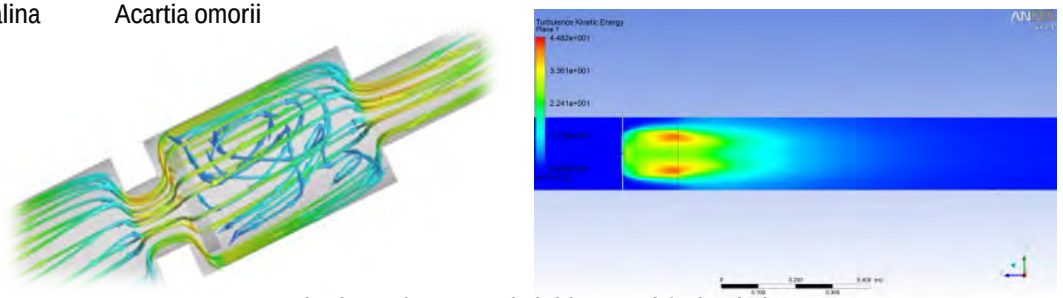
Plankill Pipe™ Unit + Electrolyzer Unit + Neutralizer Unit

Plankill pipe unit

- Installed directly in the main ballast pipe line
- No power supply, easy to install and maintenance
- Reduction of aquatic organism by physical effect as collision and turbulence

Oithona sp. Balanus larvae

Artemia salina Acartia omorii Disruption



Result of CFD (Computed Fluid Dynamic) Simulation

02

Technology for Ballast Water Management System

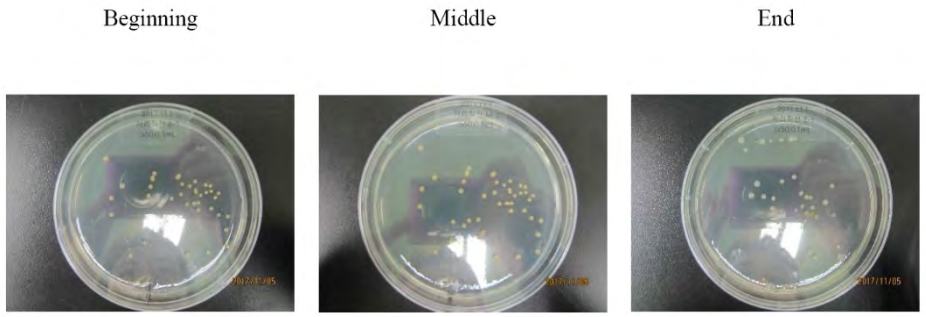
MARINOMATE™ BWMS It is the most efficient and most effective method of electrolysis among multiple methods of handling the vessel balance.

Principle Technology for BWMS

Plankill Pipe™ Unit + Electrolyzer Unit + Neutralizer Unit

Electrolyzer unit

- Installed directly on the Main ballast pipe line, High compatibility of installation by ballast pipe line arrangement
- Installed directly on the Module type. Easy installation & maintenance
- Achieve a stable treatment efficiency by powerful disinfection(NaOCl) & Maintain residual effect

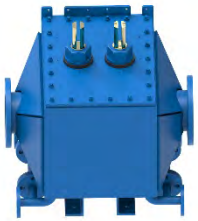


Before Treatment

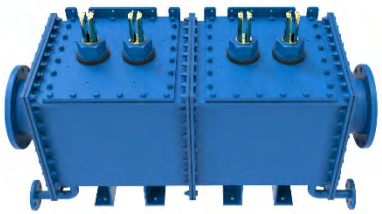
After Treatment

Neutralizer unit

- Reduction of remaining TRO(as Cl2) to ballast tank
- Increasing of neutralization efficiency as turbulence effect using mixer
- Automatically operated by PLC



150TON / Electrolyzer



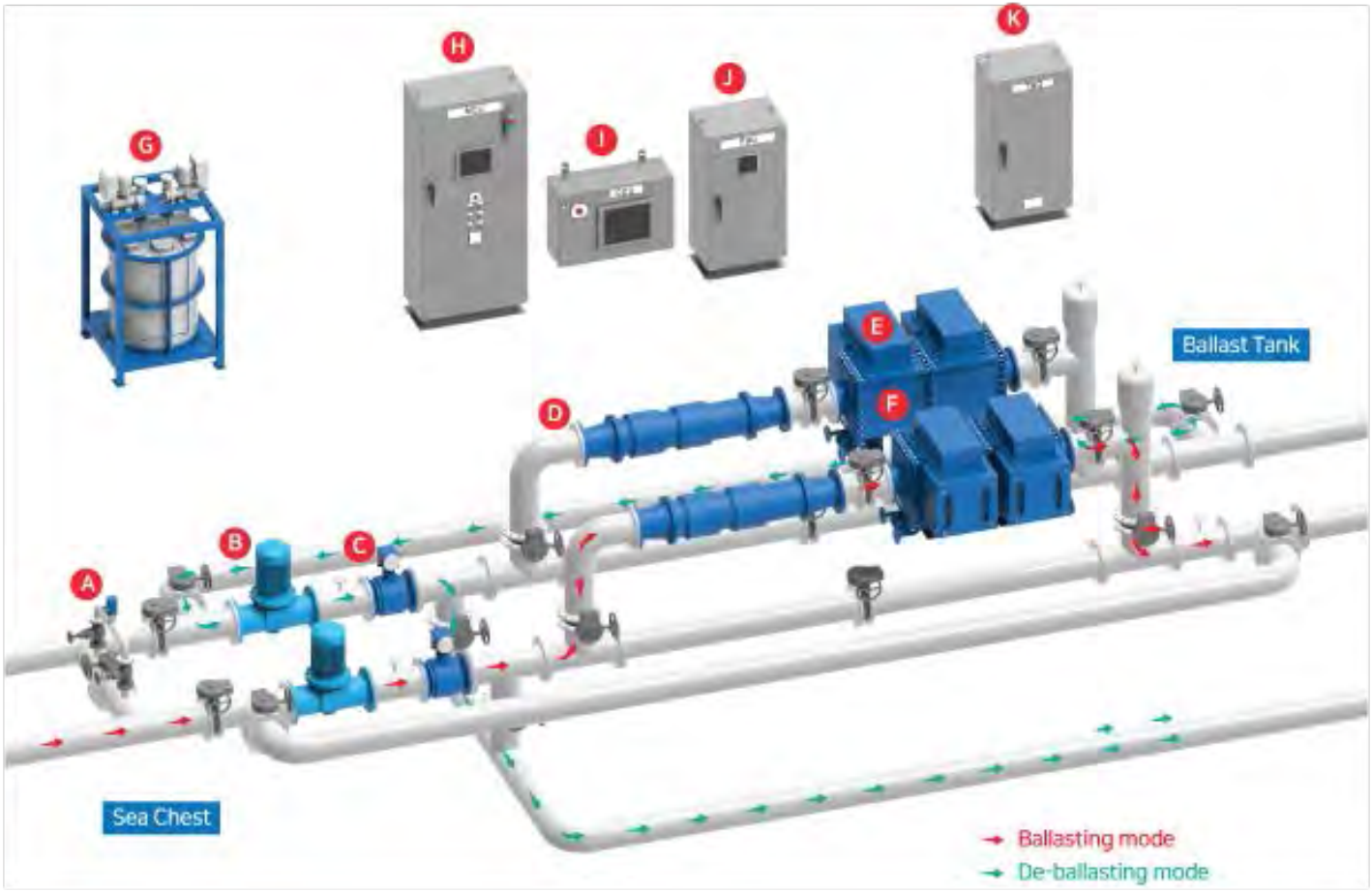
300TON / Electrolyzer

02

Technology for Ballast Water Management System

MARINOMATE™ BWMS It is the most efficient and most effective method of electrolysis among multiple methods of handling the vessel balance.

MARINOMATE™ BWMS Process



- A Conductivity Meter
- B Ballast Pump
- C Flow Meter
- D Plankill Pipe Unit
- E Rectifier
- F Electrolyzer
- G Neutralization Unit
- H Main Control Unit(MCU)
- I Computer Control Unit(CCU)
- J Power Distribution Unit(PDU)
- K TRO Panel

02

Technology for Ballast Water Management System

MARINOMATE™ BWMS It is the most efficient and most effective method of electrolysis among multiple methods of handling the vessel balance.

Key Equipment

Electrolyzer

· Disinfect aquatic organisms in the ballast water

· Including rectifier & electrode by special coating

Rectifier

· Input AC 440V

· Max Output DC10V, 2000A

Plankill pipe Unit

· Reduction of aquatic organisms by physical effect as collision and turbulence

· No power supply, easy to install and maintain

Neutralization Unit

· Reduction of residual TRO in the ballast tank during deballsting

02

Technology for Ballast Water Management System

MARINOMATE™ BWMS It is the most efficient and most effective method of electrolysis among multiple methods of handling the vessel balance.

Key Equipment

MCU

· Main Control Unit

· Control and monitor the operating status in real time

CCU

· Computer Control Unit

· Automatically monitor and control the MARINOMATE™ in cargo control room

· Touch screen type including HMI

PDU

· Power Distribution Unit

· Supply power to MARINOMATE™ components

TRO Panel

· Monitor TRO values during ballasting & deballasting

02

Technology for Ballast Water Management System

MARINOMATE™ BWMS It is the most efficient and most effective method of electrolysis among multiple methods of handling the vessel balance.

Status of Land Based-testing facilities

Land Based-testing facilities(For Final Approval of IMO & Type Approval of Government)

- in site of Korea Maritime University (at Yeongdo-gu, Busan , Korea) / Completed 10th December 2012

Capacity of Land Based-testing facilities

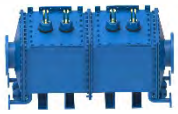
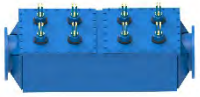
- SOURCE TANK 600㎥, Treated Tank 300 ㎥, Control Tank 300㎥
- Testing facilities can perform internal test with 150 ~500 ㎥ per hour of capacity.

02

Technology for Ballast Water Management System

MARINOMATE™ BWMS It is the most efficient and most effective method of electrolysis among multiple methods of handling the vessel balance.

