



Integrity Management Program for Cracking

The client experienced failures caused by stress corrosion cracking (SCC). A special task force was created to assess the risk of SCC in the entire pipeline system. An innovative, customizable excel-based application was created to analyze the data and create a risk priority model to select exploratory excavation sites to assess the risk of SCC.

Critical issues

To view and analyze data from a large multiple input data base for the purpose of assessing and prioritizing SCC locations.

The client experienced failures caused by stress corrosion cracking (SCC). Upon historical review, it was discovered that other pipeline segments had SCC issues. As part of an effort to improve their integrity management program, a special task force was created to assess the risk of SCC in the entire pipeline system. This risk assessment included: extensive data collection, placing all data in a single location for reference, selection of exploratory dig sites, validation of excavation results, determination of the extent of SCC, and ideas to improve the integrity management plan for assessing SCC. The data collected included in-line inspection surveys, close interval surveys, historic dig records, historic pressure test data, operating pressures, soil characteristics, elevation data and other relevant information. A major obstacle was to find a way to view and analyze data from this large multiple input database for the purpose of assessing and prioritizing SCC locations.

Solutions

An Excel-based application tool was created to display all the available data at a particular location on the pipeline in a single view. This was done by layering data in a clickable chart and allowing the user to select which area of the pipeline to be displayed and how many of the 66 data types to display. The user could also scroll along the pipeline and zoom in and out on a particular location.

When specific information is available for a particular piece of data, it can be displayed simply by hovering over that area on the chart with the cursor. This too aided in the development of a risk priority model that provided selection of exploratory excavation sites to assess the risk of SCC.

Value delivered

- Locations to excavate were prioritized by collecting information in the most cost effective manner.
- An Excel-based application tool that can display many different data sets, allowing for more meaningful analysis, was created.
- A methodology for assessing SCC risk on other pipelines in the future was created.
- An SCC integrity management plan was created, increasing the safety and reliability of the entire pipeline system.

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