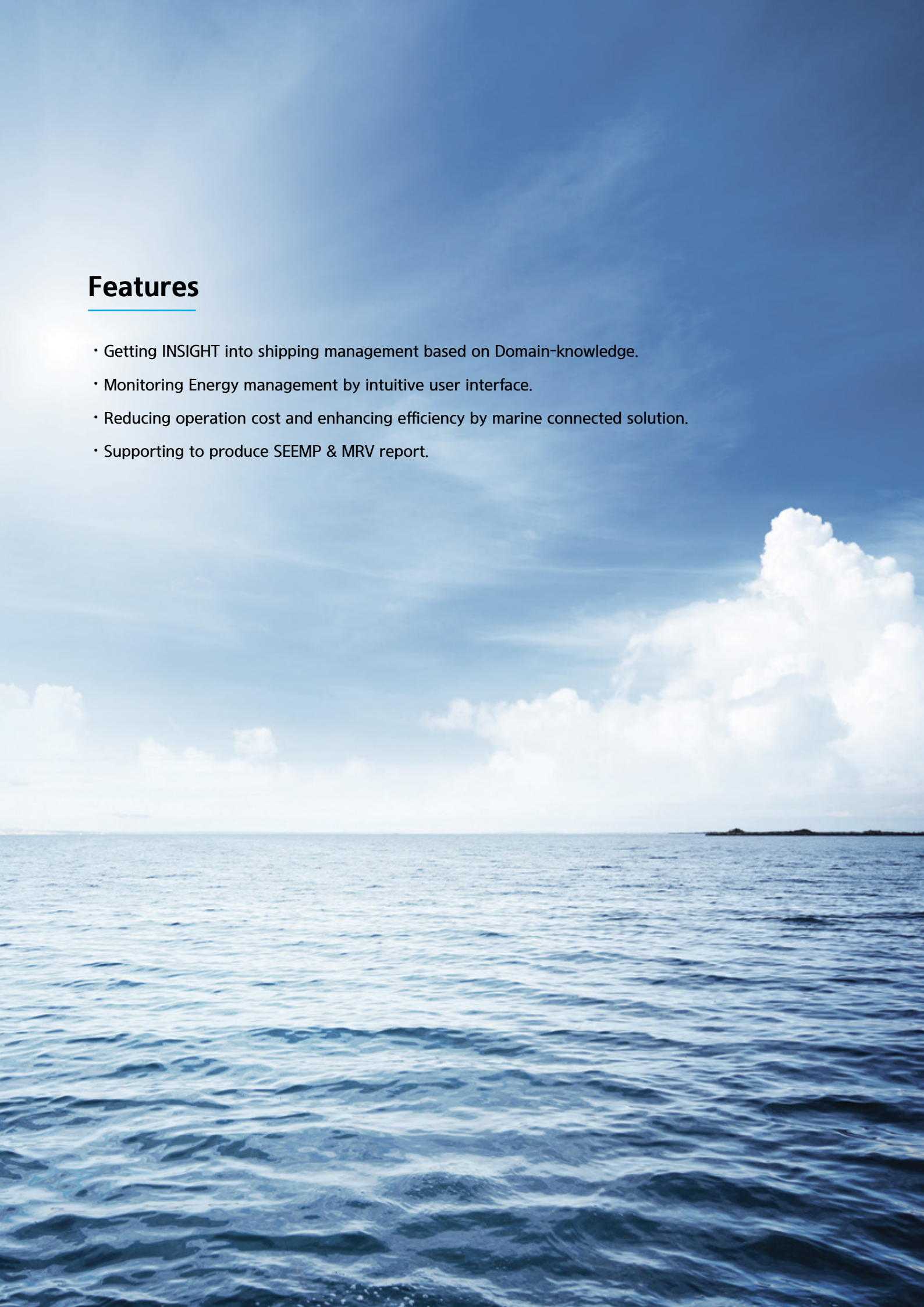

# INTEGRICT
# Smart ship Solution

HYUNDAI
ELECTRIC



## Features

- Getting INSIGHT into shipping management based on Domain-knowledge.
- Monitoring Energy management by intuitive user interface.
- Reducing operation cost and enhancing efficiency by marine connected solution.
- Supporting to produce SEEMP & MRV report.

