



Courtesy HMC

Tombua Landana transports undergo fatigue assessment

Heerema Marine Contractors (HMC) contracted MARIN to monitor the barge motions during two Tombua Landana transports with Compliant Tower sections from its yards in the US to the installation site in Angola.

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HMC was in turn contracted by DSME (Daewoo Shipbuilding & Marine Engineering) for the transportation and installation of the Compliant Tower for Cabinda Gulf Oil Company (CABGOC), a Chevron affiliate.

As part of the overall project, a drilling and production platform supported by a compliant tower was installed in the Tombua Landana field, which is approximately 50 miles off-shore Angola, in a water depth of 1,200 ft.

The CABGOC specifications called for redundant motion monitoring during the sea voyages, which lasted four to five weeks, in October/November time. MARIN had to mon-

itor the behaviour of the transportation barges in waves and to store this motion data for post-voyage fatigue analysis. In a fatigue calculation the ship or 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 barge/cargo.

To monitor the motions of the barges with cargo continuously and to provide the measurements in real-time on the tug, a dedicated, wireless and redundant Tow Monitoring System was installed. On the barge, the system comprised two motion sensor units, the power supply and two radio transmitters. As no power was available

on the barge, a stand-alone power generation and power supply package was installed. Solar panels and deep cycle batteries formed the automatic power system. On the tug, two radio transceivers and two laptops for data collection, display and storage were installed. The system provided a daily measurement report, describing the motions and accelerations. This report was sent to HMC and MARIN every day.

After successful monitoring of both transports, all the measurements were analysed at MARIN in more detail. Statistics and the cumulative rain flow distribution of the motions were determined and reported. In the figure above, the roll motions of the barge/cargo during both voyages are shown. ▢