EMERGENCY PREPAREDNESS AND RESPONSE

TransCanada conducted more than 120 emergency drills and exercises across our entire network of assets in 2014. These simulations allow company personnel and external agencies to practise the skills and communication protocols required in the unlikely event of a serious incident involving one of our pipelines or facilities.

Our Emergency Preparedness and Response (EP&R) team is sharply focused on its strategic goal, “to effectively respond to and remediate emergencies in a timely and co-ordinated manner.” With oversight and governance from a steering committee of senior management, EP&R develops and continually improves programs to:

- Provide robust and effective emergency response capabilities spanning the full scope and life cycle of our assets
- Achieve high standards of competency and awareness for employees, contractors, stakeholders, communities and emergency responders

In 2014, we participated in the Canadian Energy Pipeline Associations (CEPA) joint emergency management exercise. This exercise was held in Edmonton, Alberta and focused on CEPA’s Mutual Emergency Assistance Agreement (MEAA) functionality. MEAAs enable members of CEPA to call upon each other to assist with emergency response situations, as needed. The purpose of the exercise was to provide participants with an opportunity to practise MEAAs on a simulated pipeline release/spill. It was a very valuable undertaking for TransCanada, and we were proud to be part of the first exercise of its kind for us to engage with our industry partners.

ENSURING OUR ASSETS ARE SAFE AND RELIABLE

While caring for your safety includes outreach and emergency preparedness, it also includes the preventive and maintenance work of the engineers and experts who make up the Pipeline Integrity and Facility Integrity and Reliability Management groups. Our goal is to keep our assets operating safely and reliably, every day.

2014 MANAGEMENT SYSTEMS AND PERFORMANCE

At TransCanada, we are committed to using a management systems approach for the continuous improvement of our day-to-day activities. TransCanada’s management systems — including the Capital Project Management System (CPMS), Asset Management System (AMS) and Health, Safety and Environment Management System (HSE MS) — are “plan, do, check, and act” cycles and include measures of our overall safety program performance.

These management systems consist of standards, processes, and tools that provide structure to our risk control and safety management programs and are based on risk and quality management principles. Through these management systems, our assets achieve safety program performance requirements and targets consistent with TransCanada’s objectives for cost, reliability, efficiency, quality, regulatory compliance, safety, security and environmental protection.

Capital Project Management System

CPMS is a quality management framework that supports TransCanada’s objective to excel in project delivery. It is based on industry-accepted best practices, International Organization for Standardization (ISO) 9001, for project management and quality management standards for large-scale construction projects.

CPMS consists of nearly 50 core processes that outline project management and quality management requirements for projects from proposal to implementation. It also includes procedures, forms, tools and templates that support meeting those requirements.

Our continual improvement procedures enable us to correct issues quickly, identify root causes, prevent future issues, and further refine our management processes over time. We believe all defects are preventable and are committed to continual improvement. As well, we endeavour to do business with suppliers and contractors who share our expectations for quality management and work with them to continually improve.
Asset Management System

Based on risk and inherent value of specific assets, the AMS consists of processes, techniques and tools that provide an integrated and scalable approach in decision-making.

The 17 elements of the AMS, based on the Publicly Available Standard (PAS) 55 structure, provide a consistent “plan-do-check-act” cycle for ongoing pipeline and facility integrity management and planned maintenance programs for all TransCanada assets.

**Integrity Management Program (IMP)**

One of the key programs within the AMS is the company’s Integrity Management Program. The IMP is a written methodology that defines who, what, where, when, and how specific pipeline- and facility-related integrity activities are to be conducted.

The IMP is used to provide consistent implementation, accountability, documentation, and performance measurement, and addresses:

- Required Activities
- Locations
- Schedules
- Processes and Procedures

Currently, there are six IMPs that govern our pipeline integrity activities:

1. U.S. High Consequence Areas — Natural Gas Pipelines
2. U.S. Non-High Consequence Areas — Natural Gas Pipelines
3. U.S. Liquid Pipelines
4. Mexico Natural Gas Pipelines
5. Canadian Natural Gas Pipelines
6. Canadian Liquid Pipelines

The safety of our assets is important to us, and we strive for excellence by continually reviewing our performance as well as benchmarking ourselves against our industry peers throughout the world.

**Improvements to Integrity Management Program**

TransCanada’s IMP was audited by the National Energy Board (NEB) in 2013 and received various findings of our management system. In line with our commitment to compliance and public safety, the corrective actions were collaboratively developed and provided to the NEB in the form of a Corrective Action Plan (CAP). The CAP has been monitored and reviewed with the NEB on a regular basis and is in line with targeted commitments. The key elements that were targeted are highlighted in the table on page 30.
The safety of our assets is important to us, and we strive for excellence by continually reviewing our performance as well as benchmarking ourselves against our industry peers throughout the world.
Four Tiers of Health, Safety and Environment

As an integral part of TransCanada’s Business Management System, the HSE MS provides a systematic, four-tiered approach to HSE governance:

**Tier 1 activities**
Driven by regulatory specifications, internal risk analyses and best practices for safety and environment compliance, Tier 1 is the foundation for HSE governance. In 2014, we completed 235,944 Tier 1 activities.

