LINE 3 REPLACEMENT PROJECT

Application for Certificate of Need

Minnesota Public Utilities Commission
Appendix B

Pipeline Safety Report

ENBRIDGE ENERGY, LIMITED PARTNERSHIP

MINNESOTA PUBLIC UTILITIES COMMISSION

MPUC DOCKET NO. PL-9/CN-14-916

Line 3 Replacement Project
Pipeline Safety Report

April 17, 2015

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I. Introduction

Enbridge Energy, Limited Partnership (Enbridge) prepared this Line 3 Replacement Project Pipeline Safety Report (Report) to provide the Minnesota Public Utilities Commission (MPUC) with information about Enbridge's pipeline safety programs, policies, and procedures. Safety is at the core of Enbridge's operation. We are committed to safely operating and maintaining our assets and ensuring that everyone returns home safely at the end of each and every day. Our commitment to safety means that we:

- Ensure the safety of our communities, customers, contractors, partners, employees, and the environment;
- Proactively work to identify and prevent potential safety issues;
- Respond immediately when a safety issue is identified; and
- Continually seek ways to improve safety performance.

The Enbridge Values of Integrity, Safety, and Respect establish how we conduct our affairs, individually and collectively.

Enbridge strives to meet its goal to have zero safety incidents. The decisions we make and the actions we take in pursuit of that goal are guided by several foundational principles. Specifically, we believe that:

- Management is accountable for safety performance;
- Policies and procedures must be strictly followed to minimize risk;
- All incidents can be prevented;
- All injuries and occupational illnesses can be prevented;
- All employees and contractors are responsible for safety; and
- Ongoing assessment and improvement are a must.

These principles are fundamental expectations as we strive towards 100% safety. They help create a culture in which safety is everyone's responsibility, leadership is accountable for safety performance, continuous improvement is required, hazards are controlled, and our commitment to caring extends beyond the work day.

By maintaining a constant focus on safety management, fostering a culture that values safety, learning from prior incidents, and addressing sources of potential future incidents, we enhance our ability to prevent incidents and unintentional releases that can have an impact on people, the environment, our assets, and our reputation.

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Sustaining and improving safety performance doesn't just happen. It is the outcome of thoughtful and expert planning, well-resourced and diligent implementation, active leadership and a strong commitment to systematic review focused on improvement.
Enbridge has developed a Safety Management System Framework[1] to provide all parts of our business with common guidance and structure. This Framework ensures that our efforts to deliver industry-leading safety and reliability performance are thoroughly and expertly planned, executed, monitored and continually improved upon using a shared approach.

The key to outstanding safety and reliability performance is a clear, effective and action-based management system to ensure that, as an organization, we are prepared and equipped to identify, understand and effectively manage all risks associated with our operations so that we can move toward our goal of 100 percent safety.

While each business unit has unique operations, the Enbridge Safety Management System Framework establishes the minimum standards and components to which each business unit must adhere. The Enbridge Safety Management System Framework establishes the responsibilities and accountabilities required to support sustained and continually improving safety and reliability performance for all businesses within Enbridge.

Through the Enbridge Safety Management System Framework each of our business units is expected to align, define, and document its specific programs, processes, and policies. This company-wide framework is used to capture and effectively and actively manage Enbridge's safety performance.

Information for this Report was provided by experts working in many disciplines within Enbridge, including employees of Enbridge's engineering, compliance, operations, and emergency response fields.

[1] A copy of Enbridge's Safety Management System Framework is available at:
http://www.enbridge.com/AboutEnbridge/Safety/Safety-Management-System-Framework.aspx

II. Regulatory Oversight

A. Federal Regulations

Pipeline safety, including emergency response plans, is regulated by the United States federal government. Specifically, the United States Department of Transportation, Pipeline Hazardous Material Safety Administration (PHMSA) is the regulatory body with oversight of and responsibility for developing and enforcing regulations governing pipeline design, construction, and operation as set forth in Chapter 601 of Title 49 of the United States Code, and regulations contained in 49 C.F.R. Parts 190, 194, 195, and 199.[2] Additionally, PHMSA is the federal regulator responsible for the development of regulations addressing inspections and audits of the pipeline operators assets and programs including approving pipeline emergency response plans under 49 C.F.R. Part 194. These regulations are included as Attachment A to this Report.

B. State Regulations

PHMSA has certified the Minnesota Office of Pipeline Safety (MN OPS) to conduct inspections on interstate gas and hazardous liquid pipelines within Minnesota. PHMSA's Office of Pipeline Safety enforces its federal regulations based on the inspections conducted by MN OPS.

PHMSA or MN OPS inspections or audits can occur at any time, but typically happen every two years. The scope of audits and inspections conducted by these regulators are quite broad, and can include:

- Compliance with aerial patrol requirements;
- Review of integrity dig records to determine both adequacy and accuracy;
- Inspection of Cathodic protection system;
- Review of tank inspection records;
- Review of the Integrated Contingency Plan manual;
- Review of operation and maintenance manuals;
- Review of pipeline integrity methodology;
- Review of leak detection methodology;
- Review of system maximum operating pressures;
- Review of facility integrity manuals;
- Inspections of facilities;
- Review of operation and maintenance procedures and records;

[2] 49 U.S.C. § 60104(c).

- Review of operator qualification records; and
- Examination of public awareness materials.

PHMSA and MN OPS also have authority over Enbridge in the event of an incident. If an incident occurs, the regulators investigate to determine the probable cause and work to prevent recurrence. Generally, pipeline regulations are governed by federal law and enforced by PHMSA.

In addition, Minnesota Statutes Chapter 115E, which is attached as Attachment B, requires pipeline companies to maintain prevention and response plans. State law also allows certain agencies to require a pipeline company to provide additional financial assurance, if, at the time of an incident, the State determines that the response efforts are inadequate.

III. Release Prevention, Detection, and Response

As stated above, Enbridge's goal is to have zero incidents on its pipelines. Enbridge works to achieve that goal by designing safe pipelines and operating them according to rigorous standards. Enbridge also acknowledges that releases have occurred and that Enbridge must be prepared to respond to releases that may occur in the future.

A. Release Prevention and Integrity Management

1. Pipeline Design

Enbridge's focus on release prevention begins with sound pipeline design and construction. The Project has been designed by a team of professional engineers with experience in liquid pipeline design and construction.

Enbridge uses the highest quality materials available. Each year, Enbridge purchases thousands of tons of pipe from plants in Saskatchewan, Alberta, Oregon, and Florida. At these plants, recycled metal is converted into liquid steel in electric arc furnaces, cast into large slabs, then rolled and welded to the precise wall thickness required for each pipeline to produce the high-tensile pipe needed for new projects. This exacting process ensures that the pipe can be relied upon to carry large volumes of oil at pressures required for pipeline operation. Producing the pipe requires meeting stringent requirements for quality and integrity.

A comprehensive inspection system at the mill and in the field helps Enbridge to achieve this quality and integrity by ensuring precision at every step of the process. Expert inspectors, employed by Enbridge, examine the formed pipe for possible defects at the manufacturer's facilities. Each length of pipe is visually inspected, every weld is examined with ultrasound or x-rays, and each pipe section is pressure-tested before a final epoxy coating is baked into the surface under the close scrutiny of Enbridge's inspectors. The inspectors' specific duties include monitoring ultrasonic or x-ray tests that examine the integrity of each weld and using calipers and micrometers to assess each section for exact tolerances on diameter, roundness, and straightness. The state of the art fusion-bond epoxy coating enhances the integrity of the pipe over previous coatings by decreasing the chance of disbondment and assisting with cathodic protection.

The 36-inch pipe used to construct the Project will have a wall thickness of 0.515 inches for a majority of the route, with wall thicknesses of .600 to .750 inches where the Project crosses roads, railroads, and waterbodies. The pipe will be manufactured according to American Petroleum Institute Specification 5L PS2. The pipe will be grade X-70 steel with minimum yield strength of 70,000 pounds per square inch (psi). The pipe will be submerged arc welded.

Enbridge uses a design factor of 0.72 for the Project, as required by 49 C.F.R. § 195.106. Enbridge has designed the Project so that the wall thickness and yield strength for all of the Project's pipe exceeds the federal requirement.[3]

2. Pipeline Construction

Pipeline construction techniques also help ensure safe operation. Enbridge utilizes rigorous construction standards, specifications, and procedures to ensure proper construction, integrity, and operational reliability.

During construction, every weld is visually inspected by qualified Enbridge inspection staff. Enbridge also hires professional non-destructive inspection firms which perform x-ray or ultrasonic inspections on 100% of field welds which, as discussed above, is more stringent than federal regulatory requirements. Each weld is covered with an epoxy coating compatible with the rest of the pipeline, ensuring consistent quality and integrity in the protective coating.

The Project is installed in accordance with the United States Department of Transportation regulations, which require a minimum depth of cover of 18 to 48 inches. For the Project, Enbridge will ensure that the depth of cover meets the federal requirements of 30 inches, however, the target depth of cover from the top of the pipeline will be 48 inches. The minimum depth of cover under roads, ditches, and agricultural lands where a depth of cover waiver has not been granted by the landowners will be 54 inches.

Once the pipe is lowered into the excavated ditch and backfilled with appropriate material, the new pipeline is pressure-tested with water to ensure integrity and to verify the MOP, which will be up to 1440 pounds per square inch gauge (psig). The Project will be hydrostatically tested in accordance with both Enbridge standards and 49 C.F.R. § 195.304, with a test pressure of at least 125% of the MOP for at least four continuous hours and, in the case of a pipeline that is not visually inspected for leakage during the test, it will be inspected for a minimum of another four continuous hours at a test pressure of at least 110% of MOP.

Following the hydrostatic testing process, each tested section is inspected with an in-line inspection tool which ensures that no dents, buckles, or geometric non-conformities are present and provides a baseline for future inspections. A cathodic protection system is then installed on

[3] Part 195 requires that the maximum operating pressure (MOP) at which the Project can operate is 72% of the rated yield strength of the pipe used for the Project.

the pipeline. A cathodic protection system involves applying a small electric current to the pipeline and inducing corrosion of a remote, sacrificial anode while inhibiting corrosion on the steel.

