Asset integrity

GRI 103-1; 103-2; 103-3; 306-3SASB EM-MD-160a.4; EM-MD-540a.1; EM-MD-540a.2; EM-MD-000.A; IF-GU-540a.1; IF-GU-540a.4; IF-GU-000.C

We continually strive to achieve and maintain industry leadership in safety and system reliability. Everything we do at Enbridge begins and ends with the understanding that we must ensure our energy infrastructure is fit for service.

Business context and our approach

As North America's largest energy infrastructure company, we operate more than 131,000 miles (200,000 km) of crude oil and natural gas pipelines across 37 U.S. states and nine Canadian provinces. We are one of North America's largest natural gas utilities, serving 3.8 million residential, commercial and industrial customers in Ontario and Quebec. Pipelines are the safest and most reliable way to transport the oil and natural gas that powers our economy and enables modern society. While infrequent, spills or releases of oil or gas are possible and have the potential to impact the safety of people, communities and the environment. That is why we actively manage the integrity of our assets and ensure the reliable and safe delivery of energy to our customers.

We believe every incident can be prevented – a mindset that drives every one of our decisions, actions and interactions. We continually strive to make our operations safer, to strengthen the system of barriers and controls that will prevent leaks and releases and to build a stronger safety culture, where every member of our team demonstrates leadership, ownership, vigilance and resilience in their pursuit of safety. Unfortunately, since 2018 we experienced incidents in our gas transmission business, one of which resulted in the death of a member of the public. These incidents reinforced the importance of diligently and effectively managing the hazards we face.

We've investigated these incidents to understand the root causes, and we're transforming our gas transmission business and our approach to integrity management across Enbridge based on the lessons we've learned. The guiding principle behind this transformation is our affirmative duty to confirm that our assets are safe and reliable before we will operate them.

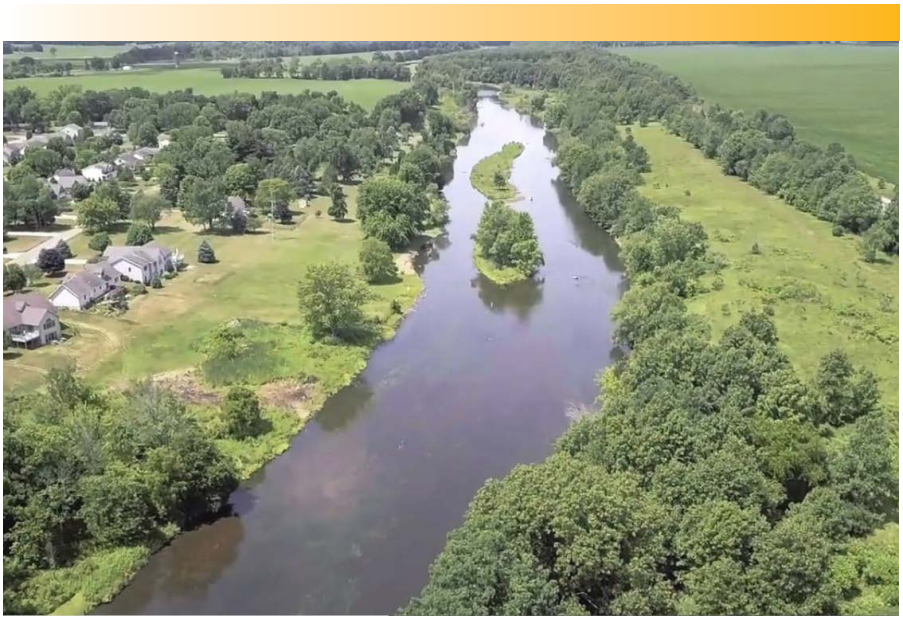
Our actions

Oversight of safety and reliability starts at the top of our organization with the Board and our ELT. Additionally, Enbridge's Safety and Reliability Team sets high standards for the organization and our auditors routinely conduct extensive assessments of our risk and integrity management programs.

We take a lifecycle view of integrity management, encompassing design and construction, monitoring, prevention and leak detection to verify continually the integrity of our pipelines and to identify and mitigate signs of degradation. New approaches to improve the safety and operational reliability of our existing assets through innovative leak detection and prevention, and investments in new, emerging technologies is a strong focus of Enbridge's asset integrity management.

Over the past three years, we've invested approximately $4 billion in the fitness of our systems.

