

Fast and reliable hull integrity assessment



Oil and Gas Industry



Deployment:

- 3D platform deployment
- Field inspection with 360° camera and drone
- AI Image Analytics
- Virtual Inspection
- Dashboards
- Photogrammetry

Technologies:

- Measurement Points
- Planner
- Dashboards
- Twin Navigator
- Field Scan
- AI Image Analytics

Challenges

FPSOs require systematic hull integrity management activities to **address signs of aging** that could potentially affect normal operations. These signs include corrosion, pitting, welding, discontinuities, and buckling, and they necessitate inspection, monitoring, maintenance, and repair work to ensure the continued safe and efficient functioning of the vessel.

To map these anomalies, and **develop inspection plans** while supporting maintenance actions with the necessary information, requires the manual analysis and interpretation of extensive technical reports, resulting in a time-consuming process for engineers.

Solution

The solution for this company challenge is a visual hull integrity solution to identify anomalies and critical areas, performed repairs, and the indication of structural protection monitoring.

Step by step:



3D modeling



Reality capture by drone



Machine Vision



Virtual Assessment and processing



Hull integrity notes generation

In this context, the first step was to send one of our qualified inspectors to the field to **collect images via drones**, which were uploaded into Vidya's Platform. With all the collected images, it was possible to process them with our Artificial Intelligence trained to detect the most affected areas by corrosion, pitting, potential discontinuities, and other anomalies.

Therefore, **the images were virtually inspected** with the digital model informations using synchronized field photos and an inspector specialized in structural integrity to evaluate the state of the platform and other surface characteristics of it. To do this, the inspector fills in checklists with the necessary inspection procedures, such as:

- Coating condition and general corrosion evaluation.
- Rust degree.
- Deepness level of corrosion.
- Pitting evaluation and number of pitting spots.
- Deformation evaluation and number of deformation spots.
- Number, length and orientation of potential discontinuities.

Among other anomalies in each hull plate, and highlights on the 3D model the concerning areas. In that way, the evaluation process of the hull integrity was virtualized in **less than 30 days**, with the field survey performed with fewer people on the field.

Finally, to facilitate the analysis and prioritization of activities, **customized dashboards were developed** with all the crucial data with the classification of the most critical areas, optimizing the repair scope of work, and creating work orders on the client's SAP. Therefore, the client was able to **track all the hull inspection records and optimize inspection intervals in a visual solution**.



Results

With the implementation of the proposed solutions, it was possible to:

- Accurate data for class society RBI to optimize inspection campaigns
- Consolidate deadlines and extension intervals with planning and mapping tool
- Structure and Lifespan Extension analysis
- 90% less rope access for integrity assessment
- Support for the class society evaluation
- Digital Management of the Hull Inspection on a visual dashboard

