

HYUNDAI-BWMS

Ballast Water Management System

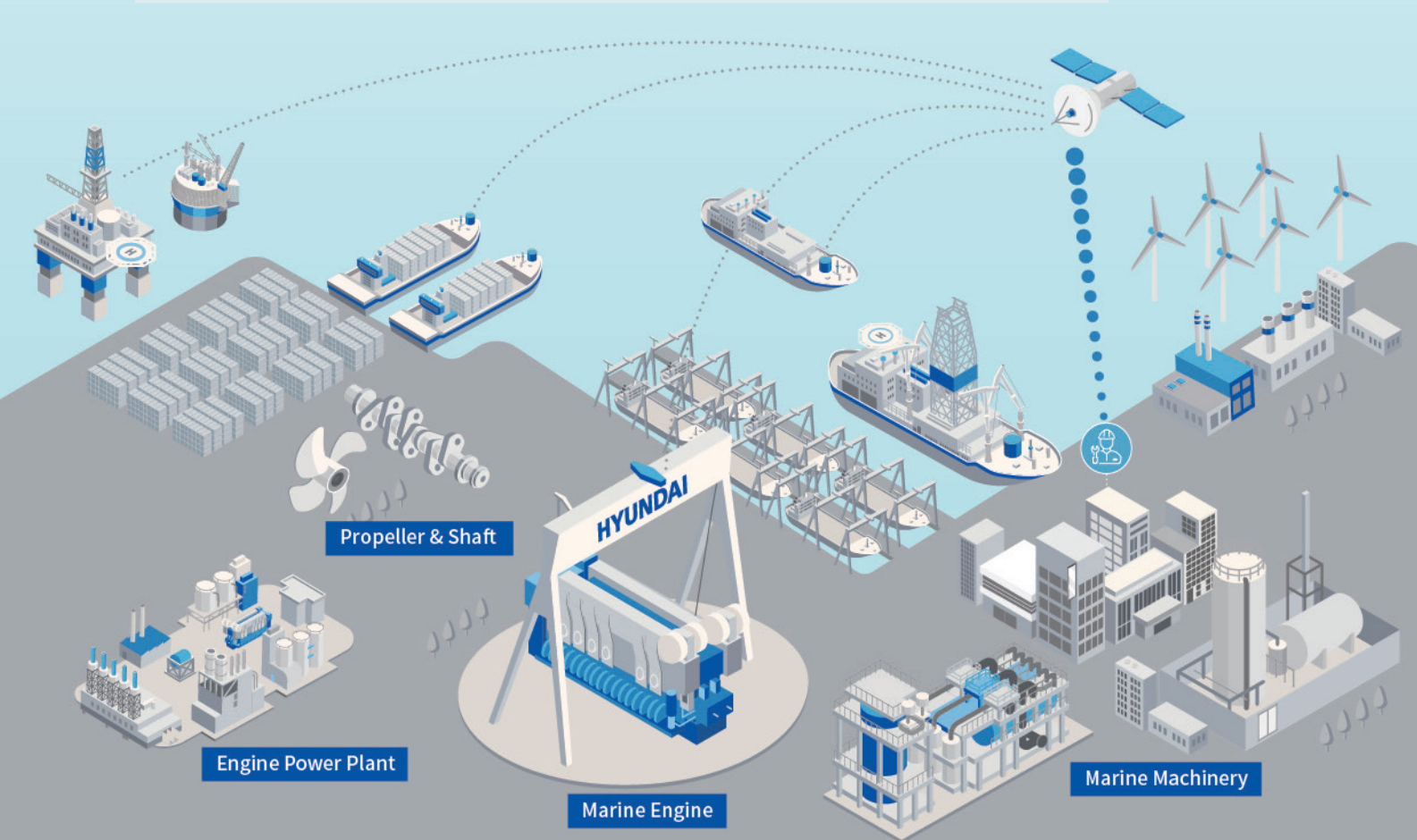
Reliable Partner for the Environmental Protection

HiBallast *EcoBallast*

HYUNDAI HEAVY INDUSTRIES ENGINE & MACHINERY LANDSCAPE

Hyundai Heavy Industries Co., Ltd.(HHI) has been leaving a remarkable footprint in global shipbuilding industry since 1972. In 1978, as one of the business units of HHI, the Engine & Machinery was launched to manufacture marine and stationary engines and has enjoyed the dominant position as the world's leading engine manufacturer until now. HHI-EMD has taken up 35% of the world's market share in 2-Stroke engines covering marine and stationary purposes.

