



**Ballast Water Management System**

## Blue Ocean

YOUR DREAM, OUR MISSION

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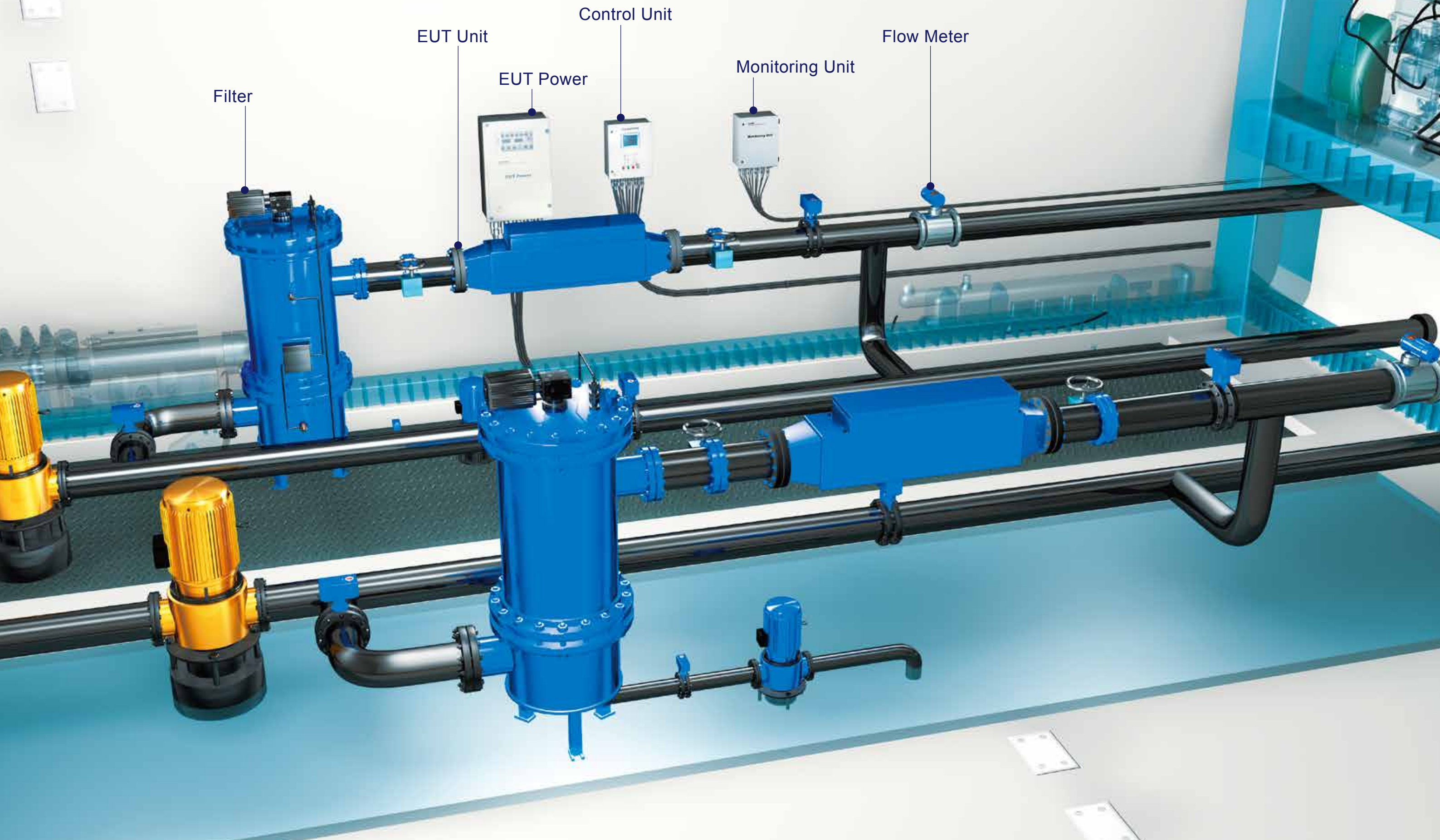
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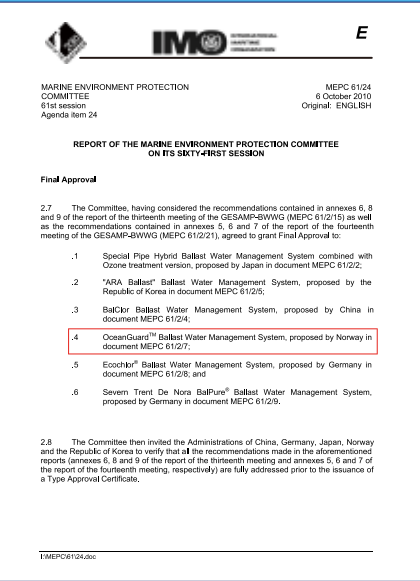
## OceanGuard® BWMS—The Right Solution