3. Valve Placement

Valves are designed to isolate sections of the pipeline for maintenance purposes or in the event of a release. Valves are also required to be installed per federal pipeline safety regulations (49 C.F.R. Part 195). The valves are remotely controlled by the Control Center to limit the extent of a release. Enbridge conducted an Intelligent Valve Placement (IVP) analysis for the Preferred Route, which ensures that Enbridge complies with federal law and places valves in the optimal locations. PHMSA has reviewed the IVP protocol.

In accordance with federal law, valves must be placed:

(a) On the suction end and the discharge end of a pump station in a manner that permits isolation of the pump station equipment in the event of an emergency.

(b) On each line entering or leaving a breakout storage tank area in a manner that permits isolation of the tank area from other facilities.

(c) On each mainline at locations along the pipeline system that will minimize damage or pollution from accidental hazardous liquid discharge, as appropriate for the terrain in open country, for offshore areas, or for populated areas.

(d) On each lateral takeoff from a trunk line in a manner that permits shutting off the lateral without interrupting the flow in the trunk line.

(e) On each side of a water crossing that is more than 100 feet (30 meters) wide from high-water mark to high-water mark unless the PHMSA Administrator finds in a particular case that valves are not justified.

(f) On each side of a reservoir holding water for human consumption.

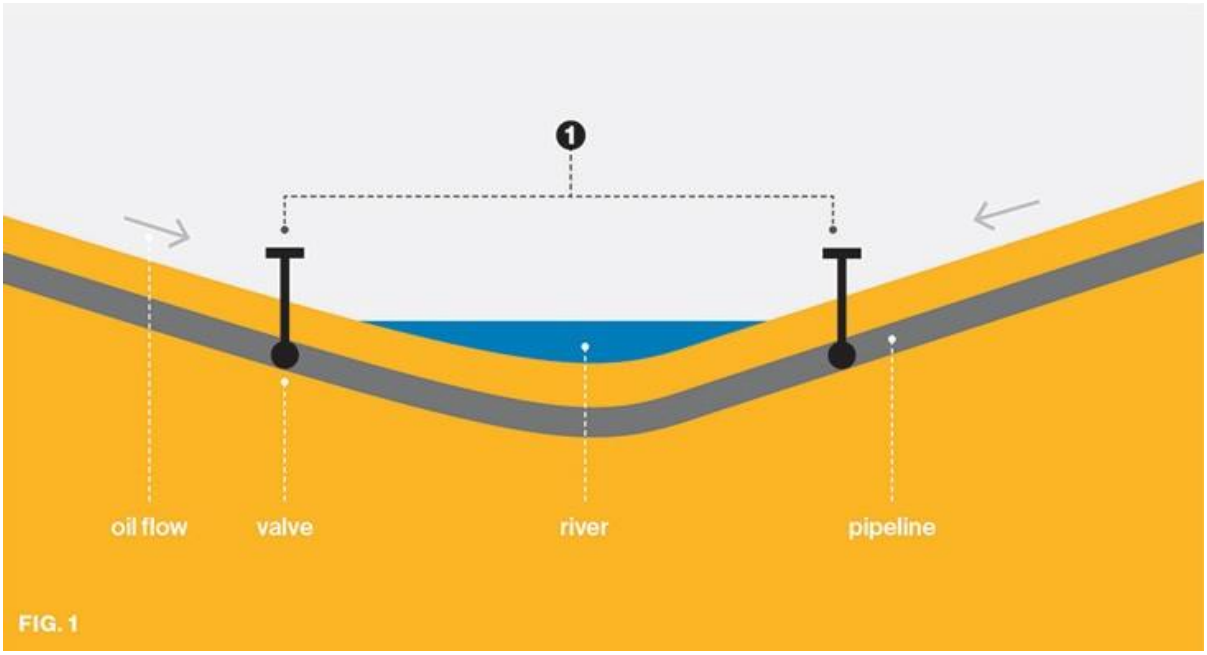
The IVP methodology, which is a key element of Enbridge's broader risk management program, combines rigorous consequence assessment, competent engineering judgment, and sound engineering practices to determine optimal valve locations. The objective of the IVP methodology, and our guiding principle, is to reduce the potential release volume in the unlikely event of a pipeline release.

Enbridge's IVP methodology is designed to ensure valves are placed at the right location to reduce potential release volumes along a pipeline corridor. Enbridge's IVP analysis takes a rigorous approach to valve placement that considers and protects water crossings, as well as other High Consequence Areas (HCAs), from potential impacts.

The following illustrations demonstrate common principles in valve placement.

Figure 1: Double Sided Valley

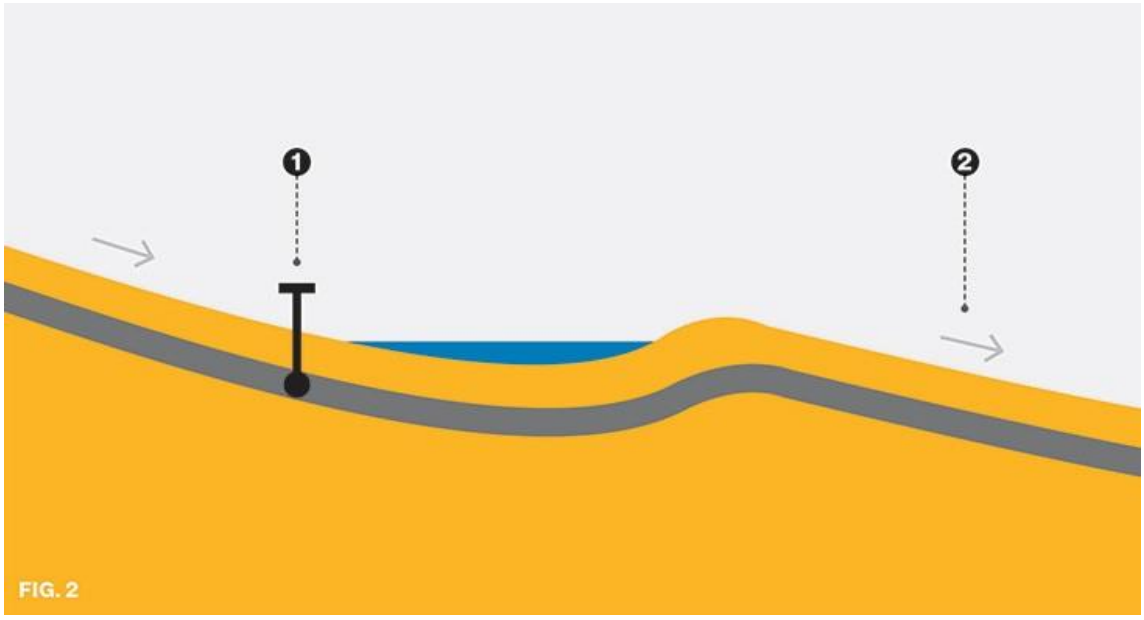
Two Valves Installed



Oil flows downhill in a pipeline after the system is shut down. In a valley scenario as depicted in Figure 1, Enbridge installs an isolation valve on each side of the water body (point 1 on Figure 1). The specific valve locations (including distance from the water body) are optimized through the IVP methodology.

Figure 2: Single Sided Valley

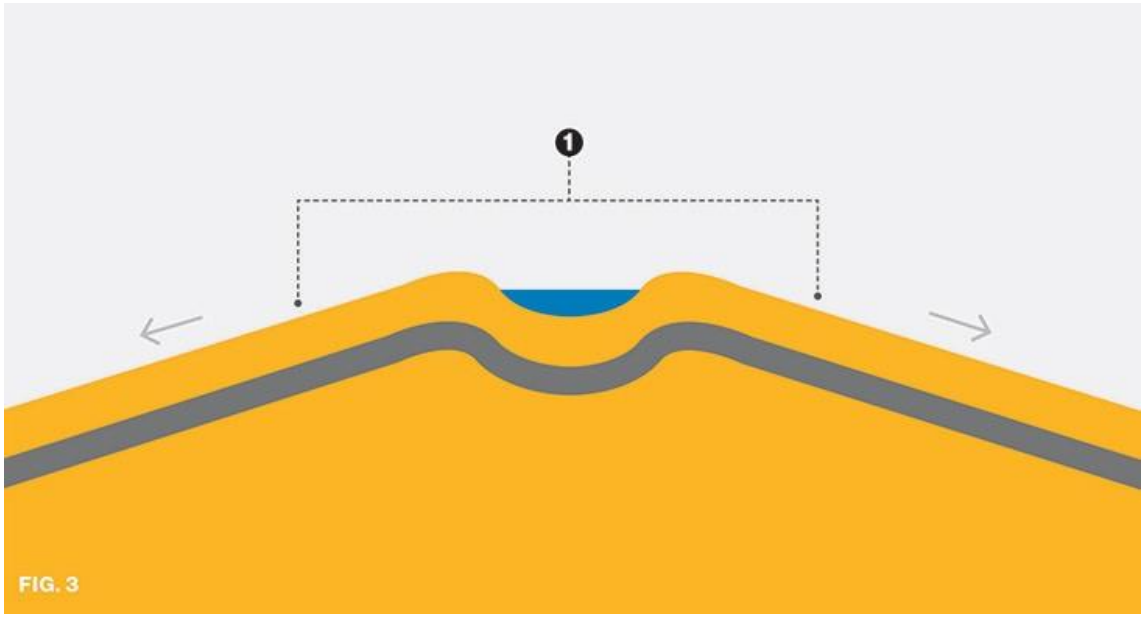
One Valve Installed



In the scenario depicted in Figure 2, an isolation valve is placed on the left side of the body of water (point 1). However, on the right side of the body of water (point 2), oil would drain downhill away from the body of water, and a valve would provide no isolation benefit. A valve would be more optimally placed downstream, closer to any water bodies or HCAs.

