Your energy.
Delivered better.
Your energy. **Delivered better** means working hard to continuously improve the energy delivery system you count on. This report outlines the transmission pipeline industry’s performance in 2017 in the areas Canadians told us they want to know about, including incidents.

Data for this report is assembled by Canadian Energy Pipeline Association (CEPA) members and also provided to the federal regulator (NEB) and provincial regulators.

Our goal is transparency. Rest assured that when it comes to the energy you need, we are always striving to deliver better.
On behalf of our Board, I would like to thank you for your interest in CEPA’s 2018 Transmission Pipeline Industry Performance Report. It is a reflection of the entire industry’s commitment to continuous improvement. Pipelines play a vital role for Canada, which makes our commitment equally vital to build a positive energy future.

It is a commitment shared by all of CEPA’s Board of Directors, which is made up of senior leaders from Canada’s 11 transmission pipeline companies, responsible for delivering 97 per cent of the crude oil and natural gas Canadians count on. With a goal of zero incidents, safety is our number one priority, and this report reflects our progress towards that goal.

When every company responsible for oil and natural gas transmission does not compete on safety, but instead collaborates to raise the bar beyond regulatory standards, good things happen. Canada needs, and counts on, a safe and reliable supply of oil and natural gas — for life, for jobs, for economic growth. And Canadians can count on the members of CEPA to deliver their energy in the safest, most responsible way.

The 2018 Performance Report marks our fourth annual report. As always, you’ll find it a clear demonstration of our commitment to be transparent and accountable to Canadians in the areas they most want to know more about — safety, environmental protection and socio-economic contributions. In addition, we have evolved the report to focus on our flagship safety and continuous improvement program, CEPA Integrity First®.

CEPA Integrity First® is focused on driving continuous improvement in 10 areas key to advancing safety, environmental protection and socio-economic growth. Members do not compete in these areas — they work together to share best practices, learn from one another and hold each other accountable to collectively improve the entire industry.

When we work together, we combine the expertise and abilities of thousands of engineers and environmental scientists in order to build a better energy future for Canada. We hope that this year’s performance report creates more awareness about what we do every day to make Canada’s transmission pipelines among the safest in the world. You can count on CEPA members to deliver the oil and gas energy you need for life to thrive in Canada.

 INCIDENTS IN 2017

Overall, the report reflects a strong, safe industry. One thing that stands out is an increase in the number of significant incidents, from one in 2016, to three in 2017. Two of the three significant incidents were liquids related. One of these incidents was the result of a pipeline being accidentally ruptured by third-party excavation equipment. The other was caused by metal loss. The one significant gas pipeline incident was very small and was the result of a pipeline being accidentally ruptured by third-party excavation equipment. All of these incidents were dealt with quickly and efficiently, with liquid spills recovered and the area around the spills in the process of remediation. CEPA member companies have delivered natural gas and liquid petroleum products with a 99.999 per cent safety record for over a decade and they continue to strive to reach their goal of 100 per cent.
Released due to unplanned incidents on rights-of-way (released natural gas quickly dissipates into the air). While the one significant incident was small (21,789 cubic feet), the incident was categorized as significant because the failure mode was a rupture (caused by third-party damage). As a percentage of natural gas shipped compared to released:

\[0.000049\] per cent.

Remaining after initial recovery (7,447 barrels spilled and 7,396 barrels recovered) from total amount of product spilled on rights-of-way. Some of the product not recovered is dissipated through volatilization (similar to evaporation) and other natural processes. Remaining product is removed through remediation. As a percentage of crude oil transported compared to remaining:

\[0.000004\] per cent.

The information in this report covers incidents on CEPA member rights-of-way (ROW) in Canada for 2017. Our focus is on ROW as they represent close to 100 per cent of the network and present the greatest exposure to the public. There were 19 incidents on our members’ ROW.

Two significant liquid pipeline incidents had an estimated liquid release of 7,403.1 barrels (out of a total liquid release of 7,447 barrels for all incidents), which is 99 per cent of total reported liquid releases in 2017. One of these incidents was the result of a pipeline being accidentally ruptured by excavation equipment. The other was caused by metal loss. One significant gas pipeline incident was very small (21,789 cubic feet). The incident was caused by external interference (third-party damage).
Liquids and natural gas incidents

Total incidents
CEPA members 2013–2017 (includes significant and non-significant incidents)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total incidents</th>
<th>Liquids</th>
<th>Natural Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>35</td>
<td>13</td>
<td>22</td>
</tr>
<tr>
<td>2014</td>
<td>17</td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td>2015</td>
<td>15</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>2016</td>
<td>15</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>2017</td>
<td>13</td>
<td>4</td>
<td>9</td>
</tr>
</tbody>
</table>

Total incidents includes significant incidents. Only a small percentage of pipeline incidents are severe enough to meet the criteria of “significant.” A significant incident includes one or more of the following that occur on members’ rights-of-way:
- A serious injury or fatality
- A liquid release of greater than 8 cubic metres (50 barrels)
- Produced an unintentional ignition or fire
- Resulted in a rupture or break of a pipeline

The majority of pipeline incidents are minor, such as small pinhole leaks. These minor incidents must be addressed but pose little risk to the public or the environment. All data on incidents can also be accessed from federal and provincial regulators, including the NEB and AER.

