

Title: Why choosing an acoustically aided INS is not just a tick box exercise

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Abstract

Choosing the correct aided Inertial Navigation System (INS) architecture is important if all the operational benefits of this technology are to be fully realized. Various manufacturers use different terminology and interpretations resulting in a limited appreciation of the technical details outside of the DP community. Fitting INS can become a “tick-box” exercise resulting in potential for compromised implementation and poor quality or even hazardously misleading station keeping information being supplied to the DP desk. This can have a knock-on effect with the expected operational benefits not being realised, and unnecessary cost and delays incurred instead.

In a true tightly integrated system the INS has full access to all the raw acoustic measurements and associated low level quality metrics in their native format with effectively perfect timing. This allows a much more precise and optimal use of the available information which adds significant fault tolerance, particularly in challenging acoustic conditions, where good, useable acoustic observations can easily be identified, and poor signals rejected.

This paper will clearly explain the system architecture behind true “tight coupling” using terminology independently established across other domains and applied to DP with reference to the MTS “7-pillars” design philosophy.

The lessons learned from real world examples of sub-optimal implementations will be discussed in terms of station keeping integrity and operational efficiency. New autonomous integrity monitoring techniques will be discussed which will make it easier for the end user and operator to identify a poorly configured aided INS system.