

Title: DP-INS – A Paradigm Shift?

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Abstract

The concept of combining USBL and Inertial Navigation Systems (INS) into an alternative and improved DP reference has been discussed at length and is now proven and gaining growing acceptance.

Following one year of DP-INS systems operating onboard vessels in the Gulf of Mexico and Brazil and this paper presents the real-world benefits in terms of risk and performance. The key benefits discussed include:

- Independence from GNSS - the best method of detecting GNSS outliers
- Improved operational efficiency, the “Single” reference transponder can be dropped close to the well allowing drilling operations to commence significantly earlier.
- DP-INS repeatability has up to a three-fold improvement over standard USBL
- Compared to multi-transponder seabed systems DP-INS allows the rig to save money on transponders and batteries.
- “Ride through capability” during acoustic dropouts caused by aeration and noise.

The paper then discusses the lessons learned from offshore operations with INS and explains system configurations can be optimized to further improve the robustness and integrity of the position measurement equipment and how the wealth of additional, precise navigation information available from an INS presents new opportunities for PME integration into a DP desk.

The availability of INS derived pitch, roll, heading, velocity and acceleration measurements effectively “perfects” accuracy and complements the conventional DP model based estimator. Through better integration with the PME the complete measurement set can be used to improve performance of a future DP system. The benefits would include tighter and more robust control, reduced wear and tear and reduced fuel consumption.

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