Typical Design Model

Model	Ballast Pump Capacity	Power Consumption	Size(Unit:mm)
 MARINOMATE-150	150 ㎥ /hr	4kW	593 X 749 X (H)780
 MARINOMATE-300	300 ㎥ /hr	8kW	1,356 X 485 X (H)876
 MARINOMATE-600	600 ㎥ /hr	16kW	1,755 X 580 X (H)580
 MARINOMATE-900	900 ㎥ /hr	24kW	2,056 X 580 X (H)580

02

Technology for Ballast Water Management System

MARINOMATE™ BWMS It is the most efficient and most effective method of electrolysis among multiple methods of handling the vessel balance.

Preparation for the BWMS installation (Retrofit)

STEP 01

PREVIEW & SHIP SURVEY

- Survey on the ship
- select a model of the BWMS
- Check the installation location, new pipelines, power supply etc.

STEP 02

SELECTION OF BWMS MODEL

- Check the price of the BWMS, construction cost

STEP 03

3D SCANNING

- Not only the 3D data on the hull, but also the surface and 2D line data.
- Data can be used for remodeling and review.

STEP 04

DRAWING MODIFICATION

- Decision the specification of the BWMS and modification
- Make the working DWG and detailed construction DWG

STEP 05

INSTALLATION

- Pipeline, BWMS installation, power supply, commissioning, class inspection, final confirmation

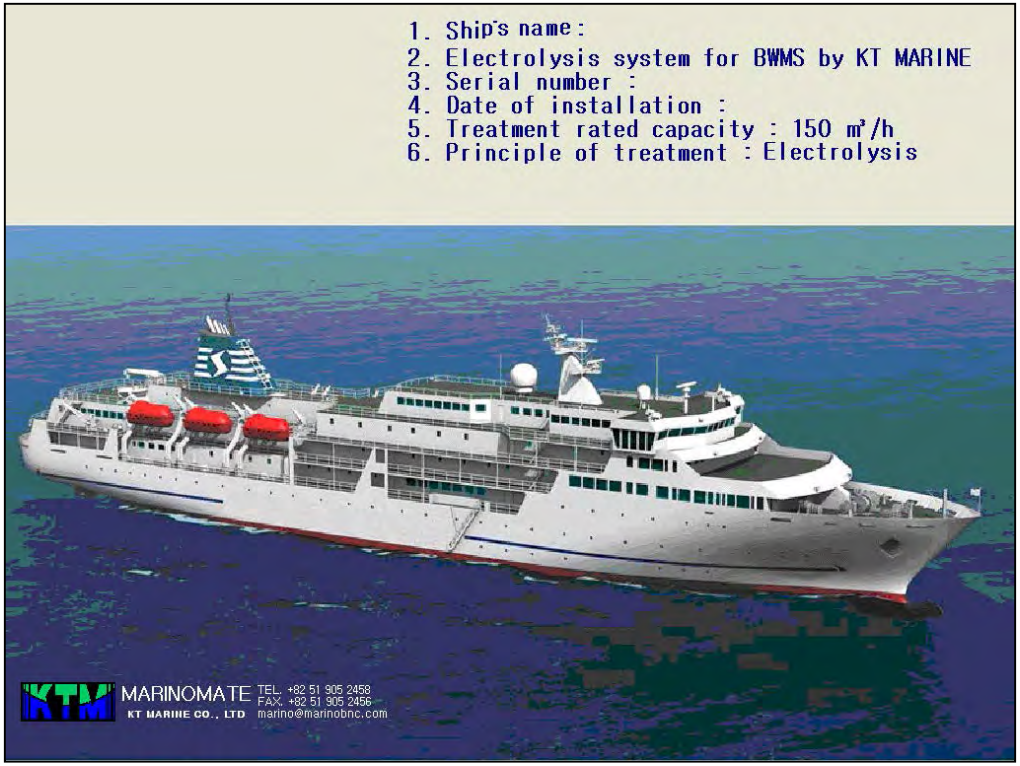
02

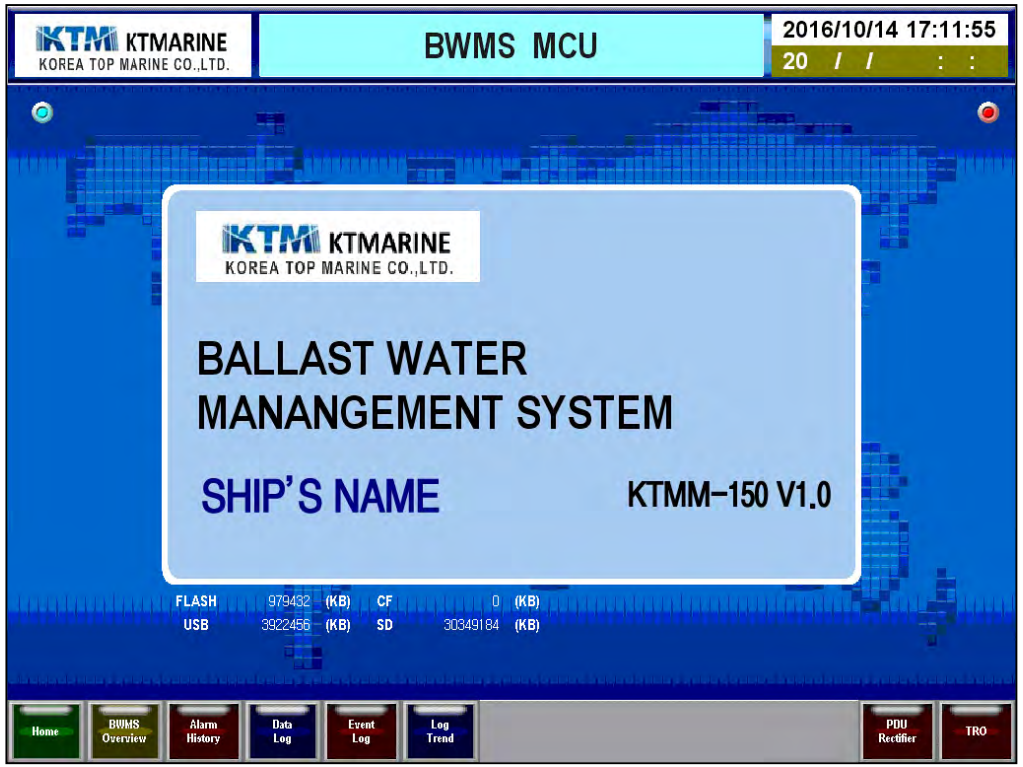
Technology for Ballast Water Management System

MARINOMATE™ BWMS It is the most efficient and most effective method of electrolysis among multiple methods of handling the vessel balance.