Figure 3: No Valleys

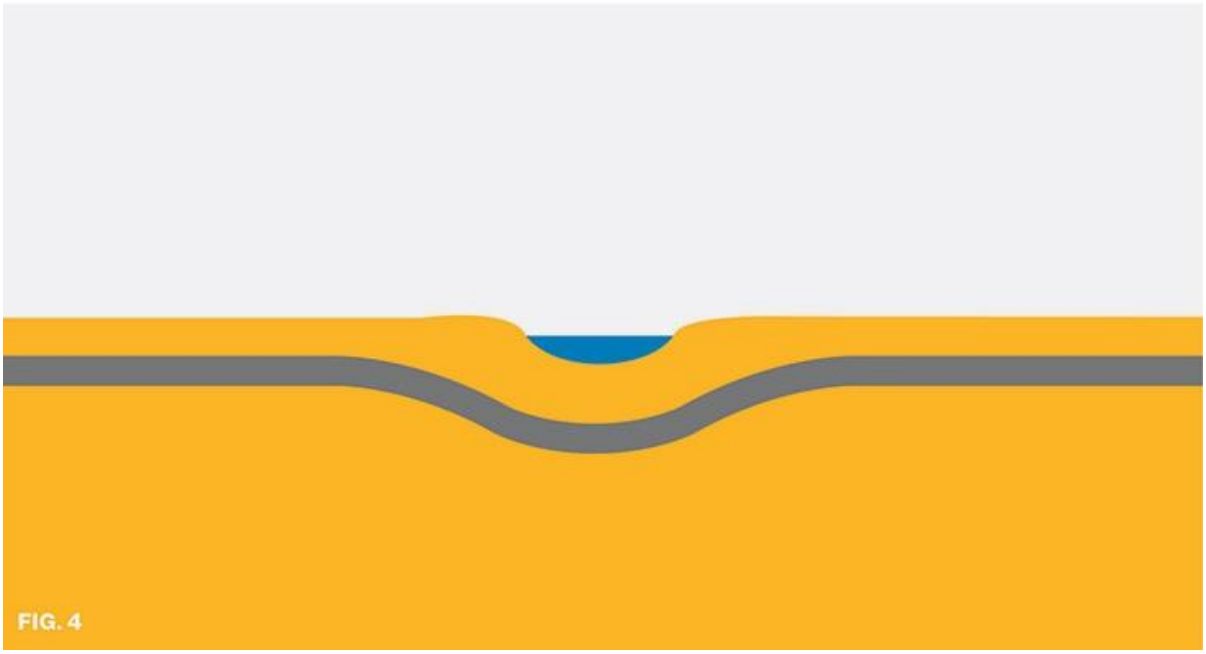
Liquid Remains in Place Naturally



In some cases as depicted in Figure 3, bodies of water are at high points along the line. In the event of a release, these areas would act as natural isolation points due to gravity; oil would not be able to flow uphill into the body of water therefore no isolation valves are employed (point 1).

Figure 4: Flat Landscape

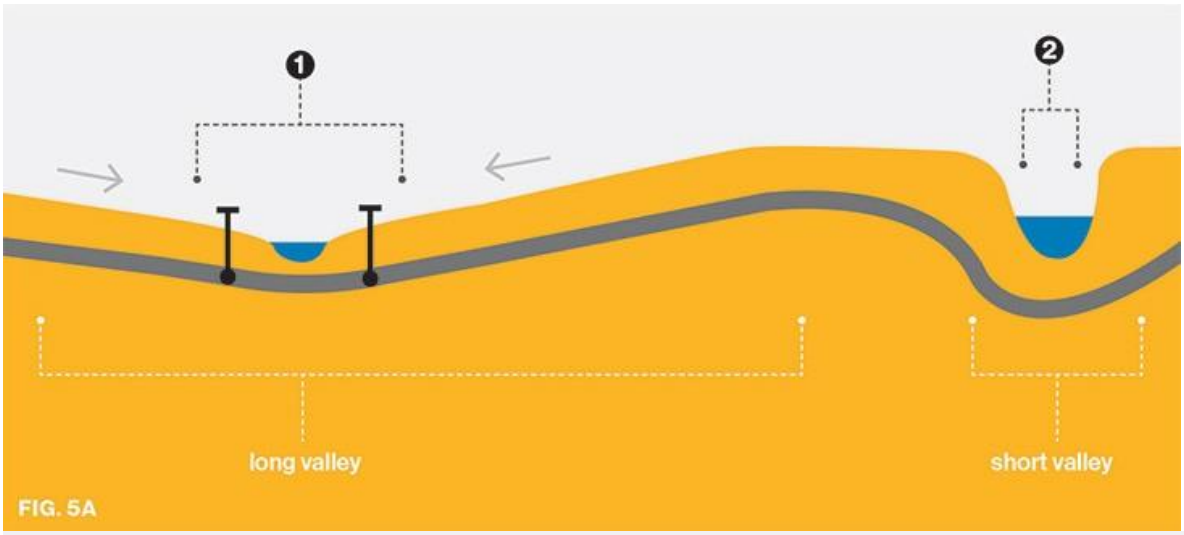
Liquid Remains in Place Naturally

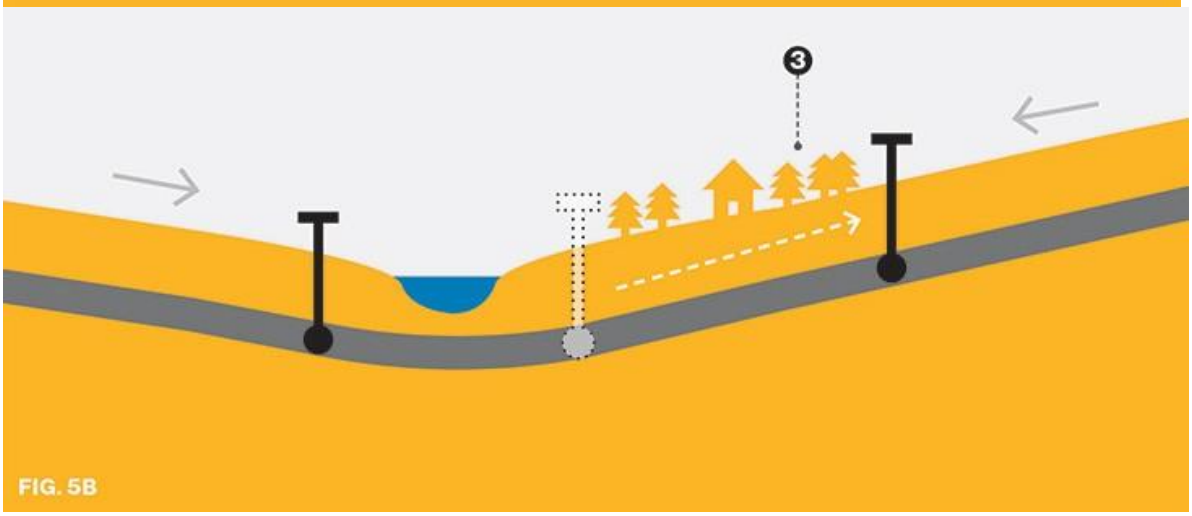


Pipeline terrain tends to be flat by design as depicted in Figure 4. In the event of a release, oil would stop flowing within the line and remain confined to the immediate area of the release. Valves provide no additional isolation benefit.

Figures 5A and 5B: Long Valley vs. Short Valley

Ideal Placement



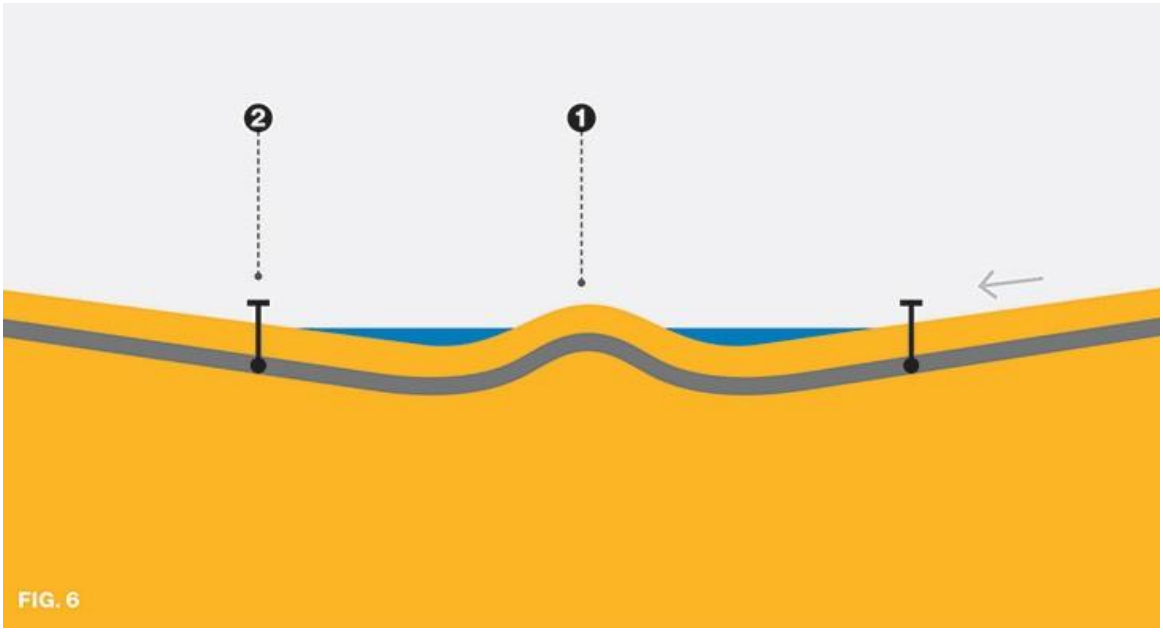


In the event of a release near a body of water at low elevation, longer valleys mean larger potential release volume. In this case (Figure 5A), isolation valves on either side of the water crossing, in close proximity to the crossing, would be optimal (point 1). Conversely, in a short, steep valley, valves often cannot be installed close to the body of water, due to the steep slope of the bank as well as the possibility of flooding; and in the event of a release, valves would only help limit oil drain along the short length of the bank, and provide little isolation benefit (point 2).

