

## API 2024 PIX PROGRAM - ABSTRACTS

### **Operator Roundtable – Company Best Practices for Sharing & Learning**

Roundtable Participants:

Debbie Price, Shell Midstream

Nick Medina, ExxonMobil Pipeline Company

A key objective of the 2023-2025 API-LEPA Performance Excellence Strategic Plan is timely sharing and learning of industry safety incidents. API committees and Policy Groups have made safety roundtable discussions a part of every meeting where operating companies share information on incidents, near misses, regulatory inspections, etc. This panel will include several representatives of API member companies that will share their experiences and internal best practices and approaches being taken to sharing information and lessons learned from across API committee meetings, industry conferences, and peer-to-peer meetings and benchmarking discussions.

### **Operations Excellence and Risk Management**

#### **Title: Remote Valve Hydrocarbon Detection**

Author/Presenter: Tripp Shaw, Colonial Pipeline Company

Hydrocarbon point sensors are being used across various industries to detect low concentration of hydrocarbons in environments with the potential for system leaks. The physical detection of hydrocarbons has specific advantages and disadvantages when compared to proximity or remote detection methods, but can fit into a layered-detection approach that deploys point sensors where they would be the most effective. Colonial has investigated proof-of-concept and pilot-level projects in this space to form potential best practices and deployment recommendations.

#### **Title: Legacy Sleeve Risk Reduction**

Author/Presenter: Mark Byelick, BP

A pipeline failure occurred in 2023 on a 10" diameter refined products pipeline. The failure was determined to occur at a Type-B sleeve repair, installed in 1971. The goal of the presentation is to summarize the main causes of both the carrier pipe failure and the sleeve repair failure. Strategies to identify similar repairs will be discussed.

#### **Title: Beyond Luck-Embracing Excellence Over Failure**

Authors/Presenters: Tim Johnson & Ruben Cheng, Shell Midstream

In December 2021, Shell Midstream experienced a high potential release of ethylene at a facility from a technician performing troubleshooting and maintenance. This incident, and subsequent Level 3 Causal brought to light the need for many changes to improve Process Safety Performance across the Organization, including: structure & accountability, ways of working, processes & systems, and people, culture & skills. To reach the desired end state this could not be a few simple changes at a single site, rather a large number of physical and cultural changes made across all sites and all employees. To not take on this challenge would have meant conceding that these types of “fail lucky” incidents would be unavoidable in our business, which was an unacceptable outcome for our community. An empowered team was formed including passionate leaders from



inside & outside, organized around 4 key themes coming from the Level 3 Causal. A dynamic workshop was held to quickly identify tangible ideas & build out improvement plans. A change management plan including training & visible leadership was established to manage the journey of roll out, implementation, embedment, and sustainment of the changes. A large number of improvements were implemented covering structure & accountability, ways of working, processes & systems, and people, culture & skills. In addition to these measurable changes a formal System Pattern Analysis was commissioned to help identify negative leadership behaviors contributing to the current culture.

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### **Integrity Management and Lessons Learned from Industry Incidents (Session 1)**

#### **Title: Lessons Learned from a Recent Pipeline Seam Failure**

Author/Presenter: Kristen Schnipke, Marathon Pipe Line LLC

Operators will learn more about a recent failure that occurred on the ESHE 8" products pipeline at a high-frequency electric resistance welded (HF-ERW) longitudinal seam. Metallurgical analysis determined the failure coincided with a 3.09 inches long by 0.151 inches deep lack of fusion (LOF) defect that increased in depth due to fatigue to the point of failure. This presentation will share details from the incident, integrity information related to construction and assessment history of the pipeline, casual factor analysis, and post-accident actions related to integrity management including collaborating with the ILI vendor to determine why prior ILI assessments did not report the failure LOF feature.

#### **Title: Challenges to Integrity Managing of Short, Deep Crack-Like Features**

Author/Presenter: Mengshan Yu, Enbridge

Pipeline operators have recognized that short but deep crack features in the long seams of vintage pipes) in operating pipelines. These features can be either through-wall or near through-wall and are challenging to detect and size with in-line inspection (ILI) and non-destructive examination (NDE) technologies. These short but deep penetrators are typically a leak threat but the consequences of a leak in a High Consequences Area (HCA) can be significant depending on the location. This presentation will describe actions taken by Enbridge in response to detection of a near through-wall axial crack flaw (88% depth) that was identified in the ditch in a 1950s vintage flash welded 24-inch liquid pipeline in the ditch. These actions included evaluation of the feature using multiple NDE technologies, cut-out of a coupon and destructive testing to assess inspection technologies measurement performance, and working with an inline inspection (ILI) technology service provider to develop a new Phase Array ILI crack tool to detect and characterize the cracking anomalies in 24/26" diameter, 1950 vintage flash weld pipe. This study provides a guideline on how to work with ILI vendors to leverage the acquired data from both ILI and field results to implement non-standard analysis procedures to address these outside-specification features. The main goal is to use the ILI and NDE data to improve the detection and sizing of short and deep crack-like features which may threaten pipelines.

