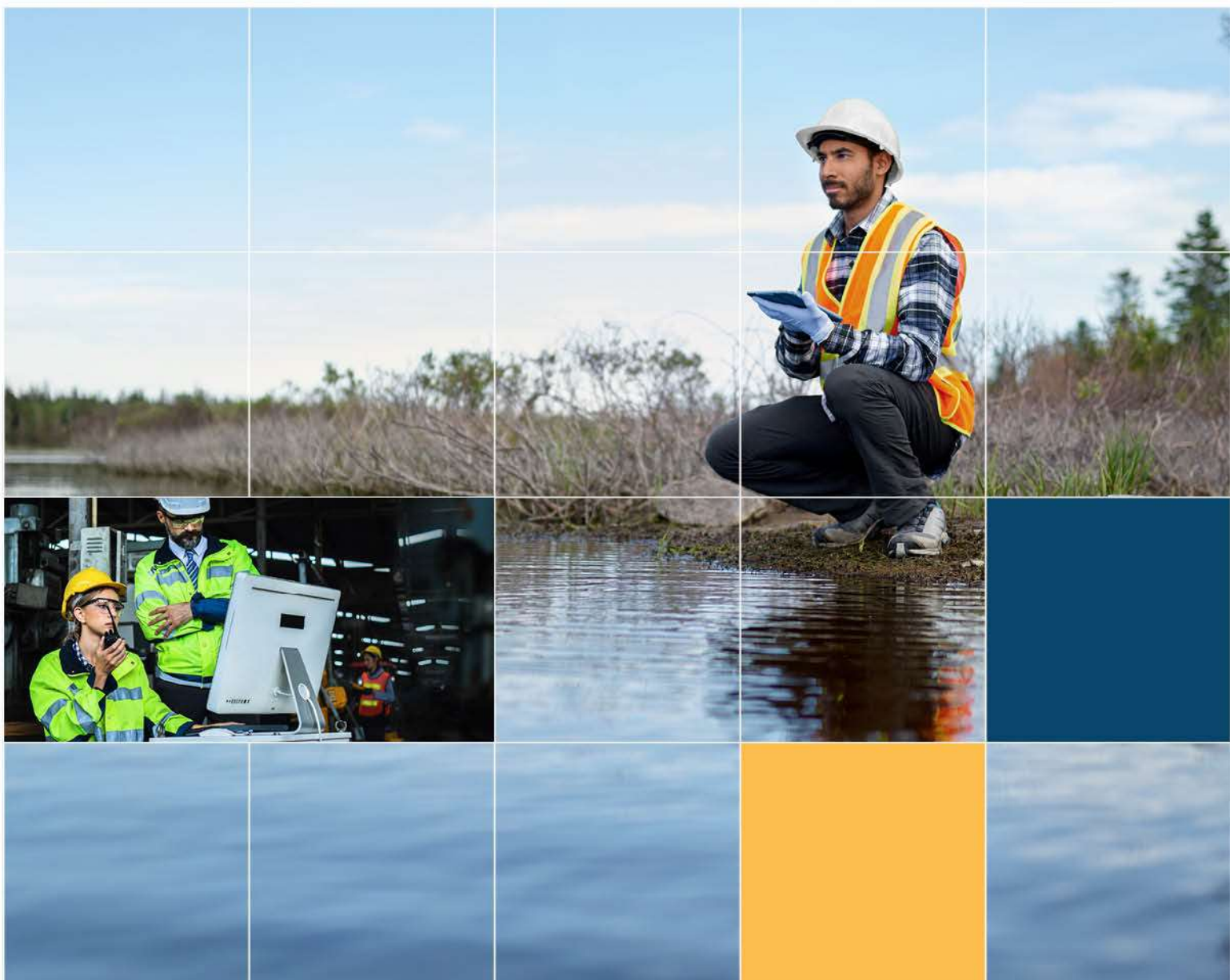Canada Energy Regulator

Régie de l'énergie du Canada

Pipeline Performance Measures
2020 Data Report

December 2021

Canada

Further Information

If a company or person wants to provide feedback or requires more information about the performance measures or the program for managing the measures, please contact the Commission via mail, email, fax or telephone as follows:

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Pipeline Performance Measures

Overview

This report marks the eighth year of the Canada Energy Regulator (CER) publishing pipeline performance measures gathered from CER-regulated companies. It includes data from the 2020 reporting year.

This reporting strengthens the CER's proactive approach to protecting the public and the environment. Performance measures are a necessary component of effective safety management systems as they focus on both improving the performance of systems designed to prevent possible incidents (leading indicators) and measuring pipeline incidents after they have occurred (lagging indicators).

The CER expects that industry leadership will use its management systems' policies, goals, processes, and procedures to formally communicate their values and expectations. Through this formal communication, executive management establishes the initial framework of the corporate culture. Where a company is strongly in tune with establishing and maintaining a positive safety culture, it scrutinizes, as a normal business function, every decision to ensure that risk is considered and managed appropriately. It sets performance measures that provide a complete picture of the company's current state in order to identify areas of weakness and to proactively manage safety to prevent incidents.

In 2021, the CER released the Statement on Safety Culture that updates the expectations for companies to build and sustain a positive safety culture. Both the performance measures and safety culture initiatives build awareness of the role that management systems and culture plays in contributing to or building defenses against accidents. Incidents can be attributed to a breakdown in technology or management system elements, but they are often because of safety culture as well.

The CER sees the information gathered for these primarily leading performance measures as an incentive for companies to set even more company internal performance measures for key programs required in a robust management system. A comprehensive set of measures informs employees on the performance being measured and the results are able to be tracked over time to contribute to continual improvement in operations and to contribute to a more positive safety culture.

The data generated from the measures in this report will also be used by the CER to better regulate pipeline operations. In addition, the CER continues to use the performance measures data to inform its compliance verification planning. Data from these leading indicators are incorporated into the CER's risk-informed modelling and analysis. This additional information provides the CER with a more complete picture of regulated companies' pipeline operations.

The CER also evaluates the performance data to determine if companies are providing information that is consistent with the CER's knowledge of the pipeline and if they are

planning the appropriate numbers of safety-related activities. If, in the CER's view, there are inconsistencies, the CER will take action.

Performance Measures Data Format

The performance measures were developed through a public consultation to cover key activities in the programs required by the CER:

1. Safety Management
2. Security
3. Emergency Management
4. Integrity Management
5. Environmental Protection
6. Damage Prevention

To facilitate the reporting and subsequent sharing of data, each performance measure is quantitative in terms of numbers and percentages

Most of the measures are to be reported on a pipeline-system basis. However, there are certain measures that must be reported on a facility basis. These exceptions have been indicated in the guidance.

Data was received from 23 companies owning a total 23 pipeline systems and 110 individual pipelines. The data was grouped in categories based on product (liquid or gas) and length of pipeline (greater than 50 kilometres and less than or greater than 5000 kilometres, or charting purposes, gas pipelines between 50 kilometres and 5000 kilometres will be labelled as medium and gas pipelines over 5000 kilometres will be labelled as large).

This report includes performance measure data for 2020. Data averages may be less than 1 as the total for a particular metric (such as the emergency response exercises conducted among all the companies) may be less than the total number of companies. In most cases, values have been rounded off to whole numbers where appropriate.

Guidance

Guidance is provided with each measure to enhance the accuracy of company reporting, provide common understanding, and encourage consistent application for reporting purposes. In addition, definitions, descriptions of terms, and interpretation are included.

Implementation

These performance measures are also posted on the CER's website (www.cer-rec.gc.ca) in the Safety and Environment section.

The submission of performance measure data is mandatory for companies selected by the CER given the number of kilometres of pipeline they own. The CER has directed these companies to electronically submit the data (for the previous calendar year) by 1 April of each year. The reporting form and the instructions for submission are available on the CER's website.

Companies that are new to the CER's jurisdiction should seek advice from the CER to determine if they should report on the measures. However, all companies are encouraged to use these measures in their integrated management system.

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1. Safety Management Performance Measures

1.1 Facility Safety Inspections

Guidance

The purpose of this measure is to track completion of safety inspections planned for facilities to prevent harm to employees, the public and the environment. This supports Paragraph 6.5(1)(u) of the *Canadian Energy Regulator Onshore Pipeline Regulations* (OPR), which requires a process for inspecting and monitoring in order to evaluate the adequacy and effectiveness of a safety management program.

Average Facility Safety Inspections Planned and Conducted (inspections per pipeline system)
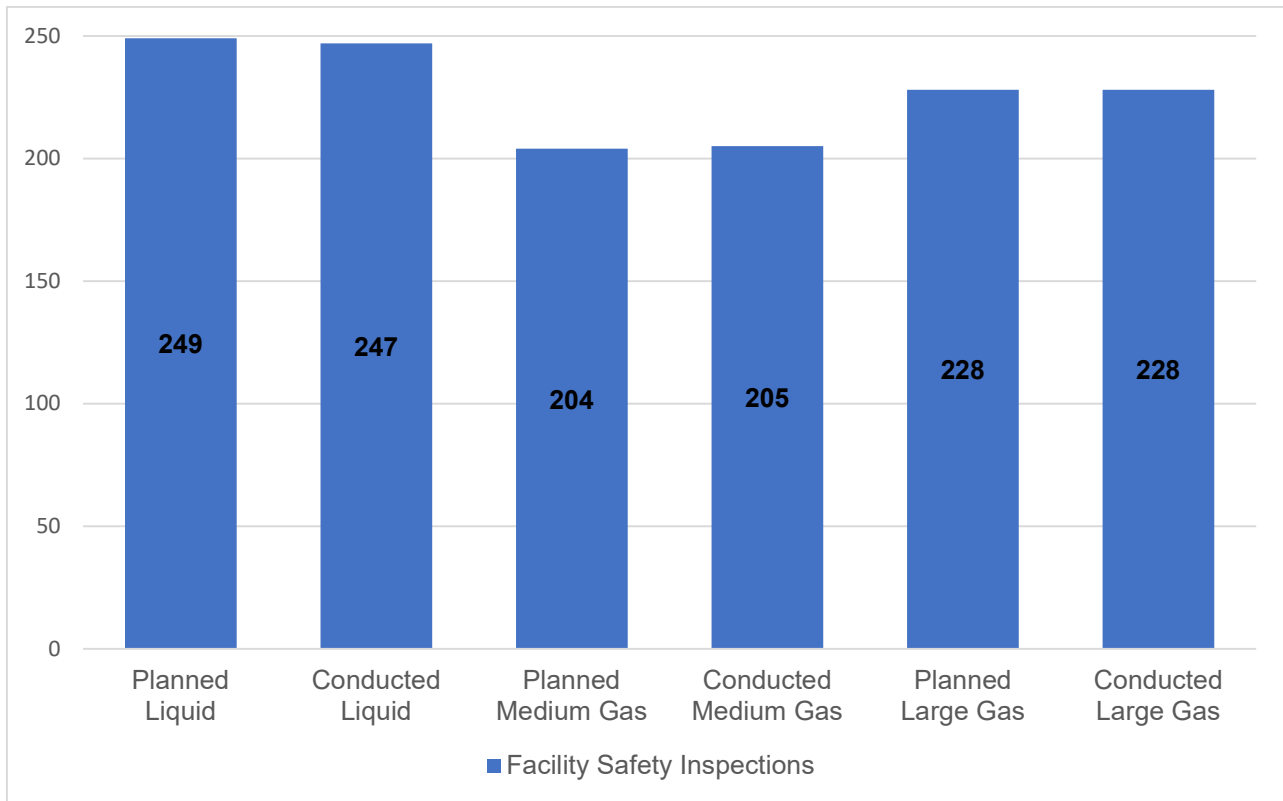
Figure 1.1

What is a "facility"?

For the purposes of this measure, a facility is integral with a pipeline and may include pump stations, compressor stations, metering stations, mainline block valve yards, tank farms, terminals and launcher and receiver yards. This definition is consistent with the facilities

identified in the Canadian Standards Association (CSA) Z662, *Oil and Gas Pipeline Systems*.[1]

What is an "inspection"?

For the purposes of this measure, an inspection is a workplace inspection conducted at a field facility in accordance with the requirements of a company's facility integrity and/or safety program management system. An inspection may include facility and equipment inspections conducted for both process safety and workplace safety purposes.

Inspections conducted to follow up on corrective actions are not recorded for this measure (see Safety Management Performance Measure #2). Although these inspections are an important component of a safety program, they are not included in this measure because the number of these inspections can vary depending on the situation.

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[1] The OPR defines CSA Z662 as the CSA standard entitled *Oil and Gas Pipeline Systems*, as amended from time to time. Accordingly, companies should use the most up to date version of CSA Z662 when reporting data for all measures.

1.2 Corrective and Preventative Actions

Guidance

The purpose of this measure is to support paragraphs 6.5(1)(r), (u) and (w) of the OPR with regard to the tracking of corrective and preventative actions and the completion of the actions in a timely manner. This measure will also help companies manage hazards and find ways to reduce the potential for safety incidents. This measure is not focused on the completion of actions in the same calendar year they were identified. Rather, as mentioned above, the focus is on the completion of actions in a timely manner.

Some companies' management systems may track **operations and maintenance activities** separately. In this case the data is to be combined for reporting on the measure.

Average Number of Identified and Completed Corrective and Preventative Actions (counts per pipeline system)
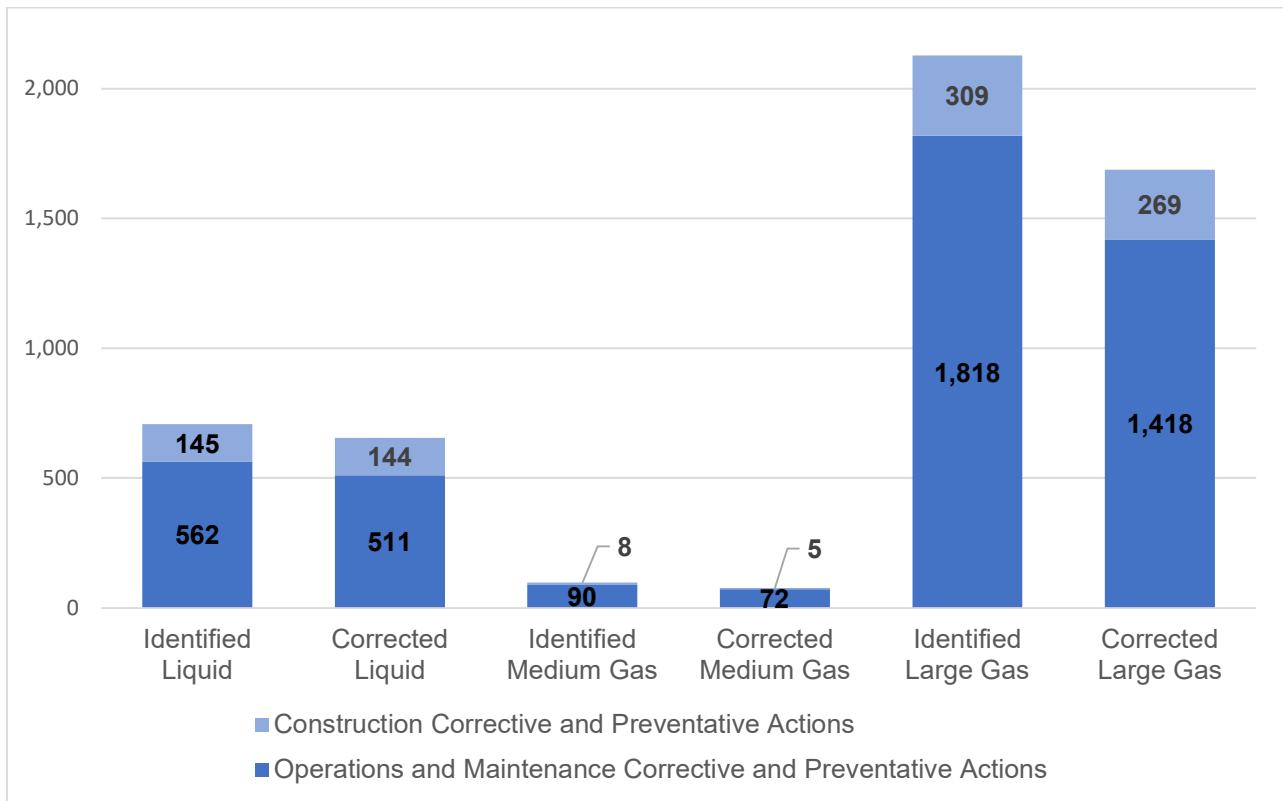
Figure 1.2

What is a "corrective and preventative action"?

