Case Study Overview: FPSO Integrity Assessment Project

An International Operator recently acquired an FPSO to deploy to the North Sea in 2025. The FPSO is currently undergoing modifications and upgrades to accommodate the new field operating conditions.

Objective:

To conduct a comprehensive integrity assessment of the FPSO to identify and prioritise items for replacement, repair, or fabric maintenance. The assessment was conducted in two steps:

- Step 1 – Complete internal condition assessment of all pressure systems.
- Step 2 – Complete an external condition assessment utilising GDi's Vision for all pressure systems, structures, hull and marine elements.

Whilst ensuring minimal offshore intervention from an integrity standpoint, over the operational life of the field, up to COP 2035.

Scope of Work: The focus of the integrity assessment was the examination of topsides pressure systems, which included pipework, vessels, heat exchangers, tanks, and filters, as well as topsides structures. The methodology included the following steps:

- **Internal Inspection Data Extraction:** Gathered Non-Destructive Testing (NDT) reports from inspection company, including internal integrity assessment data.
- **Data Preparation:** Similar data formatting was required, cleansing and correction on data sources provided by the client.

- **EXACT Software:** Identified "good data" for trending, segregated extreme data (ED); data that: May pose an immediate integrity threat. May not; pose an immediate threat but required further investigation.
- **External Inspection Data Extraction:** Collected 100% external visual inspection reports from GDi Vision scans, covering external integrity evaluations for pipework, vessels and structures. And additional data preparation thereafter.

Results & Benefits:

- An internal condition assessment at system and line level, summarising all existing and new anomalies with primary findings and recommendations. Acting as a primary feed to the longer-term RBI program.
- An external condition assessment summarising primary findings and recommendations for all pressure systems, structures, hull and marine elements.
- A fully cleansed, corrected and interpreted legacy data set covering both internal and external conditions with mapped and predicted degradation, failure patterns and hot spots.
- Recommendations equating to a **substantial reduction of approximately 40-50% of the anticipated maintenance and repair spend.** Integration with GDi Vision provided a "current condition" of the FPSO including new anomalies that hadn't previously been captured.
- A short-term remedial program with defined repair, replace and fabric maintenance scope. With long-term recommendations and targeted fabric maintenance (FM) actions to preserve asset integrity over the field's operational life, up to COP 2035.

Client Testimonial: "*We are extremely pleased to share our experience with the recent Integrity Assessment Project for the FPSO, a crucial endeavour in ensuring the long-term viability of our asset in the North Sea. We understand the paramount importance of maintaining asset integrity while minimising offshore interventions and the collaboration with Imrandd and GDi has proven to be a very clever and cost-effective way to gain the results we required.*

The project's objective was clear: to comprehensively assess the integrity of the FPSO and identify key priorities for replacement, repair, or maintenance. This strategic approach aimed to secure a seamless operational life for the field, up to the current designated cessation of production year in 2035. Imrandd and GDi's expertise and proprietary technology were instrumental in helping us achieve this goal.

The scope of work was large, focusing on a thorough examination of the topsides pressure systems, internal and external integrity evaluations, data analysis and providing actionable recommendations. The use of GDi's Vision tool in combination with Imrandd's analytics technology provided a comprehensive data extraction,

cleansing, and formatting process from which a robust and accurate foundation was built to base our decisions.

Overall, the novel way in which the experienced engineers at Imrandd and GDi completed this project was a creative and cost-effective method to achieve the integrity assessment of our FPSO".

Project Topsides Engineer – International Operator