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ACTUAL STRESS

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Structural Integrity & Monitoring

Fatigue life is stated in terms of stress ranges that are developed by the varying loads imposed to a structure. Regarding the offshore structures, existing, though rather out-of-dated, fatigue models can be used to predict the evolution of the fatigue damage over time by estimating the loads based on

wave statistics and then, by applying them into a finite element model. Due to uncertainties associated with environmental loads, safety factors are also commonly included into the analysis and mainly design phase of structure. However, the introduction of safety factors commonly leads to underestimation of the operational fatigue life of the offshore structure. Nowadays, mainly driven by economic reasons, the need for extending the lifetime of existing offshore structures leads to the necessity of developing more accurate and realistic fatigue life predicting models that, in turn, can favor the damage detection while the inspection and maintenance strategies maintenance can be further optimized.

The current abstract (and the corresponding poster) presents how the Operational Modal Analysis (OMA) has been implemented in order to estimate the developed strains based on monitored responses. By comparing those



estimated strains with strain gauges measurements, it is seen that the strains, being estimated via OMA, are in really good agreement with the measured ones. Hence, the uncertainties associated with strains/stress estimation are being reduced and the fatigue life of the offshore structures can be estimated with higher confidence and reliability.