A corrective and preventative action is an action that the company has determined is necessary based on findings from internal inspections, audits and investigations. The reported data would include both corrective and preventative actions.

An investigation is any assessment of an unsafe situation from a near miss to an incident. If any investigation generates corrective and/or preventative actions then these actions are considered a corrective and preventative action for the purposes of this measure and therefore should be reported.

How are corrective actions tracked if they are identified in one calendar year, but addressed in another calendar year?

It is recognized that some actions are not able to be addressed in the calendar year that they are discovered. For example, some may require more time than others, or some actions may be identified too late in the year. Any corrective and preventative actions not completed in a calendar year are carried over to the next year. These actions are then identified in the management system at the start of the next calendar year. They will be supplemented with new actions identified over the course of that calendar year.

What is "construction"?

Construction activities are those conducted by employees, contractors or any other persons involved in the construction of a pipeline.

1.3   Near Misses

Guidance

The purpose of this measure is to track reporting and management of near misses for hazard management in accordance with Paragraph 6.5(1)(s) of the OPR, so as to reduce the potential for pipeline process safety incidents and occupational health and safety incidents.

Average Number of Near Misses Reported and Addressed by a Competent Person (counts per pipeline system)
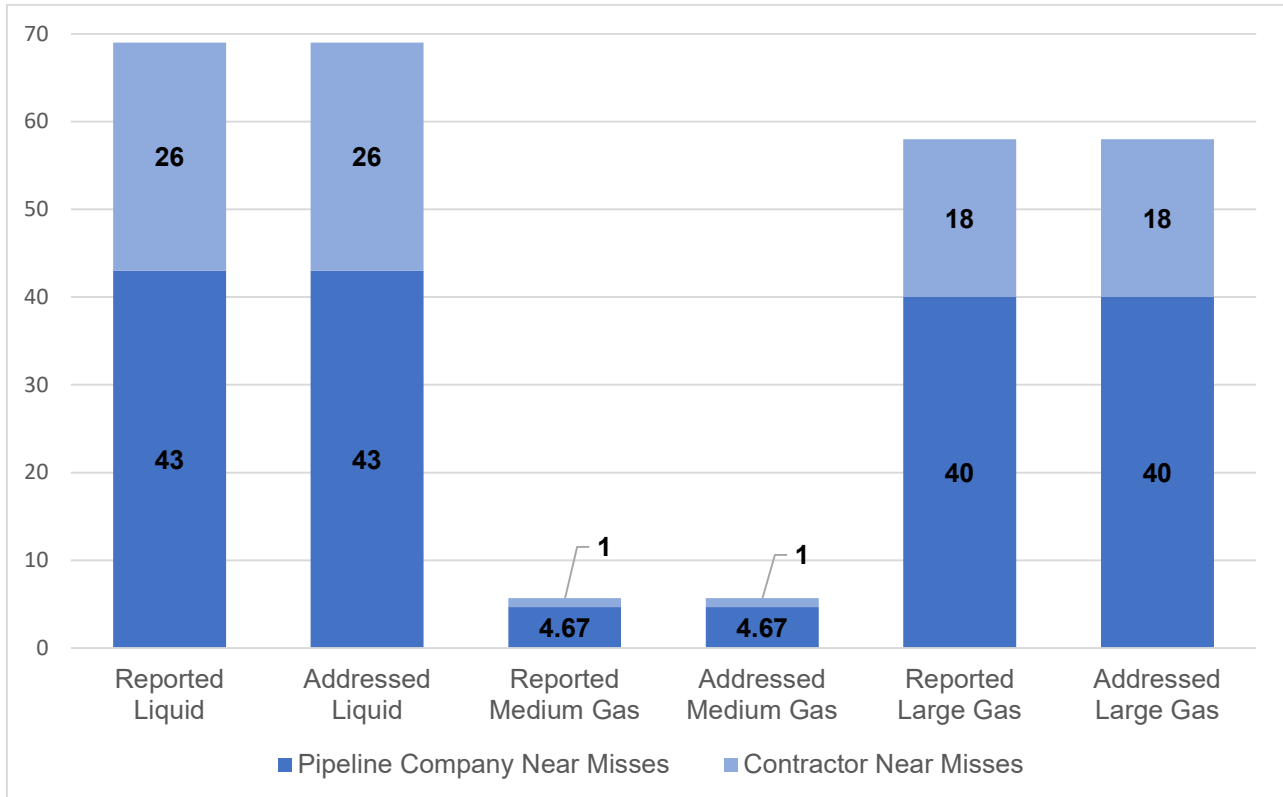
Figure 1.3

What is a "near miss"?

A near miss is an undesired event that under slightly different circumstances could have resulted in harm to people, or damage to property, equipment or the environment. Near misses apply to operation, maintenance and construction activities conducted by a company. Near misses do not apply to other companies, public or third party incidents on pipelines as these events should be managed under a damage prevention program.

In order for a company to properly report on this measure, it may have to provide specific direction to each contractor so that all near misses are reported and reviewed. Such

reporting should be included in a company safety management program in accordance with paragraph 6.5(1)(r) of the OPR.

What do "addressed" and "competent person" mean?

Addressed means that a determination of need for corrective and/or preventative action was made and where appropriate corrective and/or preventative action was taken. In some cases no action may be required. However, a determination must be made promptly to assess the risk and the need for corrective and/or preventative action.

Competent Person for a Pipeline Company: The determination of a need for action at a company must be conducted by a person who is competent (i.e. a person who is qualified, trained and experienced to conduct safety incident investigations). A determination of need for action must also be reviewed by an appropriate authority (i.e. management) to confirm that the determination was appropriate, that related learning is incorporated, and that information has been shared with workers to increase awareness and prevent similar occurrences.

Competent Person for a Contractor:

The determination of a need for action at a company may also be conducted by a contractor if:

a. the near miss resulted from an action taken by the contractor; and
b. the contractor is competent (i.e. the contractor is qualified, trained and experienced to conduct safety incident investigations).

A determination of need for action must be reviewed by an appropriate authority. In the case of a contractor, the appropriate authority is either:

a. the contractor's management (and then the pipeline company must be advised of the determination); or
b. the pipeline company's management.

The review by the appropriate authority must be undertaken in order to confirm that the determination was appropriate, that related learning is incorporated, and that information has been shared with workers to increase awareness and prevent similar occurrences.

2. Security Performance Measures

2.1 Training and Competency

Guidance

Employees are a company's greatest security asset; all employees must have knowledge of the company security management program, as well as their role and responsibilities within the program. This measure gathers data on companies' security training program.

The information collected as a result of this measure should not include data on a company's security awareness process. The CER recognizes that security awareness initiatives (such as posters, bulletins or notices on a company's intranet, etc.) are valuable components of a company's overall security management program. Nevertheless, security awareness initiatives do not replace the need for training for each employee.

Subsection 6.5(1) of the OPR states that a company shall, as part of its management system,

(j) establish and implement a process for developing competency requirements and training programs that provide employees and other persons working with or on behalf of the company with the training that will enable them to perform their duties in a manner that is safe, ensures the security of the pipeline and protects the environment;

(k) establish and implement a process for verifying that employees and other persons working with or on behalf of the company are trained and competent and for supervising them to ensure that they perform their duties in a manner that is safe, ensures the security of the pipeline and protects the environment.

Average Number of Employees Requiring and Having Current Security Training (counts per pipeline system)
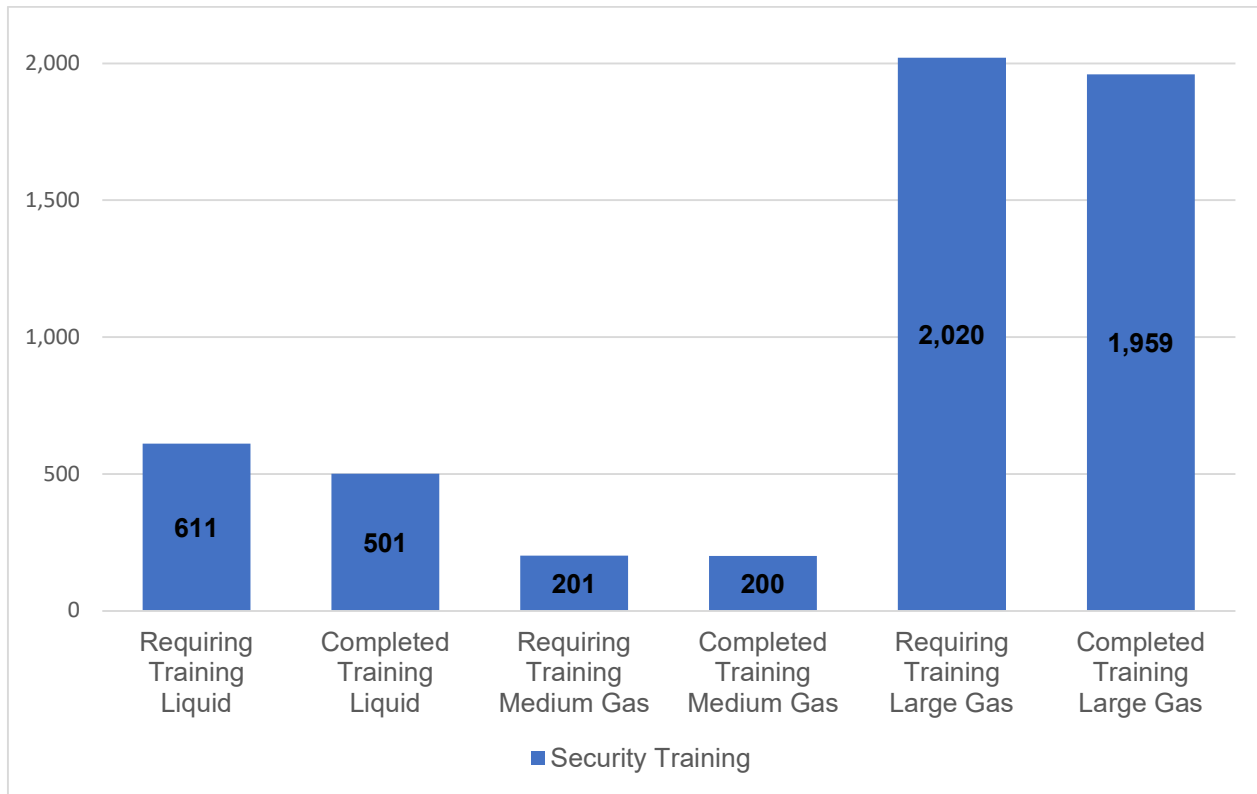
Figure 2.1

Who is a "company employee"?

This measure applies to all employees of a company. This includes employees that are involved in regular, abnormal or upset conditions on CER-regulated pipelines. It also includes employees who are working in the same location as these employees but are not directly involved with CER-regulated pipelines.

The company management system should identify any consultants and contractors that require security training. This measure also applies to these consultants and contractors.

Paragraph 6.5 (1)(l) of the OPR requires that a company establish and implement a process to make persons working on behalf of a company aware of their responsibilities. Paragraph 6.5(1)(q) of the OPR requires that a company establish and implement a process for coordinating and controlling operational activities of employees or other people working with or on behalf of the company so that each person is aware of the activities of others.

What is "current security training"?

Current security training means that as of the end of the reporting period an employee has the required training as set out in the company's security training program. The company's

security training program will define what level of training every employee requires and the length of time between initial and follow-up training.

While Clause 8.3.2 of CSA Z246.1, *Security Management for Petroleum and Natural Gas Systems*, recommends a 24-month recurring timeline for training, companies are expected to define the timeline for follow-up training within their management system, based on security training needs.

The type and extent of training may vary depending on an employee's position and location in the company. For example, an employee working in a corporate environment may receive training regarding handling mail or on protection of information measures. Operations employees working at field locations may receive training on suspicious activity and photography, or on recognizing and handling suspicious packages. Finally, employees with a designated security role may receive enhanced training on documenting, reporting and managing security incidents.

Security training is a structured learning event with a means of assessing employee competence. Examples include:

- Computer-based module with a test/exam; or
- Instructor-led training with a test/exam.

This performance measure does not require a company to report the type of security training provided to employees. However, companies are expected to track this information internally along with its other performance measures for security for inclusion in the company's annual report required under Subsection 6.6(1) of the OPR. The CER will review this material during on-site compliance activities.

3. Emergency Management Performance Measures

3.1 Emergency Response Exercises

Guidance

The purpose of this measure is to collect information regarding companies' preparedness to mitigate hazards and risks associated with emergency responses. Paragraphs 6.5(1)(f), (t) and (u) of the OPR provide guidance on the management system processes necessary for such mitigation. Each category of exercises in this measure is to be reported separately.

Average Number of Planned and Conducted Emergency Response Exercises (exercises per pipeline system)
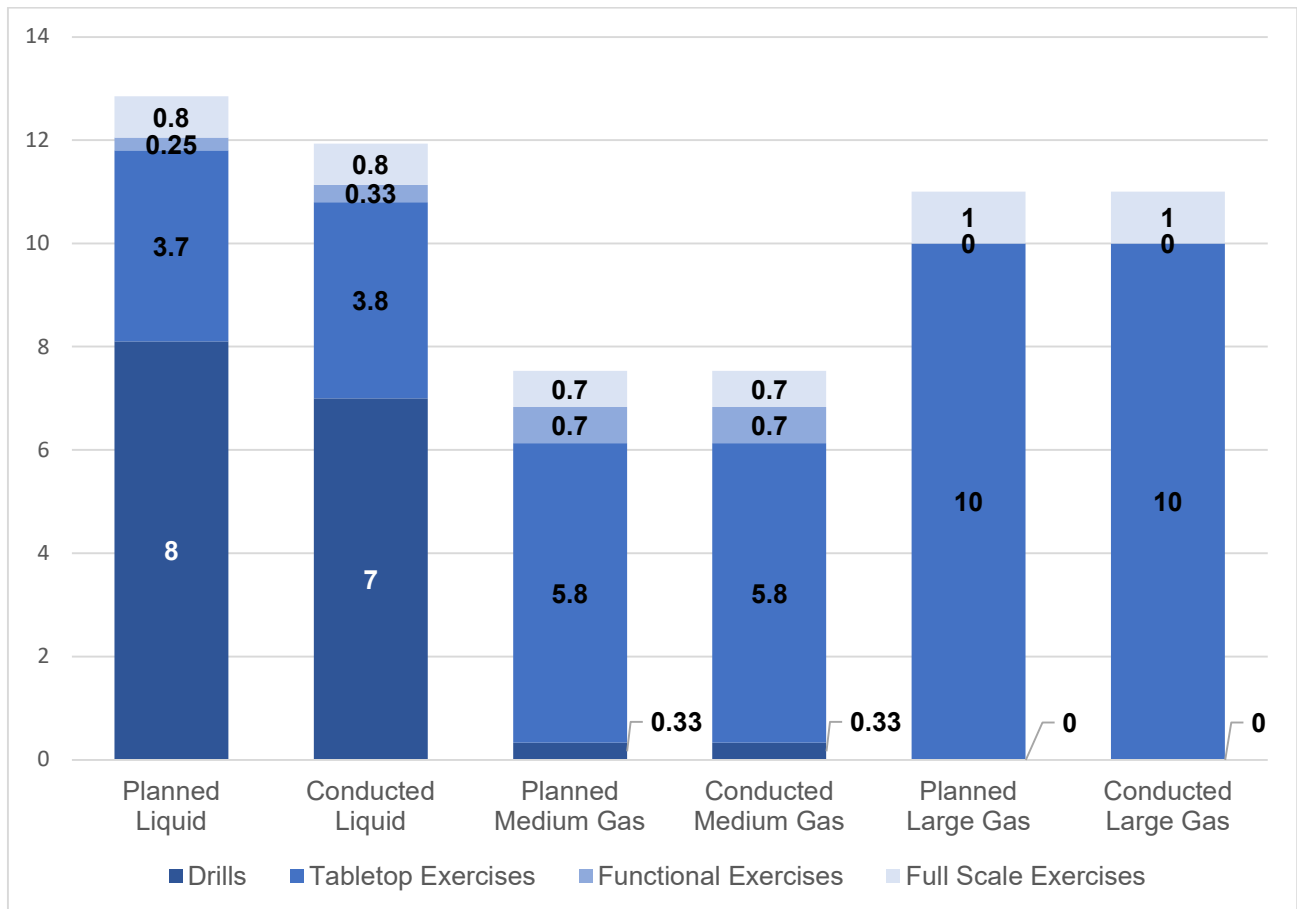
Figure 3.1

What is an "emergency response exercise"?

