

Title: DP Assisted Offloading Operations in Brazilian Waters

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Abstract

In this paper, several aspects regarding DP assisted offloading operations in Brazilian Waters are discussed. The main objective of such work is to define a more accurate set of premises to the design of the DP System of the new Shuttle Tankers (ST) that will operate in Brazilian waters and to expose the actions that Brazilian scientific and industry communities are taking to define those premises.

Initially, important issues of the Brazilian regulatory guideline related to the operation are addressed, focusing on the safety procedures and DP-ST design requirements. Full scale measurements of a DP offloading operation were done, considering all stages of the operation: approach to the FPSO, connection, oil transfer and disconnection. The results of such monitoring campaign were used to validate the Numerical Offshore Tank time domain simulator (TPN), and the main results are presented in the paper. Some numerical studies concerning comparison between DP and non-DP offloading operations are presented. Such studies were carried out using the TPN simulator, considering normal situations, extreme environmental conditions and failure scenarios. A procedure to evaluate the operational downtime, based on numerical simulations is also presented. Small scale model of typical Brazilian DPST's were also built, and ocean basin experiments were done. Preliminary results are discussed. Finally, novel research topics related to such operation are addressed, related to the hydrodynamic and aerodynamic interference between the FPSO and the ST. Computational fluid dynamics (CFD), small scale experiments and numerical models are being used to evaluate the impact of such effects on the dynamics of the ST and on the DP System power requirement.

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