Approval

1 IMO Final Approval



2 Full-Scale DNV Type Approval



3 CCS Type Approval



4 USCG-AMS Certificate



5 RINA Type Approval



Approval in Progress





## Treatment Process of OceanGuard® BWMS

### 1 Step1- Filtration

50 microns precision filtration ; Automatic backflush and filtration at the same time ;

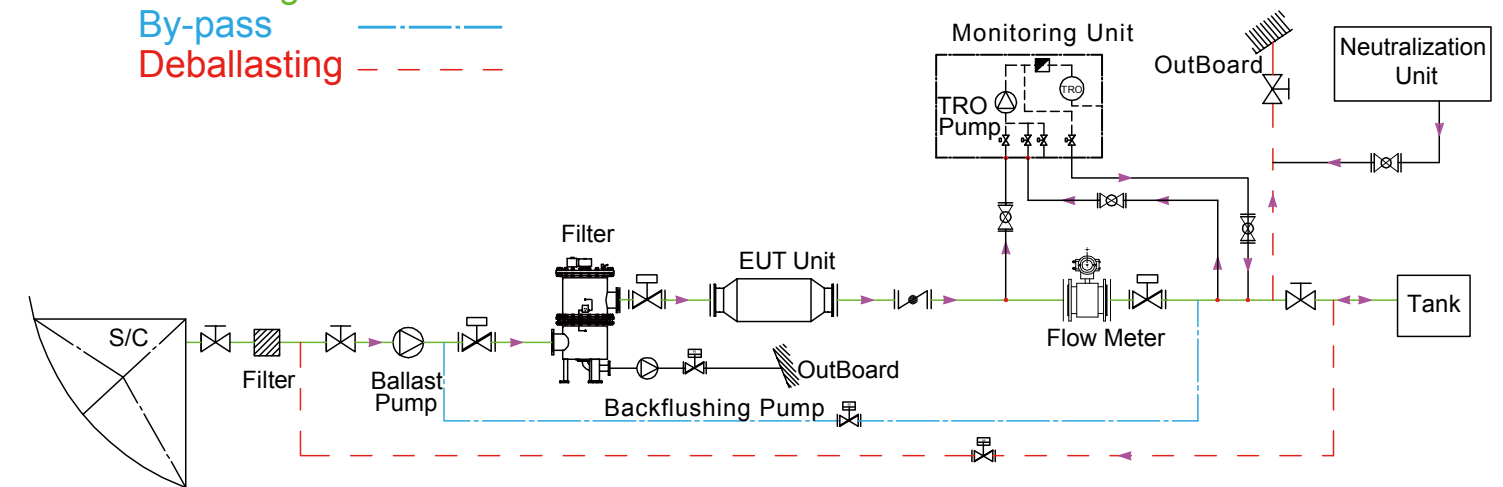
### 2 Step2- Advanced Electro-catalysis Oxidation Process (AEOP)

Electro-Catalysis in the EUT Unit produces  $\cdot\text{OH}$  radicals with perfect sterilization performance ; The final products of reaction are  $\text{CO}_2$ ,  $\text{H}_2\text{O}$  and traces of inorganic salt without any hazardous residuals — zero-pollution emissions.