For the purposes of these performance measures, emergency response exercises are defined as follows:

- Drills: a supervised activity that tests a single or specific operation or function. Drills are commonly used to provide training on new equipment, or test new procedures;

to practice and maintain skills; or to prepare for more complex exercises. For the purposes of this measure, "man down" and fire drills are excluded and should not be reported.

- Tabletop Exercise: a facilitated analysis of an emergency situation in an informal, stress-free environment. A tabletop exercise is designed to elicit constructive discussion as participants examine and resolve problems based on existing operational plans and identify where those plans need to be changed.

- Functional Exercise: a single or multi-agency activity designed to evaluate capabilities and multiple functions using simulated response, without moving real people or equipment to a real site. A functional exercise is designed to evaluate management of emergency operations centers, command posts and headquarters.

- Full-Scale Exercise: a multi-agency, multi-jurisdictional activity involving the mobilization and actual movement of emergency personnel, equipment, and resources, as if a real incident had occurred.

Companies may report a real incident as an exercise if it meets the same objectives as the planned exercise, if the incident occurs in the region that a planned exercise was to occur, and if appropriate methodology is used.

What is the difference between a drill and a functional exercise?

A drill involves a single function, whereas functional exercises involve multiple functions. Drills involve the actual deployment of resources and personnel, whereas functional exercises use simulation.

3.2 Communication

Guidance

Companies are required under section 33 of the OPR to establish and maintain liaison with the agencies that may be involved in an emergency situation. Under section 34, companies must take reasonable steps to make sure that all parties are aware of the procedures to be followed in an emergency situation. The information provided by the company must be consistent with what is specified in the company's Emergency Procedures Manual (EPM), required by section 32 of the OPR.

At the time of an emergency situation, the assistance of various first responders (e.g. fire, police and medical) as well as other parties may be required. Prior knowledge of potential hazards and individual roles by the company personnel, first responders and other parities prior to an emergency is critical for the safety of all involved.

Average Number of Planned and Conducted Emergency Management Liaison Activities (activities per pipeline system)
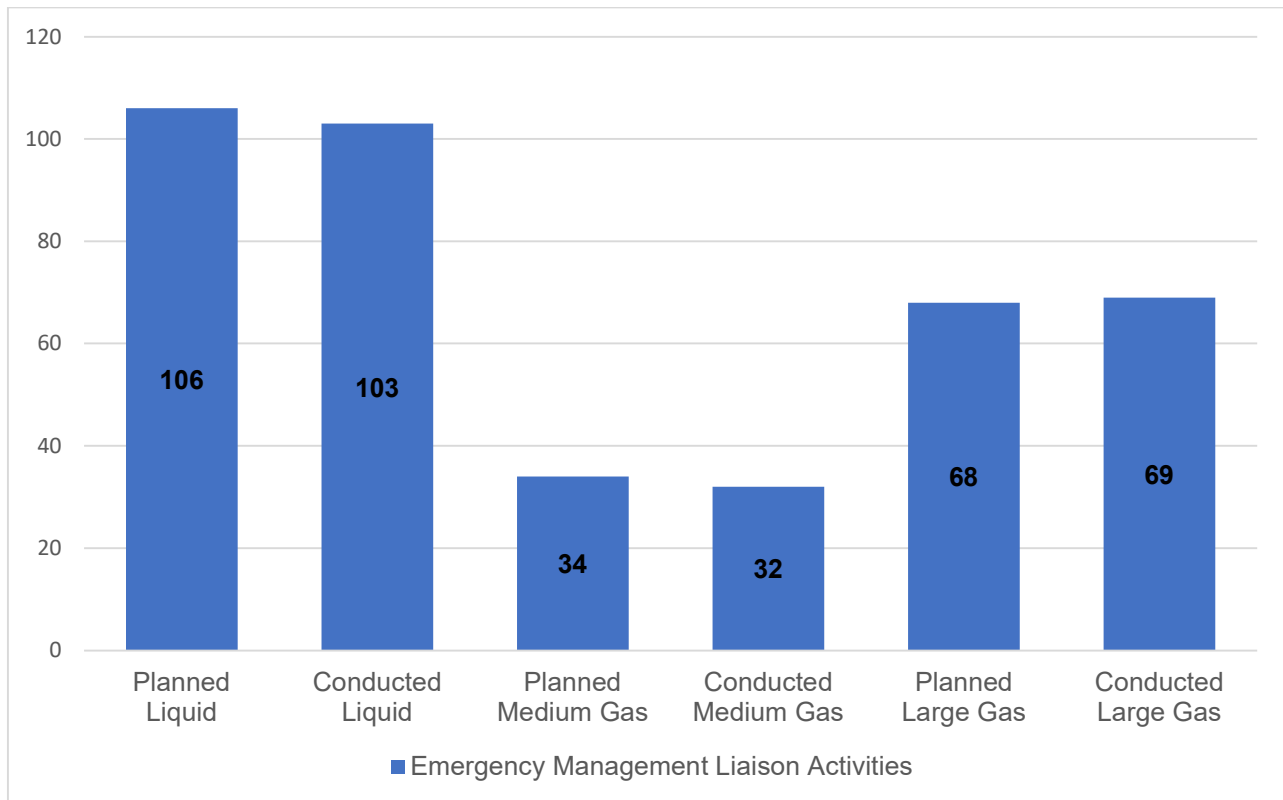
Figure 3.2

What are "parties"?

Parties include: police, fire departments, emergency medical services, and all other appropriate organizations (e.g. mutual aid partners, contractors, spill cooperatives,

government departments and agencies (e.g. CER, Transport Safety Board), Aboriginal groups where applicable, and persons who may be associated with an emergency response activity on or adjacent to the pipeline).

What are liaison activities?

A liaison activity is an exchange of information to gain mutual understanding and cooperation with parties that may be involved in an emergency situation. Examples of information discussed in an exchange of information include:

- the type and locations of a company's facilities;
- all potential hazardous products transported in the pipeline and/or stored at company facilities in significant volumes;
- key roles of personnel and agencies involved in an emergency;
- response capabilities (e.g. of people, equipment); and
- emergency procedures and practices for dealing with an emergency consistent with those specified in the EPM.

Liaison activities reportable for this measure include: meetings, telephone conversations, information sessions, and presentations.

In the case of multiple parties participating in an integrated liaison event, each party that is participating can be considered a liaison activity for the purposes of this measure.

3.3 Training and Competency

Guidance

Section 46 of the OPR requires a company to develop and implement a training program for any employee directly involved in the operation of a pipeline. The section requires the training program to instruct the employee on the emergency procedures set out in the EPM and the procedures for the operation of all emergency equipment that the employee could reasonably be expected to use.

In addition, the EPM should list roles and responsibilities for employees and contractors of the company. The employees and contractor staff referred to in the measure are those identified as fulfilling a role in the EPM.

Average Number of Employees and Contractors Identified as Having a Role and Responsibility During an Emergency and Having Up-to-Date Training in Those Roles and Responsibilities (counts per pipeline system)
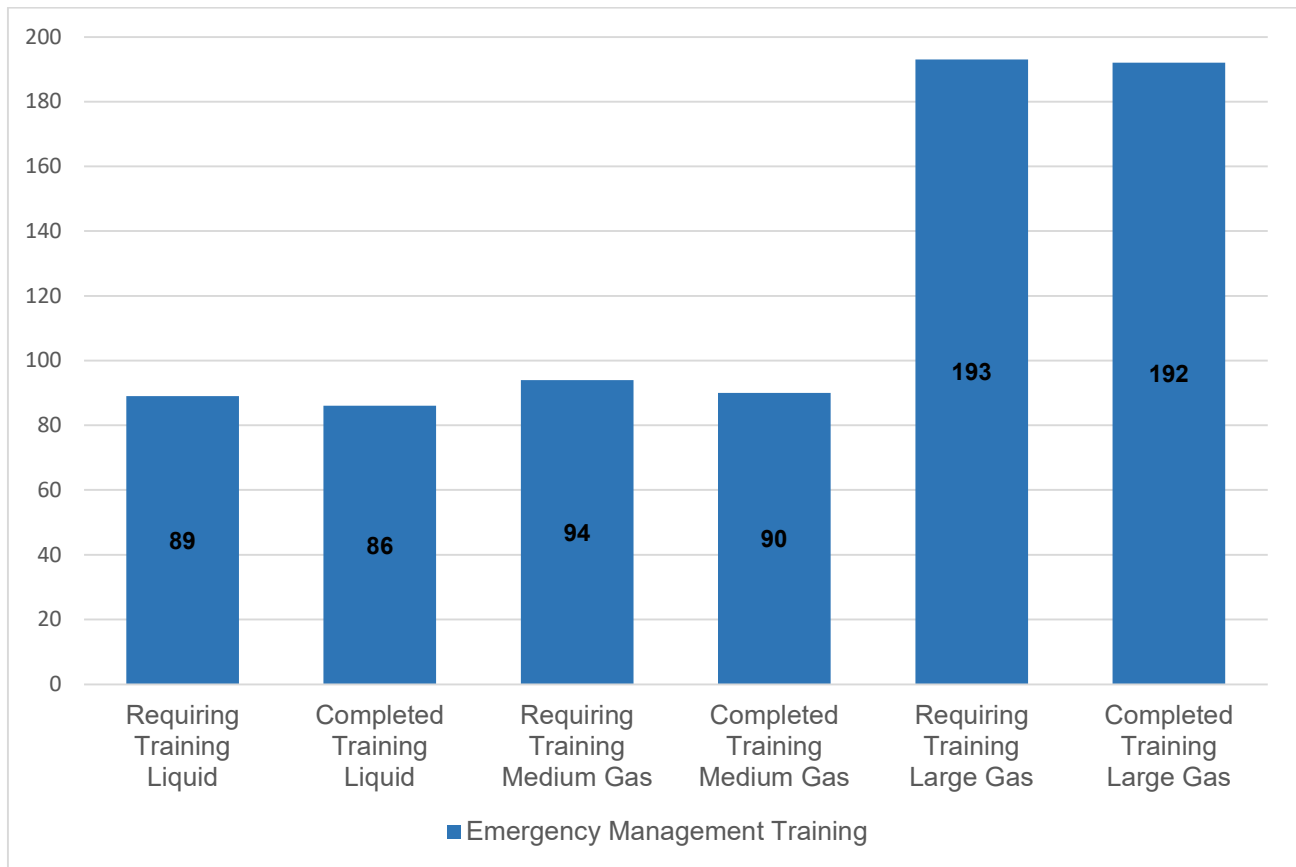
Figure 3.3

How does a Contractor fulfill a role in the EPM?

Often contractors fulfill a company role in responding to an emergency on its behalf or performing critical roles for incident command. For the purposes of this measure, these

contractors are considered equivalent to company staff. Contractors that are fulfilling contract requirements for equipment or supplies on an "as needed" basis are not to be included in this measure.

What is "trained"?

Trained refers to employee training on the emergency procedures set out in the EPM and response plans, as well as training on the procedures for the operation of all emergency equipment that an employee could reasonably be expected to use.

Employees and contractors working with the company on December 31 of the year in which the measures are being reported on must be counted as trained for the purposes of this measure. Employees and contractors who were trained earlier in that calendar year but who are no longer employed with the company are not to be counted as trained for this measure. Contractors that are on an "as needed basis" are also not to be counted as having been trained.

What is "up-to-date training"?

Up-to-date training means that at the end of the year being reported on, an employee or contractor has the required training. Training requirements for roles and responsibilities should either be in a training program, in a company management system or in the emergency management program. These processes should identify a frequency for training. An employee must meet the minimum requirements set out in these processes.

At the end of the reporting period the training records for all employees and contractor staff will be assessed to determine if the training is up-to-date with the company requirements. It is recognized that new employees may not have received all training by the end of the calendar year. However, the reported information must include all employees that have not met the training requirements, including new employees.

3.4 Coordinating Operational Activities

Average Number of Employees and Contractors Identified as Having a Role and Responsibility During an Emergency and Being Trained in Those Roles and Responsibilities (counts per pipeline system)
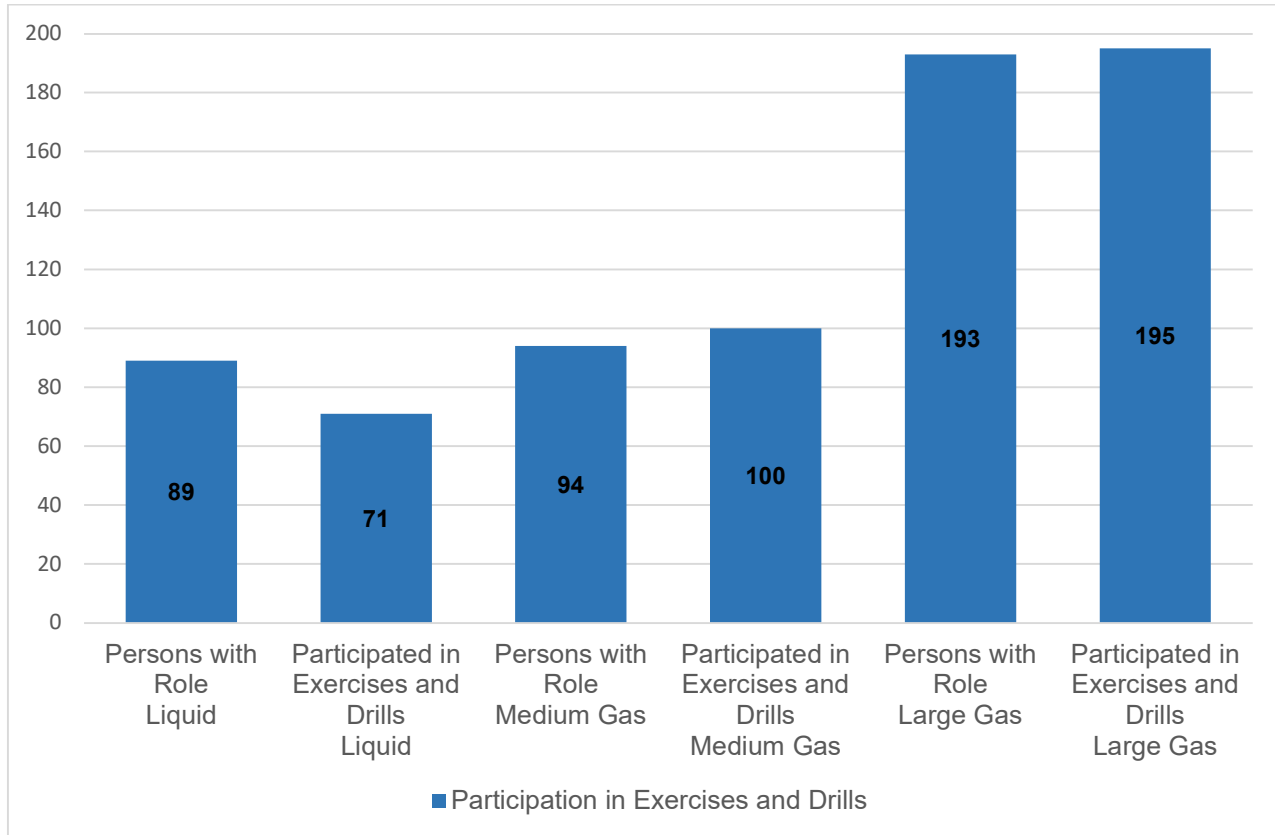
Figure 3.4

What is an "emergency response exercise"?