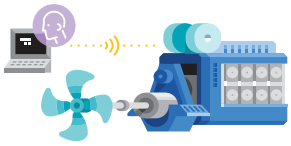
# Introduction

Hyundai Electric has unveiled its Smart ship Solution based on INTEGRICT, which delivers safe, eco-friendly and economical sailing and efficient operations, in collaboration with Hyundai Heavy Industries, a global shipbuilding company, possesses excellent modeling and interpreting technologies.

'INTEGRICT-Smart ship Solution' (ISS) helps to reduce operational cost during voyages. It estimates the optimal voyage considering the weather forecasting, operational condition, voyage schedule, etc. You can make better decision by comparing the current status of your voyage and optimal voyage recommended by ISS.
You can also track the energy flow of your vessel and have intuitive understanding through the machinery management module. Reports such as noon, voyage, MRV and DCS can be generated by the solution to assist the user's document work.

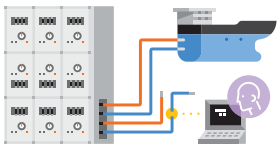
## INTEGRICT-Smart ship Solution


Economic and optimized voyage

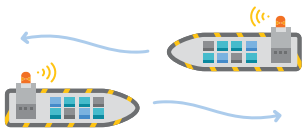


Propulsion analytics


Remote maintenance from shore



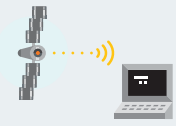
Electrical power analytics



Safe ship navigation

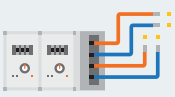
**INTEGRICT**

Integrated by and into INTEGRICT, Hyundai ICT platform

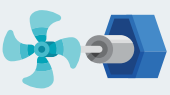


Navigation and communication

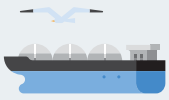
Monitoring



Energy management



Propulsion support

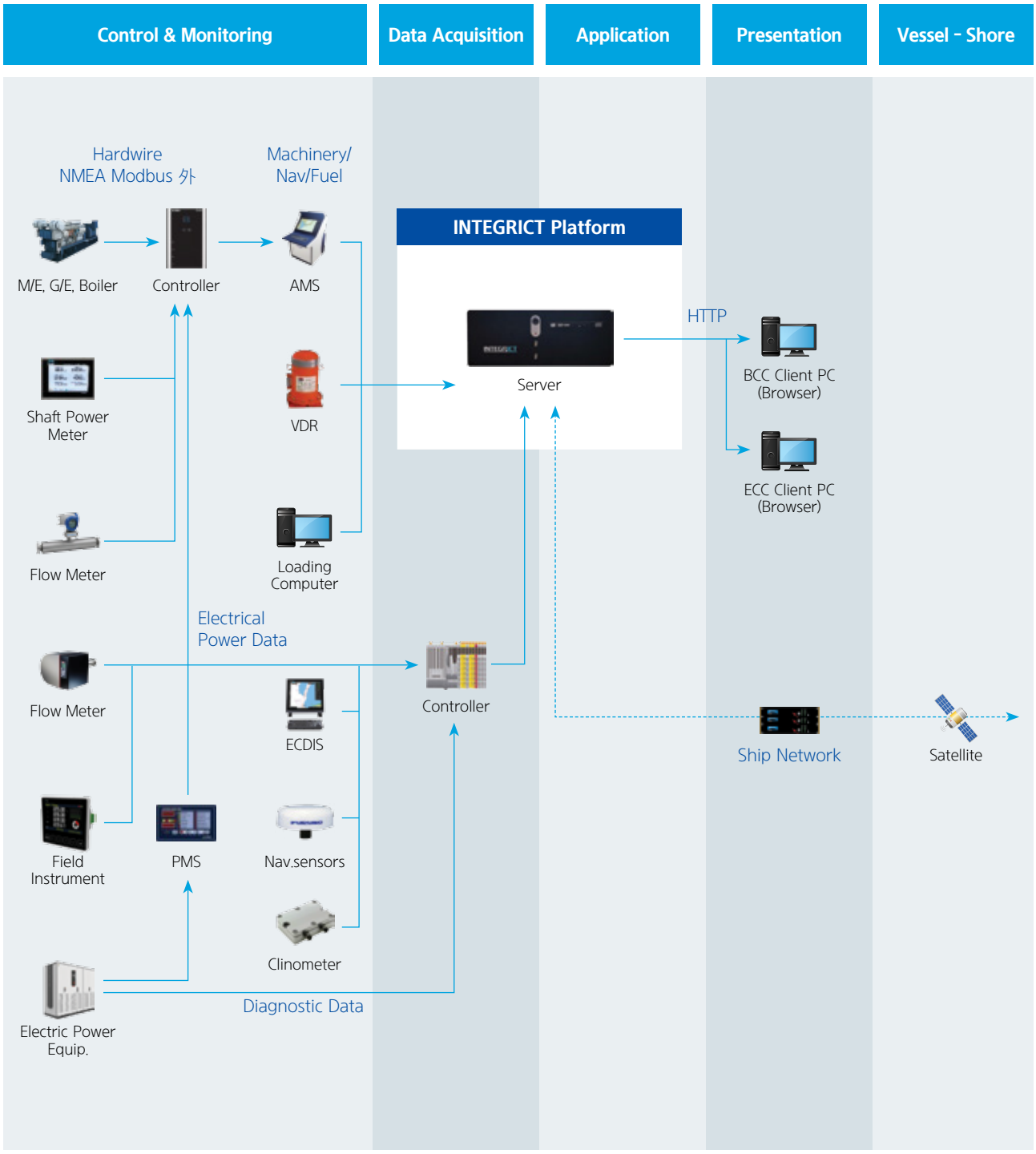


