

Implementing a Quantitative Risk Program

A North American midstream pipeline operator and Dynamic Risk started working together in late 2009 with the vision of initially loading data into Dynamic Risk's Integrated Risk Assessment System (IRAS) software platform to manage and consolidate the vast sources of data and information into one standard database. Since many of the pipelines were attained through acquisitions, there was a magnitude of data stored in various formats and source locations to manage. They required a solution that compiled, consolidated and provided a complete transparent view through a user-friendly interface and the ability to leverage the data in a usable form.



IRAS DataView and Query were the applications that were leveraged as part of the operator's pipeline integrity management program to view their data in a concise and usable format for in-depth analysis and reporting, and that would serve them well for the years to follow.

As the data was being loaded into IRAS, there remained some interest in pursuing a risk program that leveraged the IRAS data. In 2014, a decision was made to implement a standard qualitative risk algorithm that best matched the data that the operator had at that time.

The risk algorithm adhered to regulatory requirements and industry standards, however, by 2016 it became clear the company was outgrowing this approach. They wanted to do more robust analysis than what the qualitative approach was able to support. To do that, they needed to get away from qualitative descriptors and Subject Matter Experts (SMEs) inputs that formed a major component of the original approach in lieu of actual data. The lack of comprehensive data to support the risk model and instill confidence in the data quality hindered adoption and therefore wasn't actively used as part of their asset integrity team's decision-making process.

In 2017, the operator made the decision to kick-off a quantitative risk assessment program. It was decided that the risk algorithm was to be completely customized to their organizations specific needs and requirements using their own internal SMEs to ensure the model reflected their operations environment as close as possible. Extensive efforts were made around leveraging Dynamic Risk's industry-leading risk approaches as a starting point, along with the operator's existing workflows, data inputs, and known threats to ensure that all potential risks were being considered, and that their data was being used to appropriately calibrate and validate the model against operator experience. If a specific data variable wasn't initially available to support the model, a commitment was made to gather it – data wouldn't be the limiter in the approaches considered.

CLIENT

North American
Midstream Operator

SOLUTION

Dynamic Risk's Integrated
Risk Assessment System
(IRAS) software platform

BENEFITS

Enables informed decision-making in risk assessments

- Achieves buy-in from executive leadership team
- Proactive approach for regulatory compliance
- Quantitative measures provide confidence and trust with proven data
- Facilitates the comparison of pipeline asset risk to other company-owned assets

Benefits of Agile Implementation:

- Increased flexibility in the risk solution using agile based methodology
- Faster turnaround from concept to execution and more real-time result generation
- Ability to address multiple models in parallel
- Increased innovation through mid-flight modifications based on new data, ideas and approaches

In conjunction with DataView and Query, the operator implemented IRAS RiskAnalyst to obtain quantitative metrics and analysis to facilitate a proven, repeatable and pro-active approach in managing their pipeline assets. An agile based approach was used for developing, testing, validating and calibrating the new risk model. This enabled them to quickly access, review and edit existing approaches to best fit their needs.

“Prior to 2014, our pipeline integrity program was managed as discrete elements and our view was that a dedicated risk program was not required. The challenge with this approach was that information was not fully integrated and developing mitigation strategies was quite challenging. The information available did not provide an accurate and thorough understanding of the potential pipeline risks across our pipeline system” comments the Operator.

The importance of having access to current data and information to align the operator’s understanding of which high-risk areas to focus on was paramount in reducing the risk of pipeline failures. Data sets from third party service providers that provided information such as environmental concerns or natural forces were also used for reporting. They realized that just simply looking at ILI data and other data separately did not provide an accurate and complete understanding of the potential risk factors as it did not capture the environment and safety conditions surrounding the asset. It was critical for the team to see more than just the corrosion risk, but other factors both related and unrelated to the ILI data, to capture the bigger picture of threats and their associated failure mechanisms and consequences along a pipeline asset. This would ensure that proper remediation activities were being performed.

Within RiskAnalyst, they were able to incorporate risk results into their internal Operational Risk Matrix (ORM) to compare assets to other pipeline assets, or any asset they own such as a facility, and analyze how they stacked up in their risk profile. This provided valuable insight across all asset operations and the ability to place emphasis on the highest priority areas to focus resources and capital spend for the highest return on investment. This new level of transparency provides confident, quick decision-making regarding the potential risk if they focus their efforts on one particular asset, and the potential risk if they don’t.

Since implementing RiskAnalyst, they have been able to streamline workflows by alleviating the need for software developers to manage every step of the process due to the application’s user-friendly functionality and intuitive programming. Using the agile approach within RiskAnalyst, the engineering team (whether it is the operator or Dynamic Risk) can administer changes on their own. This provides users a higher level of control and more flexibility in doing risk assessments and scenario model analysis.

OUTCOME

The operator’s goal is to expand the quantitative risk results across other departments outside of their pipeline integrity team and utilize the data and reporting to assist in decision-making at the corporate level for all assets in operations.

Comments the Operator “Often there can be multiple threats at play for a pipeline asset. Individually, these may not be a major concern, however, when over-laid together, can pose a significant concern. By partnering with Dynamic Risk, they bring the technology expertise that can be leveraged across the asset lifecycle, and we bring the operations expertise for a truly holistic, transparent view of the current state of each asset and location.”

WHY PARTNER WITH DYNAMIC RISK?

Dynamic Risk’s technology and consulting services optimize risk-informed decision making to manage risk through an asset’s entire life cycle. Our software models pipeline systems to proactively determine where they are most likely to fail and the corresponding consequences of unintended releases. From gathering systems, midstream pipelines, transmission pipelines, and distribution networks, we have software applications and in-house expertise to provide complete pipeline risk assessment, data management and compliance reporting.

Canadian Headquarters

Suite 1110
333 – 11 Avenue SW
Calgary, Alberta, T2R 1L9
(403) 547-8638

USA Headquarters

10001 Woodloch Forest Dr
Suite 250
The Woodlands, TX 77380
(832) 482-0606