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## **Panel Discussion: API Conservation Program for Pipeline ROWs and Facilities - Lessons Learned from First Adopters**

Moderator: Mary Youpel, API

Panelists: Donnie Garrison, Shell Midstream; Ronan Mason, TC Energy; Scott Sharpe, Marathon

This panel will include presentations by pipeline operating companies that have developed internal programs for ROW and facilities conservation management and integrated vegetation management (IVM) programs. A pipeline right-of-way conservation program is a collection of projects representing an effort to maintain rights-of-way in a manner that consciously considers the environment for targeted species while ensuring vegetation is compatible with pipeline functionality and regulatory requirements. Implementing a pipeline conservation program has a parallel goal of fostering positive relationships with the communities in which we operate. The benefits of developing a comprehensive pipeline conservation program extend beyond the primary objective of preservation of a safe, functional pipeline - implementing a pipeline conservation project can provide economic benefits, environmental benefits, and community relationship benefits for companies implementing the program:

- **Economic Benefits:** Companies will spend less money maintaining the ROW through more focused, selective controls. Full-scale IVM has been shown to have a long-term cost savings of 48% over 15-20 years.
- **Environmental Benefits:** If done with intention, IVM can create stable plant communities and compatible habitats for many species. It can cultivate greater biodiversity, increase carbon sequestration, and improve air quality.
- **Community Benefits:** Companies will be able to develop and improve relationships with community members by involving stakeholders in conservation planning and implementation. API has developed the API Conservation Initiative, which is led by a group of industry representatives to advance conservation along pipeline rights of way.

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## **Inline Inspection Sharing and Learning**

**Title: API 1163 and IMU**

Author/Presenter: Fernando Curiel, ExxonMobil

Pipeline Operators are using IMU data for integrity decisions akin to MFL, UT, or Geometry data and that necessitates a framework for obtaining high quality IMU data. API Standard 1163 provides a framework that could be used to ensure consistency in the analysis and processing of IMU data for integrity management of pipelines. An internal review of 127 ILI reports available from multiple vendors and operators indicated that 48% presented an adequate specification for IMU based data beyond XYZ anticipated geospatial accuracy. This publication proposes how key elements of API Standard 1163 can be applied to IMU data and provides examples of how some routine practices would have avoided costly and inefficient use of resources. In recent years, the weather and outside forces threats have gained more visibility within the pipeline industry, and IMUs provide necessary data to perform post-ILI assessments of these threats (e.g., bending strain, strain change, FFS, centerline refinement, DOC, etc.) that are used to support risk-based integrity decisions. Unlike more established and routine technologies like MFL, the adoption of API 1163

process to IMU technologies has not been widespread throughout the industry. This presentation will discuss guidance/considerations for IMU specifications, IMU DQA, qualifications, system qualification, reporting requirements, QA/QC. The intent of this presentation is to be a call to action to implement API Standard 1163 to IMU data in the pipeline industry.

**Title: Seam Cracking IMP Enhancements with an Innovative and Accurate Time-Based Crack Sizing ILI Tool**

Author/Presenter: Xavier Ortiz, Imperial Oil

Pipeline operators face several challenges during the implementation of a seam cracking integrity management program (IMP). Some of these challenges are related to improving confidence on NDE dig data, ILI tool data analysis and crack sizing, and implementing crack assessment methodologies under a risk-based assessment framework. Overcoming those challenges is key for the development of an effective and efficient dig program and long-term asset management strategy. As part of the seam cracking IMP enhancements, Imperial Oil Ltd used a new and innovative crack detection tool that was developed and recently presented by ExxonMobil at the 2024 European Pipeline Technology Conference. Although the new ILI tool has shown to be highly accurate, the success of the enhanced seam cracking IMP was the result of the implementation of supporting integrity programs to ensure the right information and assessments were being used. This paper and presentation will discuss the steps that were followed for the implementation of a successful ERW seam cracking IMP. Details about the new ultrasonic ILI technology with consistent and reliable tip diffraction sizing capability, the implementation of a structured NDE and validation program, the deterministic and probabilistic evaluation of reported seam weld anomalies using the PRCI MAT-8 methodology, and the implementation of a risk-based approach for dig selection and definition of a long-term seam cracking management plan, will be included in this document.

**Title: Caliper Tool Anomaly Investigation; “Lightning Can Strike Twice”**

Author/Presenter: Nathan Nissley, ExxonMobil

Pre-commissioning caliper runs have successfully been used to identify fabrication and installation related anomalies in new pipelines. Anomalies identified during caliper runs are investigated, and where necessary, remediated. This presentation discusses the findings from two anomalies that were attributed to lightning strikes. The presentation explores how the caliper tool identified the anomalies and examines the factors that contributed to the lightning strike events. The assessment included a metallurgical evaluation of the line pipe as well as the coating integrity assessment to ensure the pipeline was fit-for-service after the entry damaged section was removed. Construction best practices will be discussed.

