



**TYPE APPROVED BY
U. S. COAST GUARD**

OceanGuard[®] Ballast Water Management System

HEADWAY TECHNOLOGY GROUP (QINGDAO) CO., LTD.

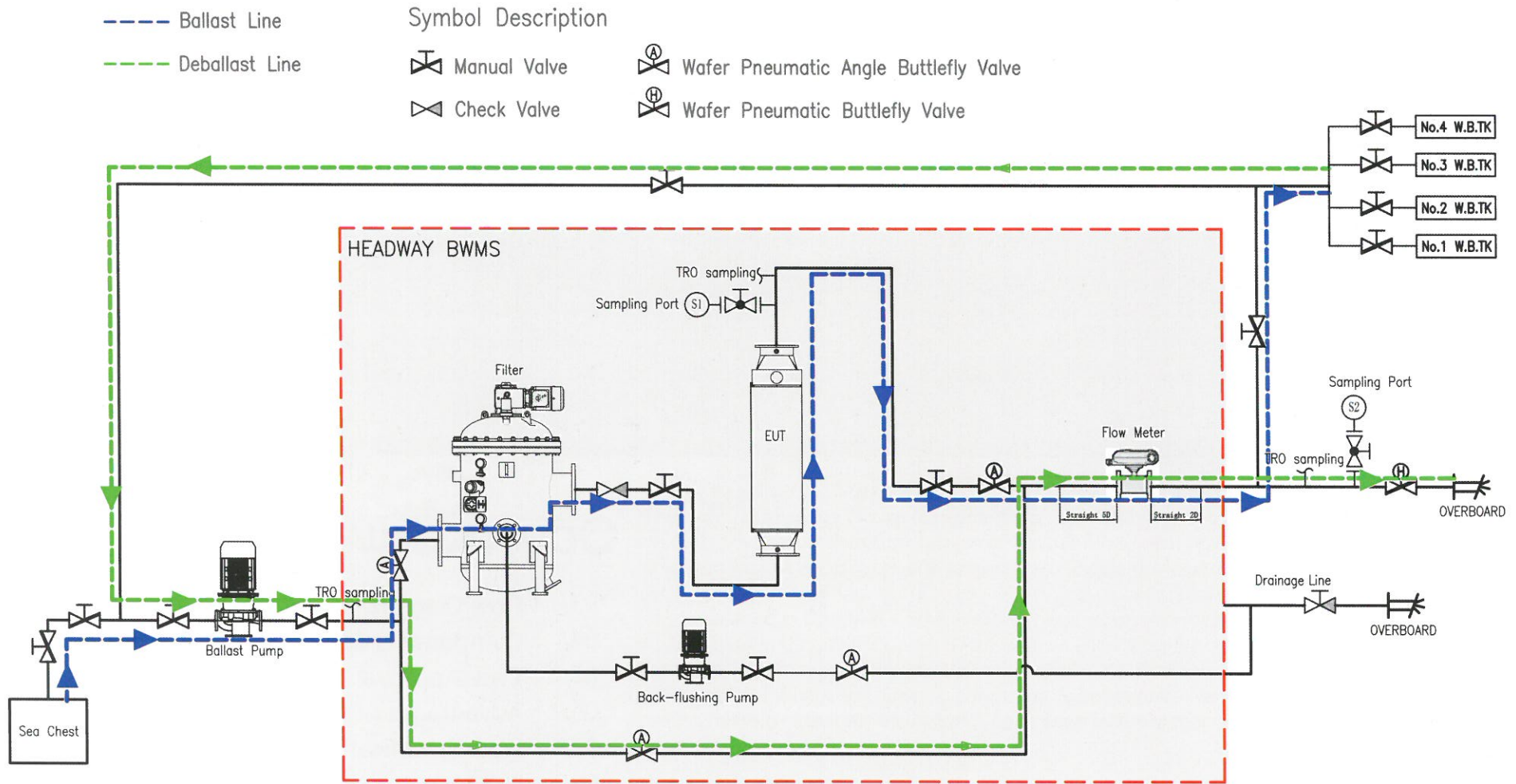


- Headway Technology Group (Qingdao) Co., Ltd. is a high-tech enterprise that takes technological innovation as the purpose, specializes in professional R&D, manufacturing and sales of high-tech marine accessories and provides worldwide professional after-sales service.
- Headquartered in Qingdao, China, Headway has set up an independent R&D center and production base in Qingdao High-tech Park with an annual production capacity of 1,000 sets. Furthermore, Headway has also established one subsidiary company in Shanghai, branch offices in