Because every pipeline faces unique threats and stresses, Enbridge employs a wide range of risk assessment, inspection and surveillance techniques. Once threats and hazards have been identified, we select an optimal combination of controls to preserve integrity over the lifecycle of the pipeline. As inspection technology, pipeline materials and construction practices improve with time, and as we gather new data on threats and pipeline condition, our methods of maintaining fitness for service evolve.



A safer company

July 26, 2020 marked 10 years since the rupture of Line 6B near Marshall, Michigan. The incident at Marshall forever changed how Enbridge operates. The hard-earned lessons we learned from this incident have ultimately made us a safer company.

We've since put in place a wide range of measures to enhance the safety and reliability of our entire North American pipeline system. We have enhanced organizational structures, strengthened our public awareness programs and continually sharpen our emergency response capacity and expertise through frequent exercises, simulations, drills and equipment deployments.

Learn more

How we take action

Design and construction

- Carefully select pipeline routes and facility locations
- Follow strict standards for engineering and design
- Conduct extensive testing and validation before introducing new materials and technology
- Incorporate special design considerations for areas such as road, river and creek crossings
- Set rigorous standards for pipeline materials received from manufacturers and continually confirm those standards are met
- Employ professional inspectors to oversee every facet of construction; use X-ray or ultrasound technology to inspect welds for potential defects

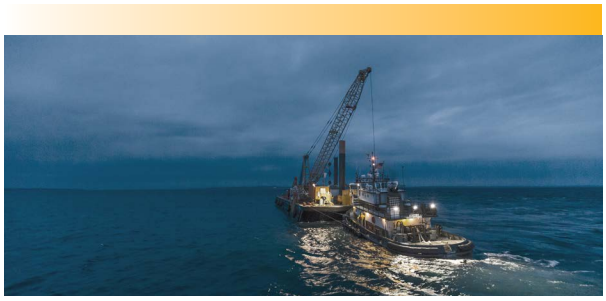
Monitoring, prevention and operations

- Once pipelines are commissioned and operating, continuously monitor them for any signs of trouble
- Conduct inline inspections to detect any signs of internal and external corrosion, cracking, strain, fatigue, dents and legacy manufacturing defects; repair any defects found
- Recognize conditions that previously caused failures and carefully analyze failures from our peers. Take a structured, systematic and methodical approach to mitigate or eliminate the risks
- Provide adequate cathodic protection for steel pipelines
- Minimize pressure cycling to limit fatigue
- Conduct regular preventative maintenance
- Monitor land use changes and ground disturbance work around pipelines
- Inform the public, public works and excavating companies about the presence of pipelines, and how to dig safely
- Locate pipelines for parties digging near or on our ROWs
- Investigate unauthorized activities on ROWs
- Devote resources – both people and automated systems – on a continuous basis to ensure control of pipelines and rapid response to abnormal situations
- Apply comprehensive, multi-layered liquids leak detection system using several independent methods
- Monitor pipelines for possible leaks and damage using multiple, redundant methods

Liquids Pipelines

In 2019, we safely transported nearly 4 billion barrels of oil, the highest volume in our 71-year history.

A key component of our Liquids Pipelines safety and reliability is our approach to integrity management that uses reliability targets and safety case assessments. Our long track record of extensive inline inspection has provided us with detailed insight and knowledge of the integrity of our assets in the liquids pipeline system. To prevent leaks and ensure we meet stringent reliability targets, we proactively assess and maintain every segment of every pipeline. Furthermore, we independently check the results of our integrity assessments to validate the effectiveness of our program and to ensure the risk remains as low as reasonably practicable throughout our integrity inspection and assessment cycle.



Safeguarding the Great Lakes

Our proactive inspection program allows us to monitor the fitness of our pipelines from both the inside and the outside to protect the Great Lakes. We monitor Line 5 around the clock, using both human and automated resources, as part of our commitment to safe operations.

Learn more

Gas Transmission and Midstream

While we had good results in many areas of safety and reliability in 2019, we experienced incidents in our GTM business which deepened our resolve to strengthen our safety performance and culture, based on our firm belief that every incident can be prevented. We've taken steps in response to these events to further enhance the safety and integrity of our systems.

Our revised approach includes performing a comprehensive fitness-for-service assessment on all our GTM natural gas pipelines across the U.S. and Canada. This massive undertaking applies best practices from across Enbridge and high-hazard industries, as well as what we learned from our incident investigations. While working aggressively to ensure we had the best information possible regarding the integrity of our assets, we implemented several self-imposed pressure restrictions across our system and will leave them in place until we can confirm our assets are safe. Pressure restrictions reduce the amount of oil and gas flowing through pipes to address safety concerns.