In addition, HHI-EMD has developed technical solutions for pollution prevention and is pleased to introduce its own ballast water management system as one of the challenges to contribute toward the cleaner marine environment.



FOR CLEAN BALLAST WATER

Since 2011 HHI-EMD has delivered optimal solutions for ballast water management system, HiBallast(electrolysis type) and EcoBallast(UV filter type).

HiBallast

Key Features

ROBUSTNESS

- Corrosion resistant component

REPAIRABILITY

- Easy replacement by engineer / ship crew
- 24-hour response(World wide)

EcoBallast

RELIABILITY

- Highly accuracy of each sensor unit
- Highly reliable components

RAPIDNESS

- Fast and accurate control unit
- One touch and automatic operation with one touch panel

Protecting the Marine Environment from the Transfer of Harmful Aquatic Organisms in Ballast Water Carried by Ships

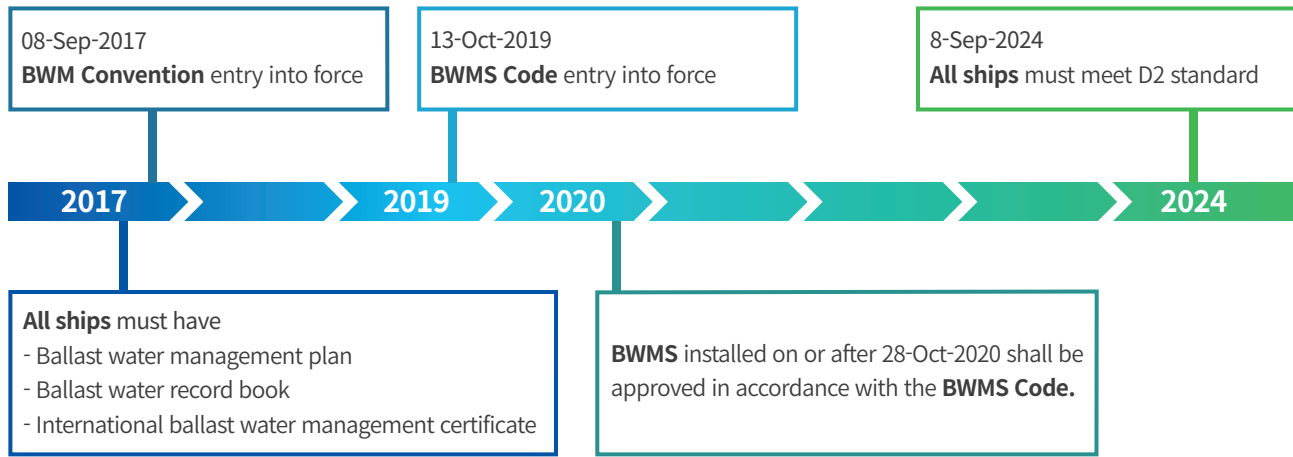
BWM Treaty Requirements

Under the Ballast Water Management Convention adopted in 2004, all ships in international traffic are required to manage their ballast water and sediments to a certain standard, according to a ship-specific ballast water management plan. All ships have to carry a ballast water record book and an international ballast water management certificate. The ballast water management standards are being phased in over a period of time. New ships must meet the ballast water treatment standard. Existing ships should exchange ballast water mid-ocean but they will need to meet the ballast water treatment standard by the date of a specified renewal survey. Eventually, most ships will need to install an on-board ballast water treatment system.

BWMS Code

Regulation D-3 (Approval requirements for Ballast Water Management systems) of the BWM Convention requires that ballast water management systems used to comply with the Convention must be approved by the Administration taking into account the Guidelines for approval of ballast water management systems (G8). The Guidelines (G8) have been revised in 2016 and converted into a mandatory Code for approval of ballast water management systems (BWMS Code), which was adopted by MEPC 72 (April 2018) and entered into force in October 2019.