In some cases (Figure 5B), isolation valves are not directly adjacent to the banks of major water crossings. Instead, they are intentionally placed to protect not only major water crossings but also HCAs such as additional watercourses, water intakes, urban infrastructure, and ecologically sensitive areas (point 3) – and exceed regulatory requirements in doing so.

Figure 6: Long Valley - Multiple Crossings

Ideal Placement



For a long valley with multiple water crossings as depicted in Figure 6, the land between the crossings acts as a high point, providing natural isolation from crossing to crossing (point 1). Optimal valve location is near the bottom of the long, sloping valley (point 2); this placement, in effect, allows one valve to protect more than one water crossing.

In addition to complying with all PHMSA regulations, the IVP also considers:

- The elevation profile of the proposed route;
- Locations that will reduce the potential consequence of a release;
- Construction limitations;
- Pump station locations;
- Floodplains;
- Presence of potential HCAs as defined by PHMSA;
- Proximity to densely populated areas;
- Accessibility;
- Operational considerations; and
- Future pipeline expansion potential.

Enbridge's primary consideration when determining valve locations is to reduce the potential flow of oil from higher elevations to lower elevations, particularly those close to waterbody crossings and HCAs. Among other factors, the IVP methodology recognizes that high points of topography provide effective natural isolation of product between valves. Enbridge uses a multi-step process to determine the optimal locations for mainline valves.

Enbridge first identifies the elevation profile and all waterbodies and HCAs along the centerline of the proposed route. Enbridge enters this information into a computer model. The model uses the centerline elevations to calculate the amount of oil that could be released at any point along the route. The model identifies where valves could be placed at various locations to reduce potential release volumes in major waterbodies and HCAs. The model continues to be run with various iterations of valve locations until optimized for reduction of potential oil released and the number of valves. Based on this optimized model, Enbridge develops an initial list of valve locations for further engineering review. Once the engineering review is complete, Enbridge field-verifies the potential list of valve locations to determine if any on-site constraints exist that would prevent installation of a valve at that location. Once the field verification is complete, Enbridge finalizes its list and seeks landowner agreement to place the valves at the identified locations. If any valves are moved during the review process due to on-site issues or landowner concerns, the model is rerun to verify that the new locations are effective.

Enbridge places a valve on either side of a water crossing that is more than 100 feet (30 meters) wide as required by federal regulations, see 49 C.F.R. § 195.260(e). However, valves may not be placed directly adjacent to the water crossing in order to protect tributaries to the crossing as well as the crossing itself. There are instances where moving the valves further away from the water crossing provides additional protection to the waterbody since the valve then protects the entire basin, watershed, or tributary.

The valves prescribed through the application of the IVP methodology are remotely controllable. Remote-controlled valves can be closed quickly in the event of an incident, significantly reducing the potential volume of crude that can be released. All valves, however, are also physically accessible by roads so that they can be maintained and operated manually if necessary.

The IVP model is conservative and is based on a worst-case full-bore release. That is, the model assumes a complete rupture of the line occurring precisely at the lowest elevation between isolation points while the line is operating at full capacity until the valves are closed. The model assumes it takes a full 10 minutes for a Control Center operator to detect the rupture and initiate the shut-down of the pipeline prior to initiating valve closure. This assumption is conservative in that Enbridge's leak detection systems and Control Center monitoring process are capable of detecting such a full-bore rupture almost instantaneously. By design, valve closure takes three minutes from initiation. Therefore, using the full 10 minutes for initiating shut-down would result in much larger modeled volumes released than would be expected under normal operating conditions.

Enbridge estimates the potential volume of product released before valves are closed based upon these conservative assumptions. The IVP methodology then considers additional valve placements targeted at minimizing the remaining release of product after the valves have closed. The process examines the pipeline segment-by-segment on an iterative basis.

This conservative approach to risk management and valve placement is designed to ensure Enbridge meets regulatory standards.

There are operational limits on the number of valves that can be effectively placed on a pipeline. First, valves must be located where they will be of benefit, as determined by the IVP analysis. Second, the valves must be located in compliance with federal law. Finally, the valves must be placed in accessible areas where they can be supplied with power and communications equipment to allow Enbridge to remotely control the valve.

The valves are sophisticated pieces of equipment designed to isolate sections of the pipeline in the event of a release or for maintenance purposes. Each valve site will include a slab gate valve that can be controlled locally as well as remotely from the Control Center. Valve sites are also used to monitor the operation of the Project. Each valve site includes digital pressure and temperature monitoring devices that provide real-time pressure and temperature information to the Control Center.

4. Integrity Management Program

Enbridge's integrity management program is a key component of Enbridge's release prevention efforts. Enbridge's integrity management program requires the collection of pipeline integrity data through the use of highly sensitive tools that travel through and scan the internal and external conditions of the pipeline. This data is analyzed to identify integrity risks to the pipeline such as corrosion or cracking. The analysis is then reviewed to develop a plan for safely maintaining the pipeline with the objective of restoring the pipeline to its historical capability.

The sections that follow address components of Enbridge's integrity management program. Additional information regarding Enbridge's integrity management program is provided in Section 3.0 of the Project's Certificate of Need Application.

(a) Inspections.

Pipeline inspections, internal and external, are a key method by which Enbridge assesses the integrity of its pipelines. Enbridge relies on sophisticated internal inspection instruments, referred to as "smart pigs" or in-line inspection tools (ILI), to identify areas of corrosion, cracks, and deformations (dents) that exist in a pipeline. Any anomalies that are discovered by the tools that meet specific criteria are identified for further inspection and are excavated, inspected, and repaired, as necessary.

For example, in the detection of corrosion, there are two types of sensor technologies - magnetic flux leakage and ultrasonic transducers- which provide a highly detailed profile of corrosion on external and internal surfaces. Figure 7 shows a Baker Hughes Vectra tool which uses magnetic flux leakage for corrosion detection. The tool is commonly used throughout the industry with a great deal of success in identifying integrity anomalies.

Figure 7– In-Line Inspection: Baker Hughes Vectra tool

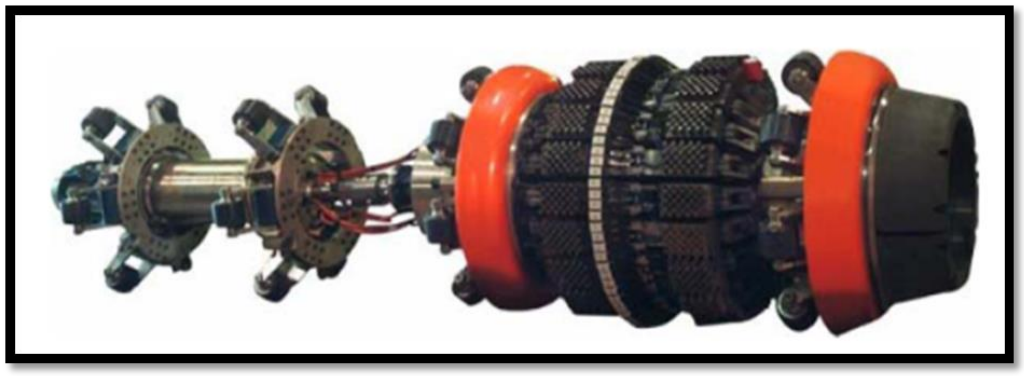


Figure 8 below depicts an ultrasonic crack detection ILI tool: the General Electric Phased Array Tool. The tool provides the highest resolution detection and characterization to identify cracking in welds and the pipe body.

Figure 8 – In-Line Inspection: General Electric Phased Array Tool

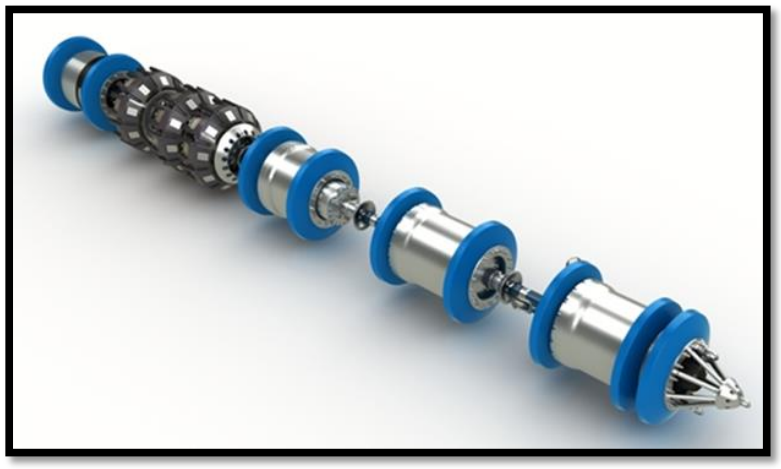


Figure 9 below depicts a tool that is used to detect and characterize pipeline deformations.

Figure 9 – In-Line Inspection: Deformation & Strain Detection ILI Tool

These tools are commonly used throughout the industry with a great deal of success in identifying integrity anomalies. Together these extremely sensitive toll sensors work to inspect the pipeline using calipers (to measure geometry), gyroscopes (to gauge pipe movement), GPS (for precise pipe position), and ultrasonic or magnetic flux (to measure associated gouge, corrosion, and cracking) to measure the size, frequency and location of minute changes on both the inside and the outside of pipe walls. The ILI tools Enbridge uses to inspect its pipelines are extremely sensitive and measure the size, frequency, and location of minute changes on both the inside and the outside of pipe walls, providing a level of detail similar to that provided by an MRI, ultrasound, or x-ray screening in the medical industry.

