Title: **Experiences from Five Years of DP Software Testing**

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Abstract

An increased focus on multi-purpose vessels and fuel economy has pushed vessel and system designers to come up with more complex power and propulsion setups. Innovative new switchboard designs, closed bus-tie operation, and hybrid electric/mechanical propulsion setups with multiple power modes have lead to increasingly complex software functions distributed between different systems and vendors. To achieve optimal safety and performance of a DP system, the hardware and software components from these different vendors must work as an integrated system. The hardware part of the DP system is today thoroughly analyzed and tested by FMEA, but in order to properly assess the DP system software it has been necessary to introduce new tools. Hardware-In-the- Loop (HIL) testing is a well proven test methodology from automotive, avionics, and space industries, and Marine Cybernetics has applied this to advanced marine and offshore control systems since 2004. This paper summarizes experiences from HIL testing of DP system software on more than 50 DP drilling, supply, anchor handling, and construction vessels. The presented experiences demonstrate that independent testing of control systems using HIL testing technology is an important and effective service to ensure safe and reliable operation of offshore vessels.

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