Operating

Screen of basic information for system





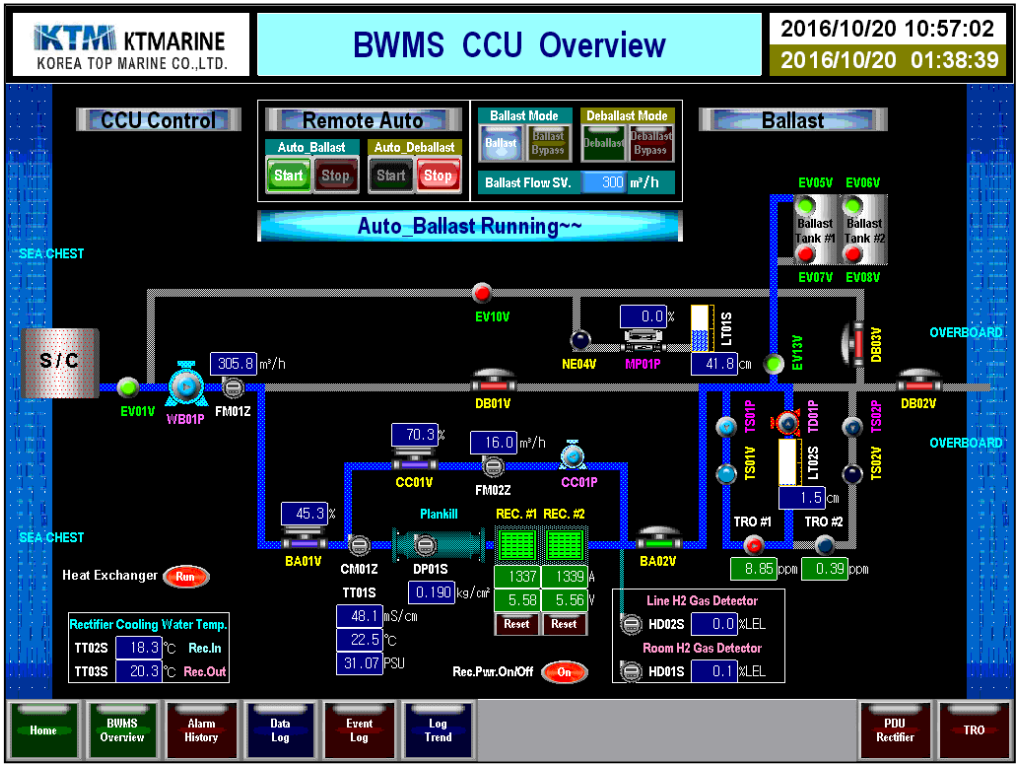
02

Technology for Ballast Water Management System

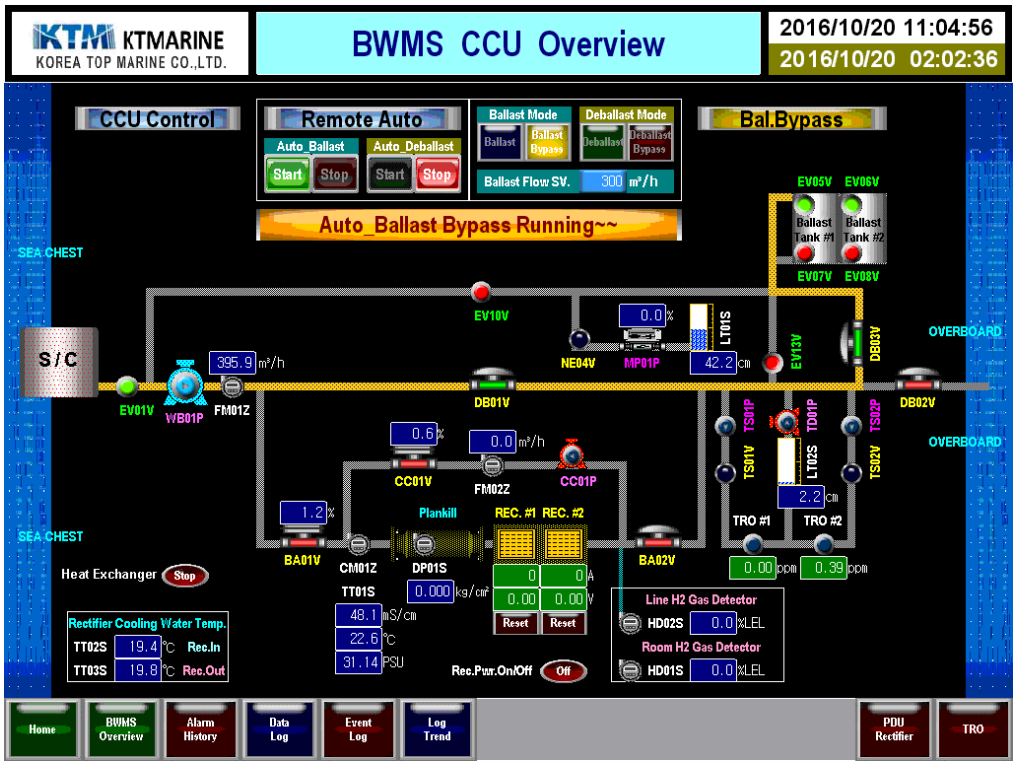
MARINOMATE™ BWMS It is the most efficient and most effective method of electrolysis among multiple methods of handling the vessel balance.

Operating

Ballast Mode



Ballast-Bypass mode



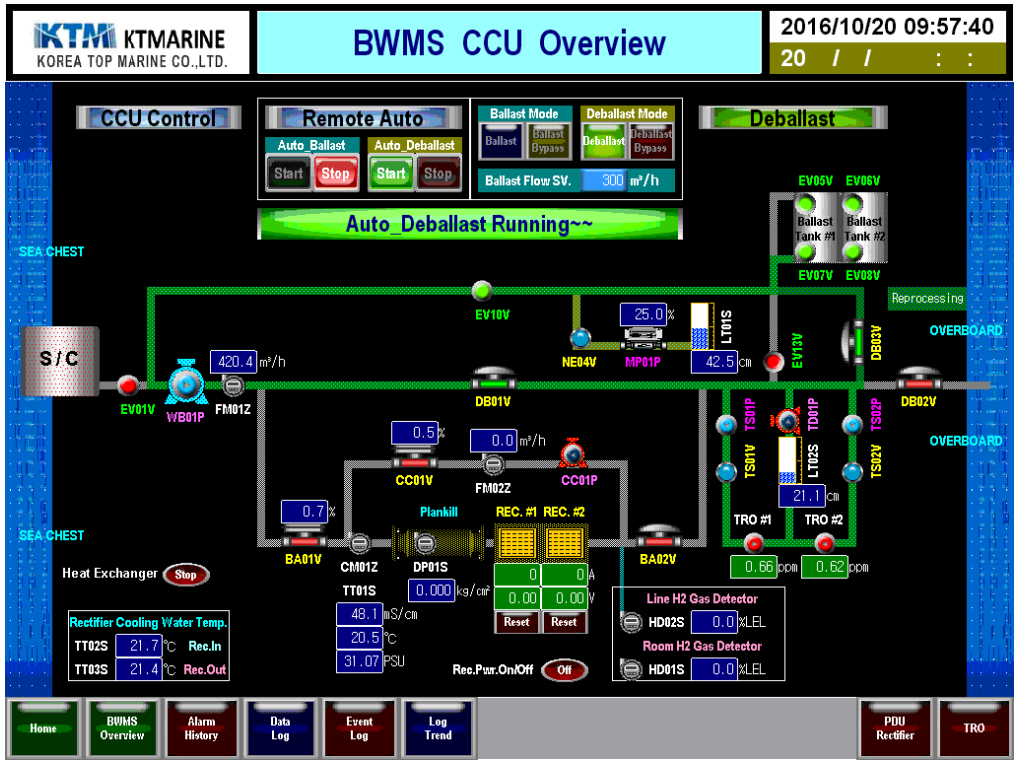
02

Technology for Ballast Water Management System

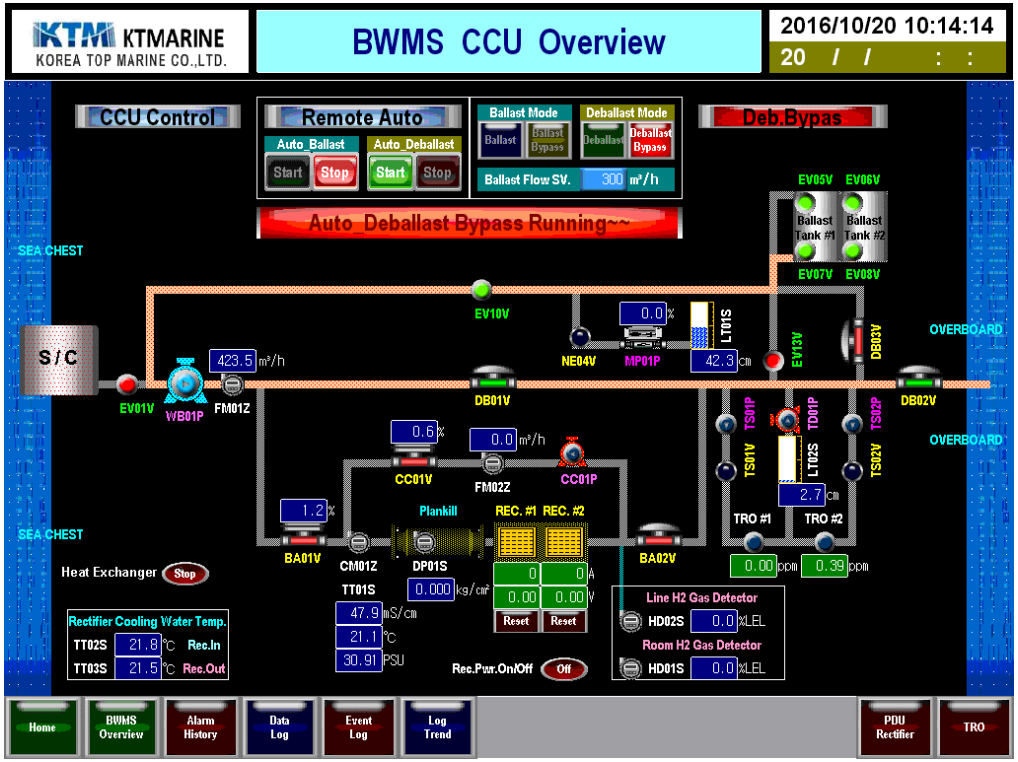
MARINOMATE™ BWMS It is the most efficient and most effective method of electrolysis among multiple methods of handling the vessel balance.

Operating

De-Ballast Mode



De-Ballast-Bypass mode



02

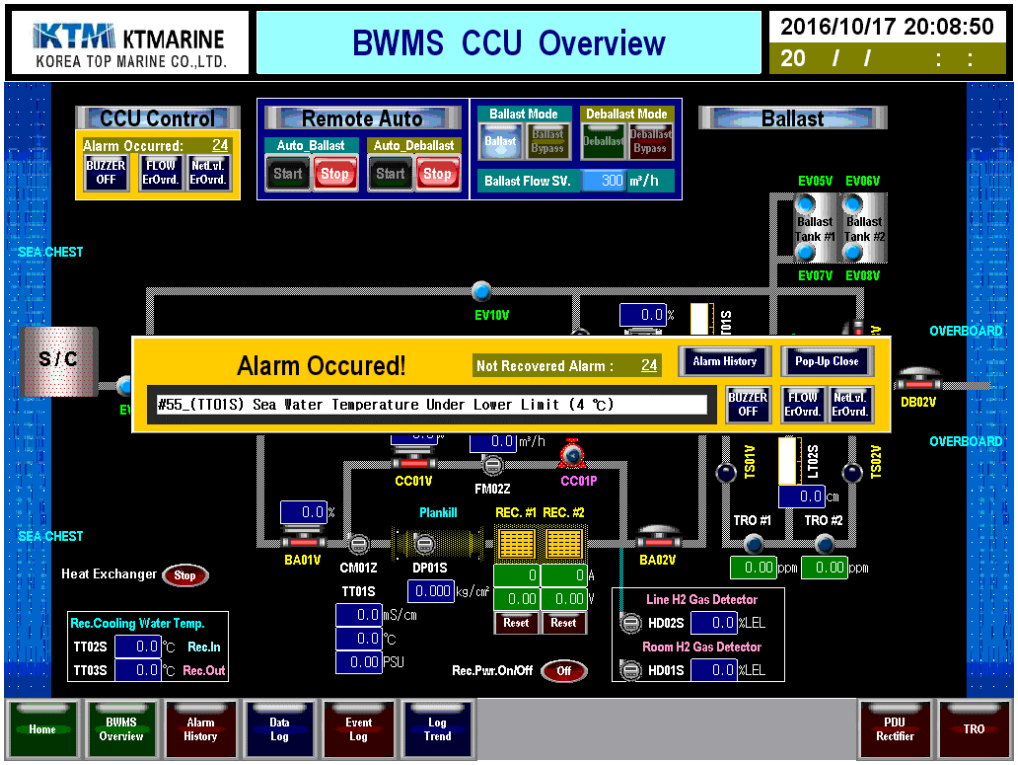
Technology for Ballast Water Management System

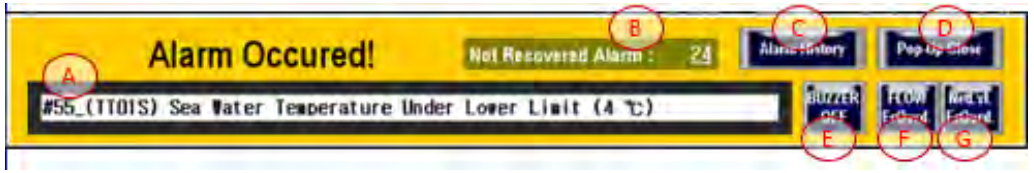
MARINOMATE™ BWMS It is the most efficient and most effective method of electrolysis among multiple methods of handling the vessel balance.