BWM Convention Compliance Schedule



Complying with Environmental Protection Regulations with Proven Technology

Certificates & Approvals

Our Ballast Water Management Systems (HiBallast and EcoBallast) fully comply with the requirement of IMO and USCG regulations and are approved by the relevant Regulatory Bodies. With these optimal solutions, our valued customers can actively participate in the great trend of environmental protection for sustainable marine ecosystem.

IMO Type Approval



USCG Type Approval



United States Coast Guard

“ Gets an Updated USCG Approval for Reduced Holding Time (24hours in all conditions) on 11th, March 2020 ”

Class Type Approval

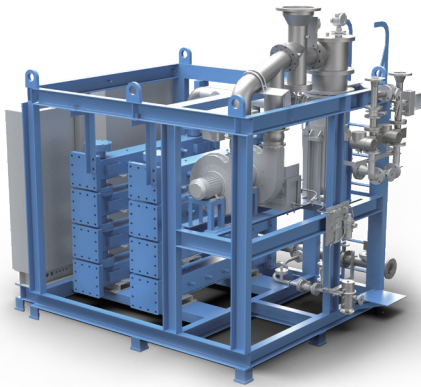
DNV-GL / RINA / KR / LR / BV



HiBallast

Disinfection System by Electrolysis of Sea Water

- No operation limit on seawater condition
 - Water Temperature : **Not Applicable**
 - Salinity : **Not Applicable**
- Broad treatment capacity : 75-10,000 m³/h
(Adjustable with the combination of electrolyzers)
- Low power consumption



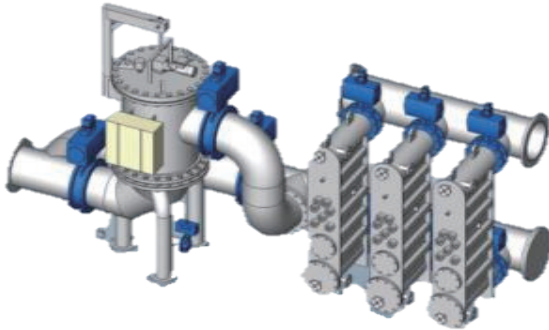
MODEL	Treatment Capacity(m³/h)	Electrolysis Unit Size L x W x H(mm)	Electrolysis Unit Dry Weight(kg)	Filter Unit Size L x W x H(mm)	Filter Weight(kg) Dry	Power (kW)
HiB-500	500	2800x2500x2800	2,400	650x650x2100	450	11
HiB-1000	1,000	2800x2500x2800	2,750	1100x1100x2350	780	23
HiB-2000	2,000	2800x2500x2800	3,095	1300x1300x2500	880	46
HiB-4000	4,000	3500x2500x3050	4,200	1650x1650x2700	1,950	91
HiB-6000	6,000	4300x2500x3200	5,030	2150x2150x3500	3,550	136
HiB-8000	8,000	5300x2700x3200	5,900	2200x2200x3500	5,000	182
HiB-10000	10,000	6100x2700x3200	6,700	2300x2300x3700	6,650	227

* Explosion proof type is also available upon request.

EcoBallast

Ultra Violet Disinfection System

- No operation limit on seawater salinity and temperature
- Zero toxicity
- Specialized for small ballast capacities :
Treatment capacity : Max. 2100 m³/h
- Minimized pressure loss
- Long lamp lifetime over 40,000 hrs with stable performance