Ballasting: step1+step2

Deballasting: step2

Ballasting ———  
By-pass - - - - -  
Deballasting - - - - -





# Blue Ocean Your Dream Our Mission

OceanGuard® BWMS  
**HEADWAY**

## Advantages of OceanGuard® BWMS

### 1 Higher Requirements Compliant

IMO D-2 Regulation, California Requirement and USCG Standard.

### 2 Single Treatment

Single Treatment, suitable for all kinds of ballast water drainage system.

### 3 Small Size, Easy Installation

Size of OceanGuard® BWMS is among the smallest in the world. The small footprint and compact design makes the installation easy and flexible.

### 4 Energy-saving

Low operating costs. Energy consumption is only appr. 17kwh for the treatment of 1000 m<sup>3</sup> of ballast water.

### 5 High Sterilization Efficiency

Hydroxyl radicals produced in the process of AEOP will disappear within several nanoseconds. These radicals have high sterilization efficiency, which are able to kill different organisms in ballast water effectively in a chained mode.

### 6 No Corrosion to Ships

Through the AEOP, concentration of total residual oxidation (TRO) is within 2 mg/L. According to results of long-term operation, OceanGuard® BWMS is proved safe and reliable, and water treated causes no corrosion to the hull.

### 7 Explosion-proof

OceanGuard® BWMS has obtained Explosion-proof approval.

### 8 Tested in Norway NIVA Facility, Quality Trustworthy

OceanGuard® BWMS is tested in NIVA—one of the most famous test facilities, with strict test procedures and integrated data.





## Auto-Back Flushing Filter of OceanGuard® BWMS

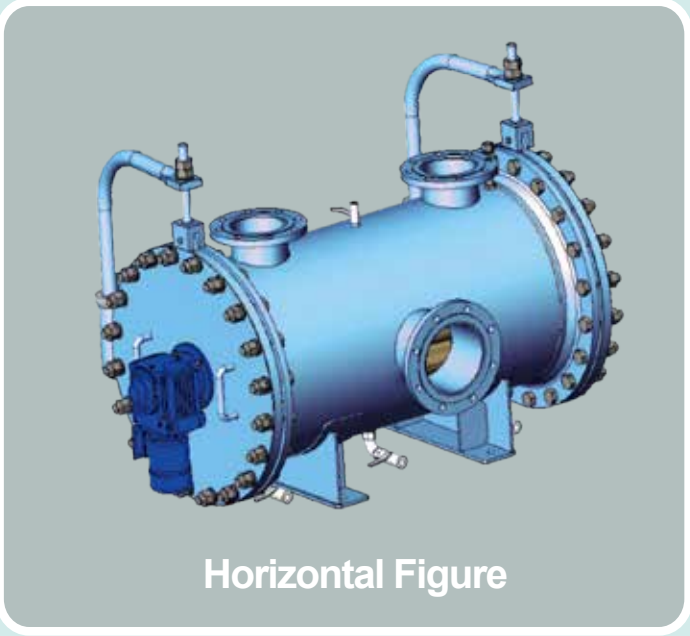
OceanGuard® BWMS adopts fully auto-back flushing filter with 50µm filtration precision , realizing the operation of filtration and back flushing at the same time, removing organisms larger than 50µm in ballast water to prevent micro organisms and sediments entering ballast tank.

## Unique Features of OceanGuard® Filter

- 1 Specially design for usage of ballast water management system ;
- 2 Perfect back flushing performance, long- running without blockage has been proved from test results in different waters ;
- 3 Low pressure loss.