Eco-friendly navigation

* MRV : Monitoring, Reporting, Verification
DCS : Data Collection System

# Configuration

Operation data of engines, generators, electric power equipment and control systems are seamlessly collected to ISS server in a standardized way. Such verified data are sent to onboard databases and onshore. These are displayed on client PCs at bridge/ECR upon client's requirements. Users can access the ISS on board and onshore via satellite.



# Functions

| Function | Contents |
|---|---|
| Dash Board | Navigational index, energy flow and weather data display |
| Voyage Planning | Weather routing, RPM / trim optimization |
| Performance Analysis | Speed/Weather effect analysis based on ISO15016 and machine learning<br>Recommendation about cleaning time based on hull & propeller fouling analysis |
| Machinery Monitoring & Analysis | Preventive maintenance and part change guideline based on fault detection |
| Energy Management | Electrical energy flow from generation to consume<br>Fuel consumption forecast, power quality analysis and Fuel management |
| Report | Producing essential report, SEEMP, EU MRV, IMO DCS report |

## Dashboard

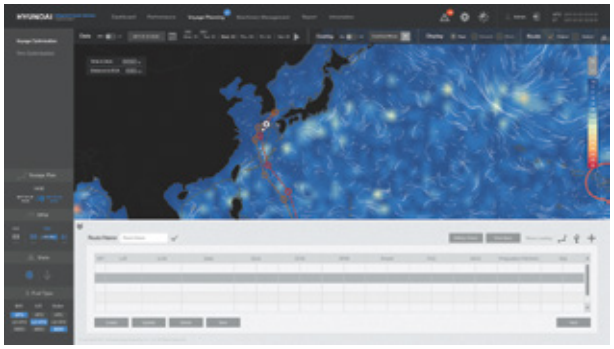

Displays information about the current sailing conditions intuitively :

- RPM(current & optimal)
- DFOC
- EEOI
- Trim
- Propulsion Efficiency
- etc.

## Trim Optimization

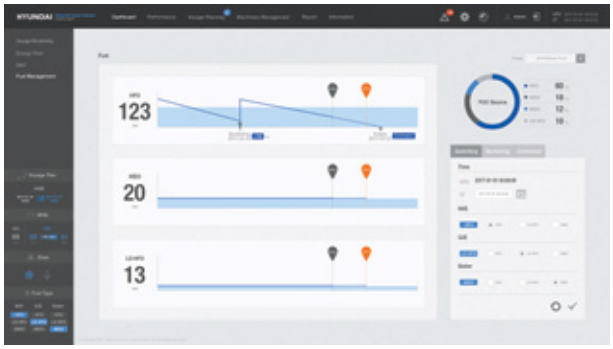

Proposes the optimal vessel trim based on the modeling ability & interpreting technologies of shipbuilding architecture.