Once gathered, the data from each ILI run is analyzed by internal Enbridge and external engineering and integrity experts to align current and prior ILI data such as anomaly density and severity with pipe characteristics, relative location of anomalies, environmental conditions, coating materials, and operating history.

Data analysis requires significant expertise by engineers and integrity specialists to review the millions of pieces of data collected through the tool runs. Once the data is collected and analyzed, Enbridge then reviews the analysis to develop an integrity management plan to address the anomalies that have been identified. This maintenance plan addresses both the work required to be undertaken and predicts the amount and type of work required into the future.

PHMSA's regulations require Enbridge to continually assess the integrity of its pipelines at five-year intervals, not to exceed 68 months. While that is the minimum, inspections are typically more frequent due to the wide variety of ILI tools employed by Enbridge. In fact, Enbridge has conducted in-line inspections of 99% of its liquid pipelines since 2010. Enbridge also assesses certain features via a risk-based approach, which may require additional tool runs. Federal safety regulations also require Enbridge to perform a baseline assessment of the Project prior to placing it into operation.

Enbridge also inspects its facilities, such as pump stations and terminals, through targeted tankage, equipment and piping inspections. A team of subject-matter experts in Engineering, Operations, and Integrity guides a release detection program for all facilities throughout the liquids pipeline system.

Visual inspections are also very important. Enbridge patrols all pipeline right-of-way by air at least 26 times per year (not to exceed a three-week interval). These inspections review conditions on or adjacent to the right-of-way. Aerial inspections are made on a weekly basis, weather and other factors permitting. Line walking inspections are used, as necessary, to supplement aerial inspections in congested areas.

Enbridge also checks operation of isolating valves at least twice per year, and regularly reviews the equipment used to limit, regulate, control, or relieve pipeline pressure.

(b) Corrosion Protection.

Enbridge's pipelines have cathodic protection systems to prevent corrosion of the pipes. The cathodic protection system operates by applying a low-voltage electrical current to the pipelines, which inhibits corrosion. The cathodic protection system is subject to regular maintenance and inspection. It is also continuously monitored. Enbridge takes actual readings each calendar year (not to exceed a 15-month interval) by taking pipe/structure to soil readings where possible. Enbridge also inspects the rectifiers and anode groundbeds used in the cathodic protection system, conducting repairs as necessary.

Enbridge evaluates the susceptibility of its pipelines to internal corrosion by integrating and evaluating data on pipeline characteristics, in-line inspection results, operating conditions, pipeline cleanliness, crude sampling, and historical leak data.

(c) Prevention & Mitigation of Pipeline Exposure.

Enbridge reviews the depth of cover over all pipelines on a periodic basis. Enbridge's ongoing integrity management program includes an evaluation of pipelines that have become exposed over time. Enbridge maintains its existing assets in accordance with federal and state law, and all new pipelines are installed according to those requirements.

The current design and construction practices for new pipelines limit the likelihood of pipeline exposure due to natural events because of the depth of cover between the top of the pipe and the ground surface. Enbridge has the ability to complete horizontal directional drilling (HDD) of waterbody crossings where conditions permit. This method results in the pipeline being installed far below river bed elevation and the drill entry point is also located well away from the river banks. This installation method reduces the risk of the pipeline being exposed or damaged due to a rain event.

Enbridge's integrity management programs also include a Geohazard Management Program, which monitors for extreme weather events and for potential line exposures at flowing water

crossings. All river crossings have been reviewed as a baseline for the potential of exposed and shallow pipe, unstable banks, and steep slopes. Based on this review, Enbridge developed flood monitoring criteria for each crossing that describes events triggering inspection (e.g., a 5-year rain event and a 25-year rain event) with the potential for several inspections based on water levels. When an inspection is triggered by an event, the regional engineering group is notified and they deploy a local pipeline maintenance crew to make visual inspection of the crossing. If the inspection finds damage, it is examined and repair work is completed as needed on a site-by-site basis. In the unlikely event that a pipeline exposure does occur, it does not operationally increase the risk of a release. Nonetheless, Enbridge will take action to reduce exposure as necessary.

(d) Prevention of Third Party Damage.

Because third-party damage is a leading cause of pipeline releases, Enbridge strives to prevent any dents, scrapes, and other damage to its pipes and facilities during construction and operation or by third parties. Enbridge has a comprehensive public awareness program in place to engage landowners, community members and first responders to ensure they are aware of our pipelines and related facilities. The program focuses on identifying the presence of the pipeline by installing markers above ground and how to prevent damage to the pipeline from excavating equipment. Enbridge supports and is a member of the Gopher State One-Call System.

(e) Replacement.

Enbridge continually evaluates the condition of its pipelines by taking full advantage of the state-of-the-art inspection technologies discussed above. These technologies, along with the expert analysis conducted of the integrity data gathered, inform Enbridge of pipeline maintenance needs and enable Enbridge to adjust each pipeline's integrity management plan, as necessary.

A strong dig and repair program is Enbridge's most successful maintenance tool to ensure the safe and reliable operation of its system. Where it is required, other mitigation actions are employed, such as restricting operating pressures or pipe replacement.

Short term pressure restrictions are implemented as temporary measures to ensure safe operation until a dig and repair program can be completed. Longer term pressure restrictions are considered when the dig and repair program becomes impractical. Pressure restrictions can cause significant operational challenges and typically limit capacity making them less than optimal.

Replacement is considered if the number of digs scheduled are, among other things, overly burdensome to the landowners, economically infeasible, or impracticable. Pipe replacement is neither an easy decision nor a last resort. Instead, it is a calculated decision that takes into consideration the costs and benefits to both landowners and customers given the circumstances of the specific pipeline.

B. Release Detection

Release detection is accomplished through pipeline monitoring and inspections. The Project will be monitored 24 hours a day, seven days a week, and 365 days a year by the Control Center. The state-of-the-art Control Center was constructed in 2011 and incorporates extensive design elements that support the effective execution of the Control Center's responsibilities by personnel directly responsible for the 24/7 operation of the Enbridge system, including controllers, senior technical advisors, and shift supervisors. The Control Center also houses management, training, and technical services staff who are responsible for implementing the processes and systems that support the day-to-day activities of the Control Center personnel. The systems operated by the Control Center incorporate approximately 15,380 miles of pipe segregated into 28 distinct pipeline assets, 16 of which are located in the United States. Enbridge also maintains a fully functional back-up Control Center in the Edmonton area that can assume full control of the Enbridge system in the unlikely event the primary Control Center is unable to function properly.

1. Monitoring Systems

The Control Center employs multiple redundant systems that have been designed and optimized to prevent the release of hydrocarbons and mitigate the magnitude of a release in the unlikely event of a pipeline failure. The following methods are used by the Control Center to monitor and assess whether a release may have occurred:

(a) Computational Pipeline Monitoring (CPM).

The Project will be protected by a computer-based pipeline monitoring system that utilizes measurements and pipeline data to detect operational anomalies that indicate possible leaks. This system employs a sophisticated computer model that applies a sequential probability ratio test to the corrected flow balance system. This system continuously calculates the statistical probability of a release based on fluid flow and pressure measured at the inlets and outlets of a pipeline. The expected pressures and liquid flow rate in each section of the pipeline are compared to the actual measured pressures and flow rate. Discrepancies between the expected and actual values result in a leak alarm that precipitates shutdown.

(b) Supervisory Control and Data Acquisition (SCADA).

The Project will be remotely controlled and monitored using a SCADA system. The system is designed to remotely control the line, detect anomalies, issue controller alarms, and initiate a station shutdown or line stop when allowable operating limits are exceeded or logical arguments fail.
Examples of SCADA controller alarms include:

- Explosive vapor alarms;
- Pump seal failure alarms;
- Equipment vibration alarms; and
- Station fire alarms.

Examples of SCADA initiated station shutdown or stop line commands include:

- High pressure limits;
- Low pressure limits; and
- Unintentional valve closures.

(c) Line Balance Calculations.

The Controllers will employ line balance calculations that compare the volume of oil injected into the pipeline with the volume of oil delivered from the line to identify unexpected losses of oil that would indicate a leak. Line balance calculations are performed every two hours using both two hour and 24 hour balance intervals. Enbridge also maintains a rolling 24 hour calculation based on the calculations done at the prescribed set times. These calculations identify unexpected losses of pipeline inventory during pipeline operation. Negative line balances that exceed the detection thresholds may indicate a release and result in the line being shut down.

(d) Controller Monitoring.

The Project will be monitored 24/7 by specially trained and qualified Enbridge employees located in the Control Center. Controllers are trained to monitor the operating parameters of the line and react to operational anomalies, CPM alarms, discrepancies in line balance calculations, SCADA alarms, SCADA station shutdown commands, and SCADA stop line commands.

Controllers continuously monitor SCADA data to identify the pipeline leak triggers. Pipeline leak triggers from the upstream side of a suspected leak site include:

- Sudden drop in upstream discharge pressure;
- Sudden change in upstream control valve throttling or pump speed;

- Upstream unit(s) shut down (or lock out) in combination with a sudden drop in upstream discharge pressure and/or a sudden change in upstream control valve throttling (or a sudden change in percentage Variable Frequency Drive (VFD) control); and
- Sudden increase in upstream flow rate.

Pipeline leak triggers from the downstream side of a suspected leak site include:

- Sudden drop in downstream suction pressure;
- Sudden change in downstream control valve throttling or pump speed;
- Downstream unit(s) shut down (or lock out) in combination with a sudden drop in downstream suction pressure and/or a sudden change in downstream control valve throttling (or a sudden change in percentage VFD control);
- Sudden drop in holding pressure at a delivery location; and
- Sudden decrease in downstream flow rate.

Controllers also consider alarms from the CPM system and line imbalances that exceed the line balance thresholds from the line balance calculations as independent leak triggers.

