

COMPANY RESPONSE TO NTSB INFORMATION REQUEST NO. 115

May 8, 2020

NTSB Request: Provide a summary of changes to Enbridge GTM's Asset Integrity Program and a summary of Enbridge GTM's Safety Management System

Company Response: Enbridge GTM's historic approach to asset integrity decision making has primarily been driven by qualitative assessments and by benchmarking program and procedural requirements against the top decile/quartile of our Industry peers. In early 2019, Enbridge GTM determined that approach was not yielding the performance level consistent with our expectations and risk tolerance. Several pipeline failures in 2018 and 2019 made it clear that we had opportunities to improve our performance. We clarified the expectation that we will not have any more ruptures -- with confidence, driven by facts and data. We set definitive safety targets at significantly higher level of performance than Industry average performance (within 2 years 1.0E-5, within 5 years 1.0E-6, vs 5.0E-5 10-year historic Industry average)¹. To achieve that step change in certainty regarding our safety performance, we needed make a significant shift in our mindset and approach to Asset Integrity. Rather than focusing on our peers, we modelled this shift after industries that have achieved superior performance levels (e.g., aviation, nuclear, and chemical/refining). Fundamental to this shift is that we be able to prove the integrity of our assets using a quantitative, as opposed to a qualitative, approach to risk assessments. This shift will entail a 3-5-year, iterative transformation of the organization, programs, behaviors, data and support systems as structured by our Integrated Management System (see attached for overview of our Integrated Management System design which complies with API RP 1173, Pipeline Safety Management Systems).

As a first step in early 2019, we conducted an Independent Pipeline Integrity Program Review (IPIPR) and fitness for service assessment against critical threats led by Dynamic Risk and supported by our internal subject matter experts. Based on the findings from these assessments, we designed and launched the most profound transformation of our integrity program in GTM's history. One of the guiding principles in the mindset shift and this assessment was that fitness for service would not be assumed. If the state of risk could not be proven by facts and data, the risk was assumed to be present and actions were taken to mitigate or prove the condition state. As a result, we began instituting mitigation strategies including taking pressure restrictions for the highest risks and adopting other preventive measures when not enough information was available to prove that our assets were safe. Consequently, we have significantly increased our use of inspection and testing diagnostics and are generating much more data in our efforts to increase confidence. In order to achieve our safety targets, we have expanded our integrity inspection and risk assessment capabilities on the most prominent threats across the system. And, we have increased the consistency of our assessments through a deliberate quality control review process against our safety targets. In order to support this shift, we have significantly expanded our organizational capabilities and integrity budgets to support the strongest safety targets in the industry.

One year into our integrity transformation journey, we are encouraged by the results achieved to date. We have staffed our organization to protect the time needed for critical thinking. We have increased our staff from 50 to 113 team members and added new capabilities such as reliability and geohazards engineers. We have centralized our integrity organization and redefined our responsibilities and accountabilities to create a group that is focused exclusively on integrity and risk assessment activities.

From 2018 to 2019, we prioritized inspection, testing and pressure restrictions on the segments representing the highest risk likelihood for each threat across the system as identified by the IPIPR. We increased integrity activities between 1.5 and 4 times. We went from 86 to 371 pipeline in-line inspection tool runs and subsequently increased anomaly digs from 655 to 980. To ensure the interim safety of the

¹ 1.0E-5 is equivalent to 1 incident per 100,000 miles/year; 1.0E-6 is equivalent to 1 incident per 1,000,000 miles/year; 5.0E-5 is equivalent to 5 incidents per 100,000 miles/year.

system while we were collecting the needed facts and data, we imposed an unprecedented number of pressure restrictions. We restricted pressure on 101 pipeline segments, equivalent to 3,189 miles. In addition, we restricted pressure on 45 segments with A.O. Smith pipe corresponding to 2,290 miles – representing 28% of our 19,500 system miles.

Our Integrated Management System (IMS) defines the framework and structure for our asset oversight and drives continuous improvement across the organization. The IMS defines eight protection programs (including the three asset integrity programs) as well as the eleven program elements that provide the structure for each program. In the interest of continuous improvement, during 2019 and early 2020, we completed a comprehensive overhaul of our Integrity Management Programs (IMPs). We converged multiple Pipeline IMPs from our operating companies into one consolidated Pipeline IMP that addresses the findings of the IPIPR and incorporates best practices from across Industry. We developed a new Facilities IMP, increased facility inspections and updated our Storage IMP. To facilitate consistency across the integrity programs and create more tangibility of the IMS in the day to day application of the IMS within the programs, we created a group within Asset Integrity with a dedicated focus on clarifying accountabilities, work processes and applying the program elements within the Integrity Management Programs. The new and converged IMPs will be fully implemented in the second quarter of 2020.

We have made significant improvements in our processes and the use of digital tools to conduct inspections and determine and assess operational and health and safety risks. We have improved our data acquisition and management processes leveraging artificial intelligence and machine learning technologies to support our goal of increased confidence in the integrity of our assets and more rigorous assessments.

All these accomplishments have been supported by a 300% budget increase from 2018 levels.

In conjunction with our IMS, we have established several long-range strategies to build sustainable organizational capabilities in order to achieve our strategy and goal of zero ruptures with confidence. Some of the areas in which we will iteratively focus to evolve our capabilities include:

- Foster awareness and reinforce shift in key behaviors to support applying conservatism in the absence of certainty, chronic unease and continuous improvement
- Expand Asset Long Range Plan to provide the structure and guidelines to establish integrity plans for all assets or segments which will be reviewed on an annual basis
- Improve data availability and accuracy, including incorporating automated data handling, quality control, analyses and machine learning
- Expand validation of tool capabilities, quality control of vendor assessments and deliberate efforts to advance diagnostic tool capabilities
- Improve confidence in our Risk Assessments through the expanded use of quantitative risk assessments and by expanding capabilities to perform statistical uncertainty quantification, conduct probabilistic fitness for service assessments and determine explicit integrity reliability targets
- Expand the detail of our hazard and threat matrix and achieve a more fulsome risk registry
- Expand and deepen the use of documented Safety Cases for all assets through the use of system-wide assessments and defense-in-depth to drive certainty.
- And lastly, better use of and line of sight to meaningful metrics to drive awareness and continuous improvement

GTM Integrated Management System