Operating

Alarms

- When an alarm occurs during operation be on display thiswarning as shown below.
- Alarm recording is possible to check on the alarm history screen.





A : The most recent occurrence of the alarm information display

B : Displays the current number of notifications of non-recoverable state

C : Alarm history display switching button

D : Close button for warning windows

E : Alarm buzzer off button

F : Ballast flow abnormal alarm forced off button

02

Technology for Ballast Water Management System

MARINOMATE™ BWMS It is the most efficient and most effective method of electrolysis among multiple methods of handling the vessel balance.

Operating

Alarms History screen

- The alarm history screen show the list of alarm occurred
- The alarm pop-up screen is automatically closed when changing to Alarm history screen
- Alarm history is being backed up automatically every 30 seconds
- After 30 minutes of recovering the alarm generated, the alarm is automatically deleted from the list

A : Alarm time

B : Alarm information (alarm list 70 ; see 3.3 Alarm List)

C : Check visually confirm an alarm: When selecting / checking the alarms indicated separately

D : Alarm recovery time

E : Alarm list move button area

F : Alarm verification and check Show Filter button area

G : Alarm time, and display the contents of the most recent alarms are not recovered

02

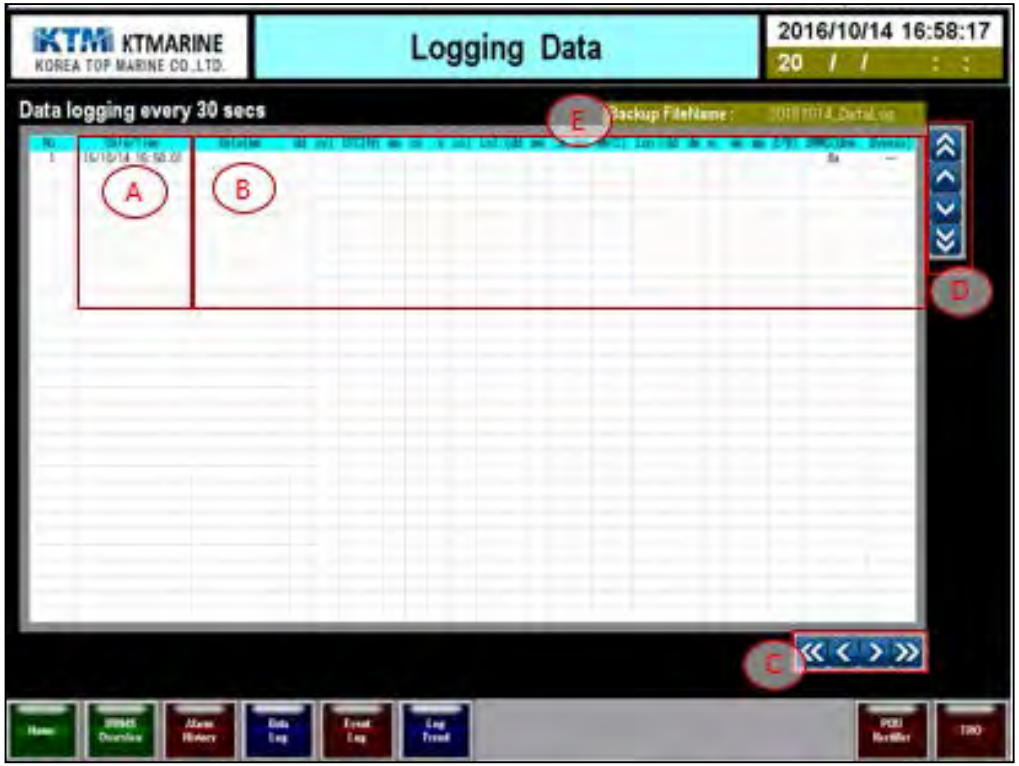
Technology for Ballast Water Management System

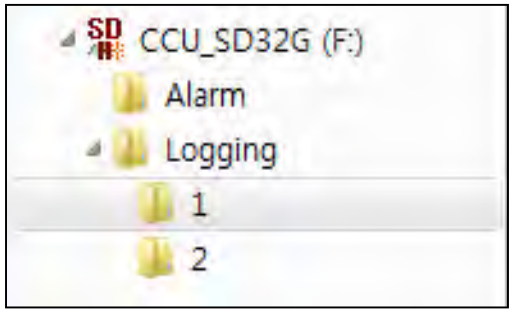
MARINOMATE™ BWMS It is the most efficient and most effective method of electrolysis among multiple methods of handling the vessel balance.

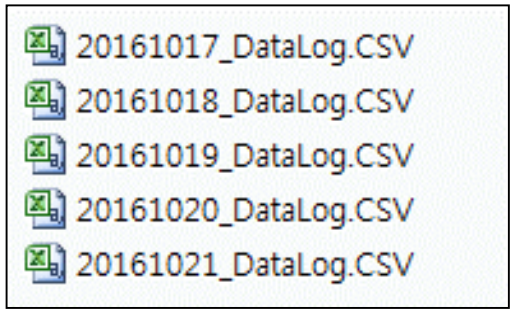
Operating

Logging Data screen

- In the above screen, the logging data can check the logged data at 30-second intervals.
- The logged data is being backed up automatically every 30 seconds.







02

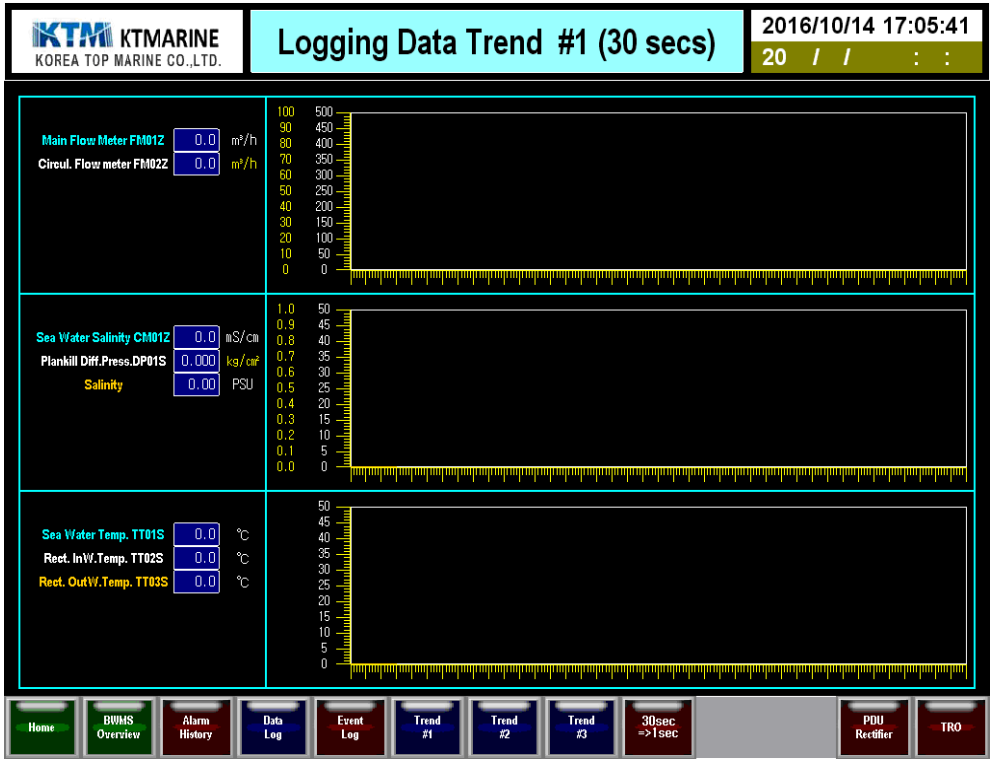
Technology for Ballast Water Management System

MARINOMATE™ BWMS It is the most efficient and most effective method of electrolysis among multiple methods of handling the vessel balance.

Operating

Logging Data Trend

- Interval 30 seconds trend : The display 200 of the logging data at 30-second intervals



02

Technology for Ballast Water Management System

MARINOMATE™ BWMS It is the most efficient and most effective method of electrolysis among multiple methods of handling the vessel balance.

Maintenance

An inspection should be conducted on a regular basis in order to prevent potential accidents during operating this system for the ballasting an de-ballasting process.

Item	Interval	Description	Method
Electrolyzer	1 month	Cleaning	Chemical cleaning for 20 minutes
	5 years	Renewing	Change damaged electrode
TRO sensor	3 months	Renewing	DPD solution
	1 year	Renewing	Buffer solution
	1 month	Cleaning	Inlet Strainer
	3 months	Cleaning	Clean Cuvette
	3 months	Resetting	Check Flow rate of sample water
	3 months	Calibration	Compare with portable chlorine analyzer
Cooler	1 month	Replenishing	Fill up fresh water tank to normal level
	3 months	Cleaning	Clean cooler seawater side

02

Technology for Ballast Water Management System

MARINOMATE™ BWMS It is the most efficient and most effective method of electrolysis among multiple methods of handling the vessel balance.

Maintenance

An inspection should be conducted on a regular basis in order to prevent potential accidents during operating this system for the ballasting an de-ballasting process.

Item	Interval	Description	Method
Level switch	1 month	Testing	Drain water from electrolyzer and Check the lamp of sensor inside(no water red lamp on)
Level transmitter	1 month	Checking	Compare with real level of neutralizer tank
Gas detector	6 months	Calibration	Supply H2 Gas(50ppm) which is made by maker to Gas detector

02

Technology for Ballast Water Management System

MARINOMATE™ BWMS It is the most efficient and most effective method of electrolysis among multiple methods of handling the vessel balance.

