

## AI-Powered Inform Predict™ Software Optimizes Inspection Intervals for National Operating Company

Digital predictive analytics software extracts critical information from data to eliminate over-inspection, delivering time and cost savings



### Project Overview

In this pre-pilot project, Oceaneering employed Inform Predict™ digital predictive analytics software to determine the appropriate inspection interval for piping on an asset owned by a national oil company (NOC). Using 2,229 condition monitoring locations (CMLs), Oceaneering fed the data available from the

NOC into an AI-powered algorithm to predict when the pipelines would reach minimum allowable wall thickness (MAWT). Knowing with precision when pipe failure is most likely to occur permits the operator to extend time between inspections and plan more efficiently for pipe maintenance and repair.

## Issues

Wanting to avoid downtime while implementing a data analysis program, this NOC was looking for a solution that could be put in place without disrupting operations or requiring extensive training for its on-site teams. The solution would have to work seamlessly with existing systems and be able to take in data in multiple formats. The goal of the pre-pilot program was to use the limited data available to generate quantifiable results that would permit the time between inspections to be extended and to enable more precise planning for maintenance when required.

## The Oceaneering Solution

Oceaneering's data agnostic Inform Predict™ digital predictive analytics software takes in disparate data formats in bulk and applies a proprietary algorithm to analyze historical data along with data being collected continuously from specific CMLs. Because of its flexible deployment structure (Cloud or Edge), the Oceaneering solution allows field inspection and integrity data to be input in real time for rapid analysis that enables early warning notifications for at-risk components.

By identifying the precise amount of wear at specific locations in the pipeline and using continuously input data to measure wall thickness, the software can predict when assets will be at risk. The operator planned to use the information generated via better data analysis to move away from a calendar-based inspection program to one based on actual physical asset integrity.

## Execution Plan

The NOC recognized the improved value artificial intelligence (AI) and machine learning (ML) could deliver over traditional approaches

to asset integrity management and was looking for a provider that could use the company's existing inspection data to develop a more efficient inspection and maintenance schedule.

On this project, the Oceaneering team began by gathering historical and recently acquired inspection data, as-built data, and results from risk assessments to input to the Inform Predict software program.

Inform Predict took in all the information gathered from the CMLs and identified bad data, performing self-validation and repeatedly assessing all the data in the system to refine its understanding of the asset and calculate more precise wall thickness measurements. In this way, the algorithm identified segments of pipe that were reaching the MAWT as well as segments that were being over-inspected because of false integrity assumptions. With real measurements in hand, the operator could see where more frequent inspection was necessary and could dispense with ultra-conservative inspection programs based on estimations rather than data.

To prove the accuracy of Inform Predict, Oceaneering used the available data provided by the NOC except the most recent information collected. By withholding the most current data, the operator would have real-world data against which to judge the accuracy of the results generated by Inform Predict.

The Oceaneering team ran the algorithm on 10 to 15 years of inspection data to predict what that last set of data would be. The results correlated closely with the actual measurement, proving that even with incomplete data, the algorithm can produce accurate predictions.

## Results

The Inform Predict software fit easily into the current inspection program and interfaced seamlessly with other software, providing a dashboard that enabled the operator to see what was happening within the algorithm. The first pass of the initial dataset was accomplished within 48 hours, with subsequent analyses carried out more quickly as new datasets were introduced.

By carrying out risk prediction using specific CMLs, the team could see how the pipe was performing at exactly the same location each time data was gathered and analyzed the data gathered over time to deliver precise results. According to the analyses facilitated by the algorithm, approximately 5% of the CMLs required a longer inspection interval

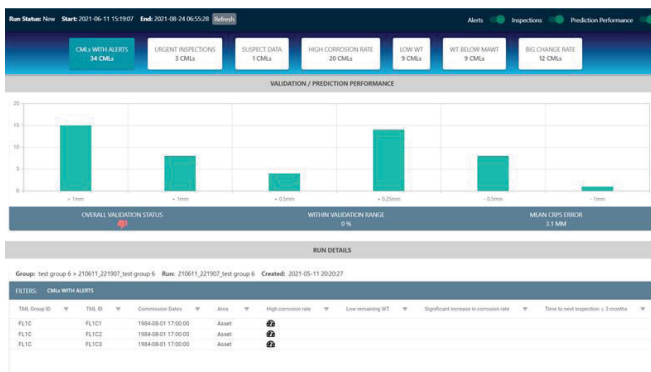
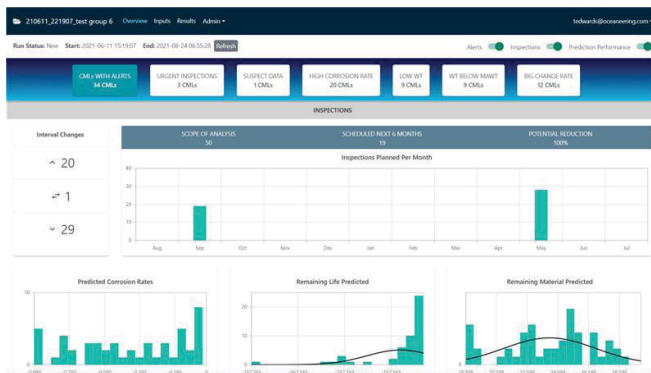
than the NOC had deemed necessary based on assumptions about the rate at which wall thickness was diminishing. Between 15% and 20% of the inspections were being done at appropriate intervals. The remaining CMLs did not need the short inspection interval the operator had been following.

Working within the 10-year maximum inspection interval established by the NOC, the software was able to safely reduce the inspection scope by 44%.

This successful pre-pilot program proves that the precise data generated by Inform Predict can improve integrity management, optimize inspection intervals and save considerable time and money for asset owners.

## Project Highlights

- » The Inform Predict software's flexible deployment structure allows field inspection and integrity data to be input in real time for rapid analysis, enabling early warning notifications for at-risk components.
- » Inform Predict used 10-15 years of historical inspection data to create accurate predictions, which matched with real-world data the NOC had gathered separately.





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