



THE TRUE VALUE OF PIPELINE RISK MANAGEMENT

Why do you perform risk assessment?

How do you create value from risk assessment?

What is the difference between integrity management and risk management?

Imagine a risk management approach that meets the needs of all stakeholders in your company, results in greater efficiency of your maintenance and capital dollars, and increases the effectiveness of your programs! At a time when greater demands are being placed on your teams to do more within fixed budgets, risk management is essential to meet so many critical business needs.

Why do you perform risk assessment?

Pipeline operators often perform risk assessment to meet **regulatory requirements**.



In the United States, regulations have been in place since the 1970's and have evolved significantly over the past several decades. Congress has considered, adopted, and re-authorized a number of bills focused solely on improved pipeline safety. The National Transportation Safety Board has put forward several recommendations to Congress, and these recommendations have been considered and acted upon by the Department of Transportation (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA).

More recently (March 2016), Pipeline and Hazardous Materials Safety Administration (PHMSA) released the text of the Notice of Proposed Rulemaking (NPRM) for Title 49, Parts 191 and 192 of the Code of Federal Regulations for Transportation of Natural and Other Gas by Pipeline (the Code).



In most cases, the regulations in Canada are developed through technical committees within the CSA (Canadian Standards Association) where the regulators are significantly involved in the process. As such, the CSA standards are incorporated within both Provincial and Federal regulations and form the basis for the requirements.

One additional difference is the application of one CSA standard as the regulatory basis for both natural gas and hazardous liquid pipelines. This approach is especially helpful for those pipeline operators responsible for transporting a wide range of hydrocarbons.

More recently, The Canadian National Energy Board (NEB) has mandated that a company shall establish, implement and maintain a management system that addresses all aspects of inter-provincial pipeline operation including risk and integrity management.

Pipeline operators often perform risk assessment to **support maintenance decisions and new pipeline projects**.

The pipeline industry is often required to demonstrate the risk associated with pipeline projects including but not limited to pipe replacement, re-routes, and new construction. While it has been proven that the pipeline industry is the safest and most reliable mode for transporting hydrocarbons, there are often concerns raised about pipeline reliability by those in close proximity to certain projects. As such, it is incumbent upon our industry to demonstrate any associated risks using a fact-based and method driven assessment. Then, the identified risks must be evaluated and shared with appropriate stakeholders. Since these approaches are often quite technical in nature, effective communication of results is required to all stakeholders. Risk becomes a very effective communication tool to show that we understand and have worked to effectively mitigate all unacceptable risks to the people and communities we travel through.



How do you perform risk assessment?

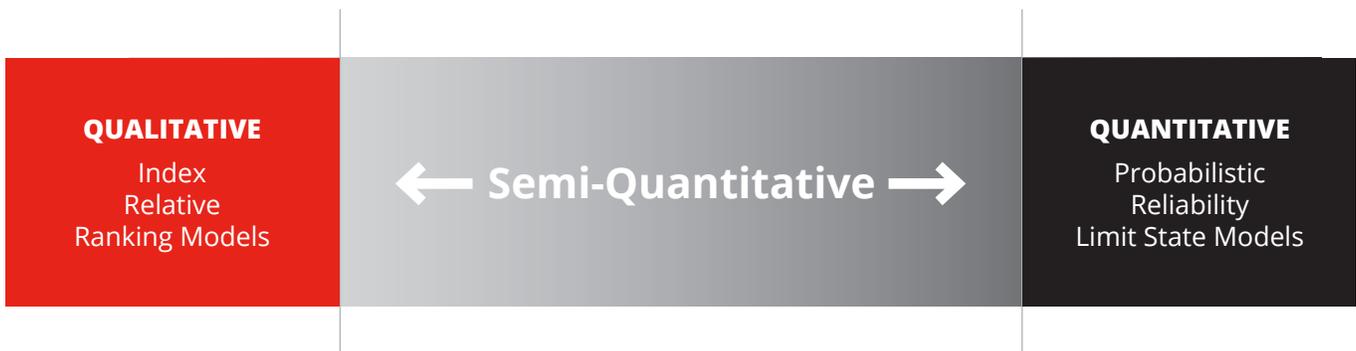
Risk Assessment is a continuum of approaches.

Some of the first risk assessment models developed back in the early 1990's were strictly index models where weighting factors were based primarily upon subject matter expertise. This process required identification of the threats and consequences associated with each pipeline and then to begin acquiring and maintaining the data required to support risk assessment.

Over the past several decades, the algorithms used to perform risk assessment have significantly evolved and often rely upon industry failure statistics and engineering evaluations to better characterize the threats and consequences. As such, the use of semi-quantitative risk models are used by many pipeline operators today.

