

# Floating Production

## Monitoring to support inspection, maintenance and repair of offshore structures



BY REMCO HAGEMAN

**M**aintenance is essential for operators of high performance craft and offshore units and relevant and up-to-date information is required to make well-informed decisions. As an FPSO does not enter drydock for regular inspections in-field maintenance is very important. On the other hand, inspection and maintenance is expensive because it requires a partial interruption of production, tank cleaning and the availability of specialized personnel. Moreover, inspection and maintenance activities introduce risks for both the people performing the maintenance and the structure. Therefore, careful planning is vital.

Classification societies and operators make increasing use of risk-based approaches to determine rational inspection intervals for offshore structures. Detailed information is required to make a thorough assessment and classification societies naturally make use of their extensive experience. However, important information for a specific unit can be retrieved through monitoring. This can significantly improve the inspection scheduling for that unit. The application of condition-based inspection and maintenance ensures that maintenance is conducted when needed, while at the same time avoiding the costs of conducting maintenance at an uneconomical fre-

quency. The AHMS system of MARIN is used to capture fatigue loads on an FPSO hull. Measurements from such a system can also be used to support maintenance decisions. Based on this, an exploratory analysis has been executed by Delft University of Technology, Bureau Veritas and MARIN. Measurements from an AHMS system have been used to calculate fatigue failure probability of one critical structural detail. This was compared with the results of design calculations. The uncertainties in the load can be assessed using results from long-term monitoring campaigns. This is important input for the risk-based assessment to determine inspection, repair and main-

tenance activities. By using monitoring data, a great improvement can be made for this unit's specific assessment. Current research efforts within the Monitas Group are striving to complete this goal. Undoubtedly, this application shows that continuous monitoring can provide very practical benefits.

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