Troubleshooting

Error Message	Warning Level	Fault Level	Normal Range
Ballast TRO Reading Value Out of 8.2~10.0 ppm	TRO ballasting >10 mg/L 3times <8.2 mg/L 3times	TRO ballasting >10 mg/L 5times <8.2 mg/L 5times	TRO 8.2~10 mg/L
Room H2 Gas Over 25/50% LEL	H2 gas >25% LEL	H2 gas >50% LEL	Under 25% LEL
Line H2 Gas Over 25/50% LEL	H2 gas >25% LEL	H2 gas >50% LEL	Under 25% LEL
Neutralizing Tank Level Over Upper limit	Level >90cm		21~89cm
Neutralizing Tank Level Under Lower limit/ Mimimum limit	Level <20cm	Level <10cm	21~89cm
Sea Water Temperature Under Lower Limit	Temperature <4℃		Over 4℃
Differential pressure Over Upper Limit/ Maximum Limit	Pressure >0.5bar	Pressure >0.8bar	Under 0.5bar

02

Technology for Ballast Water Management System

MARINOMATE™ BWMS It is the most efficient and most effective method of electrolysis among multiple methods of handling the vessel balance.

Troubleshooting

Error Message	Warning Level	Fault Level	Normal Range
Salinity Under Lower Limit(8PSU)		PSU <8PSU	Over 8PSU
Ballast Flow Over SV.*110% for 3/5min	Flow Rate >110%, 3min	Flow Rate >110%, 5min	91~109%
Ballast Flow Under Sv.*90% for 3/5min	Flow Rate >90%, 3min	Flow Rate >90%, 5min	

03

Reference

03 Reference

Certificates and Patents

특 허 증

CERTIFICATE OF PATENT

특 허 제 10-1398617 호 (PATENT NUMBER)

출원번호 (APPLICATION NUMBER) 제 2013-0026779 호

출 원 일 (FILING DATE:YY/MM/DD) 2013년 03월 13일

등 록 일 (REGISTRATION DATE:YY/MM/DD) 2014년 05월 16일

발명의명칭 (TITLE OF THE INVENTION)
선박평형수 인라인 처리장치의 전처리장치

특허권자 (PATENTEE)
(주)케이티마린(180111-0******)
부산광역시 해운대구 센텀북대로 60, 센텀is타워 1808 (재송동)

발명자 (INVENTOR)
박옥열(591123-1******)
부산광역시 해운대구 센텀동로 9 ,D동3303호(우동,트럼프월드 센텀)

위의 발명은 「특허법」에 따라 특허등록원부에 등록 되었음을 증명합니다.

(THIS IS TO CERTIFY THAT THE PATENT IS REGISTERED ON THE REGISTER OF THE KOREAN INTELLECTUAL PROPERTY OFFICE.)

2014년 05월 16일

특 허 청 장 김 영

COMMISSIONER, THE KOREAN INTELLECTUAL PROPERTY OFFICE

연차등록료는 2017년부터 매년 05월 16일까지 납부하여야 하며, 등록원부로 권리관계를 확인바랍니다.

Certificate of patent
NO. 10-1398617

특 허 증

CERTIFICATE OF PATENT

특 허 제 10-1296207 호 (PATENT NUMBER)

출원번호 (APPLICATION NUMBER) 제 2013-0019143 호

출 원 일 (FILING DATE:YY/MM/DD) 2013년 02월 22일

등 록 일 (REGISTRATION DATE:YY/MM/DD) 2013년 08월 07일

발명의명칭 (TITLE OF THE INVENTION)
생물막 생성 억제를 위한 순환형 배관이 설치된 선박평형수의 인라인 처리장치

특허권자 (PATENTEE)
(주)케이티마린(180111-0******)
부산광역시 해운대구 센텀북대로 60, 센텀is타워 1808 (재송동)

발명자 (INVENTOR)
등록사항란에 기재

위의 발명은 「특허법」에 따라 특허등록원부에 등록 되었음을 증명합니다.

(THIS IS TO CERTIFY THAT THE PATENT IS REGISTERED ON THE REGISTER OF THE KOREAN INTELLECTUAL PROPERTY OFFICE.)

2013년 08월 07일

특 허 청 장 김 영

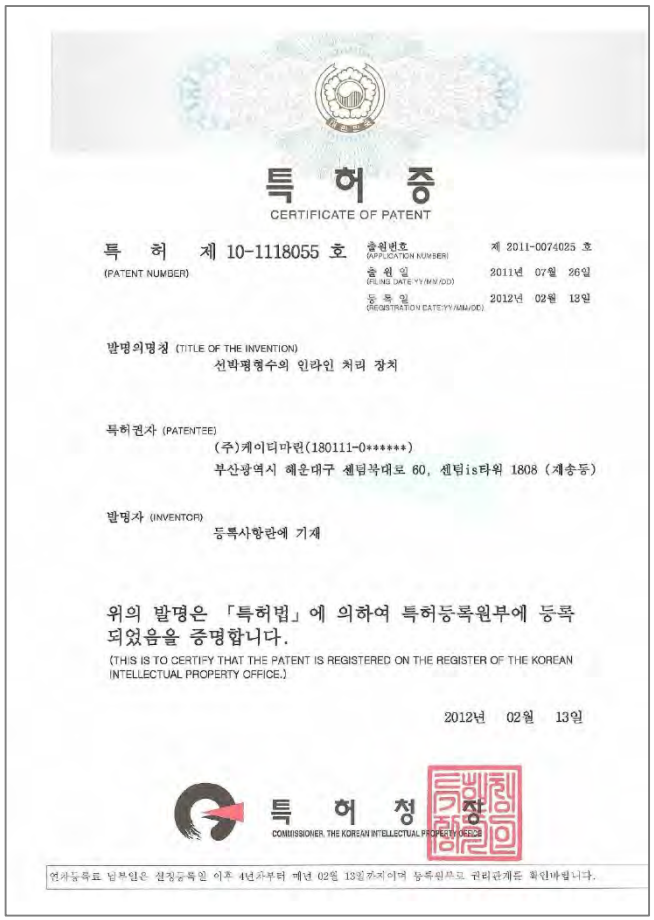
COMMISSIONER, THE KOREAN INTELLECTUAL PROPERTY OFFICE

연차등록료 납부일은 설정등록일 이후 4년차부터 매년 08월 07일까지이며 등록원부로 권리관계를 확인바랍니다.

Certificate of patent
NO. 10-1296207

03 Reference

Certificates and Patents



특 허 증

CERTIFICATE OF PATENT

특 허 제 10-1118055 호 (PATENT NUMBER)

출원번호 (APPLICATION NUMBER) 제 2011-0074025 호

출 원 일 (FILING DATE:YY/MM/DD) 2011년 07월 26일

등 록 일 (REGISTRATION DATE:YY/MM/DD) 2012년 02월 13일

발명의명칭 (TITLE OF THE INVENTION)

선박평형수의 인라인 처리 장치

특허권자 (PATENTEE)

(주)케이디마린(180111-0******)

부산광역시 해운대구 센텀북대로 60, 센텀is타워 1808 (재송동)

발명자 (INVENTOR)

등록사항란에 기재

위의 발명은 「특허법」에 의하여 특허등록원부에 등록되었음을 증명합니다.

(THIS IS TO CERTIFY THAT THE PATENT IS REGISTERED ON THE REGISTER OF THE KOREAN INTELLECTUAL PROPERTY OFFICE.)

2012년 02월 13일

특 허 청 장

COMMISSIONER, THE KOREAN INTELLECTUAL PROPERTY OFFICE

연차등록료 납부일은 설정등록일 이후 4년차부터 매년 02월 13일까지이며 등록원부로 권리관계를 확인바랍니다.

Certificate of patent
NO. 10-1118055

证书号第2430068号

发明专利证书

发明名称：船舶压载水线内处理装置的预处理器

发明人：朴玉烈

专利号：ZL 2014 8 0015168.8

专利申请日：2014年01月15日

专利权人：株式会社凯普玛琳

授权公告日：2017年03月29日

本发明经过本局依照中华人民共和国专利法进行审查，决定授予专利权，颁发本证书并在专利登记簿上予以登记。专利权自授权公告之日起生效。

本专利的专利权期限为二十年，自申请日起算。专利权人应当依照专利法及其实施细则规定缴纳年费。本专利的年费应当在每年01月15日前缴纳。未按照规定缴纳年费的，专利权自应当缴纳年费期满之日起终止。

专利证书记载专利权登记时的法律状况。专利权的转移、质押、无效、终止、恢复和专利权人的姓名或名称、国籍、地址变更等事项记载在专利登记簿上。

局长
申长雨

国家知识产权局

2017年03月29日

第1页(共1页)

Certificate of China patent
NO. ZL201480015168.8

03 Reference

Certificates and Patents

서비스표등록증
CERTIFICATE OF SERVICE MARK REGISTRATION

등 록 Registration Number 제 41-0392250 호
출원번호 Application Number 제 41-2016-0017245 호
출원일 Filing Date 2016년 04월 12일
등록일 Registration Date 2017년 03월 24일

서비스표권자 Owner of the Service Mark Right
(주)케이티마린(180111-*******)
부산광역시 해운대구 센텀북대로 60, 센텀is타워 1808 (재송동)

서비스표를 사용할 서비스업명 및 구분 List of Services
제 37 류
선박용 평형수(Ballast water) 처리장치 설치업등 4건

MARINOMATE

위의 표장은 「상표법」에 따라 서비스표등록원부에 등록되었음을 증명합니다.
This is to certify that, in accordance with the Trademark Act, a service mark has been registered at the Korean Intellectual Property Office.

