Title: **Integration of an Inertial Navigation System and DP**

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Abstract

The paper describes an architecture for the integration of an inertial navigation system (INS) into a dynamic positioning (DP) system. It discusses the major benefits of using INS for DP, and includes the results of sea-trials conducted to show these benefits.

There are a number of possible benefits to using an INS as an input to the DP system. These benefits are dependent upon a range of factors including the operations being undertaken by the vessel, the ease of use and the quality of the equipment.

One use of an INS is to supplement or clean-up measurements from an existing measurement system. By coupling the INS to a hydro-acoustic system the INS can help to reduce the noise on the measurements and fill-in for long update rates, for example, to prolong battery life for transponders.

A further use is to act as an independent position measurement system in the event of outages. In this configuration the INS can provide position measurements during short outages (up to a few minutes) of all other PMEs.

In order to gain the greatest advantage, the integration of the INS with the DP system is key. A flexible architecture allows the INS to be used to its full potential. The architecture described allows INS-DP integration that is easy to install and maintain and also allows dynamic reconfiguration to make the most of the available PMEs or to provide the greatest advantage for a particular application.

The paper further describes sea-trials performed to assess the ability of an INS system to provide the advantages described above. They include full-scale trials of INS performance at sea with a number of GPS outages. Also, performance of INS with acoustics-only is assessed from real-life data on a trial vessel.

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