Causes of pipeline incidents
CEPA members 2013–2017 (includes significant and non-significant incidents)

<table>
<thead>
<tr>
<th>Cause</th>
<th>Geotechnical</th>
<th>Other</th>
<th>Materials, manufacturing and construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geotechnical</td>
<td>7%</td>
<td>8%</td>
<td>12%</td>
</tr>
<tr>
<td>External interference</td>
<td>17%</td>
<td>17%</td>
<td>25%</td>
</tr>
<tr>
<td>Cracking</td>
<td>25%</td>
<td>31%</td>
<td>31%</td>
</tr>
<tr>
<td>Metal loss</td>
<td>31%</td>
<td>12%</td>
<td>17%</td>
</tr>
</tbody>
</table>

“Geotechnical” refers to damage by floods or landslides. “External interference” refers to damage by third parties. “Other” refers to control system malfunction, improper operation, lightning, fire and unknown. “Metal loss” is primarily caused by corrosion.

Liquids spill history
CEPA members 2013–2017 (includes significant and non-significant incidents)

<table>
<thead>
<tr>
<th>Year</th>
<th>Liquids</th>
<th>Natural Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2014</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2015</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2016</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2017</td>
<td>4</td>
<td>7,396</td>
</tr>
</tbody>
</table>

99.3% of barrels spilled were remediated
In 2017, there were four liquid pipeline spills, of which two were significant. A total of 7,447 barrels were released and, of those, 7,396 barrels were recovered.

Natural gas release history
CEPA members 2013–2017 (includes significant and non-significant incidents)

<table>
<thead>
<tr>
<th>Year</th>
<th>Natural Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>736.7</td>
</tr>
<tr>
<td>2014</td>
<td>116.7</td>
</tr>
<tr>
<td>2015</td>
<td>121.3</td>
</tr>
<tr>
<td>2016</td>
<td>0.374</td>
</tr>
<tr>
<td>2017</td>
<td>2.8</td>
</tr>
</tbody>
</table>

Total unplanned product released from our members’ natural gas pipelines in 2017 was approximately 2.8 million cubic feet (or 79.6 e⁻³m³).
In 2017, CEPA members held 542 emergency response exercises, ranging in complexity from emergency drills to full-scale exercises. The exercises included participation of multiple agencies and jurisdictions and mobilization of personnel and equipment as if a real emergency had occurred.

While the total recordable injury rate (incidents per 100 full-time employees) was slightly higher in 2017 than 2016, the rate of injuries to member employees has declined almost 38 per cent over the past five years. CEPA members have a number of ongoing training programs and safety initiatives to reduce injuries and motor vehicle incidents.

In 2017 our members reported 74 incidents that occurred within facilities and 19 on ROW. Typically, incidents that occur within a pipeline facility pose less potential threat to the public or environment because of their size and the fact that facilities have both restricted public access and a leak containment system to keep the releases within the facility.

0 Fatalities

CEPA’s members are focused on ensuring the 13,376 people directly employed by our industry, and the many thousands of contractors who work on their behalf, return home safely at the end of the day. Just as our members have committed to a goal of zero pipeline incidents, they also have a goal of zero incidents affecting the health and safety of their employees.

9% increase in motor vehicle incident rate, and a 54% decline over the past 5 years

The number of driving incidents per million kilometres driven fell from 2.97 in 2013 to 1.37 in 2017. Incidents increased from 1.26 in 2016 to 1.37 in 2017, 50 per cent of those incidents were bumping a fixed object. CEPA members continue to strengthen efforts in areas such as regular driver training and work planning to ensure workers are not fatigued and have sufficient time to travel the required distances.
Prevention for environmental protection

$1.6 Billion
Invested in maintenance and monitoring

In 2017, CEPA member companies conducted 2,557 integrity digs to examine pipelines for defects and make repairs – that’s a total of 28,134 integrity digs since 2007.

The number of integrity digs in any given year is not a set number. Each company decides when and where to perform an integrity dig, based on the results of in-line inspections and according to members’ operations and management programs. During an integrity dig, a section of pipeline is excavated to give pipeline operators an up-close view of the pipeline to determine if a repair or replacement is required.

2,557 Integrity digs

In 2017, CEPA members invested more than $1.6 billion in maintenance and monitoring of their Canadian pipeline systems.

36,882 Kilometres of in-line inspection

In 2017, our members conducted in-line inspection runs on 36,882 kilometres of pipelines in Canada using highly sophisticated tools called “smart pigs” that examine a pipeline from the inside to identify features such as metal loss, dents and cracks that may require further investigation. More than 30 per cent of our members’ 117,800 kilometres of pipeline in Canada was inspected by one or more in-line inspection tools in 2017.