The Control Center actively monitors all pipeline and terminal systems, including systems that are operating and systems that are shut down. The Control Center monitors all field work and maintenance activities taking place on Enbridge assets. It has processes in place to ensure that these activities are considered and that alternate monitoring strategies are developed when required. In addition to monitoring and controlling the pipeline systems, the Control Center monitors the incoming and outgoing terminal flows and individual tank levels. The Control Center also performs volume balance checks on the Project while also monitoring gas alarms and fire alarms.

2. Enbridge Inspections

Enbridge performs visual inspections of all pipeline rights-of-way. These inspections allow Enbridge to identify potential safety issues caused by activity on or near the right-of-way, while also allowing a visual inspection of the entire right-of-way for potential releases. Line-walking is also used, as necessary.

3. Third Party Reports

Enbridge operates an emergency telephone line whereby members of the public and public officials can notify Enbridge of any issues related to its pipelines. The emergency phone number is communicated to emergency officials and the public as part of a continuing public awareness program. The number is also advertised on the www.enbridge.com website and on Enbridge right-of-way signage. The Control Center continuously monitors the Enbridge emergency telephone line for reports of oil on the ground or reports of odor provided by third

parties. Reports of oil within the vicinity of a pipeline will result in an immediate line shut down.

4. High Consequence Areas

HCAs are defined by federal law and include the following four areas:[4]

- High Population Area;
- Other Populated Area;
- An Unusually Sensitive Area (a drinking water or ecological resource area); and,
- A Commercially Navigable Waterway.

Enbridge has expanded this list by subdividing the "Unusually Sensitive Area" definition in two types of sensitive areas to create the following five HCA areas:

- High Population Area;
- Other Populated Area;
- Drinking Water Resource;
- Environmentally Sensitive Area; and,
- A Commercially Navigable Waterway.

Federal law requires specific inspection and safety measures in HCAs. Enbridge follows the applicable federal regulations regarding identification and protection of HCAs. Enbridge reviews and updates its list of HCAs included in the ICP on an annual basis.

IV. Emergency Response

As the operator of vital energy infrastructure across North American, including renewable power generation, power transmission, gas transmission, gas transportation and distribution, and the world's largest and most complex petroleum pipeline network, Enbridge knows the public has entrusted it with the responsibility to deliver energy safely and reliably. That responsibility includes preventing an incident and having a comprehensive Emergency Response Plan in the event that an incident occurs to minimize any impact to people or the environment.

[4] 49 C.F.R. § 195.450.

A. Emergency Response Plans

1. Integrated Contingency Plan

Enbridge's emergency response plan, referred to as the Integrated Contingency Plan (ICP), was approved by PHMSA on July 11, 2013 and was formally put into place on August 30, 2013. PHMSA's letter approving the ICP is included in Attachment C. Enbridge's current ICP serves as the emergency response plan for all Enbridge U.S. Liquids Pipelines until November 2019.

The ICP was developed in consultation with PHMSA and was the first industry plan to undergo an extensive, multi-agency peer review process. Agencies that participated in the review of the Enbridge ICP included, but were not limited to, the United States Environmental Protection Agency (EPA), the United States Coast Guard (USCG), the Occupational Safety and Health Administration (OSHA) and PHMSA. The Enbridge ICP follows the format of a document prepared by the National Response Team (NRT), which provides technical assistance, resources and coordination on preparedness, planning, response and recovery activities for emergencies involving hazardous substances That document, known as the ICP Guidance, was developed by the EPA, USCG, OSHA, PHMSA and the Minerals Management Service in the Department of the Interior (DOI) to provide a sample contingency plan outline that addresses the requirements of various federal regulations. The ICP Guidance format is the federally-preferred method of response planning, and plans prepared in accordance with the ICP Guidance are viewed favorably by the NRT and reviewing federal agencies. Using the ICP Guidance document allowed Enbridge to create a single plan that serves as the primary emergency response tool.

The ICP consists of two parts. Part 1 is the Core Plan that serves as the overall response tool. Part 2 is a series of annexes based on the geographical Response Zone (or Region), which provides detailed supporting information and regulatory compliance documentation for each of the four Enbridge Response Regions in the United States (North Dakota, Superior, Chicago and Cushing). The Project will be within the Superior Region.

The ICP utilizes the Incident Command System (ICS), which is a system used by both public and private sector emergency responders to coordinate objectives and actions when responding to an incident. ICS is a management system that uses a Unified Command structure to set objectives for a response to any type of incident. A Unified Command is established when representatives from Enbridge, federal agencies, state agencies, and local agencies form a single chain of command to issue instructions relating to the response. Each leader is responsible for a limited number of workers, which increases safety and makes response management easier. Resources from the company and response agencies are also coordinated for maximum efficiency and effectiveness. All activities are documented in an Incident Action Plan, which is a written document created for each phase of the response.

The ICP is used by Enbridge responders to manage an emergency anywhere within Enbridge's United States system. Those responders include the Regional Incident Management Teams (IMTs), which are groups of Enbridge employees located in each region with training in the ICS,

and the Spill Management Teams (SMTs), which are groups of Enbridge employees in each region with specialized training in containment and recovery operations.

The ICP's primary purpose is to ensure an effective, safe and comprehensive response to all types of incidents, regardless of what the incident is, where the incident occurs, or what type of resource may be impacted. The two primary goals of any incident response are to prevent injury or damage to the public and Enbridge employees, and mitigate any possible impact on the environment. The specific objectives of the ICP are to:

- Provide guidelines for handling an emergency response operation;
- Develop alert and notification procedures to be followed when an emergency response incident occurs;
- Document equipment, personnel, and other resources available to assist with an emergency response to an incident;
- Describe response teams, assign individuals to fill the positions on the team, and define the roles and responsibilities of team members;
- Define organizational lines of responsibility to be adhered to during an emergency response;
- Outline specific response procedures and techniques to be used during an emergency response incident; and
- Comply with United States Homeland Security Presidential Directive 8 to take an "All Hazards" approach to emergency response, which means having a response plan to address not only a product release, but also a tank fire, power outage, or security incident.

Enbridge reviews the ICP annually. The ICP may undergo additional revisions in connection with a change in regulations, or due to operational changes that require reporting per applicable regulations.

2. Emergency Response Action Plan

In addition to the ICP, Enbridge developed an Emergency Response Action Plan (ERAP) for each of the four United States regions. The ERAP is a region-specific, condensed version of the ICP tailored to the unique features of the region. The ERAP is a publicly-available document that is distributed to Enbridge personnel and emergency response agencies. The ERAPs are also available to the public at www.emergencyresponderinfo.com. Registration is required to obtain a copy of the ERAP so that Enbridge can provide any updates to the ERAP to those individuals that have requested the ERAP in the past.

The Project will be covered by the Superior Region annex of the ICP, which includes each region's respective ERAP. The ERAPs include, but are not limited to:

1. HCA maps, which show areas of high population, other population, water, and environmentally sensitive areas;
2. Control point (CP) maps, which show downstream water access and collection points;
3. Facility Response Plans, which address pumping and terminal areas;
4. Line information, which includes valve locations; and
5. Response maps, and equipment lists.

The ERAP will be updated to include Project-specific information once the route is finalized and final construction design of the Project has been completed.

Enbridge's ICP and ERAPs meet or exceed all local, state, and federal requirements, including PHMSA's pipeline safety regulations specified in 49 C.F.R Parts 194 and 195, and applicable OSHA, USCG and American Pipeline Institute (API) national technical standards.

B. Emergency Response Resources

In Minnesota, Enbridge has established Pipeline Maintenance (PLM) shops located in Superior, Wisconsin, Bemidji, Minnesota and Thief River Falls, Minnesota. Assuming the Preferred Route is approved, Enbridge plans to add one new PLM Shops in the Project area east of Clearbrook.

PLM shops are equipped with emergency response equipment, such as tools, repair materials, vacuum trucks, boats, other specialized vehicles, containment booms and related equipment, skimmers, pumps, generators, and pre-positioned and packed response trailers. These are the main repositories of Enbridge-owned emergency response equipment. Detailed lists of equipment maintained at each station are provided in Section 6.3.2 of the ERAP for each region. Similar equipment will be available at the new PLM locations. Enbridge also locates response trailers at pump stations and district offices located along the pipeline rights-of-way to provide faster access to essential equipment.

Enbridge does not limit its response resources to only those located at staffed stations within the region where an incident occurs. Enbridge will mobilize any response asset that may be required, regardless of where the asset is located. Enbridge maintains its own Tier 1 response resources as defined in the USCG Oil Spill Removal Organization (OSRO) classification regulations. Enbridge will also mobilize resources from contracted OSRO companies and other OSRO companies as needed. Local suppliers are also used for equipment rentals and purchases of ATVs and boats. Enbridge also has an Enterprise Emergency Response Team, which is a cross-business unit response team that responds to large-scale events anywhere in North America that require more resources than a single region could provide.

Enbridge continually invests in response equipment. From 2012 to 2013, Enbridge invested $50 million to improve its equipment, training, and overall response capabilities. This investment includes new equipment – ranging from containment booms to boats – that is deployed across its systems.

Enbridge spent over $4.5 million in the Superior Region to improve response capabilities. Major items purchased include:

- Excavator, including truck and trailer to haul excavator, for Thief River Falls;
- Marsh Master utility vehicle for Bemidji;
- Wildlife Response Trailer for Bemidji, which contains bird deterrents, cages, pools, and other equipment used to keep animals away from any released product or to rehabilitate a contaminated animal;
- ASV skid loader for Bemidji;
- Vacuum truck for Bemidji; and
- Lake assault boom vessels for Superior and Escanaba.

Additionally, Enbridge will station a helicopter in Bemidji, Minnesota. The helicopter will be used for pipeline inspections and emergency response.

Enbridge also provides equipment to public emergency response agencies along the routes of its pipelines. In2014, Enbridge donated more than $36,500 to Minnesota emergency response agencies through its Safe Community Program. In the first three quarters of 2014, the North Dakota and Superior Response Regions donated $101,040 to first response agencies for equipment and training. Over the past three years, Enbridge has also donated 11 vehicles to emergency response agencies in Minnesota, including various fire departments and a health center.

