

Applying a Generic Approach to Risk-Based Inspection of Pressure Systems in Northwest Africa

Increasing efficiency while identifying potential threats, determining risk levels, and establishing inspection activities

Project Overview

The application of a traditional risk-based inspection (RBI) approach is typically labor and time intensive. Oceaneering was able to apply a generic RBI plan to a project offshore northwest Africa, increasing efficiencies while reducing risk.

Challenge

The client needed a more effective way to manage their assets and maintain them. The absence of an integrity data management system to extract information slowed our ability to develop a comprehensive RBI process. To successfully develop and execute the plan, a full suite of documents was required. Any missing information, including material types, could have created issues with the process.

The Oceaneering Solution

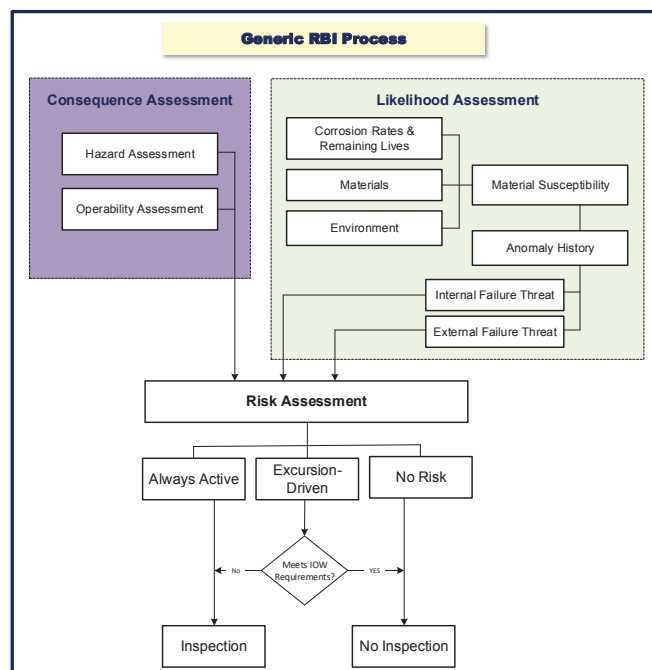
Oceaneering set up a process to acquire integrity data and provided a gap analysis system to the client so they could easily understand how and where gaps needed to be filled. The majority of required data was available from the client's maintenance build system.



Execution Plan

Our team used a generic RBI approach to check material and fluid combinations against an existing Oceaneering database to identify any potential threats to the pressure system equipment.

The study also identified potential consequences of failure for each piece of equipment. This information was integrated into the client's risk matrix to determine risk levels and establish requirements and frequencies of inspections. The identified inspection frequencies were created to be in alignment with the API requirements.



Equipment grouping and identifying corrosion circuits proved a critical step to applying RBI in an efficient and consistent way. Once the grouping was complete, active and excursion-driven threats were identified. For active threats, a regular inspection was applied. However, for the excursion-driven threats, a monitoring system was put in place to detect corrosive components fluids. If any excursions are observed in the future, then inspections may be required. The monitoring system can be configured to include factors including pressure, temperature, CO₂, chloride, pH, and water content.

Our scope of work included:

- » Data gathering
- » Completing material-fluid combination evaluation
- » Identifying always-active and excursion-driven threats
- » Reviewing materials and fluids specific to client's project
- » Developing an integrity operating window and key performance indicators (KPIs)
- » Applying a generic consequence assessment
- » Generating the risk matrix and inspection Intervals
- » Detailing inspection requirements, including where and how to inspect

Challenge

Gathering, collating, and validating integrity data was a challenge for this project. Oceaneering worked with the client to identify the critical information and detailed the knock-on effect of missing data to applying a robust RBI program.

Results

The time and resource required for a comparable project offshore northwest Africa would typically be a team of four to five specialists working for one year. By applying the generic RBI approach, the time and resources required for the project were reduced by 40%-50%. In addition, all RBI outcomes were aligned with the client's maintenance build, ensuring all RBI were included in the client's system, avoiding the time consuming re-loading of inspection requirements and KPI results.