## Filter Technical Specification of OceanGuard® BWMS

Model	Element Model	Element QTY	Volume (L)	Dimension (mm)	Capacity (m³/h)
HMT-100F	A2	11	120	650*565*1445	10~150
HMT-200F	A2	20	205	800*670*1600	10~250
HMT-300F	A2	28	300	900*780*1705	50~400
HMT-500F	A3	16	450	980*780*2210	50~550
HMT-600F	A3	24	650	1060*895*2330	50~700
HMT-800F	A3	28	860	1180*1015*2380	50~900
HMT-1000F	A3	32	1100	1300*1115*2530	50~1100
HMT-1500F	A3	50	1490	1440*1230*2610	100~1600
HMT-2000F	A4	34	1900	1500*1230*3260	100~2100
HMT-3000F	A4	44	2500	1700*1455*3480	100~3100
HMT-4000F	A4	54	4000	1900*1675*3600	100~4500
HMT-5000F	A4	72	5900	2100*1915*4050	100~5500



# EUT Unit of OceanGuard® BWMS

- 1 The core of OceanGuard® BWMS, includes Electro-Catalysis Unit and Ultrasonic Unit ; Electro-Catalysis produces ·OH radicals with perfect sterilization performance ;
- 2 EUT Unit needs no daily cleaning or maintenance, because Ultrasonic Unit cleans the inside, keeping the long-term treatment effectiveness of the electro-catalysis material.



## EUT Unit Technical Specification of OceanGuard® BWMS

Model	Capacity Range (m³/h)	Power (kw)	Dimension (mm)
HMT-50E	10~85	0.8	386*411*1041
HMT-100E	10~150	1.5	386*555*1041
HMT-200E	10~250	3	386*555*1376
HMT-300E	50~350	4.5	386*555*1701
HMT-450E	50~500	6.8	416*601*1821
HMT-600E	50~700	9	465*631*1957
HMT-800E	50~900	13	465*781*1957
HMT-1000E	50~1100	17	565*676*2123
HMT-1200E	100~1400	21	565*786*2123
HMT-1500E	100~1700	25	625*786*2208
HMT-2000E	100~2200	34	625*926*2208
HMT-2500E	100~2700	42	655*1054*2212
HMT-3000E	100~3500	52	655*1054*2222



## AEOP Technology of EUT Unit

- 1 Treatment Principle: to kill the microbes, bacteria and viruses in the water and reduce other organics by destroying the cell membrane of the microbe, using hydroxyl radicals (·OH) made from water molecules under electron excitation of the special semiconductor materials ;
- 2 Hydroxyl radical (·OH) is one of the most active substances with very strong oxidizability, extremely fast reaction rate and strong negative charge affinities ;
- 3 The final products of reaction are CO<sub>2</sub>, H<sub>2</sub>O and traces of inorganic salt, zero-pollution emissions ;
- 4 The generating and existing time of hydroxyl radicals is less than 10<sup>-12</sup> s, and the reaction rate with organics is over 10<sup>9</sup> L/(mol.s) , guaranteeing the high efficiency and effectiveness of OceanGuard® BWMS.