**Tier 2 internal inspections**
Includes planned workplace and facility inspections designed to identify hazards. In 2014, we completed 587 Tier 2 inspections.

**Tier 3 internal audits**
These are triennial assessments of TransCanada’s HSE MS across our various assets. In 2014, we had 11 action items open from previous audits and 34 new action items were generated from audits completed in 2014. Of these 45 total action items, we have closed 11.

**Tier 4 external audits**
Regulatory agencies, representing various jurisdictions, completed 22 inspections of our facilities in 2014. Of those, 19 inspections resulted in no findings and 3 inspections resulted in 32 corrective actions. There were no immediate priority corrective actions. There were no audits conducted by regulatory agencies during 2014.

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**NEB NON-CONFORMANCE FINDING AND STATUS OF RESPONSE**

<table>
<thead>
<tr>
<th>Element</th>
<th>Area of focus</th>
<th>Update</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard identification, risk assessment</td>
<td>High Pressure Piping</td>
<td>In 2014, a formal risk assessment program was developed to manage the integrity of high pressure piping at TransCanada’s compression and measurement facilities. This program includes conducting investigative digs on un-piggable segments of piping.</td>
</tr>
<tr>
<td>Inspection, measurement &amp; monitoring</td>
<td>Un-Pigged Pipe</td>
<td>In 2014, 1,051 km of previously un-piggable pipelines were assessed through inline inspection, tethered inspections, direct assessments, or direct exam with remediation.</td>
</tr>
<tr>
<td>Management review</td>
<td>Management Review</td>
<td>In 2014, a revised management review process and pipeline integrity scorecard was implemented. The revised process has improved alignment to our Pipeline Integrity department’s organizational structure, commitment statement as well as goals, objectives and targets. Pipeline Integrity’s business performance is reviewed monthly by senior management.</td>
</tr>
</tbody>
</table>

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**HEALTH, SAFETY AND ENVIRONMENT MANAGEMENT SYSTEM**

TransCanada’s HSE MS encompasses an initial planning process for identifying hazards and assessing risk, followed by implementation of specific risk control and mitigation programs, performance evaluation, including any necessary corrective measures and, finally, a review of the overall HSE MS for suitability, adequacy and effectiveness against our HSE Commitment Statement. The complete cycle is repeated, resulting in ongoing continual improvement in HSE management. The approach is not only a regulatory requirement in Canada but also represents current industry best practices.

TransCanada’s HSE MS makes safety training and certification, along with regular refreshers and updates, part of the job. This includes training in hazardous material handling, first aid/CPR, fire and driver training, and other training and certifications demanded by specific jobs.

Its 11 ISO 14001 and Occupational Health and Safety Advisory Services (OHSAS) 18001 based elements provide the foundation for all of TransCanada’s health, safety and environmental protection programs.

**PIPELINE INTEGRITY AND YOUR SAFETY**

TransCanada is very proud of its safety record. Our safety programs and operational philosophy have protected the public and the environment for more than 60 years.

At the same time, we are aware of your concerns about pipeline safety. Specifically, you want to know if a pipeline incident...
will affect you. Every situation is unique, but TransCanada’s safety procedures and integrity management program have served us and our pipeline neighbours well over the decades.

Here are some things you should know about pipelines and TransCanada’s approach to safety:

• Statistics compiled by the U.S. Department of Transportation confirm that the age of a pipeline is not a leading cause of pipeline incidents. On the contrary, well-maintained pipelines can operate safely for decades.

• Regulations for pipeline materials and operation are different in rural and urban areas. In general, pipelines in urban areas are thicker and inspected more frequently than those in the open countryside. Both are safe; the varying thickness in pipe is to address the increased amount of activity around our pipelines in urban areas.

• The vast majority of TransCanada’s pipelines are in rural areas well away from population centres.

• TransCanada uses high-quality steel and the best construction practices when building pipelines. All pipe is pressure-tested to a pressure well above normal operating pressure before being put into operation.

• All of our pipelines are monitored in control centres 24 hours a day by trained operators who respond immediately to any indication of abnormal operation.

• Our pipelines are cathodically protected, which means a low-voltage electric current is induced in the vicinity of the pipeline to inhibit external corrosion.

• Special internal monitoring tools (called “pigs”) are used to detect anomalies involving loss of wall thickness, including corrosion. When certain anomalies are detected, the pipeline segment in question is excavated and visually inspected. It is either repaired on the spot or replaced. Internal inspection tools, called “pigs,” are pushed along inside the pipeline using the pressure of the natural gas or oil itself. These tools inspect the pipe’s integrity through a variety of methods.

• Pipeline right of way is routinely patrolled from the air for visual signs of disturbances and using sophisticated instrumentation to detect natural gas leaks. Ground patrols with hand-held leak detectors are also employed in some instances.

• The pipeline industry is strictly regulated for safety. TransCanada’s assets are routinely audited by relevant state, provincial and federal agencies.

As outlined in Emergency Preparedness (page 27), in the unlikely event that an incident occurs, TransCanada proactively maintains detailed emergency preparedness and response programs to minimize the consequences.

