Development of a Coordinated Control System for Tandem Offloading Vessels

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Abstract

As part of its program in Offshore Engineering Technology, the Institute for Marine Dynamics, a division of the National Research Council of Canada, is currently pursuing research in the area of Marine Control (Dynamic Positioning) of vessels. Aspects of this research program are being carried out in collaboration with Memorial University of Newfoundland's Instrumentation, Control and Automation (INCA) Laboratory and with Intrignia Solutions Inc.

Firstly, we propose the concept of a supervisory controller that coordinates all control systems and vessel resources within a single DP vessel and across multiple vessels. Secondly, we are investigating methods of analyzing and proving that such a controller design will work for all ranges of conditions that the systems may be expected to encounter. One instance of a multi-vessel system that we are investigating is that of the tandem offloading of an FPSO to a shuttle tanker. Coordination of the various resources on board each of the vessels should lead to improved reliability and better control performance overall.

This paper describes the coordinated control concept in greater detail and the possible benefits of such an approach. An upcoming scale model test will serve as proof of concept. The techniques for model testing are described in some detail.

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