# Installation Reference



OceanGuard® BWMS  
on board COSTA ROMANTICA  
COSTA ROMANTICA: Cruise Ship, RINA

OceanGuard® BWMS  
on board ALICE FS415  
ALICE FS415: Dry Bulk Cargo, BV

OceanGuard® BWMS  
on board BOA 34  
BOA34: 140m Barge, DNV

OceanGuard® BWMS  
on board KE XUE  
KE XUE: Science & Investigation Ship, CCS

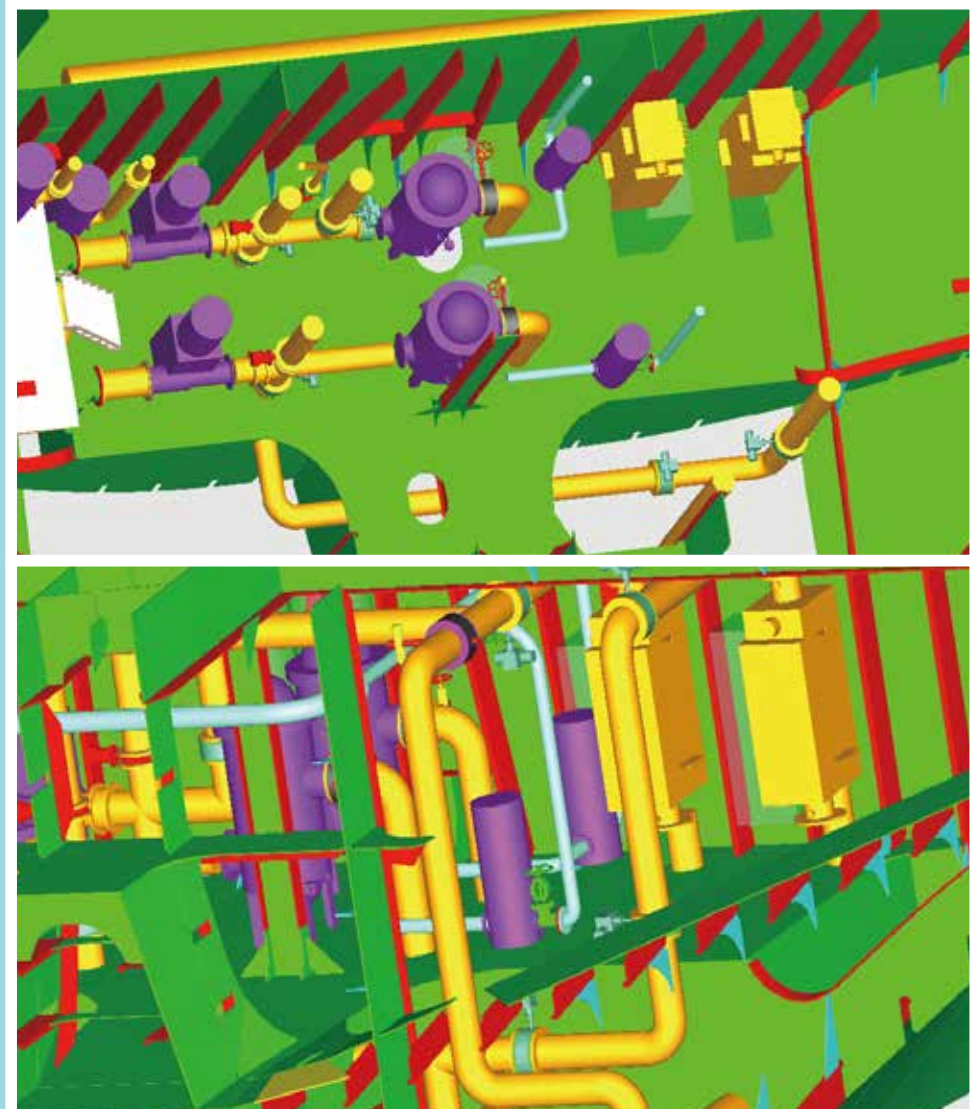


# Installation Reference



OceanGuard® BWMS  
on board FORTUNE OCEAN SHIPPING  
FORTUNE OCEAN SHIPPING:  
82,000 Bulk Carrier, ABS

OceanGuard® BWMS  
on board MV SITC YOKOHAMA  
MV SITC YOKOHAMA: Container Ship, ABS  
Installation: seven engineers, only 4 days.



OceanGuard® BWMS  
on board SEA PIONEER  
SEA PIONEER: 50,000 Tanker, DNV



# Global Service Network

Asia-America-Europe three service centers, radiation arrives 120 service bases in 56 countries and regions, forming a complete global service network, guaranteeing after-sale service and support.



ARGENTINA、AUSTRALIA、BANGLADESH、BRAZIL、BULGARIA、CANADA、CHILE、CHINA、CYPRUS、CROATIA、DENMARK、EGYPT、ESTONIA、FRANCE、GERMANY、GREECE、INDIA、INDONESIA、IRAN、ISRAEL、ITALY、JAPAN、KENYA、KOREA、LATVIA、LEBANON、LITHUANIA、MALAYSIA、MALTA、MEXICO、MOROCCO、NETHERLANDS、NIGERIA、NORWAY、PAKISTAN、PANAMA、PERU、PHILIPPINES、POLAND、QATAR、ROMANIA、RUSSIA、SINGAPORE、SOUTHAFRICA、SPAIN、SWEDEN、TAIWAN、THAILAND、TRINIDAD & TOBAGO、TURKEY、U.A.E.、UKRAINE、U.K.、URUGUAY、USA、VIETNAM