OPTIMIZING THE VALUE OF UPSTREAM PIPELINE INTEGRITY DATA

In recent years, a shift has begun in upstream integrity management towards improved integration and analysis of integrity data, driven by factors including a changing technology landscape, new regulatory mandates and ever-increasing system data availability and resolution.

Upstream Asset Integrity teams are recognizing the need to have an improved understanding of upstream assets to protect capital investment, mitigate risk, ensure the safety of public, as well as adhere to new state/provincial and federal regulations. It is increasingly apparent that effectively managing pipeline integrity data, and ensuring efficient integration and analysis, are key steps in transforming data to information, and to knowledge, in order to support decision-making.

A number of significant factors have helped spur the drive towards efficient data management, integration and analysis. These include improvements with inline inspection (ILI) technologies, specifically for upstream systems, changing regional and federal regulatory requirements, and continuous merger and acquisition (M&A) activities.

The selection of ILI technologies and overall availability has increased to the point of making ILI a much more viable inspection method for many upstream systems. Upstream operators are increasingly selecting ILI as an inspection solution as it generates very detailed data to support analysis and decision-making. As technology becomes more readily available, the focus for operators is now shifting to adjust their integrity management programs to effectively manage, prioritize and integrate this newly available data with their existing systems, and the ability to draw value from it through integration, visualization, analysis and reporting.

Over the last several years, many operators have redefined their integrity programs and procedures to adhere to newly imposed industry regulations. For example, in 2018, the State of Colorado introduced specific reporting requirements with imposed audits for managing upstream pipeline assets. In addition, PHMSA is soon set to release the much anticipated Mega Rule in three separate installments starting this year, with the third part expected to be specific to gas gathering systems.

The surge in M&A activity across the US has also significantly impacted the need for operators to truly understand the value of their assets, regardless if they are buying or selling. For companies to effectively analyze and run cost-benefit scenarios during the bidding process, the ability to conduct a high-level, integrity focused, due diligence review uncovers potential risks, confirms any required risk mitigation strategies and supports confidence in the decision making process before any deal is finalized.

The benefit for operators to understand the key factors that impact their upstream pipeline assets has started to take precedence. However, developing a sophisticated Integrity Management Program (IMP) to align with their existing integrity systems and procedures is not always a straightforward process. There can be both internal and external challenges which are outlined in the following section.

INTERNAL AND EXTERNAL CHALLENGES

Upstream pipelines not considered key assets by management

There is a common misconception that upstream pipeline systems are cost centers and do not directly contribute to revenue generation. Due to this, there is often limited resources and budget allocated to develop upstream IMPs and associated risk mitigation programs. Senior leadership teams are starting to reframe their ideologies to take into account the impact that upstream assets have on the overall value chain. If a pipeline incident occurs, it will immediately be taken out of commission, thus causing halted production and resulting in a direct impact to the company's bottom line.

Ownership and management of upstream pipeline data requires resources (people, processes and systems)

A key challenge for upstream operators is collecting, integrating and managing the vast amount of pipeline attribute and integrity data. Historic acquisitions and divestitures, asset transfers, limited regulatory requirements and rapidly changing system configurations can create challenges for operators to ensure complete and accurate system integrity records are maintained. Pipeline integrity teams are placing priority on taking ownership of their data to better plan, execute and document integrity programs to support confident decisions based on proven analysis and data trends.
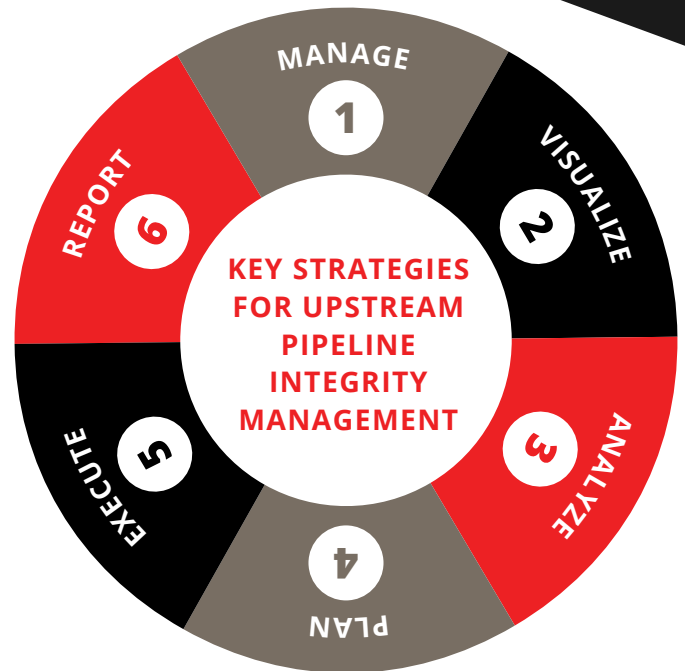
Risk based decision making is not typically formalized within upstream integrity management programs