Guangzhou, Shenzhen, Dalian, Zhoushan, Shanhaiguan, Nantong, Huangdao, etc. and a comprehensive global service network composed by more than 120 service stations across 56 countries/regions.
- "Service, Innovation and Win-win", Headway commits to satisfying customers, pursuing new technology with sincerity, perseverance and courage.



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Flow Diagram



*EUT : Electrocatalysis Ultra Treatment Unit

Components & Working Principle

CONTROL UNIT

- BOTH LOCAL AND REMOTE CONTROLS**

Alarm information can be output to the vessel's control system.

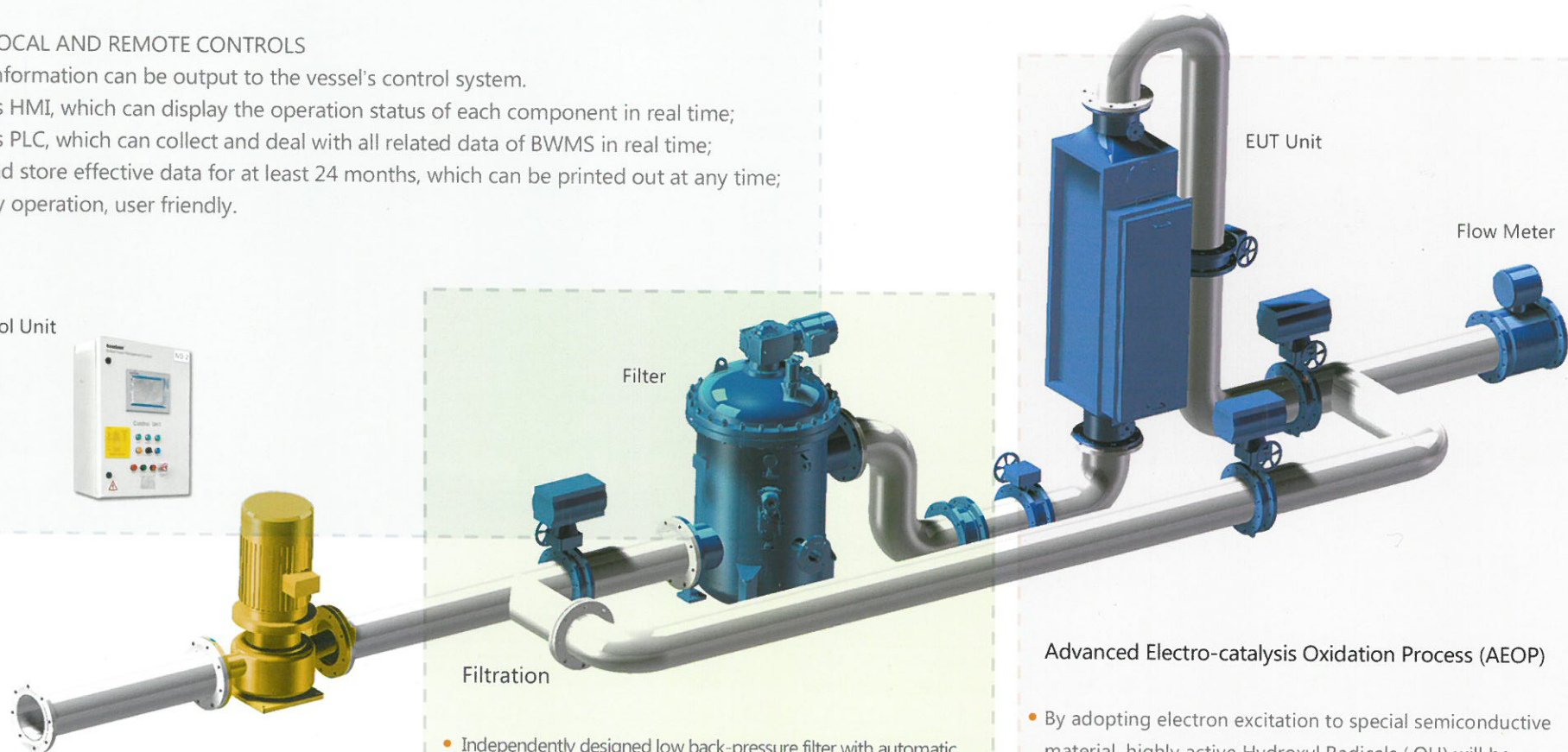
Siemens HMI, which can display the operation status of each component in real time;

