



Dynamic Hull Monitoring System Case Study

Verifying Sensor Performance with High-Accuracy Diagnostics

**Asset
Longevity**

**Proactive
Maintenance**

**Performance
Optimisation**

Overview

Client Location:
North Sea, UK

Industry:
Oil and Gas

The pilot of SMS's real-time Structural Health Monitoring (SHM) system was deployed on a working FPSO in the North Sea; the pilot ran for a six-month period.

Ship operations in the North Sea are prone to progressive damage while working in harsh marine environments.

The real-time SHM provides operators with continual insights into the condition of their vessel allowing them to make informed maintenance and intervention decisions – resulting in significant savings over the vessel's lifecycle.



Challenges

Assumed Conditions Limit Fatigue Accuracy

Vessel health (particularly in the areas of fatigue) is examined as a technical exercise using assumed sea conditions and vessel responses for a particular vessel. The real-time system provides the actual results of the vessel allowing greater accuracy of the technical exercise and potential for a more accurate replacement to this practice.

Unified Data Platform

SMS's HMS provides an integrated data platform where all of your data feeds can be collected in one place. The data can be stored in perpetuity and fed into a modern dashboard to real-time visual updates on your key data feeds.

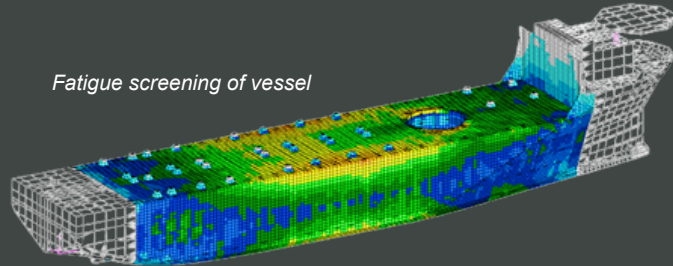
Inflexible Maintenance Schedules Limit Cost Savings

Vessel scheduled maintenance plans are rigidly defined to take place every five years as per Classification Society guidance, operators of late life vessels have a desire to decrease this frequency to lower operating costs.

Monitoring Limitations at Inaccessible Critical Structural Points

Critical structural details in vessels are difficult to monitor directly due to being hard to reach or situated where it is unreasonable or impossible to install instrumentation.

Fatigue screening of vessel



Insufficient Data Retention Impedes Insight

The data of most systems is rarely recorded for long duration, restricting the ability of operators to make informed decisions about vessel performance under different conditions.

Lack of Continuous Monitoring Data

The existing fatigue data for the client was collected infrequently, and the client has limited confidence in the findings.

Results

Benefits

- 01 Provides real-time monitoring of the health of the vessel
- 02 Advanced algorithms calculate the fatigue experienced at key hotspots
- 03 Unreachable high-risk areas can be monitored remotely via the coordinated response of the system
- 04 Data is held in perpetuity allowing for historical review of operations which can impact the vessels longevity

Value to Client



Foundation for Maintenance and RBI Success

The system has supported the client in their ongoing maintenance work and is acting as the bedrock to their newly introduced Risk Based Inspection (RBI) scheme.



Remote Instrumentation Confidence

The client now has confidence that otherwise unmonitorable locations can be 'remotely instrumented' using SMS's SHM system.



Fatigue Data Gap Closed

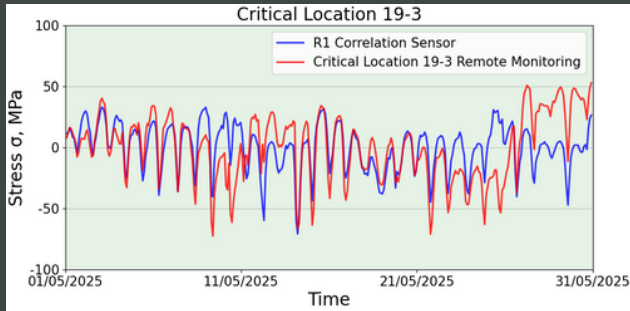
The client's lack of usable fatigue data has been corrected by the SHM system, having generated a wealth of fatigue calculations through the trial period the client is seeking to extend this information gathering by keeping the system.



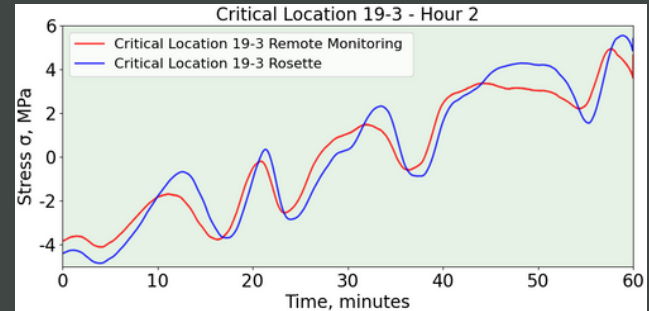
Optimised CAPEX Planning

This improved understanding of the structural fatigue life of the vessel allows for improved CAPEX planning by optimising the service life of the vessel.

Analysis



Remote Monitoring Comparison – Month



Remote Monitoring Comparison – Hour 2



The trial demonstrated a successful application of the remote monitoring principles, giving confidence to clients that the system can be used to make informed decisions about critical details of the vessel which otherwise cannot be instrumented



Fatigue calculations were performed for the duration of the trial, giving an assessment of the accumulated fatigue damage at select points across the vessel



The client requested that the system remain on board following the trial period so that they may utilise it for their upcoming operations.



Let's Keep in Touch

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