Emergency response exercises and exercise frequency are discussed in Emergency Management Performance Measure #1.

What are "roles and responsibilities"?

The EPM should list roles and responsibilities for employees and contractors of the company. The employees and contractors referred to in the measure are those identified as fulfilling a role in the EPM.

If an employee, identified as having a role in the EPM, has participated in several drills or exercises, that person should only be counted once.

What is a "contractor"?

For the purposes of this measure, a contractor is a person that is not an employee of the company but that fulfills a company role in responding to an emergency or performing critical roles for incident command on the company's behalf. These contractors must perform this role full time and be integrated into the company's training plan (as if they were company employees). Contractors that are fulfilling contract requirements for equipment or supplies on an "as needed" basis are not to be included in this measure.

What if an employee participates in an exercise in the United States?

The geographic location of an exercise or drill does not preclude its inclusion in the reported information, provided that the conditions of the exercise are similar to those encountered along the company's pipeline. However, when possible, exercises should be conducted in Canada to test integration with Canadian agencies.

4. Integrity Management Performance Measures

4.1 Pipeline Condition

Guidance

This measure provides data which is a consideration in assessing the effectiveness of an Integrity Management Program (IMP) as per Paragraph 6.5(1)(u) of the OPR. A company IMP should track activities, methods of obtaining the data, the resulting data and the mitigation. The actual field verified defects confirmed through field investigations versus the number of features identified by in-line inspection (ILI) for field investigation will provide a leading measure of the effectiveness of the IMP. It is expected that all field verified defects will be repaired or mitigated.

As a result of processing times, permit approvals, weather restrictions and other such conditions, it is possible that field verification will not be executed within the same reporting year as the ILI. Only field verified data (e.g. Non-Destructive Examination (NDE) data) obtained in the year that is being reported on should be provided.

Average Number of Features Identified for Field Investigation and Those Found to be Defects and Repaired (counts per pipeline system)
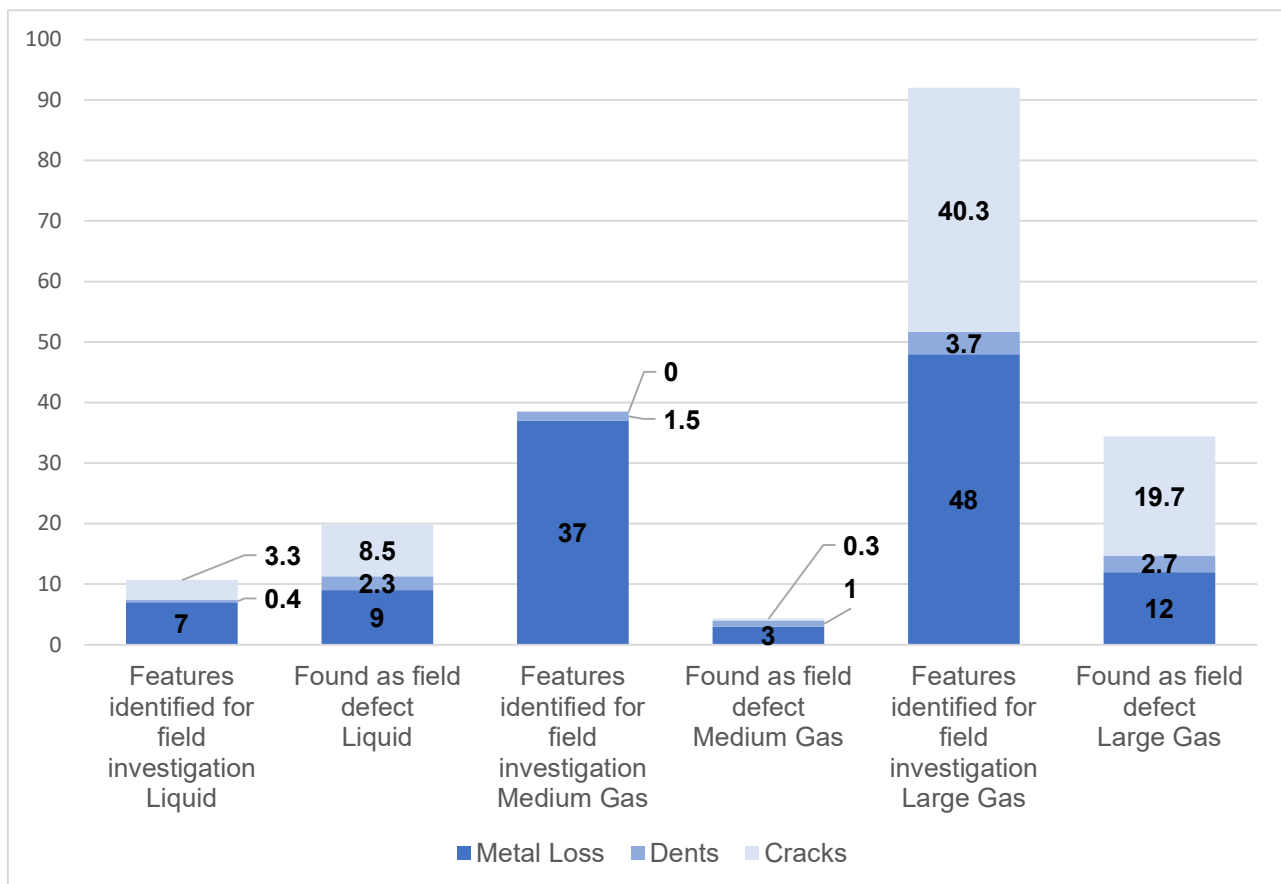
Figure 4.1

What is an "ILI feature"?

An ILI feature is an unexamined deviation in pipe material or welds detected and/or reported by an ILI.

What is "metal loss"?

Pipeline metal loss is a reduction in wall thickness that is primarily due to corrosion, gouges and grooves. Metal loss defects are identified in accordance with Clause 10.10.2.7 of CSA Z662 (corrosion) and Clause 10.10.3 of CSA-Z662 (gouges and grooves).

What is a "dent"?

A dent is a dent defects as described in Clause 10.10.4.2 of CSA Z662.

What is a "crack"?

Cracks include both mechanically driven and environmentally assisted cracking (e.g. Stress Corrosion Cracking (SCC), Stress Corrosion Fatigue) on the pipe body, seam or girth weld, as defined by Annex H of CSA Z662.

With respect to the relation between cracks and ILI reports, the company must identify how it will address all cracks as a result of ILI reports. Cracks are reported using a variety of terminology. An ILI feature reported as "crack-like", "crack-field", "seam-weld anomaly", or other linear anomaly which could be interpreted to be a crack, must be considered as a crack for this measure.

Why do cracks greater than 40% need to be addressed?

Cracks of any length or depth are considered defects according to CSA Z662. However, ILI technologies may not be able to accurately size cracks deeper than 40% of the nominal wall thickness. Therefore, companies must further investigate all cracks deeper than 40% of the nominal wall thickness for repair or mitigation.

What method should be used to measure cracks?

Depths and lengths of crack features can be measured by buffing or non-destructive examination, ILI, or a combination of these. Consideration must be given to each method's uncertainty when selecting features to be field-investigated (as described in Annex D of CSA-Z662).

If a "colony" of cracks is encountered how is it dealt with?

For a cracking colony (e.g. SCC), companies must report each crack feature within the colony with a depth greater than 40% of the nominal wall thickness.

Will reporting on this measure replace significant SCC reporting?

At this time, this reporting is not intended to replace significant SCC reporting.

If an engineering assessment is conducted, do the defects identified through ILI or field investigation still have to be included as if they were defects as defined under CSA Z662 or exceeding the 40% crack criteria?

Yes. Even though the engineering assessment could provide the criticality analysis that the feature or defect can remain in the pipeline without the immediate impact on integrity, such defects must still be reported, because they exceed the acceptability criteria.

Therefore, companies must still report the number of features or defects remaining in the pipeline exceeding the criteria provided in the measure. Companies may provide clarification related to further action taken or to be taken when reporting on the measures.

What does a company report when it has not performed field investigation and repairs or mitigation?

If a company has not performed any field investigation (excavation) including repairs or mitigation of features, or where no defects were field verified, then this measure should be reported as no defects found for repair or mitigation. Companies should only report on actual field verification activities.

What are "permanent or temporary repair methods"?

Defects can be repaired using temporary or permanent methods. Temporary or permanent methods can be found in Clause 10.12 and Table 10.1 of CSA Z662, respectively.

What is a defect mitigated by pressure reduction?

A defect mitigated by pressure reduction is a field verified defect that is being mitigated by means of a pressure reduction (to restore factors of safety in accordance with CSA Z662). Where a pressure reduction is performed as both a repair and mitigation measure to address a single defect, the defect subjected to the pressure reduction is only reported under Integrity Management Performance Measure #1.

Where multiple repairs and/or mitigations are performed on a complex defect, the company must report the number of individual defects found and repaired/mitigated in the complex

defect. For example, for a crack in a dent, if the company used pipe replacement to remove both defects as the repair method, it would report two defects repaired.

4.2 Equipment Inspection

Guidance

The purpose of this measure is to track completion of scheduled facility integrity inspections so as to prevent harm to employees, the public and the environment. This supports Paragraph 6.5(1)(u) of the OPR, which requires a process for inspections for an IMP.

Average Tank Inspections Scheduled vs Conducted
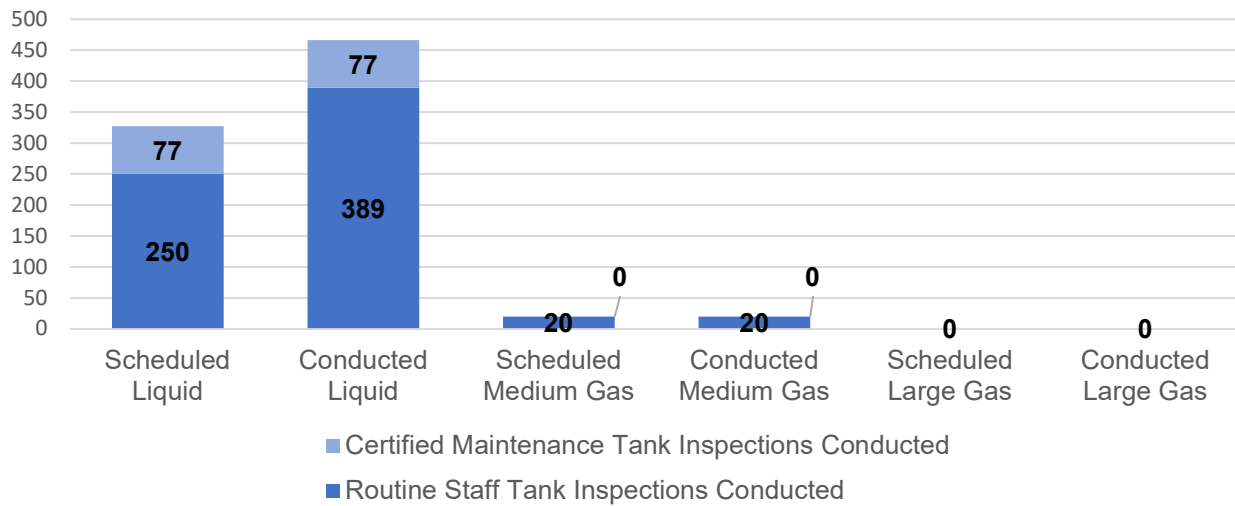
Figure 4.2.1

Average Mainline Valve Inspections Scheduled vs Conducted
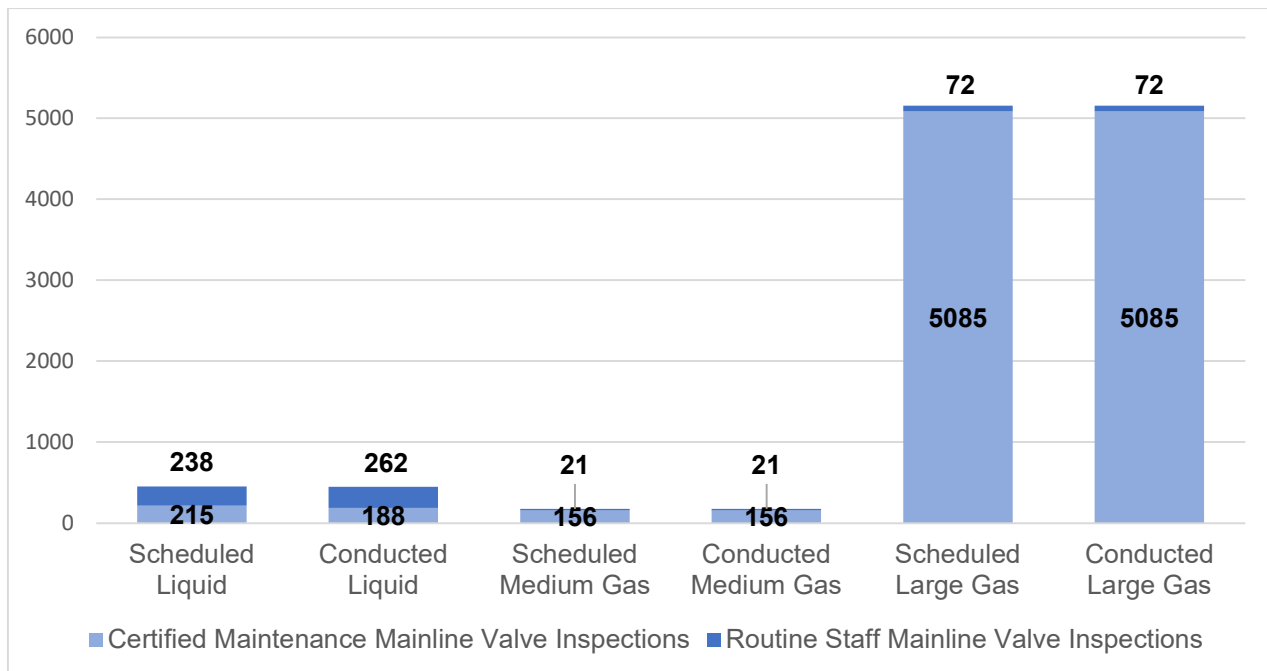
Figure 4.2.2

What is a "facility"?

For the purposes of this measure, a facility may include pump stations, compressor stations, metering stations, mainline block valve yards, tank farms, and launcher and receiver yards. This definition is intended to be consistent with the facilities identified in CSA Z662.

What tanks and mainline valves are to be assessed - some or all?

All tanks and mainline valves that are suitable for service that have not been formally deactivated, decommissioned or abandoned are expected to be inspected.

What "tanks" are included?

A company shall include all tanks (see Clause 4.15 of CSA Z662) that are part of the pipeline system or facility and have not been formally deactivated, decommissioned or abandoned. This includes sump tanks for laboratories.

What is considered a "mainline valve"?

Mainline valves are sectionalizing valves as defined in CSA Z662. Clause 4.4.3 of CSA Z662 identifies where these valves may be installed. Generally these valves are installed between large sections of pipeline and are able to stop the flow in a pipeline section.

What does "scheduled inspection" mean?

For the purposes of this measure, a scheduled inspection includes inspections, both initially planned (for the year being reported), as well as inspections that were subsequently added (during the year being reported). However, a scheduled inspection does not include corrective action (follow-up) inspections unless they are scheduled at the start of the year in which the measure is being reported. As a result, the number of completed inspections should not exceed the number scheduled.