Siemens PLC, which can collect and deal with all related data of BWMS in real time;

Keep and store effective data for at least 24 months, which can be printed out at any time;

One-key operation, user friendly.

Control Unit



Filter

EUT Unit

Flow Meter

Filtration

- Independently designed low back-pressure filter with automatic back-flushing, removes organisms larger than 50 μ m.
- As the filter can be installed either vertically or horizontally, this flexibility provides ease in retrofitting for existing vessels.

Advanced Electro-catalysis Oxidation Process (AEOP)

- By adopting electron excitation to special semiconductive material, highly active Hydroxyl Radicals (\cdot OH) will be produced from water molecules. The Hydroxyl Radicals kill micro-organisms, bacteria, and viruses in water by destroying cell membrane.

Type Approval

OceanGuard® BWMS -- the most comprehensively Type Approved system

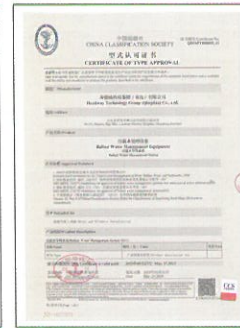
Type Approved by more than 14 International authorities



ABS



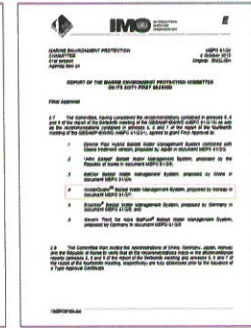
BV



CCS



DNV-GL



IMO



IRAN



KR



LR



Liberia TAC



NK



NL



RS



RINA



USCG

Advantages of OceanGuard® BWMS



OceanGuard® Ballast Water Management System



Low Power Consumption

Consumption is approx. 17 KW for the treatment of 1,000m³ of ballast water.



Safe & Non-corrosion

No harmful by-products like H₂ or Cl₂, and no corrosion to the hull.



Highly effective sterilization

Complete sterilization, meeting USCG standard.



Small Footprint

Compact design ensures flexible installation for vessels of all types and sizes.

OceanGuard® Filter Specification



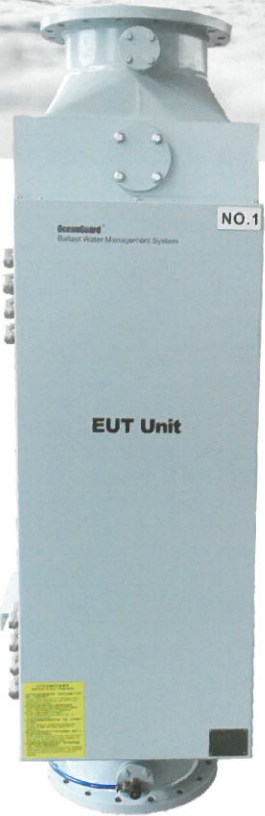
Type	Volume(L)	Dimension(MM)			Flow Range(M ³ /H)
HMT-100F	120	650	565	1445	10-150
HMT-200F	205	800	670	1600	10-250
HMT-300F	300	900	780	1705	50-400
HMT-500F	450	980	780	1705	50-550
HMT-600F	650	1060	895	2330	50-700
HMT-800F	860	1180	1015	2380	50-900
HMT-1000F	1100	1300	1115	2530	50-1100
HMT-1500F	1490	1440	1230	2610	100-1600
HMT-2000F	1900	1500	1230	3260	100-2100
HMT-3000F	2500	1700	1455	3480	100-3100
HMT-4000F	4000	1900	1675	3600	100-4500
HMT-5000F	5900	2100	1915	4050	100-5500