2017년 03월 24일

특허청
Korean Intellectual Property Office

특허청장
COMMISSIONER,
THE KOREAN INTELLECTUAL PROPERTY OFFICE
최 동 규

Certificate of service mark registration
NO. 41-0392250

서비스표등록증
CERTIFICATE OF SERVICE MARK REGISTRATION

등 록 Registration Number 제 41-0388308 호
출원번호 Application Number 제 41-2016-0017244 호
출원일 Filing Date 2016년 04월 12일
등록일 Registration Date 2017년 02월 22일

서비스표권자 Owner of the Service Mark Right
(주)케이티마린(180111-*******)
부산광역시 해운대구 센텀북대로 60, 센텀is타워 1808 (재송동)

서비스표를 사용할 서비스업명 및 구분 List of Services
제 35 류
평형수(Ballast water) 처리장치 판매중개업등 10건

MARINOMATE

위의 표장은 「상표법」에 따라 서비스표등록원부에 등록되었음을 증명합니다.
This is to certify that, in accordance with the Trademark Act, a service mark has been registered at the Korean Intellectual Property Office.

2017년 02월 22일

KOREAN INTELLECTUAL PROPERTY OFFICE · 대한민국 특허청 ·

특허청장
COMMISSIONER,
THE KOREAN INTELLECTUAL PROPERTY OFFICE
최 동 규

Certificate of service mark registration
NO. 41-0388308

03 Reference

Certificates and Patents

서비스표등록증
CERTIFICATE OF SERVICE MARK REGISTRATION

등 록 Registration Number 제 41-0388245 호
출원번호 Application Number 제 41-2016-0017247 호
출원일 Filing Date 2016년 04월 12일
등록일 Registration Date 2017년 02월 22일

서비스표권자 Owner of the Service Mark Right
(주)케이티마린(180111-*******)
부산광역시 해운대구 센텀북대로 60, 센텀is타워 1808 (재송동)

서비스표를 사용할 서비스업경 및 구분 List of Services
제 42 류
평형수(Ballast water) 처리장치 개발업등 2건

MARINOMATE

위의 표장은 「상표법」에 따라 서비스표등록원부에 등록되었음을 증명합니다.
This is to certify that, in accordance with the Trademark Act, a service mark has been registered at the Korean Intellectual Property Office.

2017년 02월 22일
특허청장
COMMISSIONER,
THE KOREAN INTELLECTUAL PROPERTY OFFICE
최 동 규

Certificate of service mark registration
NO. 41-0388245

상표등록증
CERTIFICATE OF TRADEMARK REGISTRATION

등 록 Registration Number 제 40-1226847 호
출원번호 Application Number 제 40-2016-0027001 호
출원일 Filing Date 2016년 04월 12일
등록일 Registration Date 2017년 01월 11일

상표권자 Owner of the Trademark Right
(주)케이티마린(180111-*******)
부산광역시 해운대구 센텀북대로 60, 센텀is타워 1808 (재송동)

상표를 사용할 상품 및 구분 List Of Goods
제 11 류
선박 평형수(Ballast water) 처리장치

MARINOMATE

위의 표장은 「상표법」에 따라 상표등록원부에 등록되었음을 증명합니다.
This is to certify that, in accordance with the Trademark Act, a trademark has been registered at the Korean Intellectual Property Office.

2017년 01월 11일
특허청장
COMMISSIONER,
KOREAN INTELLECTUAL PROPERTY OFFICE
최 동 규

Certificate of service mark registration
NO. 40-1226847

03 Reference

Certificates and Patents

ClassNK

NIPPON KAIJI KYOKAI

CERTIFICATE
OF
QUALITY MANAGEMENT SYSTEM REGISTRATION

KT MARINE CO., LTD.

Registration No. : 15-752

Location : RM 1801, Centum IS Tower, 60, Centum buk-daero, Haeundae-gu, Busan, Korea

Applicable Standards : ISO 9001 : 2008

Activities and Products : Ship Management for Oil Tankers and Chemical Tankers

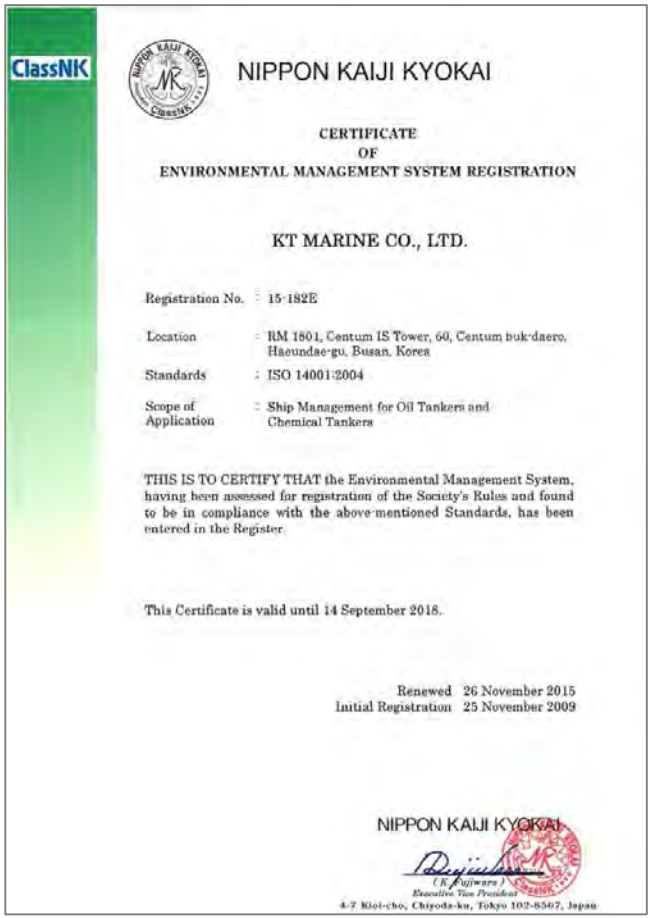
THIS IS TO CERTIFY THAT the Quality Management System, having been assessed for registration of the Society's Rules and found to be in compliance with the above-mentioned Standards, has been entered in the Register.

This Certificate is valid until 14 September 2018.

Renewed 26 November 2015
Initial Registration 25 November 2009

NIPPON KAIJI KYOKAI
(K. Fujiwara)
Executive Vice President
4-7 Kioi-cho, Chiyoda-ku, Tokyo 102-8567, Japan

ISO 9001



ClassNK

NIPPON KAIJI KYOKAI

CERTIFICATE
OF
ENVIRONMENTAL MANAGEMENT SYSTEM REGISTRATION

KT MARINE CO., LTD.

Registration No. : 15-182E

Location : RM 1801, Centum IS Tower, 60, Centum buk-daero, Haeundae-gu, Busan, Korea

Standards : ISO 14001:2004

Scope of Application : Ship Management for Oil Tankers and Chemical Tankers

THIS IS TO CERTIFY THAT the Environmental Management System, having been assessed for registration of the Society's Rules and found to be in compliance with the above-mentioned Standards, has been entered in the Register.

This Certificate is valid until 14 September 2018.

Renewed 26 November 2015
Initial Registration 25 November 2009

NIPPON KAIJI KYOKAI
(K. Fujiwara)
Executive Vice President
4-7 Kioi-cho, Chiyoda-ku, Tokyo 102-8567, Japan

ISO 14001

03 Reference

Certificates and Patents

Certificate No : R120202 - 00360

CERTIFICATE OF INNO-BIZ

Company : KT MARINE CO.,LTD.
C E O : BAG OG-YEOL
Address : RM 1808, 60 CENTUM BUK-DAERO, HAEUNDAE-GU, BUSAN, KOREA
Validity of Certificate : 2015. 04. 13 ~ 2018. 04. 12

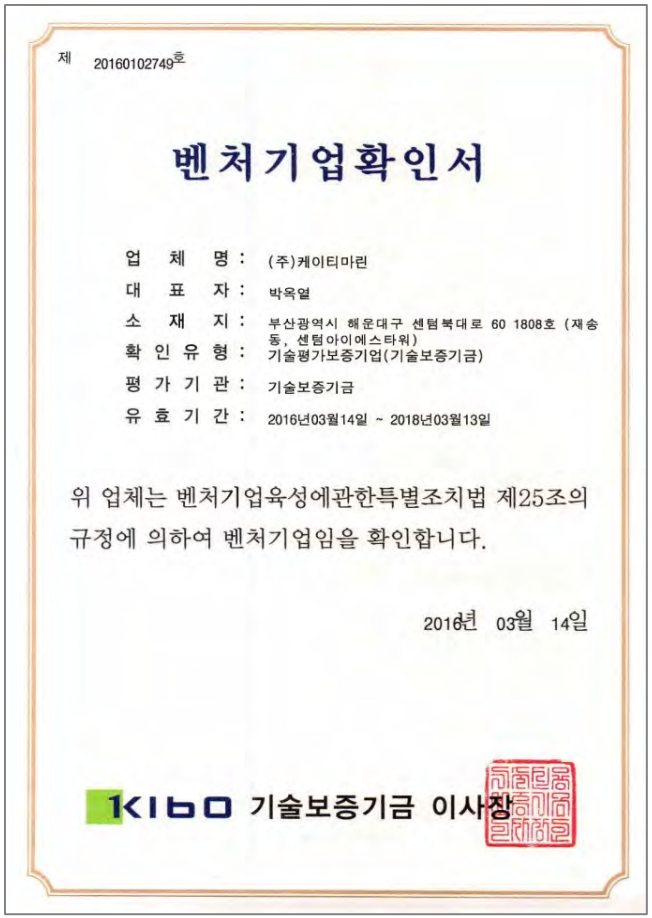
This is to certify that the above-mentioned Company is an INNO-BIZ enterprise in accordance with Article 15 of the Act on Promotion of Technology Innovation for SMEs.

APR 4, 2016

Administrator

Small and Medium Business Administration
Republic of Korea

Certificate of INNO-BIZ



제 20160102749호

벤처기업확인서

업 체 명 : (주)케이티마린
대 표 자 : 박옥열
소 재 지 : 부산광역시 해운대구 센텀북대로 60 1808호 (재송동, 센텀아이에스타워)
확 인 유 형 : 기술평가보증기업(기술보증기금)
평 가 기 관 : 기술보증기금
유 효 기 간 : 2016년03월14일 ~ 2018년03월13일

위 업체는 벤처기업육성에관한특별조치법 제25조의 규정에 의하여 벤처기업임을 확인합니다.