FACILITY INTEGRITY AND RELIABILITY MANAGEMENT
Facility Integrity and Reliability Management (FIRM) is the process used by TransCanada to meet the requirements of the Asset Management System framework for all facilities and equipment in Canada, the U.S. and Mexico.

Integrity Management procedures contribute to sustaining and maximizing the value of TransCanada’s energy assets through the development and maintenance of risk-based Integrity Management Strategies and Integrity Plans.

The FIRM program is composed of four workflow procedures that establish a consistent structure for all engineering disciplines. The four procedures are:

• Systemic Issue Management — identify, classify and prioritize facility integrity issues

• Risk Management — identify threats, define and approve risk mitigations

• Integrity Management Strategy — develop approved strategic plans for managing integrity of facilities and equipment assets

• Integrity Plan — develop tactical integrity plans

Each engineering discipline is responsible for managing facility integrity and reliability in accordance with the FIRM procedures.
The pipelines, oil and gas facilities and power plants owned and operated by TransCanada are considered to be among some of the most technologically advanced in the industry. Our track record of implementing innovative solutions to meet customer needs spans over 60 years, and we continue to conduct significant research and development (R&D).

Today, we have one of the industry’s largest R&D programs, investing over $38 million in R&D projects across North America in 2014. To complement our extensive internal R&D program, we also conduct research in partnership with industry associations and peers, academia, government and non-government organizations in Canada, the U.S. and Mexico. This enables us to pool resources and share results to improve standards across the industry.

At TransCanada, we ensure that every R&D dollar we spend aligns with our corporate values. Our R&D initiatives exemplify TransCanada’s un-wavering commitment to improving industrywide standards and ensuring our growing portfolio of energy infrastructure assets meets the needs of people who rely on us to deliver their energy safely and reliably today and well into the future.

Professor Adrian Gerlich was named by the Natural Sciences and Engineering Research Council of Canada (NSERC) as the TransCanada Industrial Research Chair in Welding for Energy Infrastructure at the University of Waterloo in 2014. Finding thought leaders such as Gerlich to head up research projects — like the one he’s undertaking with NSERC and TransCanada in his new role — is critical to achieving state-of-the-art innovation. His enthusiasm for studying the microstructural behaviour of weld material has the potential to help shape the future for the pipeline industry in terms of advancing safety, integrity and quality.

“I’m familiar with almost all the other major welding institutes around the world and virtually none of the other universities can claim to have even more than a couple students dedicated to welding of pipeline materials. But we’re going to have five or six at one time, which is a significantly bigger effort than most other places.”

The partnership at the University of Waterloo exemplifies one example of TransCanada’s extensive R&D program that supports research taking place across North America at major post-secondary institutions.
2014 INCIDENTS

Our count of leak incidents in 2014 was the lowest in our history; although, we are never satisfied with an incident rate of more than zero.

TransCanada experienced three significant failures on our pipeline networks in 2014. Through the effective execution of TransCanada’s emergency preparedness and response plans, employees successfully managed all consequences and impacts. In each case, TransCanada immediately enacted its emergency preparedness and response plans, and automatic shut-off valves were used to isolate the affected valve section.

All lines have since been safely returned to service with no injuries or significant environmental impacts.

Two of the events occurred on in-service natural gas pipelines: one on a portion of the Canadian Mainline System in Alberta and the other on the Canadian Mainline System in Manitoba. The third event occurred on an in-service natural gas pipeline in the U.S. on the ANR System in Michigan.

• On January 25, a line break occurred on the Canadian Mainline near Otterburne, Manitoba. Our emergency response team was able to restore power, gas, and heat to families in a timely manner by supporting and ensuring the safety of the affected population. The premier of Manitoba and impacted people were deeply appreciative of TransCanada’s attention to the safety, comfort and care of the community and environment.

• On February 18, a line break occurred on the Ferrier North Lateral, in a remote area of northern Alberta. TransCanada’s emergency response team was on the ground within hours and able to ensure the safety of and provide support to those impacted. Local officials commended TransCanada for its focused and sincere attention to the safety of the people as well as the protection of the surrounding environment.

• On September 16, a line break occurred on the ANR Southwest Mainline at Benton Harbor, Michigan.

TransCanada has conducted comprehensive failure investigations into all three incidents, as it does with any pipeline and facility incident. These investigations identify causal and contributing factors in order to improve all our asset integrity programs and to pursue the goal of preventing all incidents.

Safety of the public, employees, contractors and the environment is a top priority at TransCanada, and we are intent on driving toward the ultimate goal of zero incidents.

Incident Rates

When compared to industry, TransCanada continues to lead the pack in low pipeline incident rates and improving our in-service incident rates, year over year.

TransCanada compares our performance to that of other pipeline operators globally. We continue to have lower incident rates than national and global averages.

However, we believe that every incident, however minor, can be prevented. This is why our ultimate goal is zero incidents.

Note: U.S. Pipeline and Hazardous Material Safety Administration failure data is not included because its failure reporting criteria is significantly different, which makes the statistics difficult to compare.