More recently, pipeline operators have evolved to probabilistic reliability models that rely upon advanced analytical techniques and available data used to quantify certain trends. While probabilistic models are often times used for site-specific assessments, these models are being used more often for line wide assessments.

In actual fact, there are few purely qualitative or quantitative models used. The vast majority of risk assessments used by operators today are generally semi-quantitative and have elements of both. The journey to probabilistic models takes time but the advantages to decision making and your business could be significant.



What is the difference between integrity management and risk management?

Integrity management plays an important role in our day to day pipeline operations activities. The process of threat assessment, characterizing the degree of the threat and then selecting the optimum preventative and mitigative measures to manage that threat, are the core of what we do as an industry. Risk Management is a broader umbrella that incorporates integrity management and also the impacts of a release on the public, the environment and the business. It allows us to drive enterprise decision making in consideration of all impacts associated with the reliability of our pipeline systems. By way of example, in-line inspection surveys have become a gold standard for integrity assessments, and they also provide a foundational data set for probabilistic risk assessments. Risk Assessment gives us the knowledge to implement and defend why a pipeline, that may have unacceptable impacts associated with a release, requires a different frequency of inspection than another pipeline.



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So now what?

Imagine yourself setting the vision and leading the journey to a comprehensive risk management program that meets the needs of all stakeholders, achieves a higher level of effectiveness and is done efficiently, ensuring every dollar spent is assessed against its benefit. This is much more than simply considering the status of your risk management program, but instead thinking about what your risk management program can be! This is your journey....

1 Managing more than risk

The process of risk management should consider all operational variables vital to a company's success, like safety, higher asset performance and lower operational costs. Proper risk management also delivers a level of insight and control into a company that can make every single decision better, for everyone in the company, from the CEO to the engineers to the people walking the line. It is the difference between knowing and best guess, between confidence and doubt.

2 Achieving Compliance as a Minimum

The development and implementation of risk management programs certainly should meet or exceed regulatory requirements. A fact-based and method-driven approach to risk assessment that relies upon typical approaches used across the industry, will be compliant.

3 Enterprise Risk

By assessing and integrating risks from both Operational and Corporate points of view within a developed Enterprise Risk framework, an operator can better manage risk and mitigation interdependencies and drive for consistency across all lines of business.

4 Risk-based Decision Making

Significant resources are required to develop, implement and maintain risk programs. However, is this investment being used to its fullest extent? As risk programs evolve and truly establish risk-informed decisions, it has the potential to transform your company.

5 Change Management

The systems used to manage risk have evolved. At the advent of risk analysis most operators were able to assemble data and perform analytics in spreadsheets. However, as the amount of data has increased, along with the complexity of the analytics, that ability to effectively manage within a spreadsheet has become a 'risk' in and of itself. It has been demonstrated that effective controls in data management, risk calculations, and use of the results are key considerations in establish compliance with regulations.

6 Defensible Decision Making Process

A robust risk management program that relies upon a risk assessment designed to meet your specific needs will provide you and your organization with a defensible program. While each one of us does everything possible to eliminate pipeline failures, it is not likely for the foreseeable future to eliminate all pipeline failures. If an unfortunate failure does occur, having a well-established risk management program will provide the justification of why certain decisions were made. It too should be recognized that risk programs are not expected to predict when and/or where the next failure might occur; it is designed to programmatically manage risk across a system.

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External Stakeholders

It is recognized that external stakeholders, including but not limited to elected officials, the general public/land owners, regulators, and first responders, all have a vested interest in pipelines. To that end, the reliance upon a risk program to quantify and effectively communicate risks will provide these stakeholders with the confidence that all threats and consequences have been appropriately considered.

Consistency Delivers Greater Control of Pipeline Safety and Reliability

While pipelines deliver a vital service to society, operators are also in a delicate position. The social license required to operate must be honored and renewed on a daily basis. Trust is imperative, so the most robust risk management programs possible are required.

Maintaining consistency between risk-based integrity management and ILI-based integrity management enhances pipeline safety and reliability; precisely what you need in this environment.



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Patrick Vieth is an industry leading technical advisor in pipeline risk management and integrity management. Patrick has worked with more than 100 pipeline operators throughout the US over the last 30 years and is considered an industry thought leader. Patrick currently leads the risk management practice area for Dynamic Risk. If you'd like to discuss any details of this white paper, please contact Patrick (Patrick_Vieth@dynamicrisk.net) and he would welcome the opportunity to learn more about your risk program and how we may help you with your journey.