In addition, in the event that the ICP Team determines additional resources are required to respond, Enbridge has developed a relationship with other contractors along the route who have been trained and have agreed to provide resources and participate in responding to any incident when called upon by Enbridge. For example, to assist with clean up, Enbridge could call on those companies that Enbridge contracts with on a regular basis, such as vacuum truck vendors and rental companies to provide additional equipment and personnel.

All of these resources described above have been identified and have agreed to participate or assist in the event Enbridge asks for their assistance. Any contractor involved in a response, will first be trained and at the incident will be part of the ICS response. Enbridge enters into arrangements with hotels so that housing and conference space used during regular business operations is also available during emergency response.

C. Emergency Response Timing and Processes

Enbridge treats all incidents, regardless of type or location, in a uniform manner to ensure a consistent, effective response. An incident is any event that is outside of expected operating procedures and requires an emergency response. Enbridge has made the decision to immediately mobilize more resources than may be necessary to respond to an incident and then scale the response down rather than respond with minimal resources and then have to

engage others as response occurs. The ERAP provides specific response steps and tactics to be used within each region, considering the unique topography and features along a pipeline route within the region.

1. Initial Control Center Response

The Control Center is Enbridge's primary incident detection system. When one or two leak triggers are identified, the controller has 10 minutes to analyze the information and conclusively rule out the possibility of a leak. If the possibility of a leak cannot be irrefutably ruled out within 10 minutes of the first leak trigger being identified, the Controller immediately initiates a shut-down of the affected line segment so that it is sectionalized and isolated. The Controller then notifies the appropriate personnel in Enbridge, who initiate the investigation process.

When three or more leak triggers occur, immediate steps are taken to sectionalize and isolate the pipeline using remote controlled valves. There is little to no time between detection of a release and execution of the line shutdown process.

The amount of time required to identify a leak is dependent on the nature of the release. Full-line ruptures will result in multiple leak triggers and alarms that will notify the controller almost instantaneously. Small leaks are typically detected by the CPM system and the line balance calculation process (as described above), both of which are tuned to detect large and small leaks. Although the highest sensitivity leak threshold requires 24 hours to trigger an alarm, changes in operations and other monitoring techniques alert the Controller of changes in volume that will also be relied upon to shut the pipeline down and initiate an investigation in a shorter timeframe. Controllers are required to shut the line down in the event that they suspect that there is an issue with the pipeline operations.

2. Emergency Response Processes

Many activities are undertaken within a short period of time in response to an incident. When notified of an incident, the Control Center will shut down the pumps and close the valves in the area of concern. On-call operations personnel and managers are notified internally by the Control Center. These include individuals that are part of the IMT and the SMT. Notifications occur for both internal and external parties, including the National Response Center (NRC), the state, and local police.

Enbridge first responders work to confirm the nature and location of the incident as notifications occur. Trained Enbridge personnel will also be directed to the site of an incident after receiving notice of the incident.

External first responders will arrive on the scene within minutes of being alerted to an incident and secure the scene, undertake evacuations when necessary, and deploy the ERAP procedures, which are provided to Enbridge and external first responders. External first responders are public health or safety agents, such as fire or police departments, charged with

responding to an incident during the emergency phase and alleviating any immediate danger to human life, health, safety, or property. As discussed further below in Section D (ii), Enbridge has developed a state of the art web-based training program for first responders which it has provided to all first responders along the right of way. In addition, as noted above, Enbridge has also invested significant financial resources to assist first responders, more than 100,000 in 2014, including purchase of fire trucks and other equipment that will ensure the safety of the public.

Enbridge initiates the appropriate response under the ICP. There are four levels of incident and response. The levels are "Alert" to "Level 3" with increasing response actions, as set forth in Attachment D to the Safety Report. The levels are based on guidelines to help determine the size of the incident and response required. ICS is used because of the flexibility of the system to respond to any incident, regardless of its size or location.

One of the first steps under the ICS is for a Qualified Individual, which is a person with specialized training in incident command, to take the role of Incident Commander. That Qualified Individual is charged with ensuring that more than the required resources are provided to respond to the incident. The Incident Commander will set incident objectives and Operations will identify tactical objectives for the response. The primary incident objective will always be ensuring the safety of the public and responders.

Enbridge personnel are trained to respond to an incident in accordance with the ERAP. The ERAP provides specific response steps and tactics to be used within each region, considering the unique topography and features along a pipeline route within the region.

The IMT will use Enbridge's response plans and processes to create an Incident Action Plan (IAP) for each period of the incident response. An IAP is a work plan that guides response activities for the next work period, which can vary in duration from 12 hours to several days. The initial response periods are shorter and may increase in length if the objectives and tactics being used do not change. Command objectives and tactical objectives are used to create work plans, order resources, and communicate with those involved in the response.

Enbridge's emergency response plans include pre-determined steps to take in the event of an incident. Maps and tables have been developed by Enbridge that identify HCAs along pipeline routes for each region. Response regions maintain CP map sets that identify product containment and recovery sites on high risk water bodies that could be impacted by a pipeline release. The purpose of the CP maps is to identify in advance the best locations for deploying emergency response equipment, such as booms. This allows emergency responders to know exactly what equipment is required and what to do in the event of an incident.

The HCA and CP maps and tables allow Enbridge to know where to locate response resources in advance of a release, so that emergency responders can get to work immediately upon deployment. For example, Enbridge will have identified the location of sensitive resources, such as aquatic vegetation, sensitive shoreline areas, important habitats, and other features in advance and ensured that there is appropriate equipment in the vicinity which is to be

deployed at pre-determined locations. Emergency responders will use the HCA and CP maps and tables to begin placing booms and taking any other necessary response measures to protect resources and limit the impact of an incident.

These maps and tables are reviewed annually and updated in accordance with Enbridge policy and with National Pipeline Mapping data available from PHMSA for use by first responders, state and county officials. In addition, to updating the maps and information to reflect updates from PHMSA, the management groups in each operating region are responsible for ensuring that a visual field reconnaissance of each CP is carried out at least once every three years.

From an emergency response perspective, if a pipeline can be built in an area, emergency responders can reach the pipeline. Enbridge has a wide variety of methods to access an emergency site in any terrain or location.

The right-of-way itself provides direct access to a pipeline. Enbridge can access the right-of-way from public roads, or from access roads that will be built during construction and retained for future use to inspect and maintain the pipeline. Federal law requires pipeline rights-of-way to be kept free of vegetation that would interfere with inspection, so emergency responders will be able to travel down the right-of-way.

If conditions are not conducive to regular vehicles traveling down the right-of-way, Enbridge has specialized vehicles that can travel through swamp and marsh areas to access an incident. These vehicles include airboats, Marsh Master utility vehicles (specialized amphibious work vehicles that can transport equipment and personnel through wetlands and other difficult to access areas), ATV's, and work boats. Tracked mini-vacuum systems and portable tanks are also available to respond to incidents. Enbridge is in the process of stationing a helicopter dedicated to aerial inspection and emergency response in Bemidji, Minnesota.

While those vehicles can transport equipment and personnel to a response site quickly, Enbridge can also build temporary access roads or mat roads through difficult terrain along the right-of-way in short order to bring additional equipment and response personnel to an incident site.

D. Emergency Response Training

Enbridge's emergency response efforts include significant training and exercises for Enbridge employees, as well as emergency responders.

1. Employee Training

To date, Enbridge has trained more than 1,000 employees – essentially, all personnel anticipated to be involved in responding to incidents – in ICS levels 100-320. ICS is the common system used by first responders, the military and civil authorities across North America for responding to incidents. ICS classes are categorized by the different levels of information provided. ICS 100-200 classes focus on basic ICS and are taken by all responders. ICS 300 is a

two-day course for select personnel and focuses on the role of the Incident Commander, section chiefs and much of the planning section. This course includes training on staffing and response organization, reporting requirements, transfer of incident command, unified incident command structure for multi-jurisdictional or multi-agency incidents, documentation, resource management, and related topics. ICS 320 is a three-day course that focuses on the proactive planning phase of a multi-day incident. ICS training is conducted on an on-going basis and ever-increasing numbers of Enbridge team members will be trained and available to respond in the event of an incident. The qualified individuals, who function as Incident Commanders within the ICS system in each region during an emergency response situation, receive additional training focused on their role in developing an ICP for a response, coordinating resources and identifying the type and quantity of resource required for their respective regions in order to ensure more than the required resources are provided to respond to any incident.

Enbridge also delivers specialized training for the Enbridge Enterprise Emergency Response Team, a group that responds to large-scale events anywhere in North America that require more resources than a single region could provide. The Enterprise Response Team conducts major training exercises involving all of Enbridge's business units, emergency response contractors and consultants, and federal, state/provincial, and local emergency response agencies.

Enbridge's training programs meet the National Preparedness for Response Exercise Program (NPREP) standards, which were developed by PHMSA, the USCG, the EPA and DOI to establish a preparedness exercise program for federally-regulated companies. The NPREP standards require a minimum number of different exercise types over a three year period, including at least one spill response tabletop exercise and one equipment deployment exercise annually. Enbridge employees participate in regular emergency response drills and simulations to provide training, test, and improve upon Enbridge's preparedness procedures. Enbridge's exercise and drill program far exceeds federal standards.

Exercises are planned annually for employees and first responders to participate in hands-on training in their primary response area. Employees are trained through workshops, equipment deployment drills, and tabletop exercises where various scenarios are discussed. In 2012, Enbridge and its affiliates staged more than 380 exercises, drills and equipment deployments. In 2013, Enbridge participated in 475 exercises, drills, and equipment deployments. The following exercises took place in the Superior Response Region in 2013 and 2014:

- 2013: Six exercises, one of which involved county officials and a landowner association.
- 2014: 19 exercises, four of which involved county, state, and federal representatives and local first responders.