Historically, upstream operators have not had a need to have a defined risk assessment procedure in place. For operators that did, their risk assessments have predominantly been used for regulatory compliance purposes and are often limited in scope, repeatability, and decision worthy results. As more data and integrated data management systems become available on the market, operators are placing precedence in developing a sophisticated IMP with the ability to integrate multiple types of inspection data, produce performance dashboards, benchmark against KPI's and execute maintenance and mitigation programs based on the risk results, all of which are key to risk-based decision making.

Integrated integrity data management systems are heavy and difficult to implement and maintain

As our industry evolves, upstream operators are going beyond using spreadsheets, local folders and network drives for data storage, analysis and visualization. The optimal approach to facilitate the move to a more sophisticated, integrated approach is to build systems and automation around the data management and analysis. This requires resources, defined data management processes, people and systems. Current advances in data integration, spatial data processing and display, and web-based user-configurable applications are helping to address these challenges and create a modern integrated integrity data management reality. To remain competitive, upstream operators who embrace digital transformation and leverage technology enabled solutions will substantially increase system reliability, safety and ensure the limited integrity budgets are allocated to where it is needed most.

KEY STRATEGIES FOR UPSTREAM PIPELINE INTEGRITY MANAGEMENT

1 MANAGE
2 VISUALIZE
3 ANALYZE
4 PLAN
5 EXECUTE
6 REPORT

1 DATA MANAGEMENT
Leverage technology enabled solutions to consolidate and manage pipeline integrity data from various sources. Upstream operators require access to accurate and current data that is easily compiled and configured from various file and database systems.

2 DATA VISUALIZATION
The ability to put data into context using different visual formats such as maps, charts, tabs provides upstream operators with a more integrated and informative view of their assets. This supports better analysis through an efficient and streamlined process. If a picture is worth a thousand words, a map is worth a million.

3 DATA ANALYSIS
Operators need to focus on the most critical data that provides value in decision-making when completing their risk assessments. The ability to mine critical information from validated and integrated data sets assists operators to analyze and make quick, fact-based recommendations for their integrity management activities is key.

4 **PROGRAM PLANNING**

It is critical for operators to be ready with immediate access to pipeline asset documentation should they have a regulatory audit. To remain compliant, companies that have invested in developing their IMP with a programmatic and data-driven solution have the opportunity to take immediate corrective actions and use those learnings to continually improve their internal processes.

5 **PROGRAM EXECUTION**

Through the use of technology, operators can develop and implement their pipeline integrity program activities through an organization wide approach. It is important for integrity teams to have a dedicated line of communication between office and field operations with access to data via a web-based platform for integrity management.

6 **REPORTING**

Integrity teams need to be able to quickly compile and share critical information to support data driven decision-making across the organization. Through completing detailed and accurate analysis and reporting of the current state of each asset, technical, management and executive teams have the necessary information to make confident decisions to mitigate potential pipeline risks, protect capital and ensure the safety of the public and the environment.

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ABOUT US

Dynamic Risk's technology and consulting services optimize risk-informed decision making to manage risk through an asset's entire life cycle. Our platform 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 engineering expertise to provide complete pipeline risk assessment, data management and compliance reporting.

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