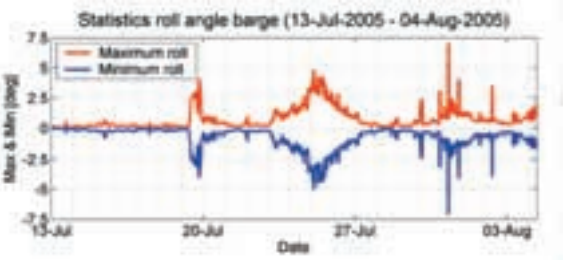
In May, Heerema Marine Contractors (HMC) commissioned MARIN to monitor barge motions during the transportation of the Valdemar AB platform jacket from the yard in Ravenna North Italy to its installation site. HMC was in turn, contracted by Maersk Olie OG Gas AS for the transportation and installation of the platform. Report provides an update.



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Tow monitoring for fatigue assessment

Located in the North Sea Danish Sector approximately 200 km west of Esbjert, Maersk Olie OG Gas is developing the Valdemar Field, by installing a new platform jacket Valdemar AB, next to the current Valdemar AA platform. The water depth at the Valdemar AB location is 41 m.

The Maersk specifications called for detailed motion monitoring during the sea voyage which took place in July. MARIN had to monitor the behaviour of the transportation barge in waves and to store this motion data for post voyage fatigue analysis. In a fatigue calculation the ship/cargo is normally assumed to be a rigid body. For this reason the only information generally needed for a detailed fatigue assessment of the voyage is a time series of the six degrees of freedom rigid body motion of the ship/cargo.

To monitor the motions of the barge with cargo continuously and to provide the measurements in real-time on the tug, a dedicated wireless Tow Monitoring System was installed. On the barge, the system comprised a motion sensor unit, power supply and radio transmitter. As no power was available on the barge, a stand-alone power generation and power supply package were installed. Solar panels, a wind generator and deep cycle batteries formed the automatic power system. The package was designed so that it was fully redundant in terms of power generation (solar and wind) and in power storage.

On the tug, a radio transceiver and a laptop for data collection, display and storage were installed. The system provided a daily measurement report, describing the motions and acceleration in the specified reference point. This was sent along with the ship's log on a daily basis to HMC and MARIN.

After successful monitoring of the transport, all measurements were analysed at MARIN in more detail in an effort to carry out a fatigue analysis. Statistics and the cumulative rainflow distribution of the motions were determined and reported. In the adjacent figure, the statistics of the roll motions of the barge/cargo during the voyage are shown.