Title: **Toward Safer and More Efficient Acoustic DP Reference Systems**

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Abstract

The latest generation of acoustic position reference systems can match GNSS levels of performance due to the tight integration of precise digital acoustic measurements and inertial navigation.

With the current oil price and vessel use there are now obvious drivers and calls to increase the efficiency of all operations in all upstream offshore operations.

So, the development of future system capability is focussed on achieving efficiency savings for both the owner and contracting oil company by reducing the number of seabed transponders, reducing overall system maintenance requirements and employing the vessel's acoustic reference system to perform survey, construction and monitoring tasks as well as DP.

This paper uses a series of case studies to explain how these efficiency savings are achieved and how potential failure modes are addressed so that DP reliability and performance is maintained and guidance based on the seven pillars of incident free DP operations as laid out in MTS documents is met.

New sensors that support efficiency savings are reviewed including combined gyros and MRUs that don't need to be returned to shore for regular calibration, DP transponders that can last for two years of continuous operational use and "SMART" instruments that can provide the driller with information to help extend riser life.