MARIN

Challenging wind and waves

Linking hydrodynamic research to the maritime industry

Prediction of quiescent periods in floater motion to assist motion critical offshore operations

On Board Wave and Motion Estimator (OWME)

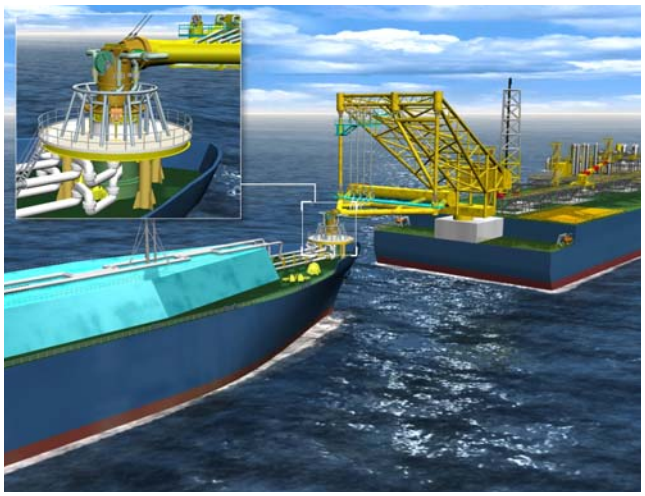
Background

Various offshore operations are restricted by the magnitude of the (relative) vessel motions.
Examples of such operations are:

- Float over installation
- LNG-offloading connect
- Lifting
- Helicopter landing
- Automatic UAV landing

In normal sea conditions this implicates that such operations can only be conducted in quiescent periods and that the go/no-go decision for such operations is critical and requires an advance and reliable estimate of vessel motions.

At present ship motions are estimated by human observations. Systems extrapolating ship motion history can only predict the motions some 10 seconds in advance.



Project objectives

The project objective is to develop, test and demonstrate a practical system to predict quiescent periods of ship and platform motions some 60 seconds in advance.

Approach

As the platform motions originate from the incident waves, the approach is based on measuring the sea state with X-Band radar in a round view of 3 km of the vessel.
By digitising the sea surface the individual waves in space in time can be recorded. In the range of the radar images the individual waves will be extracted within an analysing area in wave direction. Essential parameters must be deduced as input for the wave propagation model, applied to predict the wave elevation at the platform. Final step is to compute the vessel motions from this wave elevation. Data fusion with the continuously recorded motions will complement the system.

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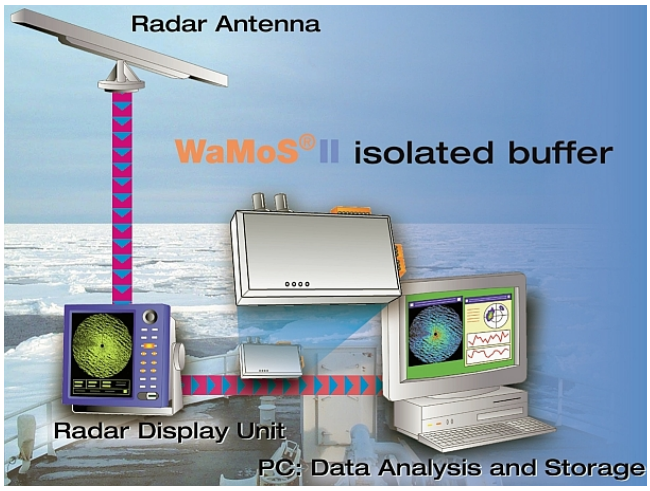


The project tasks comprise:

- Derivation of essential wave parameters for moving support, wave propagation model and vessel response model
- Integration and marinization of the system
- Testing system on floater offshore
- Evaluation of results.

Project Deliverables

Report with description of:

- Single/group wave sensing
- Single/group wave propagation model
- OWME system design
- Verification data for main system components
- Results of offshore trial

Benefits

OWME will develop and test system which will assist you in:

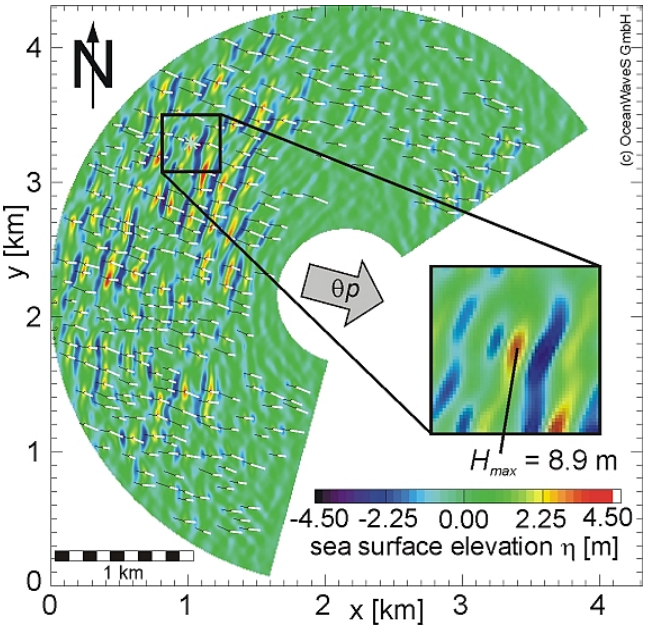
- Providing on board decision support for motion critical operations
- Reduce the risks involved in such operations
- Increase the weather window.

Project organisation

The work will be conducted in a Joint Industry Project with participating companies from the offshore and maritime industry. Partners directly involved in the work are:

- SBM/Gusto
- Shell
- MARIN (Development & Trials)
- OceanWaveS (wave measurement)
- Delft Univ. (wave propagation).

The project has been awarded the Eureka label by Eurogia and is supported by the Dutch Agency Senter.
The project is sponsored by three major oil companies.



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