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**Integrity Management and Lessons Learned from Industry Incidents (Session 2)**

**Title: Lessons Learned from a Pipeline Rupture Due to a Hard Spot**

Author/Presenter: Kay White Walker, Williams

On April 12, 2022, a Williams pipeline ruptured within a station valve yard. Thankfully, no fire or recordable injuries resulted from the incident but approximately 53 MMscf of gas was released (27 times the Process Safety Tier 1 threshold). The cause of the rupture was found to be a crack within a



hard spot. Historical industry knowledge around hard spot susceptibility primarily focused on a single pipe manufacturer, AO Smith. Yet, Williams' historical hard spot failures indicated other pipe manufacturers could be implicated. Through the investigative effort that followed the April 2022 rupture, Williams found that Bethlehem pipe manufactured in 1950 had a higher prevalence of hard spots than initially thought. Williams was able to identify and trace the Bethlehem pipe with higher occurrences of hard spots to specific purchase orders allowing the Company to take a more targeted approach to reducing its hard spot risk. Additionally, cathodic protection (CP) potentials more negative than 1200 mV increases the likelihood of hydrogen embrittlement to the steel, adding a particular concern for pipe that may contain a hard spot. To address this additional contributory risk, Williams undertook a thorough evaluation of CP levels along its mainline piping and station piping where there was an elevated hard spot risk. Williams embarked on a multi-pronged effort to remove known high risk hard spots, execute a focused recoat strategy, strategically review and rebalance its cathodic protection, as well as utilize inline inspection tools to reduce Williams' risks for hard spot failures. Further, Williams has promoted and participated in multi-year, ongoing research efforts that are providing numerous imperative learnings for the industry, including two PRCI research projects: PRCI MAT-7-2 and PRCI MAT-7-2a.

**Title: Cathodic Protection Interference challenges of Pipelines in shared ROWs**

Author/Presenter: Roger Lehman, MPLX

Operators will learn about a mainline release incident that occurred in July 2023 resulting from an aggressive external corrosion anomaly. The Operator manages two similarly constructed pipelines in a common ROW sharing cathodic protection. The integrity management plan included Inline Inspection, which did not indicate metal loss concerns, and Annual Test Station readings which met CP criteria. Previously completed Close Interval Surveys resulted in questions about survey data accuracy and documentation of remediated CIS exceptions. This presentation will share the root cause that led to the metal loss anomaly, lessons learned in reviewing previous survey data and Test Station readings, and mitigative efforts to prevent recurrence across the enterprise.

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**Designing, Constructing, and Commissioning of Pipelines**

**Title: Managing Construction Projects that No One Really Cares About?**

Author/Presenter: Heath Bryant, Colonial Pipeline Company

Pipeline companies are impacted by mandatory relocation projects due to increasing urban development, government-sponsored DOT and infrastructure projects, as well as private developers' projects. These mandatory unexpected relocation projects are highly impactful to the company resources in many ways. These relocation projects take essential company personnel, contractors and funding away from the everyday asset integrity projects, maintenance projects, and even growth/business development projects. These mandatory relocation projects generally are projects that no one wants to do but are required due to these third-party encroachments. Since many of these mandatory relocation projects occur in highly developed urban areas, trenchless Horizontal Direction Drills (HDDs) are often the preferred option due to the benefits associated with this technology. Generally speaking, the long-term impacts and temporary workspaces are reduced due to the subsurface HDD pipeline route reducing large open cut

trenches. HDDs are known as an alternative trenchless construction method where you can easily cross under a river, wetland, or other environmentally sensitive area. Additionally, HDDs allow crossings to occur under major roadways, parking lots, parks and other urban areas where it may not be best to have hundreds or thousands of feet of open trench. This presentation highlights the disruption of these unexpected, mandatory, damage-prevention projects, and brings awareness of the need for more resources and more knowledge sharing in this unwanted and undesired area of pipeline construction.

**Title: Commissioning the Transmountain Pipeline Expansion Project - Engineering Design**

Authors/Presenters: all Transmountain

David Feser - Engineering Design  
Kelly Malinoski - Pro-active Risk Management  
Stephanie Snider - Field Execution  
Kevin Stelter - Field Team Management

A series of presentations will be made by representatives of Transmountain on the design and implementation of commissioning its significant pipeline expansion project in Western Canada. The newly expanded Trans Mountain Pipeline system (Line 2) consists of 36-inch, 42-inch, and 30-inch pipeline and facilities spanning between Edmonton, AB and Burnaby, BC. Commissioning included complete line fill, reactivation of two segments of the existing pipeline, tie ins of the new system to the existing pipeline system, and filling of the remaining new expanded system. The presentations will cover the engineering design process for such a significant commissioning project and the management and execution by Transmountain staff in the field during the project. In addition, Transmountain will share information on steps taken to proactively manage risks associated with the line commissioning, including setting up an Incident Command System (ICS) structure during the line fill with 24/7 coverage during the 52-day period of the commissioning project. All meetings held under ICS were prefaced with safety context applicable to the current operational cycle, such as fatigue management, wildlife safety, road safety, and review of the applicable Trans Mountain lifesaving rules. The implementation of ICS will be considered for future applications requiring careful planning and execution of high-risk activities.