

Splash Zone Lift Monitoring



Background

Many offshore structures have to be installed sub-surface by means of lift operations. Such operations are traditionally conducted by semi-submersible crane vessels but nowadays more and more of smaller monohull vessels with relatively large crane capacities are deployed. Solid workability criteria are crucial for both the safety and the feasibility and economy of the operation, especially in harsh weather climates where the work has to be completed in a narrow time window. Operational limits today are often set in terms of statistical wave height based on vessel response and sometimes on a lift dynamics analysis with multi bodies.

For the above water phase and the deeply submerged situation, multi-body lift dynamics can be simulated and these computational methods have proved to work well [1]. The phase where the structure is passing the splash zone requires special attention. In the upper wave zone, however, the structure is subject to non-linear wave action including non-linear viscous effects. Although some work is reported on the computational approaches [2], [3] and scale model verification, a thorough full scale validation is required to understand the possibilities and limitations of computational models and to provide input for further developments.

Objectives

SplashMonster JIP's aims are as follows:

- Monitor dynamic lift behaviour, loads and motions in combination with the vessel motions and detailed wave and current action,
- Investigate the effect of leeway of the vessel and ship/lift interaction on lift dynamics,
- Correlate measured data with model tests and computational models,
- Formulate Best Practice for engineering & workability units.

Scope of Work

- Preparations,
- Monitoring campaign,
- Model tests,
- Correlation with simulation models,
- Evaluation & Best Practice.

Project Organisation

This 3-year Joint Industry Project will start in October 2012. The proposed work will be conducted as a JIP in close cooperation with an offshore contractor. Oil companies, offshore contractors and engineering companies are invited to join this JIP. JIP meetings will be held twice a year preferably in conjunction with the existing FPSO JIP Week.

References

- [1] "Monitoring Offshore Lift Dynamics", R. Wouts, A. Coppens and H. van den Boom; OTC 6948, Houston 1992.
- [2] "Numerical Prediction of Wave Loads on Subsea Structures in the Splash Zone" T. Bunnik and B. Buchner, ISOPE 2004.
- [3] Obelics JIP, www.marin.nl.



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