OceanGuard® Filter Specification



Type	Volume(L)	Dimension(MM)			Flow Range(M ³ /H)
S-ZF1-V	140	695	630	1105	10-150
S-ZF2-V	145	695	630	1105	10-260
S-ZF3-V	176	695	630	1301	50-390
S-ZF4-V	595	995	810	1676	50-650
S-ZF5-V	595	995	810	1676	50-780
S-ZF6-V	690	981	810	1828	50-1040
S-ZF7-V	690	981	810	1828	50-1300
S-ZF8-V	1440	1275	1110	2020	50-1560
S-ZF9-V	1440	1275	1110	2020	100-1950
S-ZF10-V	1528	1417	1260	1985	100-2600
S-ZF11-V	1892	1417	1260	2273	100-3250
S-ZF12-V	1892	1417	1260	2273	100-3900
S-ZF13-V	2750	1670	1440	2460	100-5220

EUT Unit



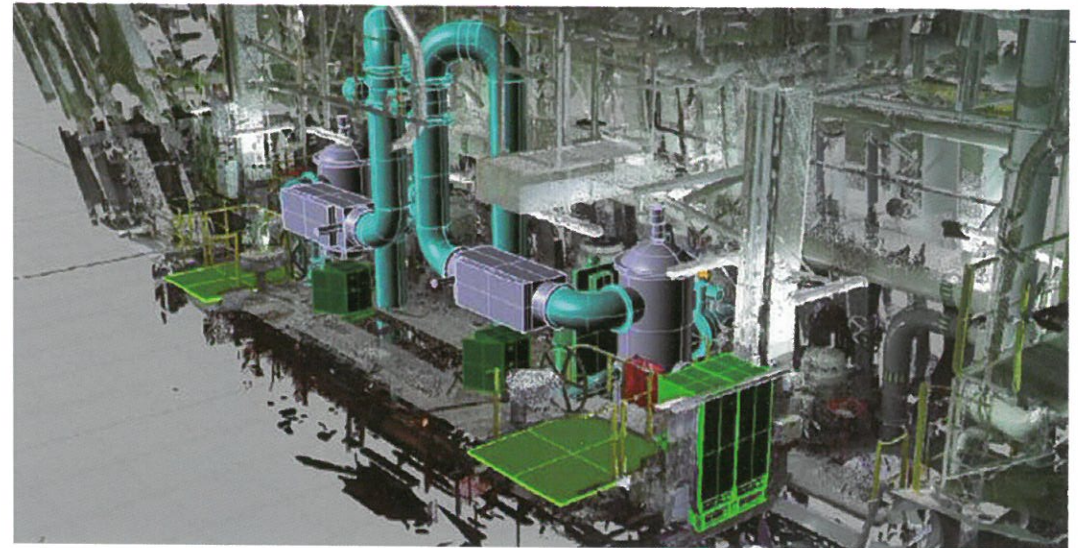
OceanGuard® EUT Specification

Type	Power ConsumptionW (KW)	Dimension (MM)			Capacity Range (M ³ /H)
50	0.8	381	445	1530	10-65
100	1.5	381	445	1530	10-130
200	3	381	527	1530	20-260
300	4.5	426	612	1701	30-390
450	6.8	456	707	1821	30-585
600	9	505	707	1957	50-780
800	13	505	844	1957	50-1040
1000	17	605	817	2123	50-1300
1200	21	605	892	2123	50-1560
1500	25	663	884	2208	50-1950
2000	34	663	1022	2208	100-2600
2500	42	695	1187	2212	100-3250
3000	52	695	1187	2222	100-3900
4000	69	695	1187	2222	100-5200

