Managing fatigue with JIP FPSO Live

MARIN's new strategy of providing integrated hydro-structural services is reflected in a new JIP being carried out with Bluewater Energy Systems and Det Norske Veritas.

Bluewater's new Joined Industry Project (JIP) FPSO Live is going to benefit from results of two international JIPs: MARIN's "FPSO Integrity" and DNV's "FPSO Capacity". The project is going to research the methodology and application of an integrated Fatigue Damage Prediction, Inspection and Maintenance System, aboard FPSOs.

FPSO Live, which is set to last four years, will use a reliability-based approach to assist the Inspection, Maintenance and Repair (IMR) programme, by predicting actual fatigue damage based on the measured fatigue loading.

Bluewater's Glas Dowr, which is being deployed on the Sable Field, offshore South Africa, will be used to test the system. In addition, a re-commissioned part of the monitoring system, which was installed by MARIN's Trials & Monitoring Group aboard Glas Dowr for the "FPSO Integrity" JIP, will be used to measure and record fatigue loading and environmental conditions. This system consists of about 50 sensors which includes pressure gauges measuring local wave and tank pressures,
Long Base Strain Gauges (LBSG) measuring the global hull bending moments, accelerometers and rate gyros measuring rigid body motions of the vessel and wave buoys.

These measurements will be used to calculate fatigue loading based on the knowledge developed within the framework of JIP "FPSO Capacity". The fatigue models are developed and verified by Bluewater using the results of the MARIN's model tests on Glas Dowr.

Bluewater will develop the overall methodology which will be later verified and approved by DNV. MARIN provides the monitoring system, is responsible for the data analysis and assists in developing the methodology.

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FPSO Glas Dowr at SA-5 yard in Cape Town, South Africa.