What is an inspection?

An inspection that is typically counted in this measure is one that has been scheduled in the following categories:

a. Routine staff inspections (e.g. daily and monthly); and
b. Certified inspections (e.g. according to a maintenance schedule which may or may not be linked to a required standard).

As a minimum, the company is required to report the number of inspections scheduled and conducted as required by CSA Z662 (Clauses 10.9.2.1, 10.9.3.1 and 10.9.6.2). Certified inspections would be carried out in accordance with any standards referenced within CSA

Z662 such as American Petroleum Institute (API) 653, which covers above-ground tanks. Inspections of a valve must include partial operation of the valve.

Inspections of underground tanks must include leak detection systems and should be conducted in accordance with National Fire Protection Association (NFPA) 326, *Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair* and National Leak Prevention Association (NLPA) Standard 631, *Entry, Cleaning, Interior Inspection, Repair, and Lining of Underground Storage Tanks*.

4.3 Facility Piping Inspection

Guidance

The purpose of this measure is to track completion of planned facility integrity inspections so as to prevent harm to employees, the public and the environment. This supports Paragraph 6.5(1)(u) of the OPR, which requires a process for inspections for integrity management.

Average Number of Facility Piping Inspections Scheduled and Conducted (inspections per pipeline system)
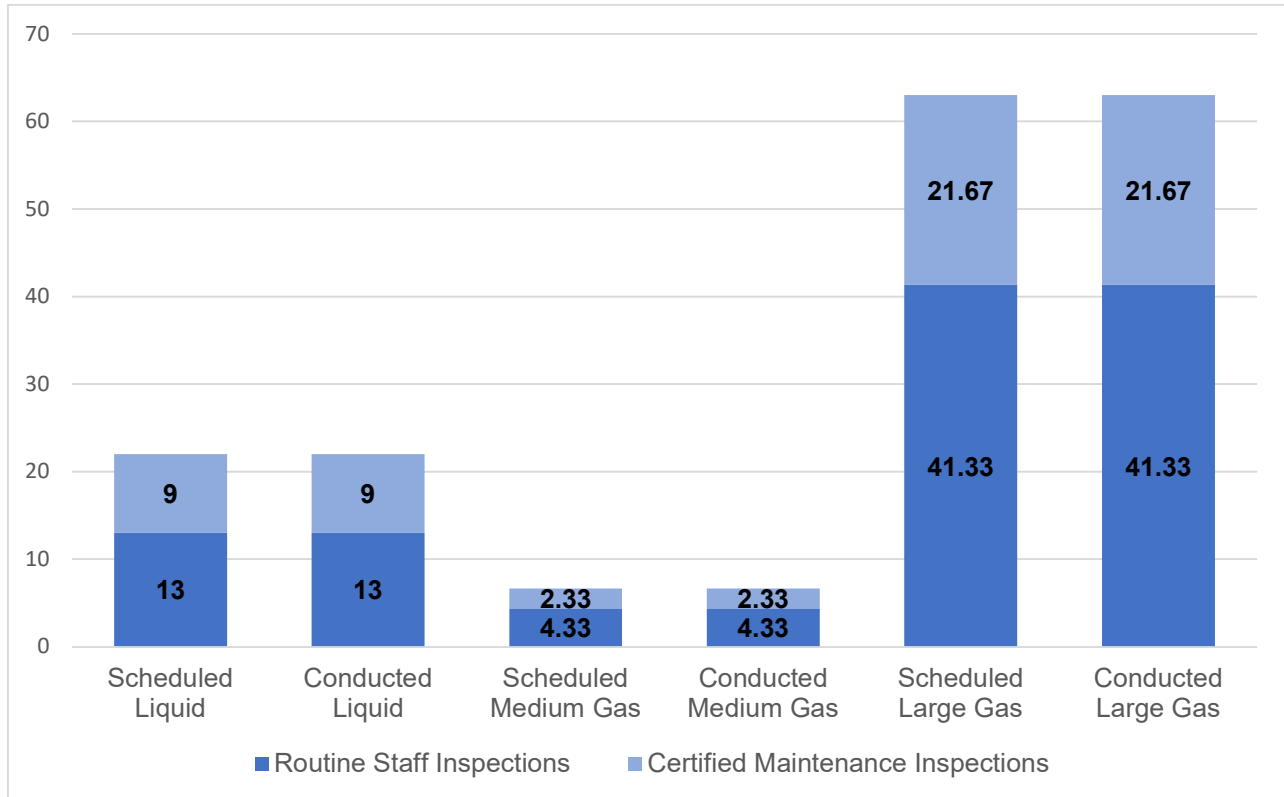
Figure 4.3

What does "scheduled inspection" mean?

For the purposes of this measure, a scheduled inspection includes inspections, both initially planned (for the year being reported), as well as inspections that were added (during the year being reported). However, this does not include corrective action (follow-up) inspections unless they are scheduled at the start of the planning year.

What is a "piping inspection"?

An adequate and effective IMP should identify that piping inspections are to be conducted commensurate to the hazards (see API 570, referenced within CSA Z662). This may include: visual inspections, non-destructive testing inspections, cathodic protection surveys,

pressure testing and other methods. Certified maintenance inspections are those that are conducted in accordance with a detailed maintenance schedule that should be guided by a standard such as API. Any above-ground and below-ground piping at a facility that carries product is to be included when reporting on this measure.

4.4   Facility Inspection Effectiveness

Guidance

The purpose of this measure is to track the number of incidents at liquid and gas facilities and to compare this number to the number of facilities.

Average Number of Reportable Incidents and Facilities (counts per pipeline system)
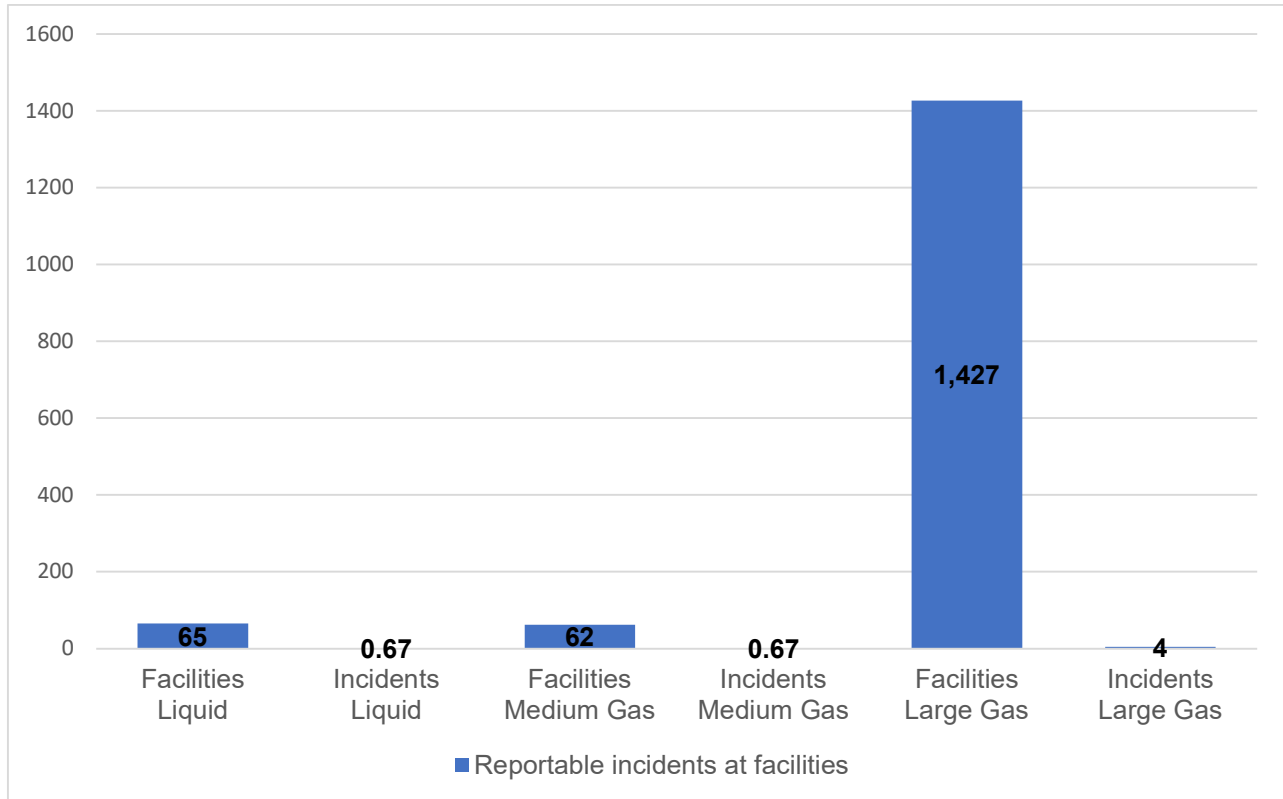
What are "reportable incidents"?

A reportable incident refers to the definition of incident contained in the OPR. Reporting requirements for incidents, as defined in the OPR, are identified in section 52 of the OPR.

What are "liquid facilities"?

Liquid facilities are above-ground or in vaults and include: pump stations, metering stations, mainline block valves, tank farms, terminals and launcher and receiver yards.

What are "gas facilities"?

Gas facilities are above-ground or in vaults and include: compressor stations, metering stations, mainline block valve, and launcher and receiver yards.

4.5 Assessment of Pipeline Hazards

Guidance

The purpose of this measure is to track completion of planned pipeline integrity inspections so as to prevent harm to the public and the environment. This supports Paragraph 6.5(1)(u) of the OPR that requires a process for monitoring facilities.

Average Kilometres of Pipeline Assessed for Susceptible Hazards (kilometres per pipeline system)
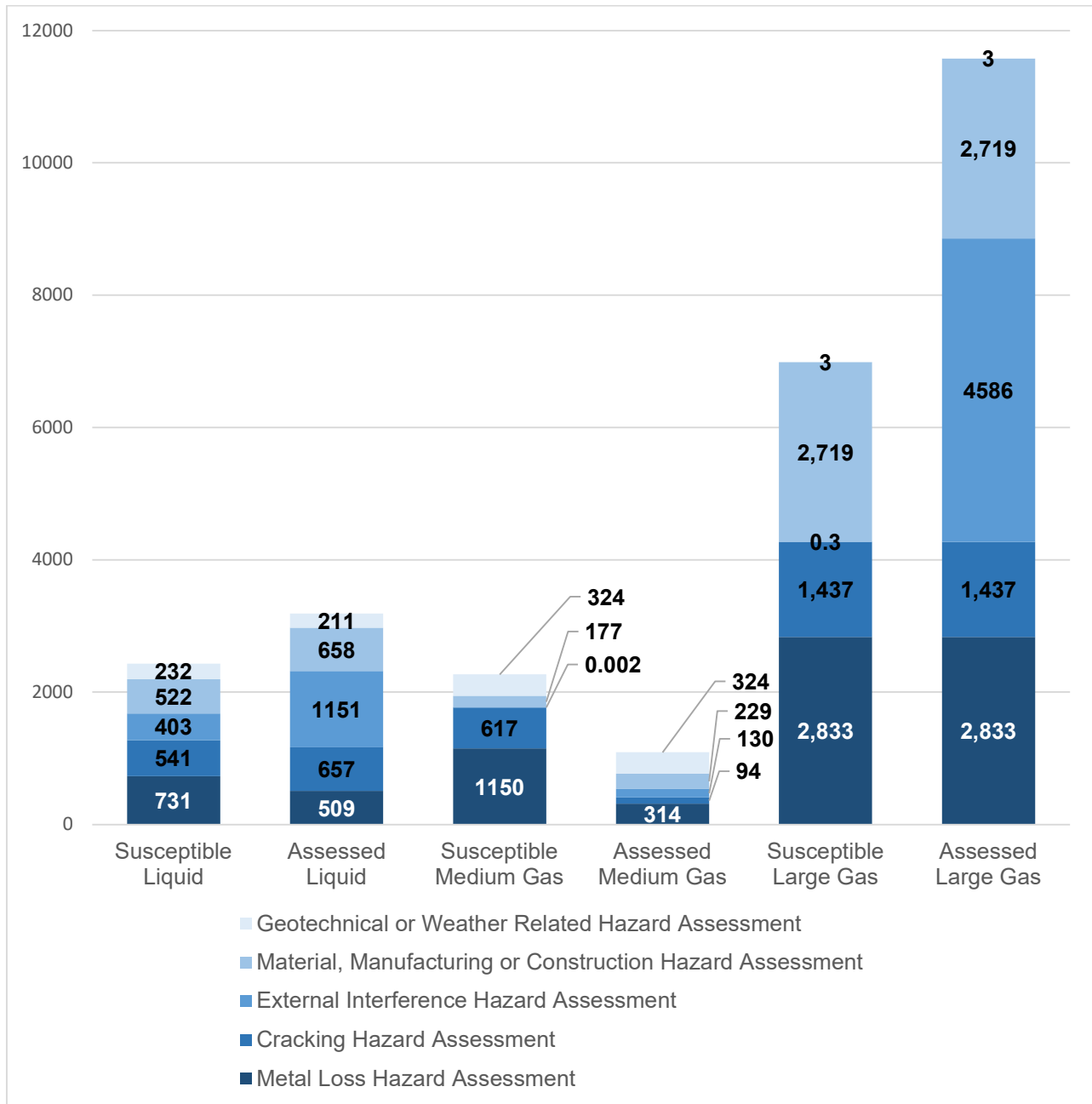
Figure 4.5

How does a company report this measure?

Companies are to report this measure based upon integrity hazard assessment reports received in the year that is being reported on. Each hazard assessment method is to be identified for each hazard and if ILI is used for assessment then the ILI resolution must be recorded and reported.

What does "integrity hazard" mean?

An integrity hazard is any of the five pipeline integrity hazards identified in the measure that are encountered through digs or through integrity assessments. A section of pipeline may have more than one identified hazard. Each hazard will be assessed under more than one measure regardless of quantity and severity. Clause 2.6.1 of Annex H of CSA Z662 describes the hazards in terms of primary causes of pipeline failures.

What is "susceptible hazard"?

A pipeline is considered susceptible to a hazard unless it has been demonstrated (e.g. Through ILI, investigative digs) that the likelihood of this hazard condition is negligible.

What is included in a pipeline integrity hazard assessment?

A pipeline integrity hazard assessment is:

- Conducted for every pipeline integrity hazard. This means that there may be multiple measures based on the number of hazards for a pipeline; and
- Validated with data from ILI, hydro-testing and direct assessment.

A pipeline integrity hazard assessment must consider manufacturing, construction, testing and operational and maintenance records (e.g. operating pressures, repairs, growth rates, incidents), and condition monitoring.

What is to be reported for external interference?

The potential for external interference from unauthorized activities on the right-of-way exists on all portions of a pipeline. In this case the hazard is limited to pipeline depth of cover less than originally designed, as determined through surveys.

4.6   Shutdowns for Hazard Control

Guidance

This measure is not a leading measure; it is a lagging measure. This measure assesses the number of shutdowns to protect the public and the environment.

