

Practical Achievements with FM-CW Based Short range Relative Positioning in Multi-vessel Operations

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Abstract

The principle of Frequency Modulated - Continuous Wave (FM-CW) signals in the C-band has proven some advantageous as a basis for short-range, relative positioning of DP vessels in simultaneous operations. Such solutions will have complementary characteristics with other systems based on e.g. GPS. The paper demonstrates this statement by an assessment of requirements of some relevant operational scenarios where vessels are operating simultaneously.

The operational scenarios are used as a background for explaining the functional principles of FM-CW based interrogators and transponders used in a multi-vessel operation. Theoretical capacities and constraints with regards to accuracy, number of vessels/targets, operational range are explained. The theoretical assessments are compared to practical experiences over the last few years, focusing on the complementary characteristics with other position reference systems. There are limitations to any technology, and the most important constraints and considerations with regards to FM-CW based, relative positioning systems are discussed. Some of the limitations will be addressed by an appropriate design of equipment and software, while others will need attention during installation and operation. Operational examples are based on experiences from PSV/Platform and Shuttle Tanker/FPSO operations in different parts of the World.

A summary including "lessons learned" during several years of operation is included.

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