$22.2 Million
Invested in innovative technology

In 2017, CEPA members invested $22.2 million in innovative technology focused on reducing pipeline corrosion and improving pipeline inspection, leak detection and damage prevention. From 2014 to 2017, our members' investment in these kinds of technologies totalled more than $84.7 million.
Socio-economic benefits

$30.2 Million
Invested in community initiatives across Canada, including $4 million to Indigenous communities.

$1.3 Billion
Contributed to government tax revenues.

$1.3 Billion
Contributed to government tax revenues.

$650 Million
Of that $1.3 billion in tax revenues, our members paid more than $650 million in 2017 in property taxes to municipalities in communities across Canada where they operate pipelines. In many rural municipalities with transmission pipelines, our industry is the largest single contributor to municipal taxes.

$4.1B
Spent in Canadian communities, including $261 million at Indigenous suppliers.

13,376
Full-time equivalent jobs
CEPA members directly employed 13,376 (full-time equivalent) employees in Canada in 2017.

$10B
In capital expenditures
CEPA members continue to make significant investments in pipeline infrastructure. Capital expenditures increased by 25 per cent compared to 2016 – to a total of $10 billion in 2017.

VIEW THE FULL PERFORMANCE REPORT AT PR18.CEPA.COM
Socio-economic data includes Canadian projects and operations.
A path to delivering better

We have a goal of zero incidents. We are getting there through initiatives like Integrity First. CEPA members share their knowledge and innovations, advancing performance in 10 key areas covering safety, environment and socio-economic contribution. Joining forces to share ideas and technology helps all 11 transmission pipeline companies deliver better.

In the unlikely event that an incident occurs, CEPA members meet to review the entire incident – cause, impact, emergency response and remediation – to determine how operations and procedures should evolve to prevent that kind of incident from happening in the future. Guidelines are then updated with key learnings so all members can improve safety performance on our path to zero incidents. These initiatives are working – incidents have been cut in half in the last five years.
How Integrity First works

Identify the most important priorities
Priorities such as pipeline integrity management or emergency management are identified through research and feedback gathered from the public and industry.

Create guidance documents
Experts from CEPA member companies work together to develop a plan, called a guidance document, to guide improvement in each priority area.

Conduct self-assessment
Member companies use the guidance document to assess their current systems, processes and practices within the priority area.

Conduct third-party verification
Third-party verification is conducted to increase trust, credibility and consistency of the member companies and industry.

Develop action plan for continuous improvement
Areas of improvement for leading practices are identified and shared among members. Action plans are developed to improve performance.

Report on activity and performance
Members, through Integrity First, regularly report on their activities and performance to increase accountability and transparency with Canadians.

Improving where it counts
Through Integrity First, CEPA members work together to continuously improve their operations in 10 key priority areas that will help us reach our goal of zero incidents.

- **EMERGENCY MANAGEMENT**
  Be well prepared to quickly and effectively respond to pipeline incidents.

- **PIPELINE INTEGRITY**
  Design, construct, inspect and maintain pipeline systems to protect people and the environment.

- **CONTROL ROOM MANAGEMENT**
  Enhance the safe and reliable operation and continuous monitoring of pipeline systems.

- **DAMAGE PREVENTION**
  Work with landowners, communities and industry to avoid unintentional impacts to pipelines.

- **WATER PROTECTION**
  Preserve water quality and the aquatic environment.

- **SAFETY MANAGEMENT**
  Protect workers and the public during pipeline construction and operations.

- **SECURITY**
  Safeguard workers, the public, pipeline systems and property from threats.

- **ENVIRONMENTAL STEWARDSHIP**
  Preserve the land, atmosphere and wildlife through sustainable environmental approaches.

- **INDIGENOUS RELATIONS**
  Build respectful relationships with Indigenous peoples to foster mutual understanding.

- **LAND USE AND ACCESS**
  Work productively with landowners to limit land-use impacts and improve access to pipeline rights-of-way.

For more on Integrity First, visit cepa.com/cepa-integrity-first.
CEPA members pool expertise and knowledge to enhance performance to help secure Canada’s energy future.

Approximately 300 volunteers from our member companies lend their time and expertise to committees, knowledge networks and CEPA’s 10 work groups, each responsible for a key area of Canada’s pipeline industry.

<table>
<thead>
<tr>
<th>Pipeline Operations</th>
<th>Business Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damage prevention</td>
<td>Indigenous affairs</td>
</tr>
<tr>
<td>Emergency management</td>
<td>Climate change</td>
</tr>
<tr>
<td>Environment</td>
<td>Property tax</td>
</tr>
<tr>
<td>Health and safety</td>
<td>Regulatory policy</td>
</tr>
<tr>
<td>Pipeline integrity</td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td></td>
</tr>
</tbody>
</table>
We want to hear from you!  
Email CEPA at info@cepa.com to submit your comments about the report and ideas on how our industry can improve. We welcome your feedback.

info@cepa.com | cepa.com | aboutpipelines.com

Canadian Energy Pipeline Association  
Suite 1110, 505-3rd St. SW  
Calgary, Alberta T2P 3E6  
Tel: 403-221-8777 | Fax: 403-221-8760

View the full Performance Report at pr18.cepa.com