Average Number of Shutdowns of a Pipeline or Facility for Hazard Control (shutdowns per pipeline system)
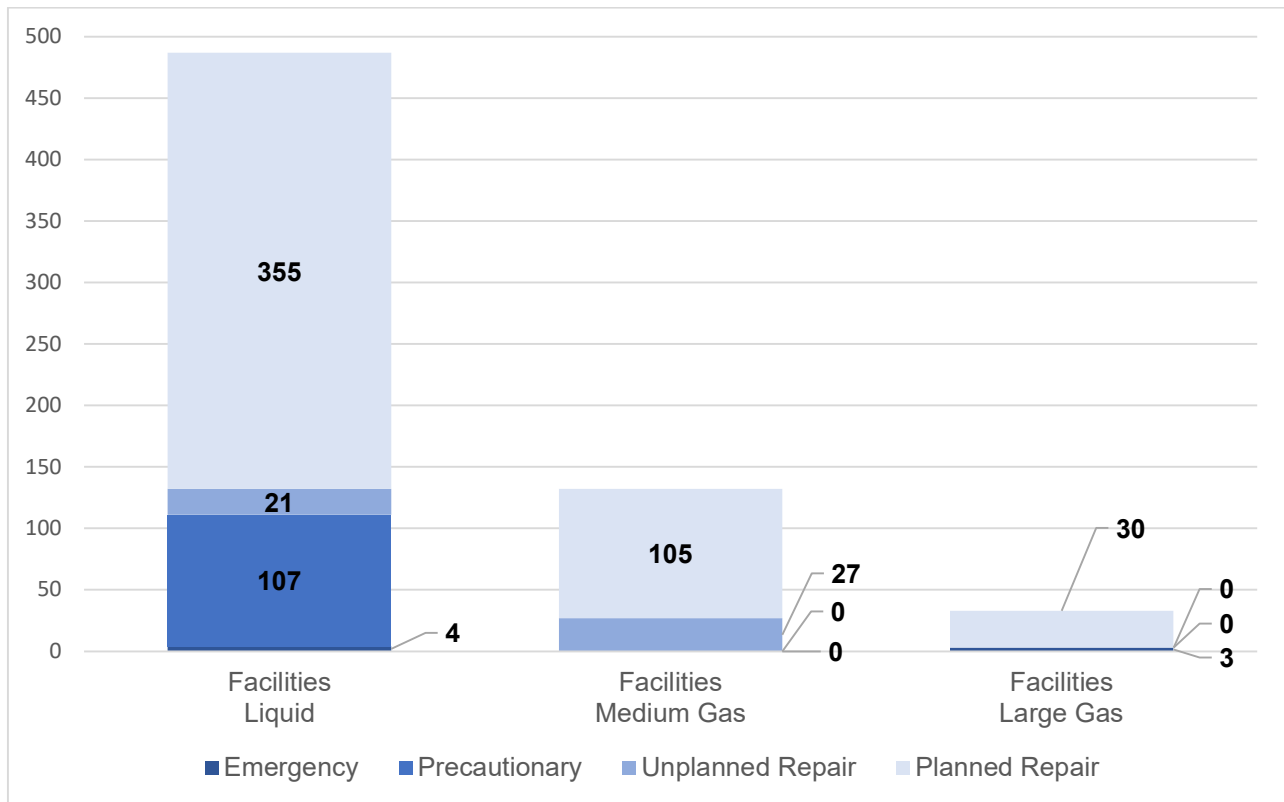
Figure 4.6

What is a facility?

In addition to pipeline segments being shutdown, for the purposes of this measure, a facility shutdown may include pump stations, compressor stations, and tank farms. A facility does not include processing plants.

What is a shutdown for an "emergency"?

An emergency shutdown is for a condition that could include: overpressure, off-spec gas, geotechnical conditions, weather conditions, or release of product. For the shutdown to be considered an emergency it must occur within five days of the condition being identified.

What is a "precautionary" shutdown (i.e. a false alarm)?

A precautionary shutdown (i.e. a false alarm) could occur where the control room operators proactively shutdown the system (based on approved procedures) when they are unable to identify the cause for various alarms on the system. A precautionary shutdown could also occur as a result of calls on the emergency line (before they are followed up with and determined to be a false alarm by company employees).

What is an "unplanned repair"?

An unplanned repair is a repair that was identified as being necessary between six days and 12 weeks from an operations or maintenance activity such as an investigative dig. The unplanned repair must have been identified as being necessary as a result of the operations or maintenance activity. The decision as to whether to undertake an unplanned repair would be based on information obtained at the time of the activity.

What is "planned integrity testing, maintenance or repair"?

Planned integrity testing, maintenance or repair refers to a scheduled activity that should be in the IMP for the year that is being reported on. It may also be a shutdown that was planned more than 12 weeks prior to the shutdown.

5. Environmental Protection Performance Measures

5.1 Program Training

Guidance

The intent of this measure is to gather data on the employees required to have training in the Environmental Protection (EP) Program, and to determine whether these employees have received an appropriate level of training.

The information collected as a result of this measure should not include data on a company's environmental awareness process. Notwithstanding the fact that this measure does not apply to this type of data, awareness of the EP Program and of environmental protection in general should be promoted throughout a company, both in the office and in the field. In addition to the employees requiring training on the EP Program, the EP Program should also identify a process and procedures for implementation of an awareness process at corporate, regional and field offices.

Average Number of Company Employees Who Have Received Training on the Company-wide Environmental Protection Program (EP Program) and Employees Required by the EP Program to Receive Training (employees per pipeline system)
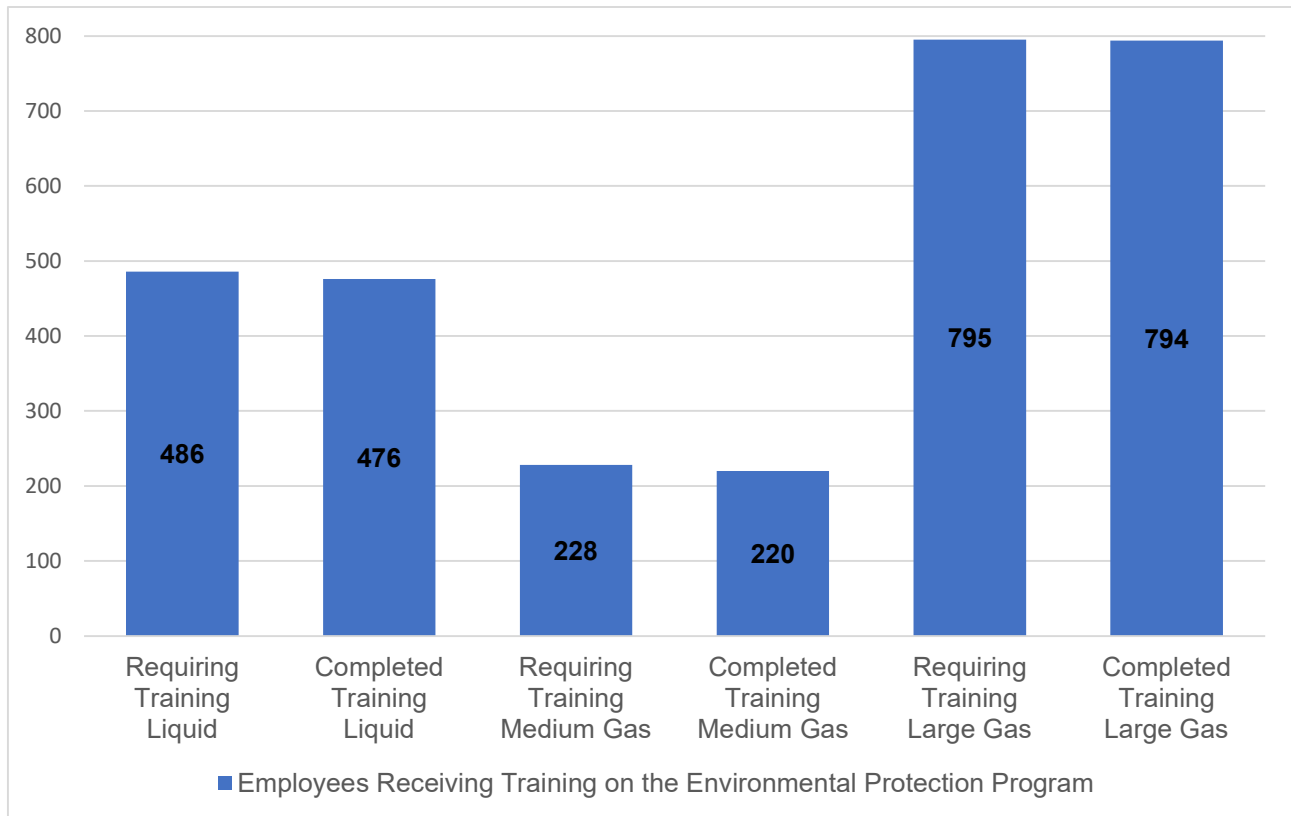
Figure 5.1

What is an EP Program?

Section 48 of the OPR requires companies to develop an EP Program that anticipates, prevents, manages and mitigates conditions which could adversely affect the environment.

EP Programs must be management-system based. Refer to Sections 6.1 to 6.6 of the OPR for details regarding the requirements for a management system, and to section 55 for internal audit requirements.

Who does this measure apply to?

This measure applies to all employees of a company that are required by the EP Program to have training on the program. The company's management system will include a process for training and establishing competency requirements for employees for their assigned tasks related to environmental protection. In addition, the EP Program must identify all employees who have tasks that could involve supervising staff or observing situations where the environment may be impacted. Paragraphs 6.5(1)(j) and (k) identify requirements relating to the processes for training programs, competency requirements and supervision.

What is a "company employee"?

A company employee includes employees that are involved in regular, abnormal or upset conditions on CER-regulated pipelines.

The company management system should identify any consultants and contractors that require EP Program training as substitute resources or provisional contractors. This measure also applies to these consultants and contractors.

Paragraph 6.5 (1)(l) of the OPR requires that a company establish and implement a process to make persons working on behalf of a company aware of their responsibilities. Paragraph 6.5(1)(q) of the OPR requires that a company establish and implement a process for coordinating and controlling operational activities of employees or other people working with or on behalf of the company so that each person is aware of the activities of others.

What is "training on the company-wide EP Program"?

Training on the company-wide EP Program is considered to be a structured learning event with a means of assessing competence. The level of training for each employee along with competency requirements will be appropriate to the level of accountability, and will be identified in the company's management system-based EP Program. For example:

- administrative staff working in the field might be required to take an overview with a quiz;

- managers, professionals and technical (e.g. construction, operation and maintenance) staff might take an on-line module with a test; and
- staff with direct accountability for environmental compliance, such as an environmental specialist/inspector, may be required to have formal classroom training with an exam.

When should employees be re-trained?

Training must be up-to-date. Up-to-date training means that at the end of the year in which the measures are being reported on, an employee or contractor has the required training. This should also be identified in the EP Program or management system. However, retraining is recommended within five years due to advances in industry best practices and potential changes to legislation.

How is this measure reported?

For the purposes of this measure, only employees that are employed with the company as of December 31 in the year in which the measures are being reported on will be counted as completing the training identified in the EP Program.

5.2   Site Specific Training

Guidance

The purpose of this measure is to gather data regarding the level of training on a company's EP Plans so that environmental impacts can be avoided and that appropriate action is taken if they occur.

For both large construction projects and small maintenance digs, any employees and contractors on site are expected to be trained and competent for company environmental protection measures relevant to their assigned tasks.

For additional guidance, refer to Environmental Protection Performance Measure #1.

Average Number of Employees Requiring and Having Site-Specific Environmental Protection Plan Training (employees per pipeline system)
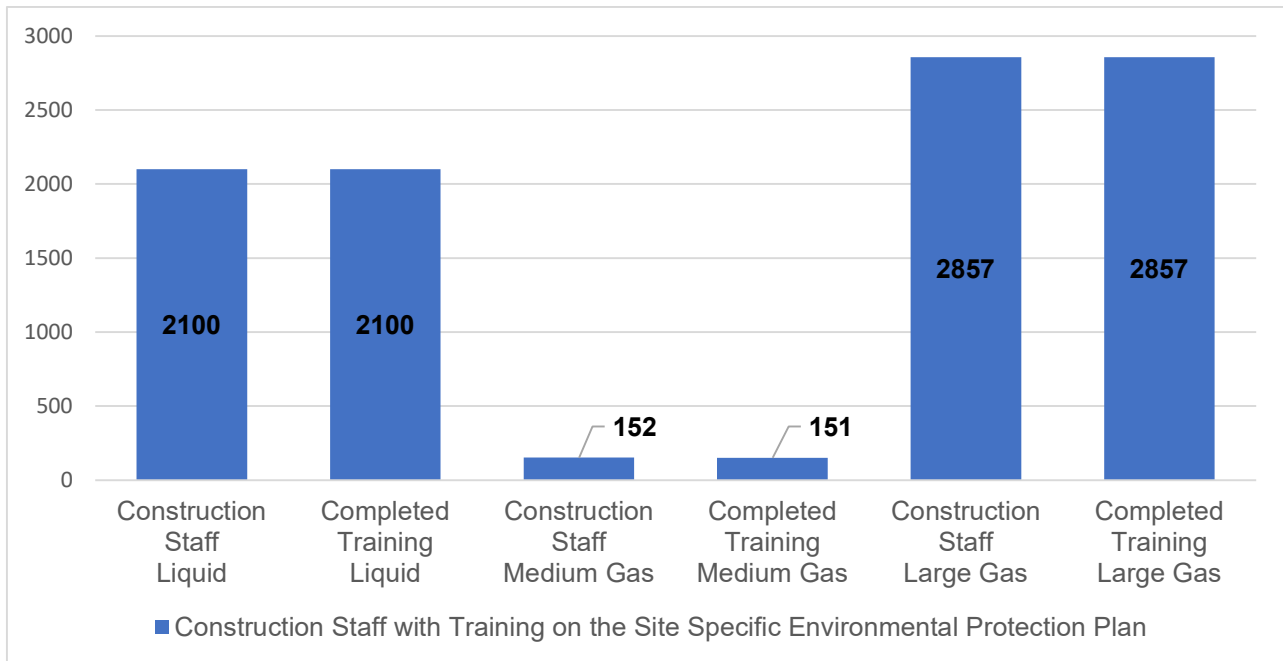
Figure 5.2

What is an EP Plan?

An EP Plan is a site-specific or project-specific plan designed for a construction project of any size where environmental impacts could occur. The EP Plan resides within the EP Program. The CER *Filing Manual* contains additional information about EP Plans.

When is an EP Plan required?

An EP Plan is required for any activity that requires construction, repair or maintenance of a pipeline that has the potential to cause environmental impacts. The level of complexity of an EP Plan may vary. For example, for small maintenance digs, the EP Plan could be the company standard operating procedures (SOPs) that are identified in the EP Program.

5.3 Restoration of Agricultural Land

Guidance

The intent of this measure is for companies to track the status of reclamation on the right-of-way that is in agricultural production. It is the CER's expectation that within a five year period, the right-of-way will be fully reclaimed to a condition similar to the surrounding environment and consistent with the current use of the land.

Average Kilometres of Land Disturbed and Restored (kilometres per pipeline system)
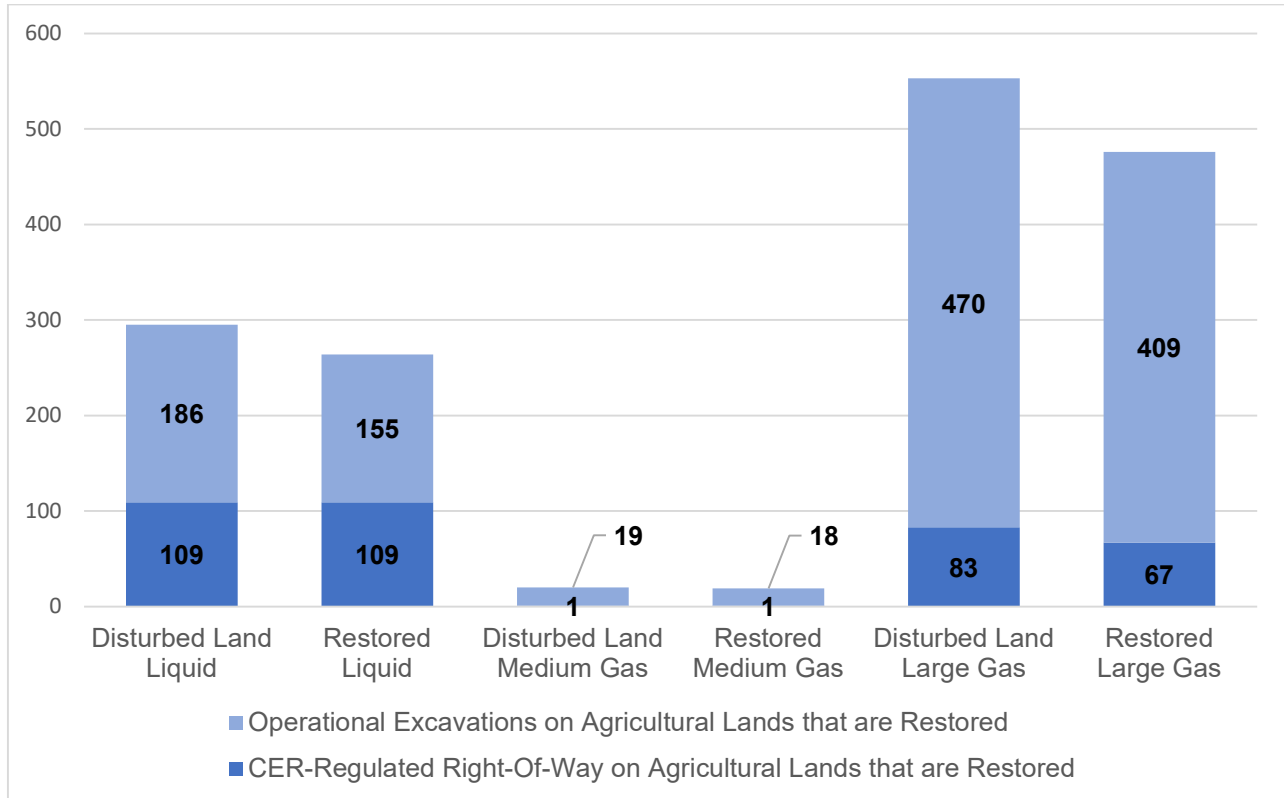
Figure 5.3

To what precision must the length of pipeline right-of-way that is restored be reported?