## Voyage Optimization



Helps reduce fuel consumption and carbon emissions by optimizing route and main engine RPM considering predicted weather condition within required time of arrival.
The optimal path is displayed in the built-in electronic chart and the possibility of collision with land is checked.

## Fuel Managing

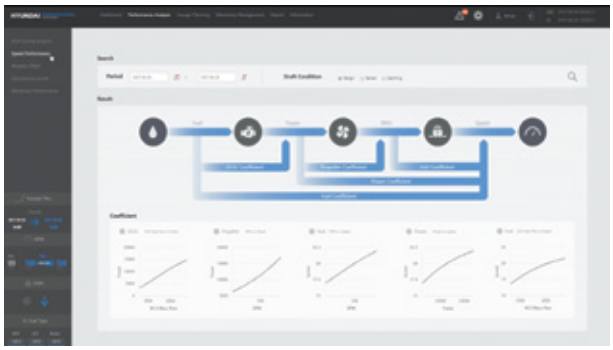



Displays remaining fuel oil, the estimated date of emptying, fuel type of each voyage and fuel type of each engine. The fuel oil bunkering and correction function are supported.

## Energy Flow Monitoring

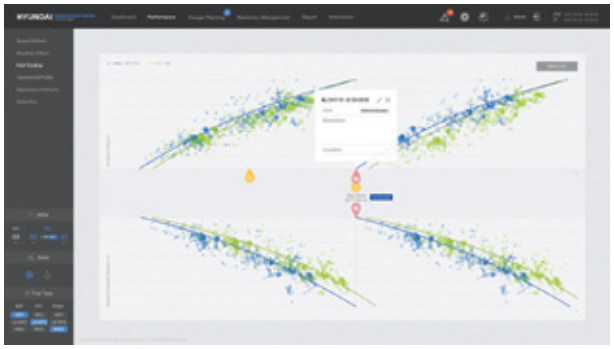

Allows users to view the Energy flow at a glance, which is the process of converting from fuel to propulsion, electricity and thermal energy in the main engine, the generator engine, and the boiler.

## Speed Performance Analysis



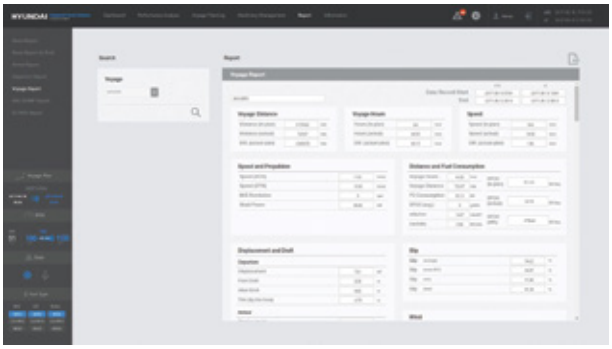
Displays correlation of the main factors such as fuel oil consumption, engine power, propeller speed.
User can also view performance of the ship from the fuel to the speed during the voyage, and understand which part affect performance reduction.

## Hull Condition Monitoring (Fouling)



Analyzes hull condition based on ISO15016 or Machine Learning, and displays the trend of hull fouling and performance reduction.
From this function, users can be decided hull cleaning/re-docking time.

## Reporting Including EU MRV/IMO DCS



Generates diverse reports on board during a voyage.
Not only are various requisite reports provided based on the collected data, but the SEEMP and EU MRV reports, which are compatible with environmental regulations, can also be generated automatically.

## Machinery Condition Monitoring

Provides a way to monitor the status of Main Engine/ Generator Engine/ Boiler.
Furthermore, it provides a way to compare current values with that of Shop/Trial/previous voyage.
With the help of this function, users can be notified of abnormality of the equipment.

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# HYUNDAI ELECTRIC

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