OTC 19450

Impact of the use of *FullQTF* on LNGC Moored in Shallow Water Studies

Cédric BRUN, Flávia REZENDE, Damien COACHE, Johan MOMBAERTS (Bureau Veritas)

Copyright 2008, Offshore Technology Conference

This paper was prepared for presentation at the 2008 Offshore Technology Conference held in Houston, Texas, U.S.A., 5–8 May 2008.

This paper was selected for presentation by an OTC program committee following review of information contained in an abstract submitted by the author(s). Contents of the paper have not been reviewed by the Offshore Technology Conference and are subject to correction by the author(s). The material does not necessarily reflect any position of the Offshore Technology Conference, its officers, or members. Electronic reproduction, distribution, or storage of any part of this paper without the written consent of the Offshore Technology Conference is prohibited. Permission to reproduce in print is restricted to an abstract of not more than 300 words; illustrations may not be copied. The abstract must contain conspicuous acknowledgment of OTC copyright.

Abstract

The prediction of slow drift motions for the design of a mooring system is usually made using the *Newman* approximation [1], based on the assumption of a very low resonance frequency of the system and small contribution of the second order wave fields. This hypothesis is commonly satisfied for most parts of the mooring systems in deep water. However, this is not the case for LNG terminals moored in shallow water.

Unlike the *Newman* approximation, the *FullQTF* formulation to compute the low frequency wave loads is more accurate but requires much longer time of computation, which presents limitations in practice when a large quantity of simulations is needed.

Further to the work presented in [2] on the quadratic transfer function (QTF) of low-frequency loading, a new approximation has been developed in [3]. The *F1* approximation gives comparable results to the *FullQTF* and presents the interesting aspect that the loads time series can be reconstructed by means of simple summations, presenting the same efficiency in computation time as *Newman* approximation.

In this paper, main parameters of mooring systems are analyzed to evaluate the impact of the choice of each method, *Newman*, *F1* or *FullQTF*. Indeed, this choice is a compromise between calculation time and accuracy of results. The conclusions raised are underlined in the study of an LNG terminal.