2016년 03월 14일

KIBO 기술보증기금 이사장

Certificate of Venture company

03 Reference

Certificates and Patents

MEPC 64/2/6
Page 2

.2 agree that Basic Approval be granted to KTM-Ballast Water Management System submitted by the Republic of Korea in document MEPC 63/2/8;

anted to Hamworthy Aquarius™-EC BWMS document MEPC 63/2/9;

and Administrations to recognize the f water quality for the test water selected esults of the test water assessment in the Approval;

on to use unpolluted natural seawater as seawater for BWMS testing;

mitting proposals for approval of Ballast hat make use of Active Substances, to additional data that could affect the the submission may not be accepted, as een included in the original submission to

evelopment of the database containing ciated with treated ballast water, developed ; and

IMO INTERNATIONAL MARITIME ORGANIZATION E

MARINE ENVIRONMENT PROTECTION COMMITTEE
64th session
Agenda item 2

MEPC 64/2/6
11 June 2012
Original: ENGLISH

HARMFUL AQUATIC ORGANISMS IN BALLAST WATER

Report of the twenty-first meeting of the GESAMP-Ballast Water Working Group

Note by the Secretariat

SUMMARY

Executive summary:	This document contains the report of the twenty-first meeting of the GESAMP-Ballast Water Working Group (GESAMP-BWWG) and includes the evaluation of proposals submitted for approval by Denmark, the Republic of Korea and the Netherlands. Following the decision of MEPC 58, only the main body of the GESAMP-BWWG report is translated in all the three working languages with the annexes being submitted in English only.
Strategic direction:	7.1
High-level action:	7.1.2
Planned output:	7.1.2.5
Action to be taken:	Paragraph 3
Related document:	GESAMP-BWWG 21/6 (attached)

Introduction

1 The twenty-first meeting of the GESAMP-Ballast Water Working Group (GESAMP-BWWG) was held at IMO Headquarters from 16 to 20 April 2012 and its report is attached to this document as GESAMP-BWWG 21/6.

2 The main purpose of this meeting was to review the proposals for approval of ballast water management systems that make use of Active Substances to treat ballast water prior to discharge into the marine environment. The findings of the Group are contained in annexes 4 to 6 of the attached report.

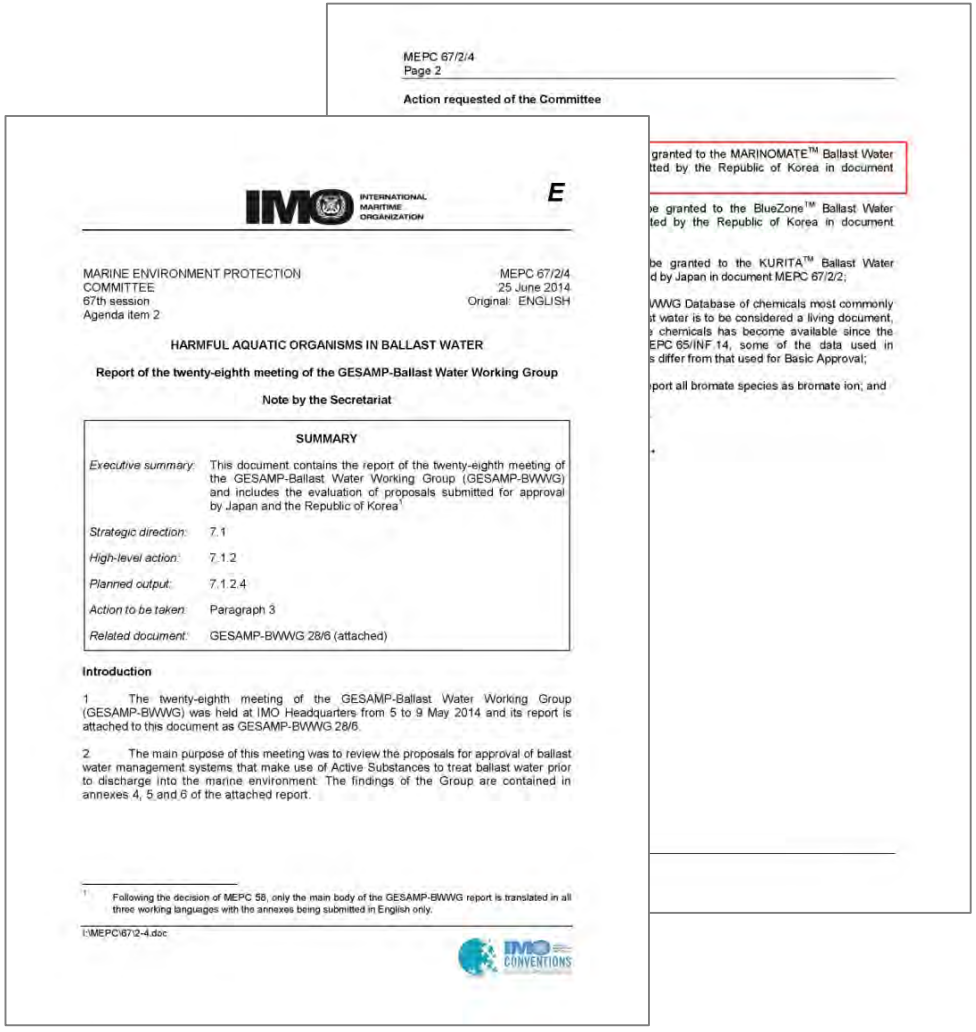
Action requested of the Committee

3 The Committee is invited to:

.1 agree that Final Approval be granted to DESMI Ocean Guard Ballast Water Management System submitted by Denmark in document MEPC 63/2/7;

I:\MEPC\64\2-6.doc

Certificate of Basic approval (IMO)



MEPC 67/2/4
Page 2

Action requested of the Committee

granted to the MARINOMATE™ Ballast Water ted by the Republic of Korea in document

e granted to the BlueZone™ Ballast Water ted by the Republic of Korea in document

e granted to the KURITA™ Ballast Water d by Japan in document MEPC 67/2/2;

WG Database of chemicals most commonly t water is to be considered a living document, chemicals has become available since the EPC 65/INF.14, some of the data used in s differ from that used for Basic Approval;

port all bromate species as bromate ion; and

IMO INTERNATIONAL MARITIME ORGANIZATION E

MARINE ENVIRONMENT PROTECTION COMMITTEE
67th session
Agenda item 2

MEPC 67/2/4
25 June 2014
Original: ENGLISH

HARMFUL AQUATIC ORGANISMS IN BALLAST WATER

Report of the twenty-eighth meeting of the GESAMP-Ballast Water Working Group

Note by the Secretariat

SUMMARY

Executive summary:	This document contains the report of the twenty-eighth meeting of the GESAMP-Ballast Water Working Group (GESAMP-BWWG) and includes the evaluation of proposals submitted for approval by Japan and the Republic of Korea[1]
Strategic direction:	7.1
High-level action:	7.1.2
Planned output:	7.1.2.4
Action to be taken:	Paragraph 3
Related document:	GESAMP-BWWG 28/6 (attached)

Introduction

1 The twenty-eighth meeting of the GESAMP-Ballast Water Working Group (GESAMP-BWWG) was held at IMO Headquarters from 5 to 9 May 2014 and its report is attached to this document as GESAMP-BWWG 28/6.

2 The main purpose of this meeting was to review the proposals for approval of ballast water management systems that make use of Active Substances to treat ballast water prior to discharge into the marine environment. The findings of the Group are contained in annexes 4, 5 and 6 of the attached report.

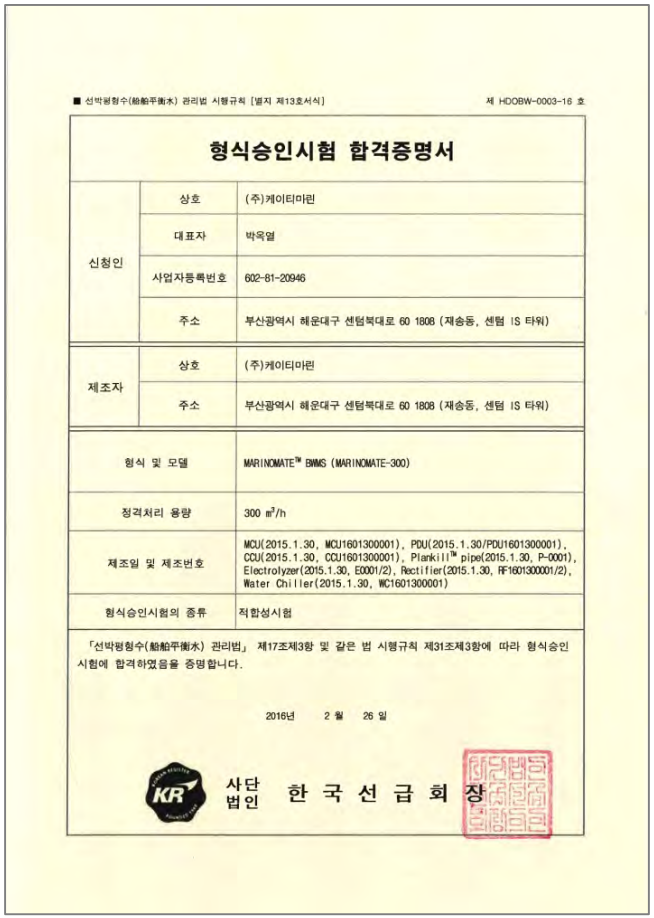
[1] Following the decision of MEPC 58, only the main body of the GESAMP-BWWG report is translated in all three working languages with the annexes being submitted in English only.