We performed more than 200 inline inspections on our gas transmission network in 2019, covering a distance of 10,000 miles (16,300 km) or the equivalent of 52% of the system, to verify the integrity of our pipelines. Additionally, voluntary pressure restrictions on 18% of our gas transmission system were imposed until such time fitness for service could be proven.

As part of our commitment to continually improve the safety of our system we assessed all 19,500 miles (31,400 km) of gas transmission pipeline with a cold-eyes expert review, where an outside party assesses problematic scenarios.

Prevention is a critical component of pipeline safety at Enbridge, and we focus on prevention—with vigorous monitoring, maintenance and inspection programs—before issues arise.

Gas Distribution and Storage

Enbridge's gas distribution network extends over 93,000 miles (150,000 km) and provides clean-burning natural gas for heat and power generation to over 3.8 million homes and businesses. While a small percentage of that mileage is composed of larger diameter, high pressure transmission pipelines and storage laterals, the majority of the distribution system is low pressure, small diameter services and mains which we may not be able to inspect using inline inspection tools. Maintaining the safety of the distribution network puts a greater focus on prevention and detection. To prevent deterioration, corrosion resistant materials (i.e. plastic pipe) are used extensively throughout the system. Wherever steel mains are used, we rigorously and regularly inspect them to ensure their integrity, and we also confirm sufficient and effective cathodic protection to inhibit corrosion. Enbridge is an industry leader in the removal and replacement of deterioration-susceptible materials, such as cast iron or bare steel mains.

Timely utility locates, extensive public outreach and customer communication are a keystone of Enbridge's damage prevention strategy. Enbridge was a founding member of the Ontario Locate Alliance to ensure that parties conducting excavations and underground installations could do so safely, without striking buried utilities.

Detection of leaks is similarly important to distribution integrity. In addition to adding odorant to gas in order to alert the public of

a leak or an appliance being left on, Enbridge has implemented a longstanding and extensive leak survey program. Building-to-building surveys are completed on a continuous cycle and state-of-the-art equipment allows Enbridge to reliably detect leaks from buried mains and services.

Cross bores (where a gas service line has intersected with a residential sewer pipe) are a significant concern for safety and Enbridge has adopted a novel and industry-leading position to tackle this problem. In addition to providing free sewer inspections when a residence experiences a blockage, Enbridge has developed a risk assessment tool to predict where cross bores are likely to have occurred to schedule proactive inspections and repairs.

Technology and innovation

At Enbridge, we are committed to pursuing innovation and technology solutions to achieve higher levels of safety, both in our operations and throughout the pipeline industry. Our Technology + Innovation Lab is a leading-edge, data-driven workspace based in both Calgary and Houston and tasked with enabling rapid evolution and adoption of new technologies.

The Technology + Innovation Lab melds traditional industry expertise in engineering and operations with skillsets in data science, technology and design. Read more here.

Accelerating the flow of innovation down the iPIPE

In 2019, Enbridge joined the intelligent Pipeline Integrity Program (iPIPE), an association of companies in the upstream and midstream pipeline industry. The association works with entrepreneurs in the pipeline integrity space, driving innovation and accelerating the development of leak detection and prevention technologies.

Learn more

Our performance

In 2019, Enbridge invested over $1.75 billion in programs that help us maintain the fitness of our systems and detect leaks across our operations.

As part of our integrity management programs, we investigate and repair anomalies found by in-line inspection. These integrity digs are another key element of our commitment to pipeline safety and integrity. In 2019, we completed 1,975 integrity digs and direct assessments and 4,016 inspections of bridges, slopes and watercourse crossings.

100 Percent of liquids pipeline system with real-time leak and rupture detection

11,790 Extent of annual leak detection survey on gas distribution and mains (miles)

806,056 Gas service connections leak-surveyed

456 Number of smart inline inspections of pipelines

73,804 Cathodic protection system checks

38,377[1] Pipeline inspections completed on our liquids and natural gas pipelines and distribution network

26,310 miles of inline inspection across our system

[1]The number of pipeline inspections includes direct assessments of pipeline integrity, inline inspections and follow-up digs, hydrostatic pressure tests, inspections completed on bridges, inspections completed on slopes and water courses and other inspections completed, such as storage-well integrity inspections and valve inspections.

