

Title: DP in Ice Conditions - Challenges and Opportunities

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Abstract

Dynamic positioning has never been used in station keeping in difficult ice operation. Manual control of thrusters has been used to keep station during limited duration during scientific drilling expeditions, which have used riserless drilling for soil cores. Such operations have much less stringent station keeping requirements compared to drilling for hydrocarbons exploration in terms of allowable offsets, reliability, etc. DP would give, when possible, clear advantage in start up of the operation, disconnection and reconnection as it would be possible to get rid of an anchored system, which would again require quite heavy anchor handling operation.

The problems that will be challenging for DP operations in ice are:

- Forces acting on the vessel
- Forces caused by ice dynamics
- Turning Yaw moment
- Changes in ice movement direction
- Predictability of ice load behavior
- New type of thruster control allocation
- Forbidden or required sectors for ice flow management
- Specific methods to lower ice loads
- Ice management and operational risk control

This paper discusses the problematic involved in these challenges based on the experience gained in ice operation in general and on various ice model tests in the subject during the recent years.

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