The length of pipeline right-of-way that is restored is to be reported to a precision of 0.1 of a kilometre (100 metres).

What is "agricultural land"?

Agricultural land is the land currently used for agricultural production for both crop and pasture. Woody vegetation crops (e.g. orchards, berry shrubs, etc.) and native prairie are excluded. In addition, agricultural land use reserve that does not have a demonstrated production is excluded.

What does "restored" mean?

Section 21 of the OPR, as well as CSA Z662 uses the term "restored".

For the purposes of this measure, restored means that the right-of-way is reclaimed or returned to a state comparable to the surrounding environment and that the desired agricultural land use of those lands affected is accommodated when it is reasonable to do so.

Though some forested land is designated as agricultural land, it is not expected that trees would be planted in the right-of-way in these circumstances unless there is a specific requirement for wildlife habitat restoration.

Restoration of roads, railways and wetlands crossed by the pipeline within agricultural land are excluded from this measure.

What is "disturbed agricultural land"?

A right-of-way is considered disturbed agricultural land if there is an activity that breaks ground. This would include disturbances caused by pipe maintenance and new pipeline construction.

What is an "operational excavation"?

An operational excavation is an operations or maintenance activity that breaks ground to conduct a repair or investigation. It may occur at several locations along a pipeline. Each occurrence should be recorded and the reclamation for each occurrence should be tracked within the company management system for the EP Program.

How does a company report this measure?

All right-of-way that has been disturbed five years prior to the reporting year is to be assessed against the commitments made by the company in the original application for the pipeline, in the EP Plan and in compliance with the conditions of approval and the OPR. Therefore, any pipelines built during or after 2009 would be reported on in 2014. This measure includes newly purchased pipelines that are under construction, or new pipelines where post-construction monitoring is being conducted.

This measure is not intended to be retroactive. Rather, it is intended to assess the current reclamation status of the right-of-way for five-year-old pipelines. Therefore, companies are not expected to report on pipelines built prior to 2009.

5.4   Resolution of Environmental Issues

Guidance

The purpose of this measure is to identify environmental issues following the post-construction reclamation period and to make sure that they are recorded and addressed appropriately.

Average Number of Operational Environmental Issues Identified and Addressed (count per pipeline system)
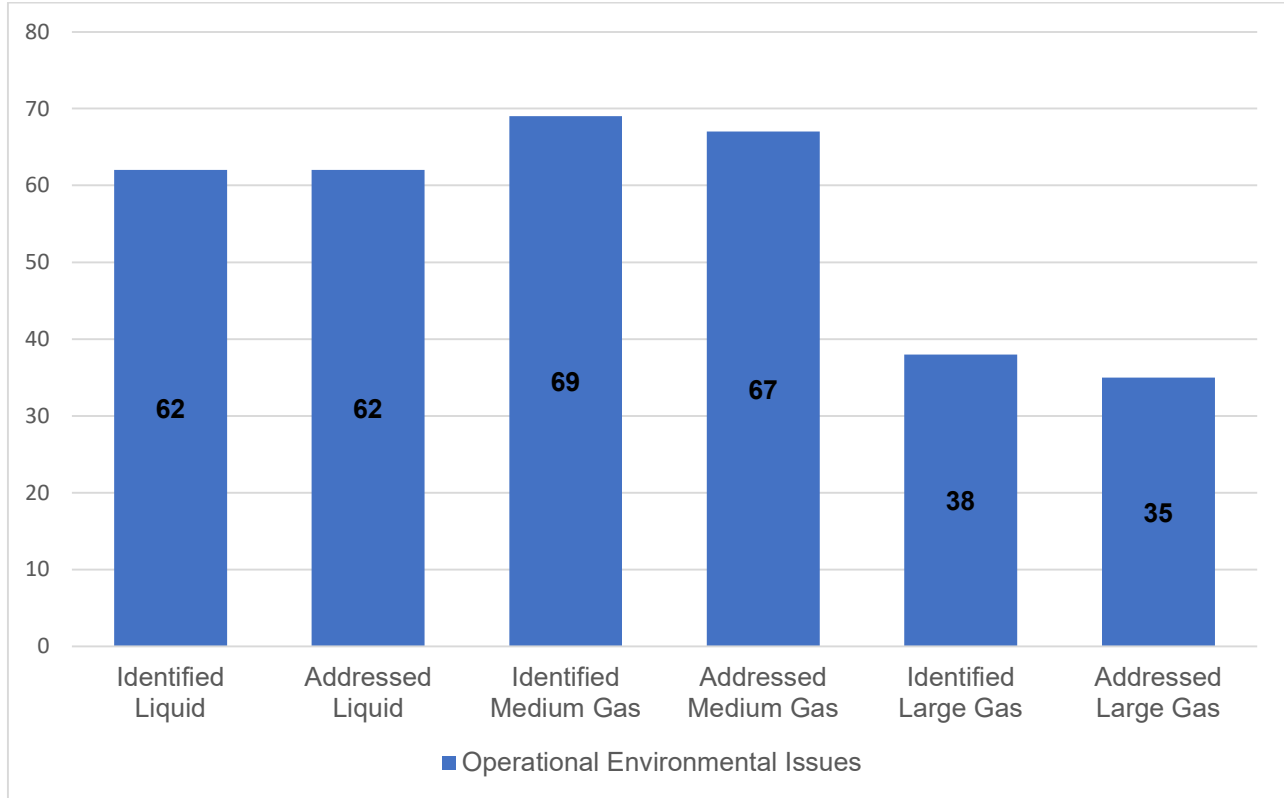
Figure 5.4

What is an "operational environmental issue"?

An operational environmental issue is a liquid release, or an environmental issue that is identified as a result of monitoring and surveillance activities under the company EP Program or EP Plan. Operational issues are identified after the conclusion of the post-construction monitoring (either as voluntarily committed to or as a CER condition of construction) and do not include right-of-way reclamation as a result of construction activities.

Operational environmental issues can include but are not limited to the topics in the following:

Residual Contamination Remediation[2]	• Contamination removal • Contamination containment • Pump and treat
Erosion	• Slopes • Berms • Drainages and watercourses • Ditch line subsidence and excessive elevation
Water Course Crossings	• Bank erosion • Bank slumping • Reclamation of fish habitat • Topography consistent with surroundings • Reclamation of riparian vegetation • Removal of temporary structures, such as bridges or sediment fencing • Potential barriers to fish passage • Changes to watercourse geomorphology
Soils	• Poor drainage • Admixing • Compaction
Vegetation	• Inappropriate reclamation strategy • Incorrect seed mix • Invasive plant and weed infestation
Access Control	• Damage or removal

What is "addressed"?

For the purposes of this measure, addressed means that corrective action has been taken and, over a specified time, resolution will be achieved as committed to in either the company EP Program or EP Plan. For example, if a decision has been made to contain an oil spill to company property and monitor it until a point in time when remediation will occur (e.g. abandonment), then it has been addressed for the purposes of this measure. The issue should be under control and should no longer be causing additional adverse effects on the environment.

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[2] For further information, see the CER Remediation Process Guide.

How does a company report this measure over five years?

To begin reporting, a company must have completed its post construction monitoring period (i.e. reclamation) as defined in the CER conditions for the project or as defined in the company EP Program. Then a company must determine the number of operational environmental issues it currently has outstanding at the beginning of a calendar year. This will be determined from the EP Program or from its management system inventory of hazards.

- During the first year all new issues and all addressed issues will be recorded and tracked along with the initial list.
- In the second year the same process will occur and the first year's results are reported on.
- In the third year the same process will occur and the previous two years are reported on.
- This process will continue until it becomes a moving five-year tracking process when, for example, in the seventh year, the report will be for year two to year six.

This performance measure will allow for ongoing tracking and trending of both the number of issues identified and the number addressed. The resulting ratio from the reported numbers could be considered as a rolling average. A company is encouraged to use the ratio in its own monitoring and analysis of this measure.

5.5   Environmental Inspections

Guidance

The purpose of this measure is to have adequate resources to provide maximum environmental protection during construction through appropriate oversight by qualified inspectors.

Average Number of Inspection Days by a Qualified Environmental Inspector and Construction Days for Newly Constructed Pipeline (days per pipeline system)
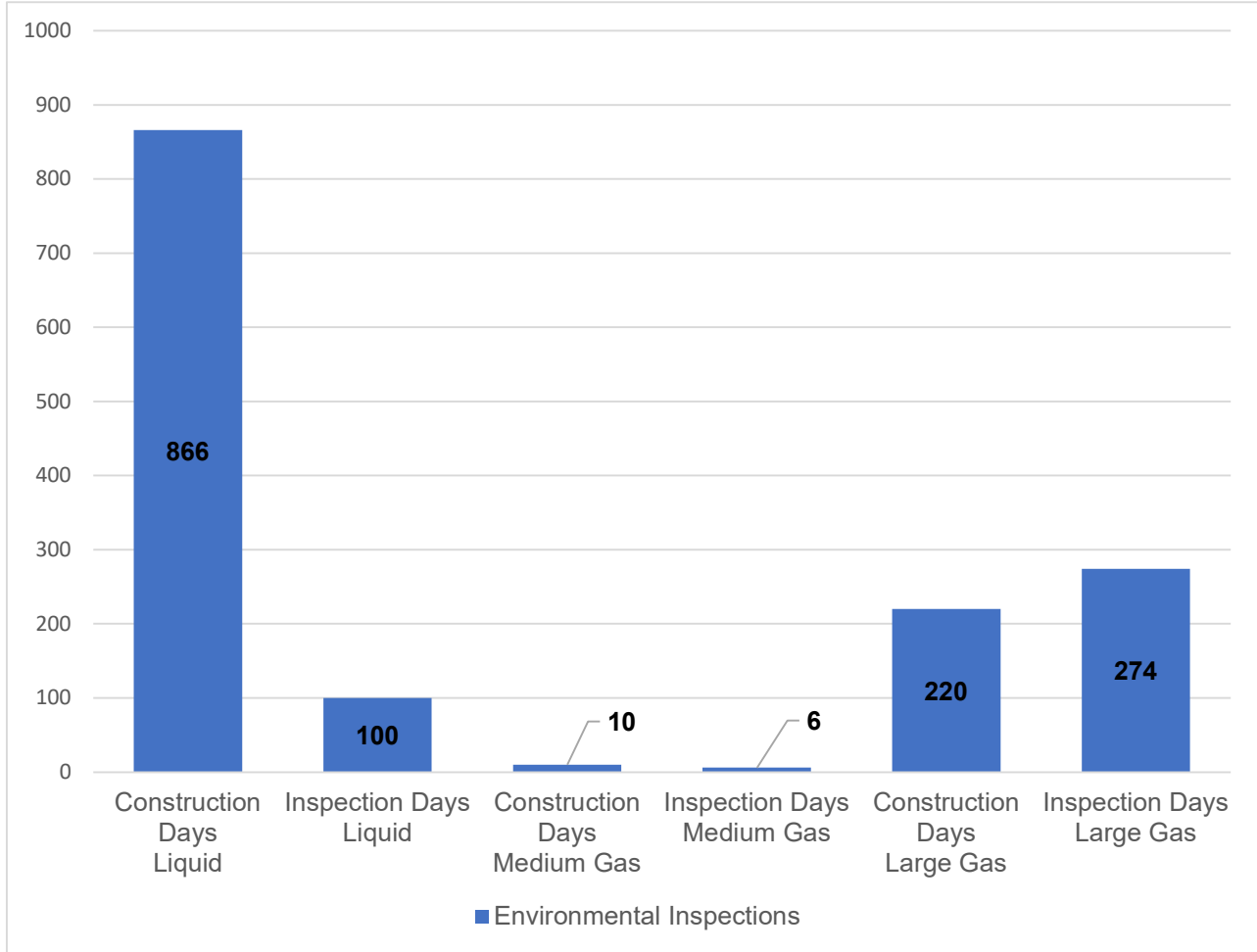
Figure 5.5

What is an "inspection day"?

Each day that a qualified environmental inspector inspects a pipeline site is considered an inspection day. If two inspectors are on site on the same day for different aspects of construction then two inspection days should be reported. It is possible to have more inspection days than construction days on large sites where the length of the project calls for multiple inspectors.

What is a "qualified environmental inspector"?

For the purposes of this measure, a qualified environmental inspector is a person who has relevant post-secondary education or a suitable equivalent (e.g. a combination of training and experience), has proven competency in the field of environmental protection, and has appropriate training on the company's EP Program and EP Plan. The company management system must provide further detail on qualifications for environmental inspectors.

What is "newly constructed pipeline"?

Newly constructed pipeline would include pipeline replacements or new pipelines that require CER approval under sections 183 and 214 of the *Canadian Regulator Act* or NEB approval under sections 52 and 58 of the *National Energy Board Act*. Pipeline construction includes the clearing of land and does not include operational activities such as digs or repairs. This measure does not apply to pump stations, compressor stations, metering stations, mainline block valve yards, tank farms, launcher and receiver yards.

What is the construction period for this measure?

The construction period is from beginning of construction (which includes clearing) to the in-service date.

6. Damage Prevention Performance Measures

6.1 Public Awareness of Pipelines

Guidance

The CER expects that a company's Damage Prevention Program will follow a management system approach. A management system approach includes the development of:

1. performance measures for assessing the company's success in achieving its goals, objectives and targets;
2. processes for identifying hazards and making sure that the hazards are mitigated and controlled; and
3. a process for external communication of information.

This performance measure can be used to guide the implementation of a company's damage prevention program and the communication plan for external party awareness.

The intent of this measure is for companies to report on unauthorized activity statistics by groups that are most likely to require authorizations to conduct an activity in or near a pipeline right-of-way. These statistics should be used by a company to identify groups where Public Awareness Programs are particularly effective. They should also provide an indication of which groups require additional focus (for example, which groups may need awareness).

NOTE: Previous Data Summary reports (2013 through 2016) were based on the *National Energy Board Pipeline Crossing Regulations, Part I & II*. This iteration of the Data Summary report is based on the *National Energy Board Pipeline Damage Prevention Regulations – Authorizations* and *National Energy Board Pipeline Damage Prevention Regulations – Obligations of Pipeline Companies,* which came into force in June 2016 and introduced the concepts of "ground disturbance" vs. "excavation using power-operated equipment".

