Dynamic Positioning Committee
Marine Technology Society

Session – Green Initiatives

Title: **Improved Cost Efficiency of DP Operations by Enhanced Thrust Allocation Strategy**

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Abstract

Dynamic positioning (DP) systems are intensely used in the naval and offshore industries. When not constrained by harsh environmental conditions, these systems provide an accurate control of position and heading. This enables complex maneuvers which have become mandatory for numerous operations. DP systems are even a standard technology assessed by certification societies since several years.

Today one of the main challenges is to minimize the average power consumed by the vessel for both sustainability and economic reasons. Relying on DP operators' expertise a first solution for alleviating the loads on the thrusters is to change the ship heading adequately considering external conditions. It is however not possible to command thrusters directly since the orders are computed by the DP system.

Recent improvements of control algorithms made by DCNS-Research/Sirehna lead to a significant reduction of operational costs while maintaining a responsive control of the ship. This involves optimizing the thrust allocation strategy to withstand external disturbances such as wind and current and improving the dynamic stability of the control loops. This solution has already been delivered to offshore industry customers. After several months of operations, they gave a very positive feedback on the behavior and the power consumption of their ships driven by a DCNS-Research/Sirehna EasyDP system.

In this paper the new design is benchmarked against a standard control strategy in a representative set of operational scenarios. Relative power consumption and ship reactivity in station keeping is analyzed for both designs. Simulation results demonstrate a significant reduction of power consumption without degrading DP performances.

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