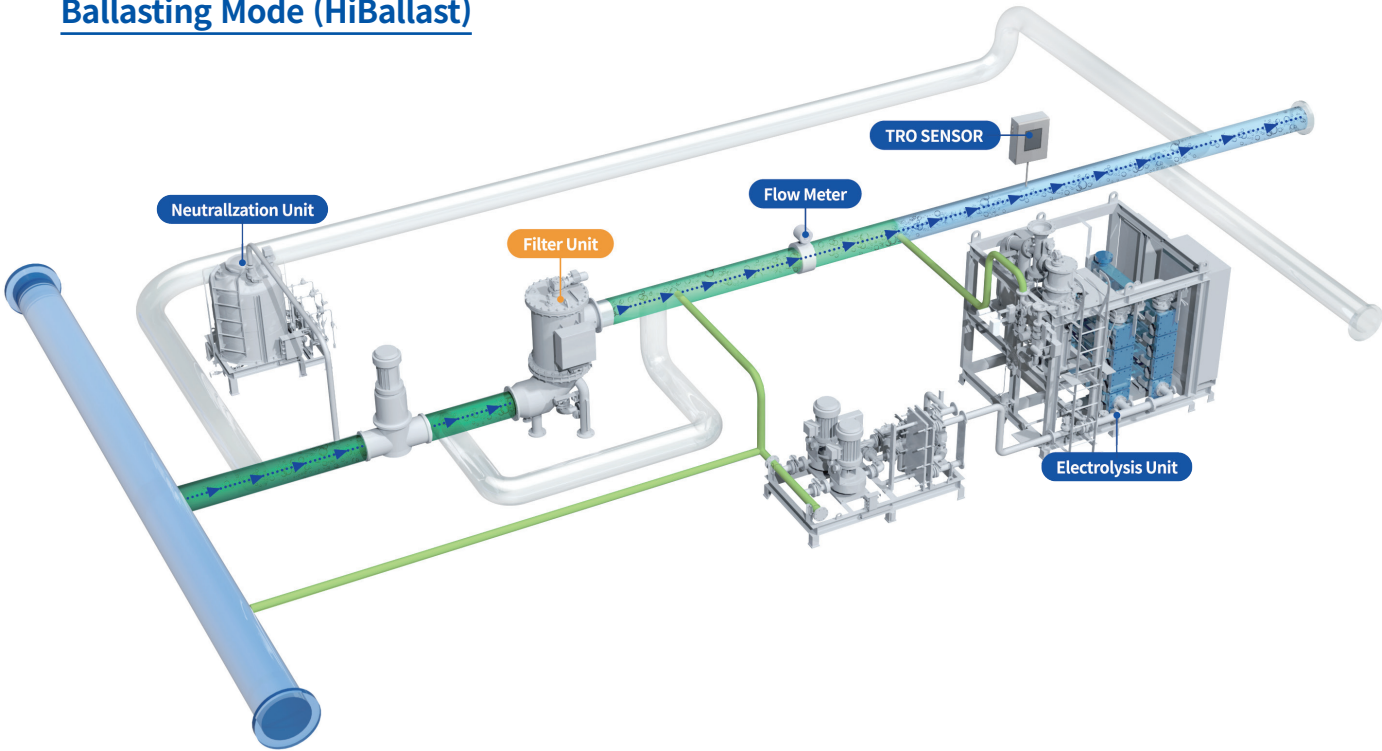


MODEL	Flow Capacity(m³/h)	UV Reactor Unit Size L x W x H(mm)	Filter Unit Size L x W x H(mm)	Weight(Wet, kg)	Power Consumption(kW)	
					Nomal	Max
ECO-350	350	400x1100x1800	850x850x2300	1,400	32	62
ECO-700	700	600x1100x1850	1100x1100x2350	2,655	64	124
ECO-1000	1,000	1700x1100x1800	1100x1100x2350	3,405	96	186
ECO-1400	1,400	1500x1100x1850	1300x1300x2500	4,410	128	248
ECO-1800	1,800	3000x1100x1800	1300x1300x2500	6,340	160	310
ECO-2100	2,100	2400x1100x1850	1350x1350x2700	6,290	192	372