These training events occur regularly and frequently across all Enbridge Response Regions to ensure that personnel are trained to respond to an incident and able to address the unique features of their environment. Many of these exercises involve local emergency responders

using emergency response equipment to practice recovery and cleanup in various terrains and/or on water.

2. First Responder Training

Enbridge's training is not limited to its employees. Enbridge currently bears the cost of training first responders and will continue to do so. Enbridge offers a free online Emergency Responder Education Program, which has been launched to more than 8,000 response agencies in North America, including those along the Preferred Route of the Project. The online program is for all public sector first responders. There is also a specific program for 911 dispatchers, which was created with the assistance of the National Emergency Number Association (NENA). The content for both programs is based on "Pipeline Emergencies," an industry-leading pipeline emergency response training program developed by the National Association of State Fire Marshals. The purpose of this training is to make sure that first responders know their role and are prepared to fulfill that role in the event of an incident. To that end, Enbridge works with first responders so that they know the following information:

- Names of companies operating pipelines in their community;
- Emergency and non-emergency contact information for all operators;
- The approximate location of the pipelines;
- What materials or products are being transported in the pipelines;
- The physical indications of an unintended release;
- Potential impacts of an unintended release; and
- Steps that should be taken to protect the public.

Enbridge also employs trained Emergency Response Ambassadors in each response region to provide additional face-to-face training and information to 911 operators and emergency responders at Enbridge's expense. Enbridge's primary focus is on those agencies and responders within a five minute response time of an Enbridge pipeline, because those are the agencies and individuals that will likely be first on scene for an incident. The goal of this additional training and information is to provide further, specific practical information to be used by first responders when interacting with the public in response to an incident. In 2014, 10 fire departments and three public safety answer/911 dispatch centers took advantage of the in-person outreach offered through the Emergency Response Ambassadors.

The level of training that incident response personnel receive, regardless of whether they work for a non-company agency or for Enbridge, is commensurate with the respective personnel's role in the incident response plan. First responders are therefore trained to be able to perform the following functions as part of an emergency response:

- Secure the scene;
- Deploy or initiate the ERAP procedures;

- Respond to protect people, property, and the environment, including isolation of the area, rescue, and evacuation;
- Call for assistance; and
- Work with Enbridge to remedy the situation.

While non-company agency personnel fulfill important incident response roles, such as ensuring the safety of the public by controlling access to the area, implementing the procedures set forth in the ERAP, providing medical support if necessary, and, if required, responding to fires or other immediate hazards to life or property, they are not expected to fulfill the role of halting or remediating a release. Enbridge employees and contractors with more specialized training will be used to perform those functions. As a result, Enbridge ensures that non-company agency personnel are trained to make sure they are, among other things, (i) aware of Enbridge and Enbridge assets in their areas, (ii) aware of and able to implement the ERAP, and (iii) able to coordinate response efforts with Enbridge as effectively as possible during all phases of incident response, from first response through remediation. In this way, Enbridge ensures that everyone who is expected to respond to an incident is equipped with the information and resources necessary to fulfill their respective roles.

Enbridge sponsors annual emergency response information and training meetings that focus on pipeline response and response safety, such as annual meetings with the emergency response personnel along Enbridge's pipelines to ensure they have the latest information on our operations. These emergency responders include Emergency Medical Services (EMS), fire chiefs, sheriffs, police chiefs, and state and county emergency managers. Enbridge offers training and, if requested, goes to the departments' training night to give a presentation. For example, Enbridge recently conducted training for the Minnesota Federal Dam Volunteer Fire Department. Enbridge has also hosted pipeline emergency workshops and exercise drills for local first responders, including the Beltrami County Emergency responders, and conducted tank fire drills with the Clearbrook and Gonvick Volunteer Fire Departments.

E. Emergency Response Funding

Enbridge's first priority and primary objective is to prevent incidents from occurring through its comprehensive operational risk management practices and processes. The safe operation of our pipelines is Enbridge's top priority; however, in the event of a release or leak, Enbridge remains committed to returning affected areas to their pre-existing conditions. Enbridge has the financial capability to ensure that Enbridge responds to an incident and satisfies its commitments.

As the Project owner, Enbridge is responsible for emergency response. Enbridge has access to multiple sources of financial resources to fund the response to and remediation of a release. Enbridge is able to draw down cash from operations, issue debt, or acquire commercial paper as a result of its exceptionally strong credit rating. Enbridge is also well-capitalized to absorb unforeseen operational costs, maintains adequate insurance for operations, and has exceptional access to public debt markets to fund operational needs, including those stemming

from pipeline releases or leaks. For example, Enbridge has spent more than $1 billion responding to the release at Kalamazoo, Michigan, demonstrating Enbridge's responsibility and ability to perform response and remediation operations.

In addition to Enbridge's ability to fully fund all response needs, during the Project operations, Enbridge will maintain a comprehensive insurance program that includes commercial general liability insurance consistent with coverage considered customary for its industry. Enbridge's general liability program provides insurance coverage under which Enbridge may submit claims to recover its incurred costs responding and cleaning up a release. Currently, the Commercial General Liability insurance program has an annual aggregate coverage limit of USD $700 million and renews in May of each year.

V. Lessons Learned

Enbridge seeks to continuously improve the safety of its operations. Enbridge maintains a comprehensive procedure and policy for investigating incidents and near-incidents in order to use them as education opportunities, with the purpose being to identify the root cause and preventative and/or corrective measures to prevent reoccurrence. In addition to investigations, Enbridge maintains a comprehensive procedure for internal health checks, inspections, and audits, which produce lessons learned that work to continuously improve the safety of our operations.

In July 2010, Enbridge's Line 6B failure released crude oil into Talmadge Creek and the Kalamazoo River near Marshall, Michigan. Based on the findings and recommendations of the National Transportation Safety Board investigation into the Marshall incident, and Enbridge's own investigation, Enbridge has made significant changes to improve the safety and reliability of its operations.

Since Marshall, Enbridge has invested heavily and enacted many fundamental changes to its operation and philosophy related to safety and operational reliability. Enbridge has taken the following steps, either in direct response to Marshall, or as part of our ongoing improvement initiatives and activities:

Organizational Structure

- Created new senior management roles focused on safety and operational reliability in each business area.
- Established the Operations and Integrity Committee, the most senior committee within Enbridge, which is chaired by Al Monaco, President and CEO. The committee meets monthly and has representation from the Executive Leadership Team and senior safety leaders from across the company. The committee is supported by several cross-enterprise working committees focused on areas of safety, such as emergency response, process safety, and integrity.

- Created the Board's Safety and Reliability Committee, resulting in enhanced governance for safety, integrity, and operational risk management within Enbridge.
- Created the role of Senior Vice President, Enterprise Safety & Operational Reliability, and established a dedicated team to support and drive company-wide safety and reliability performance.

Safety Culture

- Undertook a company-wide safety perception survey to measure the strength of Enbridge's safety culture, our progress towards a strong and interdependent safety culture, and areas where we need to focus and improve. These safety culture assessments have continued on a biennial basis as a means to monitor our progress toward a continually-improving safety culture.
- Launched the Enbridge Health and Safety principles and the biennial recertification of all employees and contractors on the Lifesaving Rules.
- Created foundational safety stories based on four incidents from Enbridge's past to highlight the human impact and toll of safety failures for all employees by building on the power of story-telling.
- Created human factors training, which is mandatory for everyone within Enbridge and equips them with the tools and knowledge to recognize and mitigate the impact of human factors in our safety performance.
- Developed and launched the first annual Operational Reliability Review in 2013, creating a new standard for open and transparent communications with internal and external stakeholders about our safety and reliability performance and how we are working to become an industry leader.
- Conducted multiple safety culture assessments of our Control Center over the previous four years.

Pipeline and Facility Integrity

- Ramped up an already aggressive, proactive approach to pipeline integrity, conducting more than 500 in-line inspections and nearly 7,250 verification digs in the previous three years on the Enbridge pipeline system.
- Substantially increased pipeline integrity management spending, investing $2.4 billion in the previous three years on Liquid Pipelines integrity maintenance.

Leak Detection

- Established a Pipeline Control Systems and Leak Detection department, doubling the number of employees and contractors dedicated to leak detection and pipeline control.

Control Center Operations (CCO)

- Revised and enhanced all CCO procedures related to decision-making, handling pipeline start-ups and shut-downs, leak detection system alarms, communication protocols, and suspected column separations (a bubble of vapor in the pipeline in an area of low pressure).
- Enhanced Enbridge's CCO organization structures to better support our operators and manage workloads.
- Augmented CCO staff by adding training, technical support, engineering, and operator positions.
- Consolidated CCO facilities in Edmonton, Alberta, to improve Enbridge's ability to safely and efficiently operate its pipelines and terminal systems.

Public Awareness

- Reviewed and strengthened Enbridge's public awareness programs in the United States and Canada.
- Developed the Emergency Responder Education Program, an industry-leading online training tool, to help emergency responders and 911 call center personnel quickly and effectively respond to a pipeline emergency.

Emergency Response

- Created and implemented the ICP to govern all emergency response preparedness and activities.
- Invested $50 million to deploy new response equipment company-wide since 2012.
- Bolstered our emergency response and preparedness efforts by holding 381 company-wide exercises, drills, and equipment deployment events in 2012, 475 in 2013, and 481 in 2014.
- Created the Enbridge Enterprise Emergency Response Team (E3RT), a company-wide team of employees trained in emergency response and the Incident Command System, to respond to large-scale, long-term incidents beyond the response capacity of a single region or business unit.

VI. Conclusion

Pipeline safety is at the core of Enbridge's operations. Enbridge's primary goal is to safely deliver crude oil with zero incidents, while maintaining the safety of its work force, the public, and the environment. By continuously improving existing practices and processes, Enbridge seeks to provide world-class performance, resulting in public and personal safety, care for the environment, reliability, and efficiency. Enbridge's policies and standards are in accordance with PHMSA regulations and industry standards. Through its efforts, Enbridge works to prevent incidents and unintentional releases that can have a serious impact on people, the environment, and our assets.