

Title: **Optimizing Energy Efficiency for DP Vessels for Variable Operational Risks**

Author: Damir Radan, *GE Power Conversion*

Abstract

In recent years, there has been a focus towards operating DP vessels with reduced OPEX costs, namely fuel consumption, engine exhaust gas emissions and maintenance costs. The increase of the power system reliability allows for the increase of the operational flexibility of the power system. During good weather conditions the load consumption at thrusters will be low and the plant is able to operate with only two generators online. At higher wind speed or more demanding operations, the power will increase together with the risk of loss of station-keeping. In order to minimize the risk of station-keeping, the paper analyzes the benefits of close bus operation in various conditions, according to weather modes and the operational profile. It compares the closed bus versus the open bus, and also compares the allowed generator load with the risk of blackout. The use of energy storage devices for the blackout ride through considers the use of energy storage as “Stand-by unit”, able to support operations with minimum number of generators online. Maximizing the energy efficiency potential of the DP vessel, the paper analyzes the use of “Father&Son” configuration for DP vessels.

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