

Fuel Consumption Analysis for various DP vessels

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Abstract

As offshore oil and gas exploration moves to deeper water the challenge of anchoring the vessels increases. Anchoring takes time, involves Anchor Handling Vessels, the materials to be used for anchor lines in deep water anchoring is a challenge and more. However anchoring has some obvious advantages when comparing to the DP alternative: When anchored, the rig doesn't need as much fuel, the emissions are less and in addition the risk for drive off and drift off are considered less.

In this paper the author focuses on fuel consumption, especially for DP drilling units, but to some extent also for general DP supply vessels. For a DP drilling unit, the fuel consumption can be divided into fuel used for Station Keeping, Drilling and Hotel Load. Based on input from operators, oil companies and data available through the DP system, Kongsberg Simrad has made an effort to obtain more exact knowledge on this subject. The statistical data collected will be presented and elaborated on together with comments related to environmental conditions and modes of DP operation and utilization of the diesel electric power plant. Modes of operation includes e.g. thruster bias modes, so called "relaxed mode" and the Kongsberg Simrad "Green DP" mode. From the Power Management point of view the class requirements applicable when operating in class 2 or 3 demands certain number of generators on-line and switchboards to be disconnected. From a pure fuel consumption and diesel generator efficiency point of view other configurations would be probably be more optimized, but FMEA considerations points in the direction of other modes. How should modern diesel electric power plants, switchboard technology and thruster drives together with advanced Power Management be combined to optimize performance ?

- How many percent of total consumption is related to Station Keeping and Drilling ?
- What about consumption for a moored rig in the same environmental condition ?

In a State Of the Art report from European research work it can be read: *"Dynamic Positioning is used successfully, even for long times of uninterrupted station keeping. This also applies for critical operations like deep water drilling. DP is well recognized and the technology of DP has matured, so that it can be taken in use for new operations e.g. on deep water mild environment FPSO's. In the future, DP technology can possibly challenge most moored concepts and contribute to simpler, more flexible and cost effective solutions. A large negative aspect in the operational cost evaluation for a DP concept is fuel consumption. However, new control technology is in development to achieve a reduction of fuel consumption. The environmental pollution is consequently also reduced and the thereby competitiveness increases."*

In this paper focus is presented on actual real life statistical data on fuel consumption in different environmental conditions. The paper also discusses how fuel consumption related to Station Keeping can be reduced.

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