Spills, leaks and releases

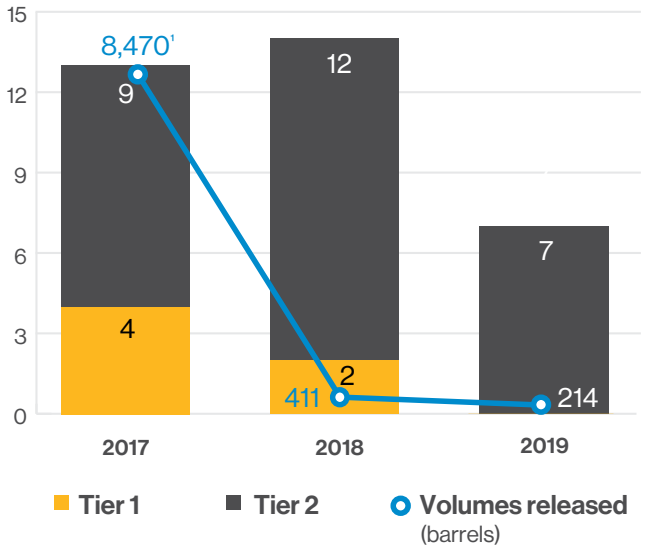
For the purpose of this Sustainability Report, we include incidents from all our businesses that are consequential and reportable to our Board:

- Tier 1 events are commodity releases with greater consequences and/or higher release volumes
- Other reportable incidents, termed Tier 2 events, are commodity releases with lesser consequences

Liquids Pipelines

Over the course of 2019, we experienced seven incidents, six of which were contained on Enbridge property. The total volume from the 2019 liquids spills was 214 barrels. All but 106 barrels were contained within plant/terminal boundaries or secondary containment. Based on volumes spilled and our gross delivery volumes, we achieved a safe delivery rate greater than 99.99999% in 2019.

Liquids/Liquids Systems process safety incidents
(number of incidents)



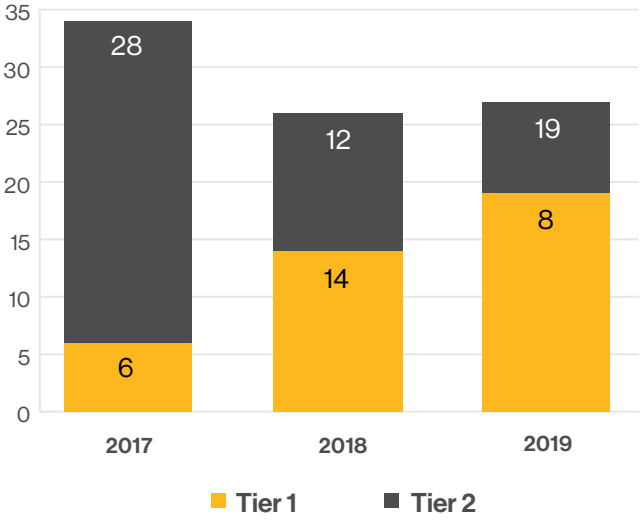
[1]2017 results were due to a third-party strike.

Process safety incident count in 2019 is based on business-specific industry criteria. For 2020, criteria is being harmonized based on a broader industry standard which will allow comparison across our businesses on a more consistent basis.

Gas Transmission and Midstream

In 2019, Enbridge transported and distributed more than 9.5 trillion cubic feet (Tcf) of natural gas through our natural gas pipelines and our natural gas distribution network. We experienced 27 reportable (Tier 1 and 2) process safety events involving the release of natural gas from pipelines, stations and other process equipment on our natural gas systems.

Natural gas process safety incidents
(number of incidents)



Process safety incident count in 2019 is based on business-specific industry criteria. For 2020, criteria is being harmonized based on a broader industry standard which will allow comparison across our businesses on a more consistent basis.

Gas Distribution and Storage

We detect a large number of small leaks on our utilities network each year due to the significant number of natural gas delivery points. In the vast majority of cases, these below ground or outside leaks are not hazardous due to the system's low delivery pressure, small line capacity and gas odorization, which serves as a warning sign of a leak.

The low-hazard nature of these small leaks means the majority fall below our reportable (Tier 2) process safety event criteria. Leaks due to third-party damage to pipeline assets make up a significant portion of these releases. To help prevent third-party damage, Enbridge has an extensive public education program for pipeline awareness and safe digging. Enbridge also supports and is a member of one-call and locate services.

Natural Gas Distribution Network	2017	2018	2019
Damages per 1,000 third-party locate requests	1.92	1.96	1.93

Read more about our safety performance in our ESG Datasheet and our 2019 Enbridge Safety Report to the Community.