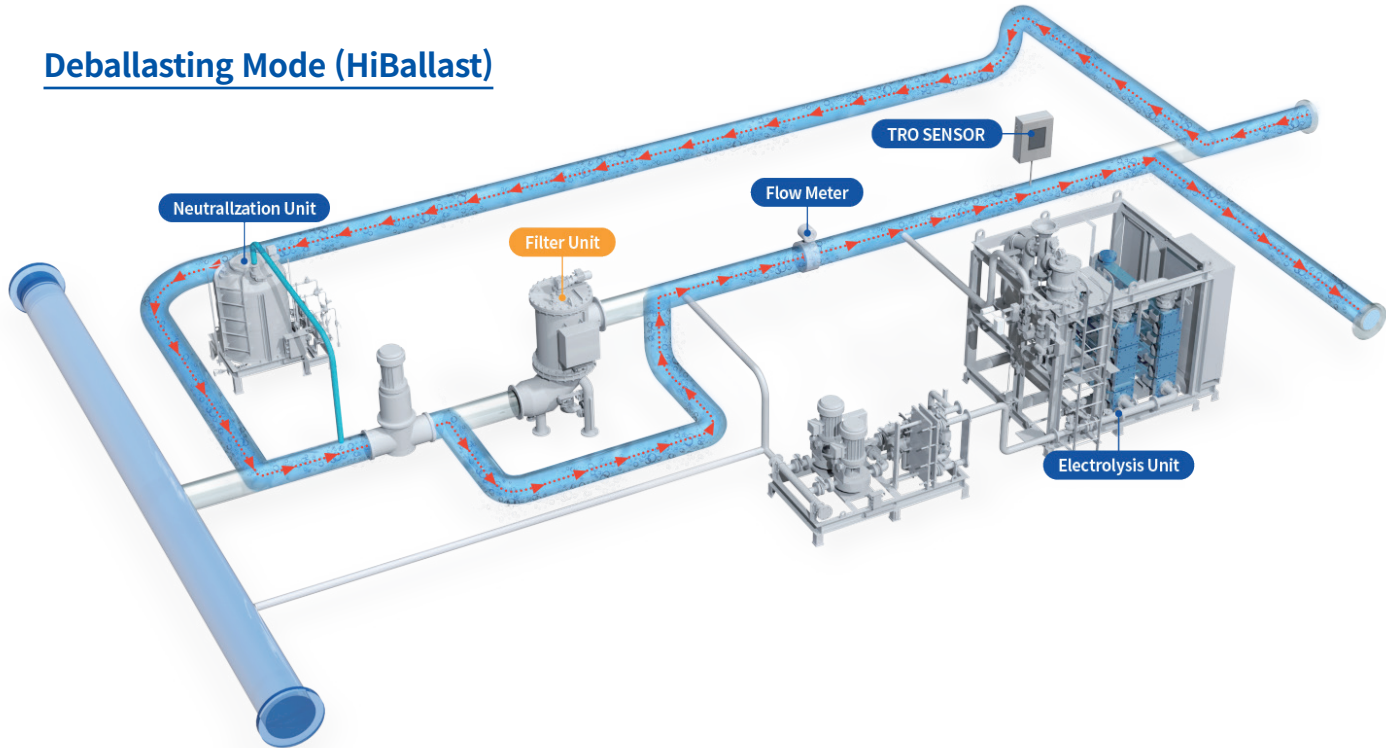
The Right Process for

Optimal Ballast Water Treatment

Ballasting Mode (HiBallast)



Deballasting Mode (HiBallast)



Smart & Compact Design That Can Be Easily Installed Both on Newly Constructed Vessels and in Retrofitting

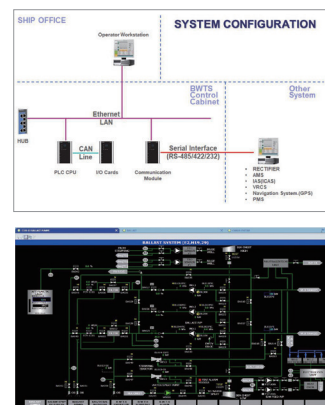
No VRC Modification for Retrofit

Existing problem
in BWMS retrofit

Solution of HiBallast

- High cost for VRCS modification
- Long lead time for valve modification
- Cost saving thanks to HiBallast integrated valve control
- Short lead time for valve modification

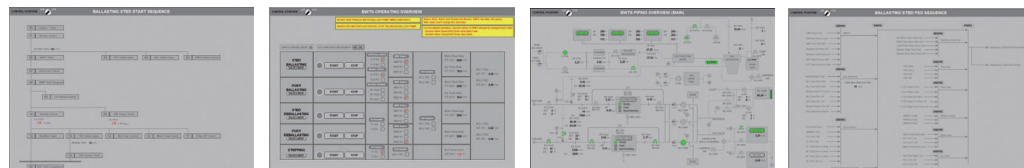
Easy Expandable PLC Program



HiBallast Human Machine Interface (HMI) is easily expandable, helps easy operation, and enables to be flexibly integrated such as:

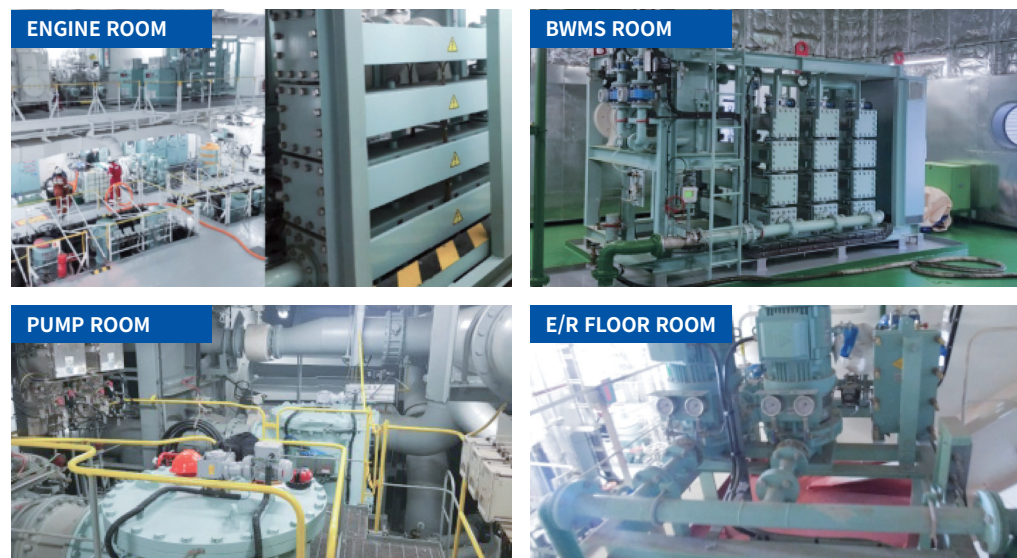
- Fully automatic operation from the valve line-up to BWMS through VRCS control
- Operation of Sea to Sea Mode and Recirculation Mode through VRCS control
- Heterogeneous communication enables BWMS operation and monitoring in the ICAS

Easy & Simple Operation



HiBallast can be simply operated by ship crews through HMI and find the fault easily thanks to user friendly and intuitive MIMIC.

