

DP-HIL

HIL TESTING OF DYNAMIC POSITIONING SYSTEMS

Reliable DP systems

Reliable DP systems are important for the safe and efficient DP operations. DP failures related to software problems have led to a number of incidents resulting in loss of position. Failures affects safety and results in less availability of the vessel and increased risk for off-hire.

Benefits of HIL testing

Independent DP-HIL testing by Marine Cybernetics will reduce quality costs for Dynamic Positioning (DP) vessels and make the building, commissioning, sea trials and DP operations predictable and efficient.

The main advantage of DP-HIL testing is that hidden software errors, configuration errors and faulty parameter settings are detected during testing at an early stage. The DP system maker can then correct errors and improve the DP system, in advance of commissioning, sea trials and delivery of vessel.

Test scope and simulation scenarios

- **Functional testing** covers different DP modes, thrust allocation modes, backup control system handling, power load limitation, consequence analysis, weighting and voting of several position reference systems and sensors, and specialized functions for e.g. drilling vessels, pipelay vessels and shuttle tanker offloading, etc.
- **Failure testing** covers single and multiple errors including drifting and noisy reference systems and sensors, protocol errors, feedback and command signal failures, signal freeze, network failures, and thruster and power system failures.
- **Known incidents** on similar vessels are reconstructed.
- **Fit for purpose**, checking if the system's alarm handling and monitoring functions are fit for purpose from an operational aspect.

Marine Cybernetics offers DP-HIL testing for class 1, 2 and 3 DP systems from all major DP makers, including thruster assisted position mooring systems.

Add-on services

1. DP System FMEA.
2. Vessel configurations for training centers (requires CyberSea Simulator license)
3. DP Capability and Thruster Capacity analysis.
4. Maneuvering trials.

FACTS

Hardware-In-the-Loop (HIL)

HIL technology is used in and 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.

“HIL testing of the DP system was performed by Marine Cybernetics on the Stena DrillMAX drillship. Potential errors in the DP system were detected at an early stage, and eased the commissioning of the drill ship. Some of the errors could have led to serious trouble if they came to surface during a drilling operation. Independent testing is important to gain the performance of the DP system and really helpful to detect hidden errors. The DP-HIL test scope was large and more systematic compared to the standard way of testing.” Tom Kennedy, Engineering Manager, Stena Drilling.

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.

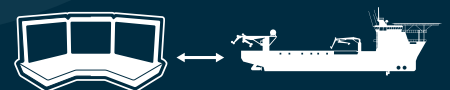
TEST AT FACTORY



TEST AT SEA



NORMAL OPERATION



PIONEERS IN SOFTWARE TESTING