

PMS-HIL

HIL TESTING OF POWER MANAGEMENT SYSTEMS

Reliable Power Plants

Reliable power generation and distribution systems are important for the safe and efficient operation of vessels. Power plant failures related to weaknesses and errors in PMS computer hardware and software have led to a number of incidents resulting in full or partial blackouts.

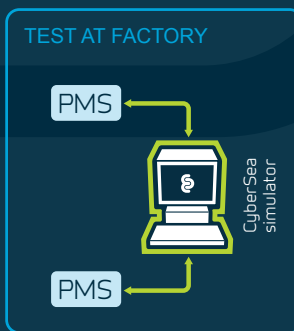
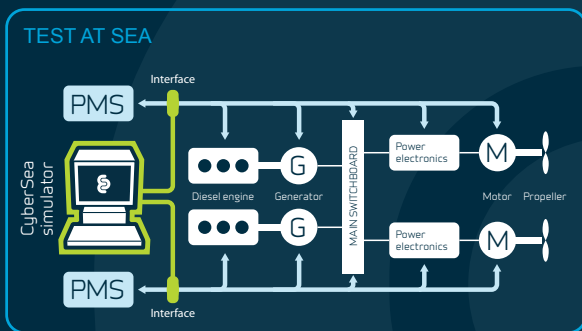
Why PMS-HIL?

Independent PMS-HIL testing by Marine Cybernetics will reduce quality costs for vessels and make the building, commissioning, sea trials and operations more predictable and efficient. The major advantage of HIL testing is that software errors, configuration errors, faulty parameter settings, and design weaknesses, that potentially may delay the vessel delivery, are detected and clarified at an early stage. The PMS maker and yard can then make corrections and improve the PMS systematically, well in advance of commissioning, sea trials, and delivery of the vessel.

Independent PMS-HIL testing will also secure the required safety and availability of the power plant, and reduce the risk for hidden errors/faults that otherwise may surface during critical operations.

What is PMS-HIL?

In PMS-HIL testing by Marine Cybernetics, the CyberSea PowerPlant Simulator is used to emulate the dynamic complexity and physics of the power generation, distribution, and consumer system onboard marine vessels. Scenarios that are potentially dangerous for personnel and equipment, or difficult to test for other reasons, can be completed safely and efficiently using the dynamic CyberSea PowerPlant Simulator. This includes functional testing and failure testing as AVR and governor failures, load sharing failures, over-voltage and frequency, excitation failures and short circuits.



Interface

The PMS computer system is connected to the real-time CyberSea PowerPlant Simulator via a Fieldbus network, control network, or hardwired I/O interface based on the actual communication topology for the system or a dedicated test interface.

Main objectives of PMS-HIL

- Functional testing of the PMS computer system to verify that all specified and available functions work satisfactorily in normal operation during varying loading conditions, and in situations of various functional failures such as sequence failures.
- Verify the ability of the PMS computer system to handle single failures according to class rules.
- Verify that all specified and available functions of the PMS computer system conform to the functional description, customer requirements, class rules, and intended use.

FACTS

Hardware-In-the-Loop (HIL)

HIL technology is used in testing of computer-based control systems. HIL testing is accomplished by connecting the target computer system to an external HIL simulator that emulates the controlled plant – ship system or offshore installation – and simulates this in realistic operating and environmental conditions, varying sea loads, and occurrence of equipment failures.

“We have never experienced so few computer problems during the first year of operation. This is important since most of our vessels operated far from base. The advantage was that both the DP and PMS were tested thoroughly early in the building process, which has not been possible before.” Jon Helge Ulstein, Superintendent, Bourbon Offshore, after Marine Cybernetics HIL tested the DP and PMS systems onboard Bourbon Monsoon and Bourbon Mistral.

Some of our PMS-HIL references:

- Bourbon Mistral
- Bourbon Monsoon
- Edda Fauna
- Stena Carron
- Deepsea Atlantic
- Sevan Driller

ABOUT MARINE CYBERNETICS

Marine Cybernetics specializes in independent HIL testing of control systems for the maritime, oil and gas markets.

Marine Cybernetics is ISO 9001 certified, and delivers HIL testing in compliance with DNV's Standard for Certification of HIL testing. Marine Cybernetics is a member of IMCA.

PIONEERS IN SOFTWARE TESTING