



# USING SMART TECHNOLOGY TO DRIVE MORE SUSTAINABLE FLEETS

## ABS and HHI Group Complete Landmark Smart-Functions Project



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### CHALLENGES

Smart technology used for health and condition monitoring has significant potential to improve the safety and operational performance of marine assets. ABS worked with Hyundai Heavy Industries Group (HHI Group) qualifying the shipyard's new technology by issuing a Product Design Assessment (PDA) and a New Technology Qualification (NTQ) for the 'smart' functions they designed.

### SOLUTION

Supporting the roll out of HHI Group's smart-function solutions by providing independent verification, validation and issuing product approval in accordance with the requirements of the ABS Guide for Smart Functions for Marine Vessels and Offshore Units.

### RESULTS

After technical reviews, ABS issued a 'SMART (INF) PDA' (data infrastructure for smart functions) notation to HHI Group's data platform as well as a New Technology Qualification for HHI Group's operational performance management (OPM) functions covering the company's route-optimization, performance monitoring and reporting solutions.

### OVERVIEW

In May 2019, ABS launched the marine and offshore industries' first notations for the application of smart technologies when it published the ABS Guide for Smart Functions for Marine Vessels and Offshore Units. The Guide established a goal-based framework for the implementation of 'smart' functions that included a risk-informed approach to the assessments. The framework supported the verification and validation of smart functions in accordance with the Guide and where applicable, the ABS Guidance Notes on Qualifying New Technologies.

The Guide was utilized as part of a joint-development project (JDP) involving HHI Group's Integrated Smart-ship Solution (ISS) system to support ABS recognition of the system. The ISS is a powerful data-management and analytics platform that supports shipowners, such as route optimization and reporting, and provides the digital platform foundation for expansion of this type of functionality.

## CHALLENGES

Smart functions are emerging technologies that have the potential to improve a vessel's safety and performance by analyzing operational data. They can vary greatly in their purpose, scope, technical approach and discipline; the hardware and software they use; and the degree to which human intervention is required.

With so much variety, it is a challenge to set the technical requirements and/or create a standard approach to verification and validation that not only is comprehensive and resilient, but also flexible enough to assess each smart function's role and purpose.

Each vendor or shipyard has a unique approach to designing smart technology. Understanding the goals, functionalities and technical approaches to implementing those solutions is a significant challenge for the assessor; as is protecting the client's intellectual property while assessing the risks that any smart technology could pose to the safety and operations of marine assets.



## SOLUTION

The ABS Guide for Smart Functions for Marine Vessels and Offshore Units provides a goal-based framework and a set of risk-informed technical requirements that meet the challenges of verifying and validating smart solutions.

ABS and HHI Group tested the shipyard's smart framework, its requirements and the required approaches to verification and validation during the project. During the project, ABS provided several key reviews and verifications, including:

- A review of the operational concept and the description of the smart function to better understand the goals of its implementation and the solution's capability.
- A review of the functional capability of the ISS system.
- A review of the system data architecture and its specifications in accordance with the techniques summarized in the Guide, including the data and the models used to analyze it.
- Worked with HHI Group to address technical and functional concerns.
- Used demonstration to validate the smart solution.

For the PDA and NTQ approvals, ABS conducted functional and system assessments to investigate the capability of the ISS system, including its safety and performance.

## RESULTS

The completion of the project resulted in a Product Design Approval and New Technology Qualification for HHI Group's ISS solution. It also opened the possibility for future vessels installed with solution to receive a SMART (INF) notation and a SMART (OPM) class record note.

Through projects like this, ABS is at the forefront of industry, providing guidance for the implement smart technologies. We work with the industry to verify, validate and issue class approval for smart solutions. ABS class approval helps to build confidence in the safety and operational performance of smart systems and promote the adoption of data-driven surveys that reduce the intrusiveness of class procedures and increases the availability of vessels.



### WORLD HEADQUARTERS

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