* Power Consumption Regular Sea Area

Retrofitting Advantages

- Suitable for vessels of all types
- Compact structure and flexible installation
- Small footprint and low power consumption
- One-stop service



Retrofitting Process

4/21 Weeks

- Onboard Inspection/3-D Scanning
- Schedule Planning
- Quotation

15/21 Weeks

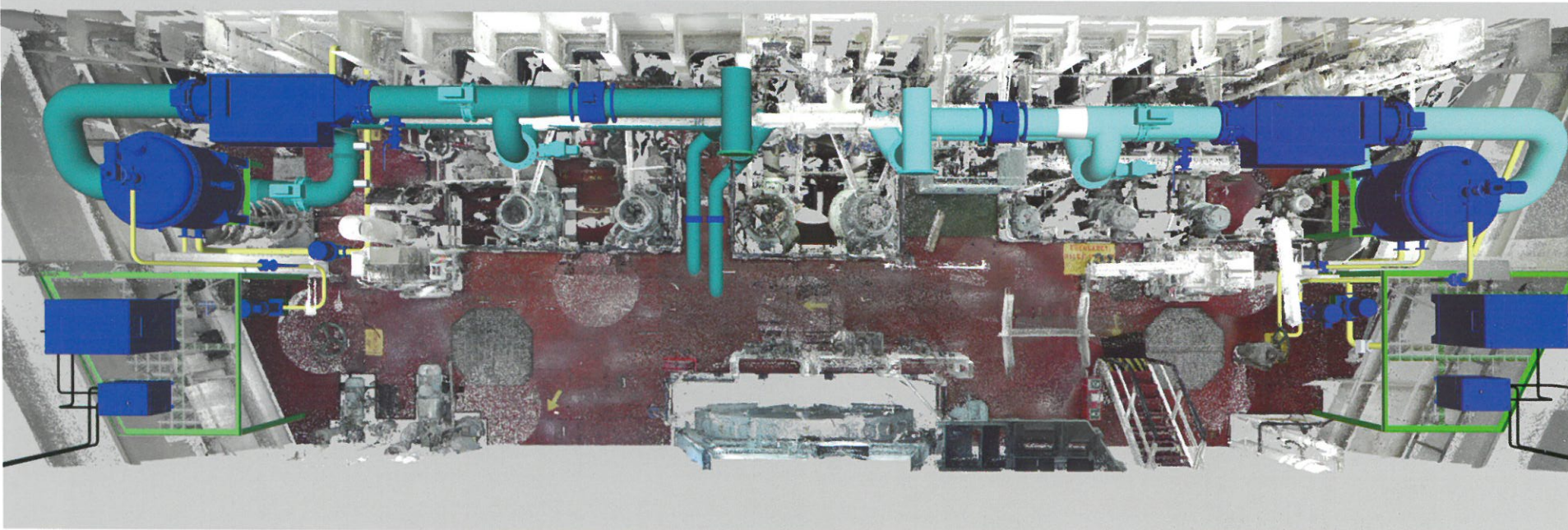
- Contract Signing
- Component Purchase
- Plan Approval
- Production