Small Foot Print & Easy Installation

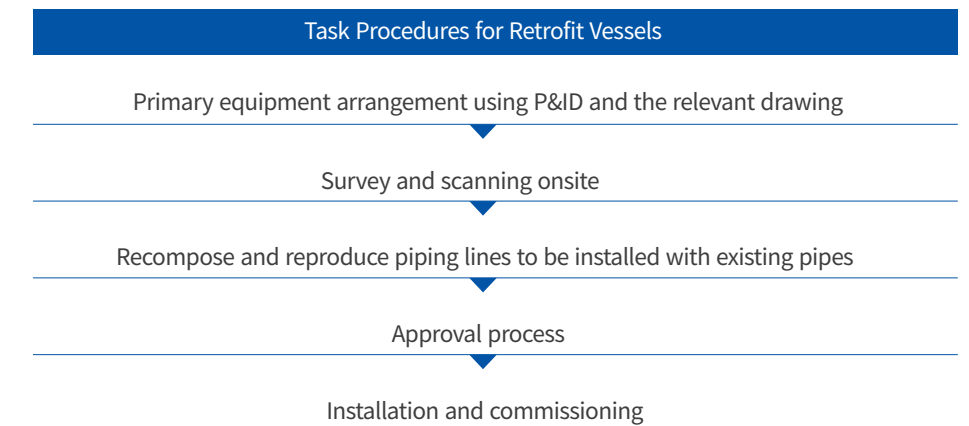


BWMS Retrofit Specialist

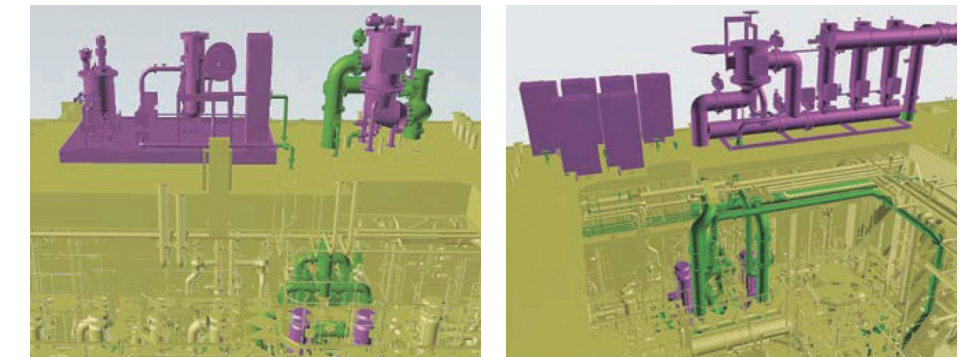
Retrofit Service Scope

- Case 1 PC (Product + Commissioning)
- Case 2 EPC (Engineering + Product + Commissioning)
- Case 3 EPIC (Engineering + Product + Installation + Commissioning)

BWMS Retrofit Procedure



Minimum Modification for Retrofit



HiBallast requires minimum modification for BWMS retrofit among all BWMS types.

Short Lead Time of Delivery

- Delivery: 3.5 months (Standard: 6 months after contract)

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Marine Solution Scope (HHI-EMD)

MARINE ENGINE	Engine	2-Stroke Diesel Engine	2-Stroke DF Engine	4-Stroke DF Engine	4-Stroke Gas Engine	4-Stroke Diesel Engine
	Application	Marine Genset	HiMSEN Propulsion System	HiEMS(Hyundai Intelligent Engine Monitoring System)	HiCAS(Hyundai Intelligent Combustion Analysis System)	
	Propeller		Shaft	Engine Components		

MARINE MACHINERY	Product	HiBallast, EcoBallast (Ballast Water Management System)	Hi-GAS(Fuel Gas Supply System)	Hi-ERS(Hyundai Innovative Economical Re-liquefaction System)	Hi-ReGAS(Hyundai Integrated Regasification System)
			Hi-Well(Cargo Pumping System)	NoNOx(Selective Catalytic Reduction)	

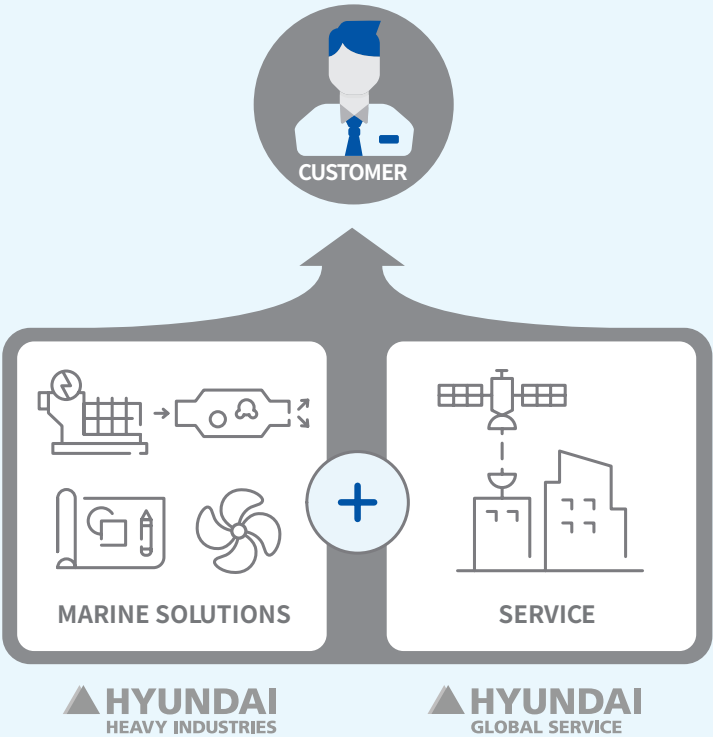
Reliable and Powerful Support around the World

- Optimized Solutions Suited for Customer's Needs
- Genuine Spare Parts from the Original Equipment Manufacturer
- Fast and Reliable Response through Global Service Network
- 24/7, Immediate Support



HYUNDAI Total Solutions

- Tailored solution suited for customer's needs
- Simple interface and easy integration
- Quality assurance
- Saving time and cost
- Global service network by Hyundai Global Service (from project study to training)



Contact Us

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