I:\MEPC\67\2-4.doc

Certificate of Final approval (IMO)

03 Reference

Certificates and Patents



■ 선박평형수(船舶平衡水) 관리법 시행규칙 [별지 제13호서식] 제 HDOBW-0003-16 호

형식승인시험 합격증명서

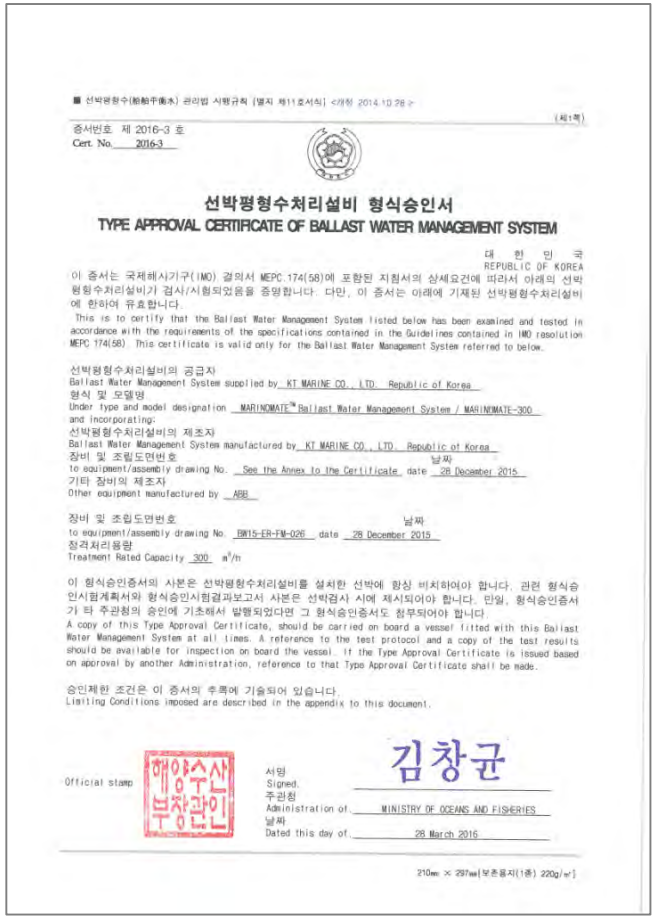
신청인	상호	(주)케이티마린
	대표자	박옥열
	사업자등록번호	602-81-20946
	주소	부산광역시 해운대구 센텀북대로 60 1808 (재송동, 센텀 IS 타워)
제조자	상호	(주)케이티마린
	주소	부산광역시 해운대구 센텀북대로 60 1808 (재송동, 센텀 IS 타워)
형식 및 모델		MARINOMATE™ BWMS (MARINOMATE-300)
정격처리 용량		300 m^3/h
제조일 및 제조번호		MCU(2015.1.30, MCU1601300001), PDU(2015.1.30/PDU1601300001), CCU(2015.1.30, CCU1601300001), Piankill™ pipe(2015.1.30, P-0001), Electrolyzer(2015.1.30, E0001/2), Rectifier(2015.1.30, RF1601300001/2), Water Chiller(2015.1.30, WC1601300001)
형식승인시험의 종류		적합성시험

「선박평형수(船舶平衡水) 관리법」 제17조제3항 및 같은 법 시행규칙 제31조제3항에 따라 형식승인 시험에 합격하였음을 증명합니다.

2016년 2 월 26 일

사단법인 한 국 선 급 회 장

Certificate of Conformity Test



■ 선박평형수(船舶平衡水) 관리법 시행규칙 [별지 제11호서식] <개정 2014.10.28.>

(제1쪽)

증서번호 제 2016-3 호
Cert. No. 2016-3

선박평형수처리설비 형식승인서
TYPE APPROVAL CERTIFICATE OF BALLAST WATER MANAGEMENT SYSTEM

대 한 민 국
REPUBLIC OF KOREA

이 증서는 국제해사기구(IMO) 결의서 MEPC.174(58)에 포함된 지침서의 상세요건에 따라서 아래의 선박평형수처리설비가 검사/시험되었음을 증명합니다. 다만, 이 증서는 아래에 기재된 선박평형수처리설비에 한하여 유효합니다.

This is to certify that the Ballast Water Management System listed below has been examined and tested in accordance with the requirements of the specifications contained in the Guidelines contained in IMO resolution MEPC 174(58). This certificate is valid only for the Ballast Water Management System referred to below.

선박평형수처리설비의 공급자
Ballast Water Management System supplied by KT MARINE CO., LTD. Republic of Korea
형식 및 모델명
Under type and model designation MARINOMATE™ Ballast Water Management System / MARINOMATE-300
and incorporating:
선박평형수처리설비의 제조자
Ballast Water Management System manufactured by KT MARINE CO., LTD. Republic of Korea
장비 및 조립도면번호 날짜
to equipment/assembly drawing No. See the Annex to the Certificate date 28 December 2015
기타 장비의 제조자
Other equipment manufactured by ABB

장비 및 조립도면번호 날짜
to equipment/assembly drawing No. BM15-ER-FM-026 date 28 December 2015
정격처리용량
Treatment Rated Capacity 300 m^3/h

이 형식승인증서의 사본은 선박평형수처리설비를 설치한 선박에 항상 비치하여야 합니다. 관련 형식승인시험계획서와 형식승인시험결과보고서 사본은 선박검사 시에 제시되어야 합니다. 만일, 형식승인증서가 타 주관청의 승인에 기초해서 발행되었다면 그 형식승인증서도 첨부되어야 합니다.

A copy of this Type Approval Certificate, should be carried on board a vessel fitted with this Ballast Water Management System at all times. A reference to the test protocol and a copy of the test results should be available for inspection on board the vessel. If the Type Approval Certificate is issued based on approval by another Administration, reference to that Type Approval Certificate shall be made.

승인제한 조건은 이 증서의 후록에 기술되어 있습니다.
Limiting Conditions imposed are described in the appendix to this document.

Official stamp 해양수산부장관인

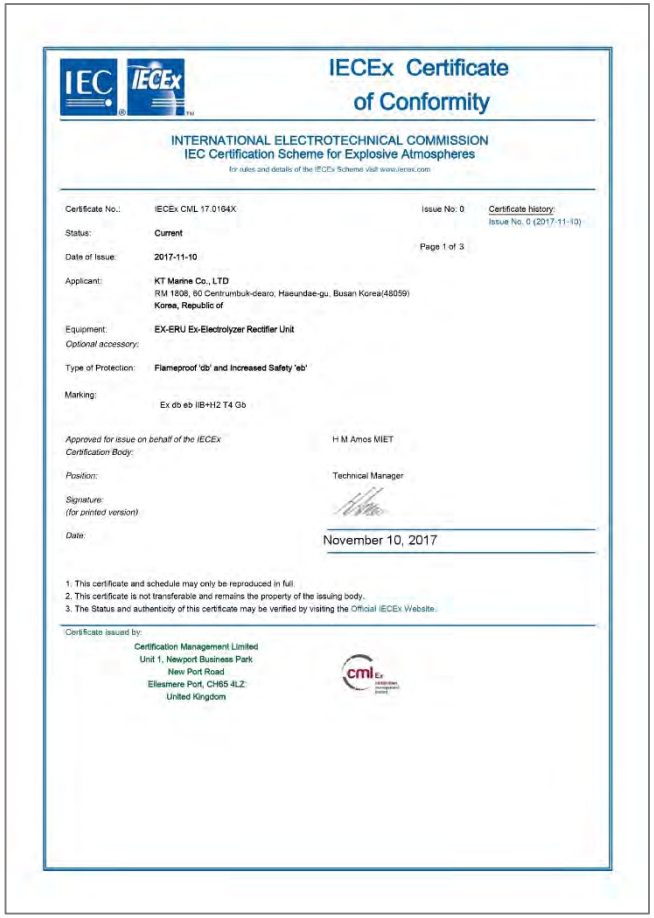
서명 Signed. 김창균
주관청 Administration of MINISTRY OF OCEANS AND FISHERIES
날짜 Dated this day of 28 March 2016

210㎜ × 297㎜[보존용지(1종) 220g/㎡]

Certificate of Type Approval by Government

03 Reference

Certificates and Patents



IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx CML 17.0164X — Issue No: 0 — Certificate history: Issue No. 0 (2017-11-10)

Status: Current — Page 1 of 3

Date of Issue: 2017-11-10

Applicant: KT Marine Co., LTD
RM 1808, 60 Centrumbuk-dearo, Haeundae-gu, Busan Korea(48059)
Korea, Republic of

Equipment: EX-ERU Ex-Electrolyzer Rectifier Unit
Optional accessory:

Type of Protection: Flameproof 'db' and increased Safety 'eb'

Marking: Ex db eb IIB+H2 T4 Gb

Approved for issue on behalf of the IECEx Certification Body: H M Amos MIET

Position: Technical Manager

Signature: (for printed version)

Date: November 10, 2017

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:
Certification Management Limited
Unit 1, Newport Business Park
New Port Road
Ellesmere Port, CH65 4LZ
United Kingdom

Certificate of Explosion Proof(IECEx)
IECEx CML 17.0164X

cml Ex certification management limited

EU Type Examination Certificate CML 17ATEX1303X Issue 0

1 Equipment intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU

2 Equipment EX-ERU Ex-Electrolyzer Rectifier Unit

3 Manufacturer KT Marine Co., LTD

4 Address RM 1808, 60 Centrumbuk-dearo, Haeundae-gu, Busan Korea(48059).

5 The equipment is specified in the description of this certificate and the documents to which it refers.

6 Certification Management Limited, Unit 1 Newport Business Park, New Port Road, Ellesmere Port CH65 4LZ, UK, Notified Body Number 2503, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.
The examination and test results are recorded in the confidential reports listed in Section 12.

7 If an 'X' suffix appears after the certificate number, it indicates that the equipment is subject to conditions of safe use (affecting correct installation or safe use). These are specified in Section 14.

8 This EU Type Examination certificate relates only to the design and construction of the specified equipment or component. Further requirements of Directive 2014/34/EU Article 13 apply to the manufacture of the equipment or component and are separately certified.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the confidential report, has been demonstrated through compliance with the following documents:
EN 60079-0:2012+A11:2013 EN 60079-1:2014 EN60079-7:2015

10 The equipment shall be marked with the following:
Ex II 2 G
Ex db eb IIB+H_2 T4 Gb

This certificate shall only be copied in its entirety and without change www.CMLEx.com

1 of 2

H M Amos MIET
Technical Manager

Certificate of Explosion Proof(ATEX)
CML 17ATEX1303X