2/21 Weeks

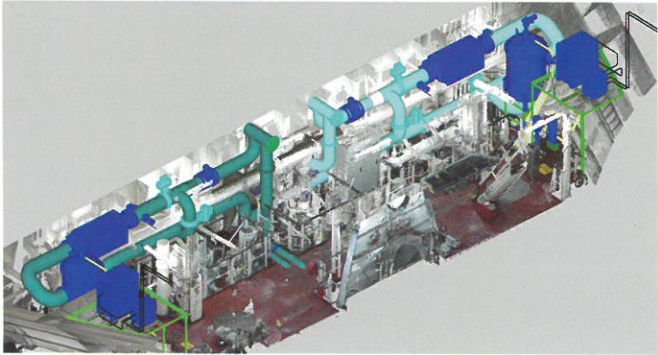
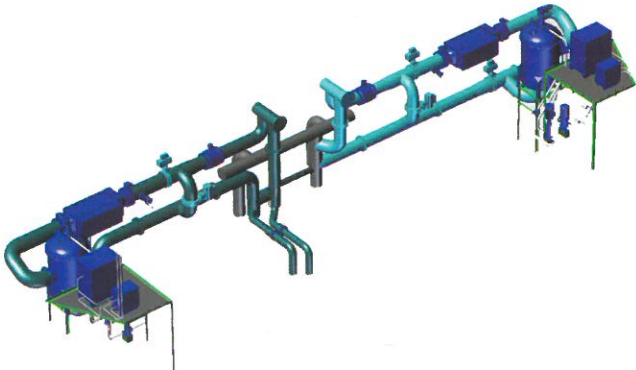
- Installation
- Commissioning
- Class Approval
- Operation Training

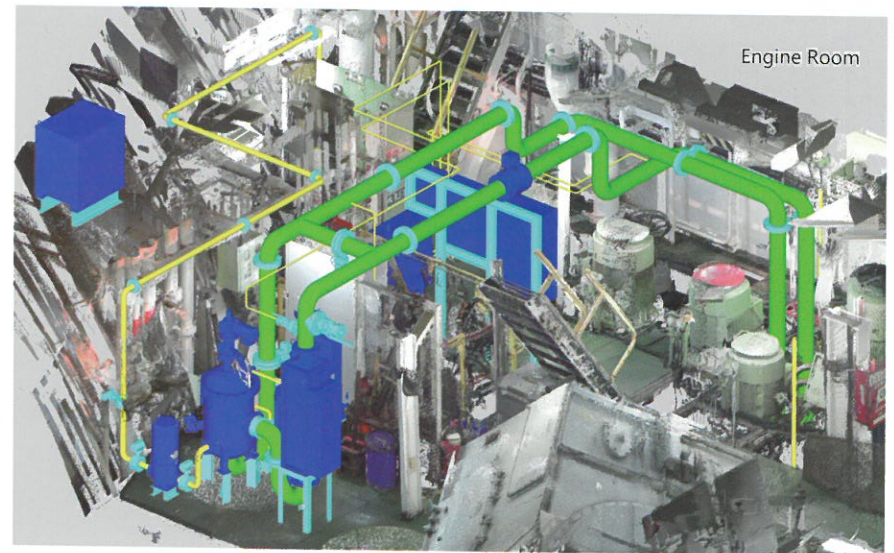
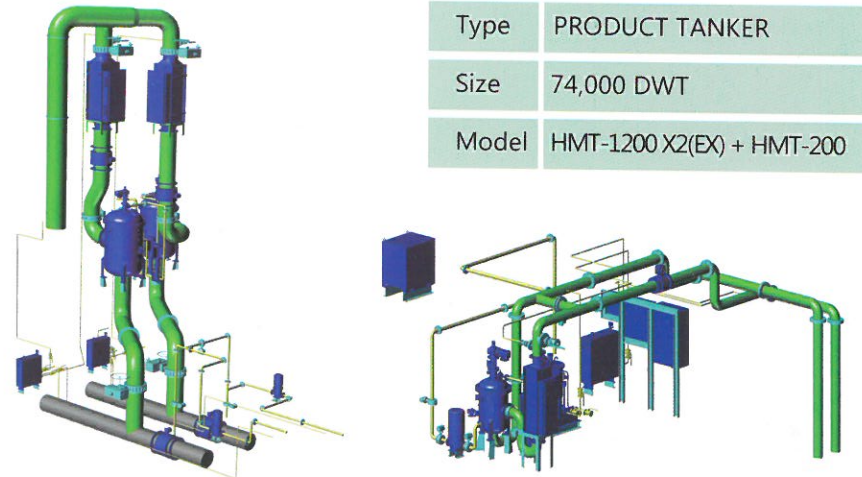
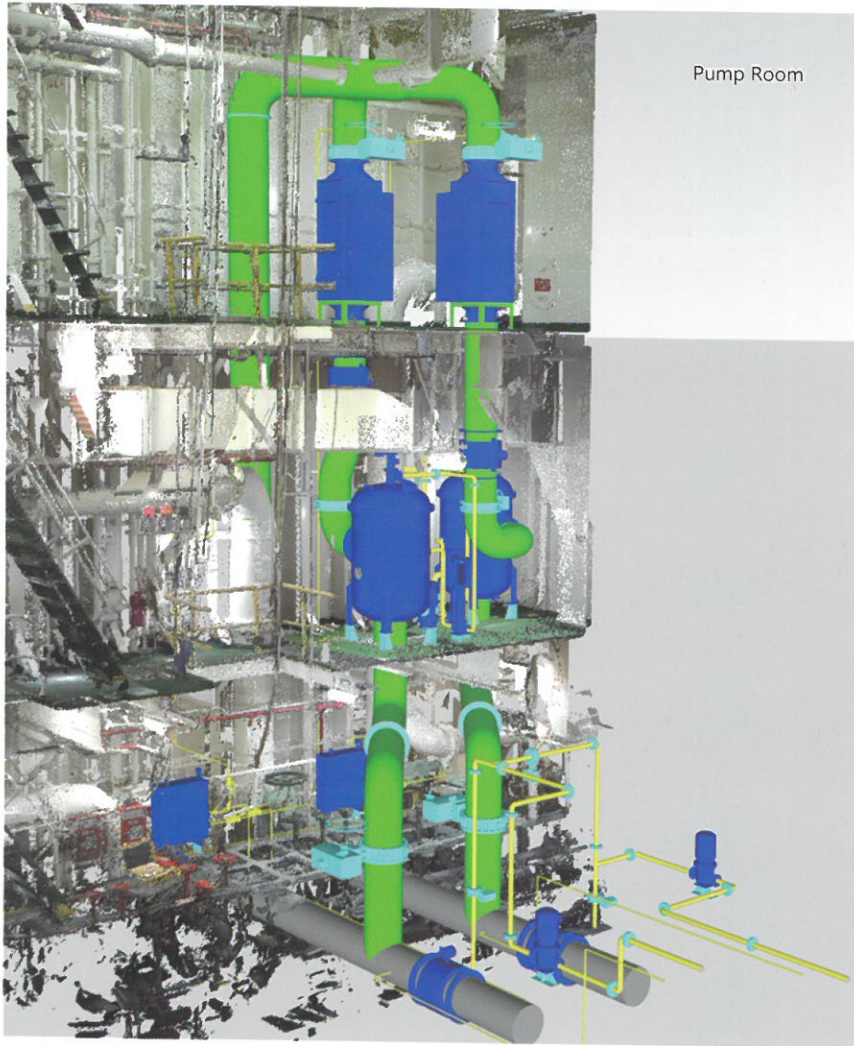


Retrofitting Design



Type	Bulk Carrier
Size	82,000 DWT
Model	HMT-1200 X2





Cases

New Building Cases

Type	Container Vessel
Size	4662 TEU
Model	HMT - 600
Date	2014



Type	Chemical/Oil Products Tanker
Size	50,000 DWT
Model	HMT-800x2(EX)+HMT-300
Date	2014



Retrofitting Cases

Type	Container Vessel
Size	4662TEU
Model	HMT - 600
Date	2016



Type	Chemical Tanker
Size	19,500DWT
Model	HMT-1000EX
Date	2015



Type	Bulk Carrier
Size	53,000 DWT
Model	HMT-1000 X2
Date	2015



Type	Crude Oil Tanker
Size	149,000 DWT
Model	HMT-2000 X2(EX)+HTM-300
Date	2015



Type	Bulk Carrier
Size	61,000 DWT
Model	HMT-1000 X2
Date	2015



Type	LPG Carrier
Size	8,000 M ³
Model	HMT-200
Date	2014



Headway has established more than 120 sales/after-sales service stations in 56 countries and regions around the world.



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