Average Number of Environmental Issues Identified and Addressed (count per pipeline system)
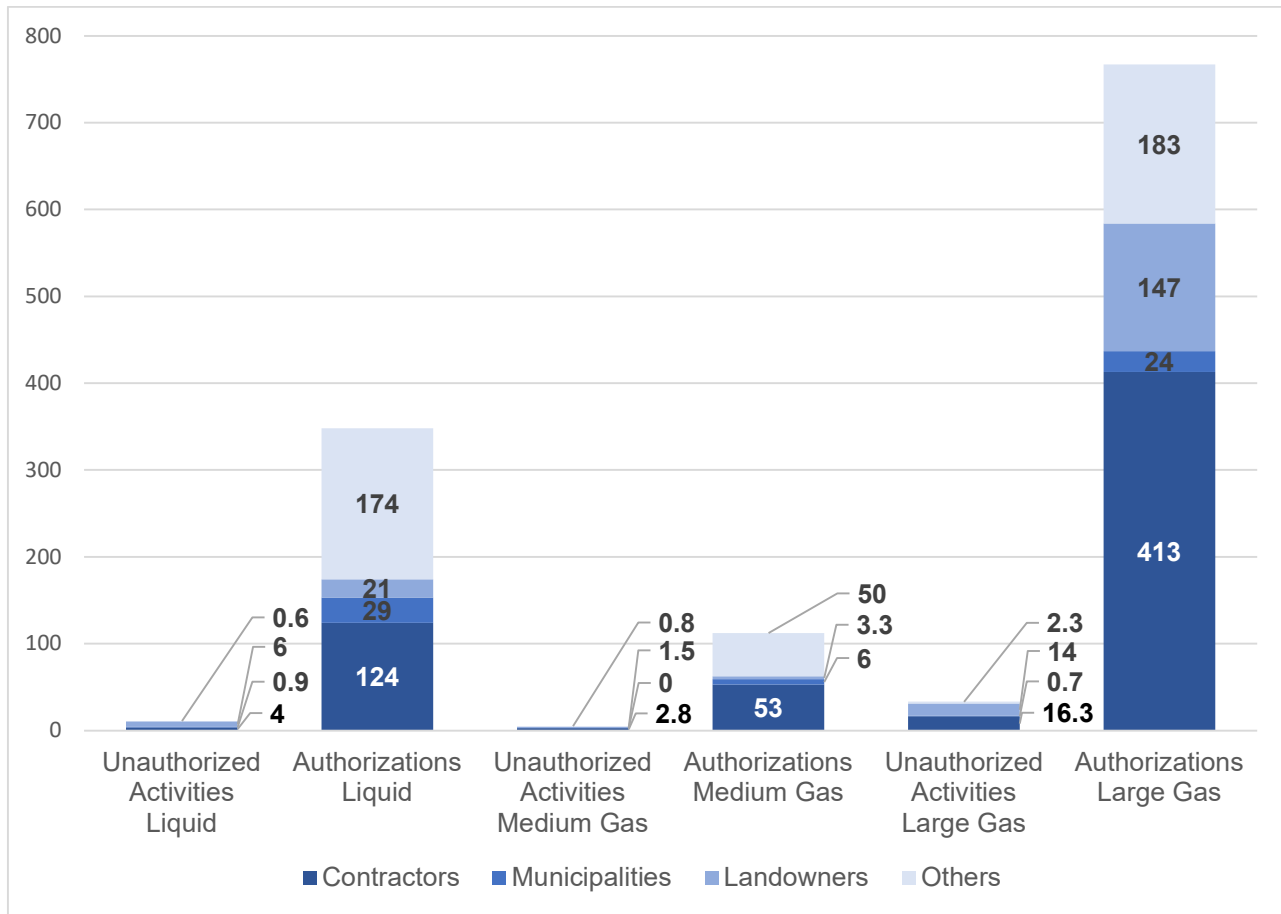
Figure 6.1

What is an "unauthorized activity"?

An unauthorized activity that should be reported as part of this measure is:

- Unauthorized construction or installation across, on, along, or under a pipeline;
- Ground disturbance in the prescribed area;
- Explosives within the prescribed area; and
- Any contravention of the *National Energy Board Pipeline Damage Prevention Regulations – Obligations of Pipeline Companies (DPR-O)*, as defined in subsection 11(1)[3].

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[3] The *National Energy Board Pipeline Damage Prevention Regulations – Authorizations* (DPR-A) and *National Energy Board Pipeline Damage Prevention Regulations – Obligations of Pipeline Companies* (DPR-O) were promulgated in June of 2016 and replaced the *National Energy Board Pipeline Crossing Regulations* (PCR), Part I and II. The 2016 and onwards reports are based on the DPR-A term "authorizations" rather than "permissions" used by the PCR, Part I and II.

What is the definition of "authorization"?

Authorization is the written consent given by a pipeline company to a facility owner or to an excavator to construct or install a facility or to excavate as provided under the *National Energy Board Pipeline Damage Prevention Regulations – Authorizations* (DPR-A) . For example, authorization from the pipeline company is required for:

- construction or installation of a facility across, on, along, or under an existing pipeline;
- ground disturbance in the prescribed area;
- in certain circumstances, operation of a vehicle or mobile equipment across a right-of-way, outside the travelled portion of a highway or public road.

How is this Measure Reported?

This measure should be reported based on the person that conducts the physical activity on the right-of-way. In most cases, that person will be a contractor hired by the Project Owner (usually, the Project owner is one of the categories identified in this performance measure, for example, a municipality).

For example if the Project Owner is a municipality that receives permission for an activity on a right-of-way, but hires a contractor that performs an unauthorized activity, it is the contractor that is the subject of the measure.

What is a "contractor"?

For the purposes of this performance measure, a contractor is an excavator (i.e. a company or individual) hired to perform an activity which results in a ground disturbance. By extension the contractor is any agent, affiliate or subcontractor of the contractor that has direct control over the person performing the excavation.

What is the "other" category?

This includes but is not limited to any entity or person that may conduct activities in a pipeline right-of-way that does not fit into the Municipal, Contractor or Landowner categories. Typically this would be a provincial, federal, railway or utility entity.

Appendix A - Tables

1 Safety Management Performance Measures

1.1 Facility Safety Inspections

2020 Company Performance				
The total number of facility inspections conducted *versus* the total number of planned facility inspections.				
Pipeline Type	Average Number of Facilities	Facility Inspections		Percentage
		Average Planned	Average Inspections	
Gas > 50 km and < 5000 km	62	204	205	101%
Gas > 5000 km	1,427	228	228	100%
Liquid > 50 km	67	249	247	99%
Pipeline Systems	Total Facilities	Total Planned	Total Conducted	Percentage
21	5,459	4,898	4,879	99%

1.2 Corrective and Preventative Actions

2020 Company Performance			
The total number of corrective and preventative actions completed *versus* the total number of corrective and preventative actions identified for the calendar year for: **A.** Operations and maintenance; and **B.** Construction.			
Pipeline Type	Safety Actions		Percentage
	Average Identified	Average Corrected	
A. Operations and Maintenance Corrective and Preventative Actions			
Gas > 50 km and < 5000 km	90	72	80%
Gas > 5000 km	1,818	1,418	78%
Liquid > 50 km	562	511	91%
B. Construction Corrective and Preventative Actions			
Gas > 50 km and < 5000 km	8	5	63%
Gas > 5000 km	309	269	87%
Liquid > 50 km	145	144	99%

Pipeline Systems	Total Identified	Total Corrected	Percentage
21	15,447	13,380	87%

1.3   Near Misses

2020 Company Performance			
The total number of near misses reviewed by a competent person and addressed *versus* the total number of near misses reported by: A. the pipeline company; and B. contractors.			
Pipeline Type	**Near Misses**		**Percentage**
	Average Reported	**Average Addressed**	
A. Pipeline Company Near Misses			
Gas > 50 km and < 5000 km	4.67	4.67	100%
Gas > 5000 km	40	40	100%
Liquid > 50 km	43	43	100%
B. Contractor Near Misses			
Gas > 50 km and < 5000 km	1	1	100%
Gas > 5000 km	18	18	100%
Liquid > 50 km	26	26	100%
Pipeline Systems	**Total Reported**	**Total Addressed**	**Percentage**
21	1038	1037	99.9%

2 Security Performance Measures

2.1   Training and Competency

2020 Company Performance			
The total number of company employees who have current security training *versus* the total number of company employees.			
Pipeline Type	**Employees with Security Training**		**Percentage**
	Average Employees	**Average Trained**	
Gas > 50 km and < 5000 km	201	200	99%
Gas > 5000 km	2,020	1,959	97%
Liquid > 50 km	611	501	94%
Pipeline Systems	**Total Employees**	**Total Trained**	**Percentage**
21	14,591	13,080	90%

3   Emergency Management Performance Measures
3.1   Emergency Response Exercises

2020 Company Performance			
The total number of emergency response exercises conducted versus the total number of emergency response exercises planned for each of the following[4]: **A.** drills; **B.** tabletop (i.e. mock) exercises; **C.** functional (i.e. simulation) exercises; and **D.** full scale (i.e. major) exercises.			
Pipeline Type	**Emergency Response Exercises**		**Percentage**
	Average Planned	**Average Conducted**	
A. Drills			
Gas > 50 km and < 5000 km	0.33	0.33	100%
Gas > 5000 km	0	0	N/A
Liquid > 50 km	8	7	88%
B. Tabletop Exercises			
Gas > 50 km and < 5000 km	5.8	5.8	100%
Gas > 5000 km	10	10	100%
Liquid > 50 km	3.7	3.8	103%
C. Functional Exercises			
Gas > 50 km and < 5000 km	0.7	0.7	100%
Gas > 5000 km	0	0	N/A
Liquid > 50 km	0.25	0.33	132%
D. Full Scale Exercises			
Gas > 50 km and < 5000 km	0.7	0.7	100%
Gas > 5000 km	1.0	1.0	100%
Liquid > 50 km	0.8	0.8	100%
Pipeline Systems	**Total Planned**	**Total Conducted**	**Percentage**
21	223	213	96%

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[4] Federal Emergency Management Agency (FEMA) naming conventions and definitions are used for exercises.

3.2 Communication

2020 Company Performance			
The number of liaison activities conducted *versus* the number of liaison activities planned.			
Pipeline Type	Emergency Management Liaison Activities		Percentage
	Average Planned	Average Conducted	
Gas > 50 km and < 5000 km	34	32	94%
Gas > 5000 km	68	69	101%
Liquid > 50 km	106	103	97%
Pipeline Systems	Total Planned	Total Conducted	Percentage
21	1,674	1,630	97%

3.3 Training and Competency

2020 Company Performance			
The total number of company employees and contractors identified as having a role and responsibility during an emergency *versus* the total number of company employees and contractors that have up-to-date training to carry out their expected emergency management roles and responsibilities.			
Pipeline Type	Persons With an Emergency Management Role		Percentage
	Average Persons	Average Persons Trained	
Gas > 50 km and < 5000 km	94	90	96%
Gas > 5000 km	193	192	99%
Liquid > 50 km	89	86	97%
Pipeline Systems	Total Persons	Total Persons Trained	Percentage
21	2,209	2,153	97%

3.4   Coordinating Operational Activities

2020 Company Performance			
The total number of company employees and contractors who have participated in emergency response exercises and drills *versus* the total number of company employees and contractors identified as having a role and responsibility in an emergency.			
Pipeline Type	**Participation in Exercises and Drills**		**Percentage**
	Average Persons	**Average Participation**	
Gas > 50 km and < 5000 km	94	100	106%
Gas > 5000 km	193	195	101%
Liquid > 50 km	89	71	80%
Pipeline Systems	**Total Persons**	**Total Participation**	**Percentage**
21	2,209	2,034	92%

4   Integrity Management Performance Measures

4.1   Pipeline Condition

2020 Company Performance			

The total number of features identified by in-line inspection for field investigation (according to integrity management program dig criteria) *versus* the total number of field verified features found to be defects and repaired by permanent or temporary methods, or mitigated by pressure reduction for the following hazards:
  A. metal loss;
  B. dents; and
  C. cracks with a depth greater than 40% of the nominal pipeline wall thickness.			

Pipeline Type	**Average Features Identified for Investigation**	**Average Defects Found and Repaired/Mitigated**	**Percentage of Features that were Defects**
A. Metal Loss			
Gas > 50 km and < 5000 km	37	3	8%
Gas > 5000 km	48	12	25%
Liquid > 50 km	7	9	129%
B. Dents			
Gas > 50 km and < 5000 km	1.5	1	67%
Gas > 5000 km	3.7	2.7	73%
Liquid > 50 km	0.4	2.3	575%
C. Cracks With a Depth Greater than 40% of the Nominal Pipeline Wall Thickness			
Gas > 50 km and < 5000 km	0	0.3	N/A
Gas > 5000 km	40.4	19.7	49%
Liquid > 50 km	3.3	8.5	258%
Pipeline Systems	**Total Features**	**Total Defects Repaired/Mitigated**	**Percentage**
21	628	363	58%

4.2 Equipment Inspection

2020 Company Performance

A. = Tank(s)
B. Mainline Valve(s)
  i. Total number of **_A/B_** inspections **conducted** *versus* **total number** of **_A/B_**
  ii. Routine staff **_A/B_** inspections **conducted** *versus* routine staff **_A/B_** inspections **scheduled**
  iii. Certified maintenance **_A/B_** inspections **conducted** *versus* certified maintenance **_A/B_** inspections **scheduled**

Pipeline Type	Data on Facility Inspections		
A.i. Tank Inspections Conducted *versus* Total Number of Tanks			
Pipeline	**Average Tanks**	**Average Conducted**	**Percentage**
Gas > 50 km and < 5000 km	0.5	26.5	N/A
Gas > 5000 km	0	0	N/A
Liquid > 50 km	44	363	N/A
Pipeline Systems	**Total Tanks**	**Total Inspections**	**Percentage**
21	528	4,515	N/A
B.i. Mainline Valve Inspections Conducted *versus* Total Number of Mainline Valves			
Pipeline	**Average Mainline Valves**	**Average Conducted**	**Percentage**
Gas > 50 km and < 5000 km	164	21	N/A
Gas > 5000 km	5,157	72	N/A
Liquid > 50 km	115	262	N/A
Pipeline Systems	**Total Mainline Valves**	**Total Inspections**	**Percentage**
21	17,831	3,488	N/A
A.ii. Routine Staff Tank Inspections Conducted *versus* Scheduled			
Pipeline	**Average Scheduled**	**Average Conducted**	**Percentage**
Gas > 50 km and < 5000 km	26	26.5	102%
Gas > 5000 km	0	0	N/A
Liquid > 50 km	275	363	132%
A.iii. Certified Maintenance Tank Inspections Conducted versus Scheduled			
Pipeline	**Average Scheduled**	**Average Conducted**	**Percentage**

Gas > 50 km and < 5000 km	0.6	0.5	83%
Gas > 5000 km	0	0	N/A
Liquid > 50 km	5.92	5.83	98%

B.ii. Routine Staff Mainline Valve Inspections Conducted versus Scheduled

Pipeline	Average Scheduled	Average Conducted	Percentage
Gas > 50 km and < 5000 km	21	21	100%
Gas > 5000 km	72	72	100%
Liquid > 50 km	238	262	110%

B.iii. Certified Maintenance Mainline Valve Inspections Conducted versus Scheduled

Pipeline	Average Scheduled	Average Conducted	Percentage
Gas > 50 km and < 5000 km	156	156	100%
Gas > 5000 km	5,085	5,085	100%
Liquid > 50 km	215	188	87%
Pipeline Systems	**Total Inspections Scheduled**	**Total Inspections Conducted**	**Percentage**
21	18,774	18,446	98%

4.3 Facility Piping Inspection

2020 Company Performance

A. Liquid Pump Stations

The total number of pump stations where piping was inspected *versus* the total number of pump stations where the piping was scheduled to be inspected by:
  i.   routine staff inspection; and
  ii. certified maintenance inspection

The total number of stations must also be reported so that the data may be normalized for additional comparisons.

B. Gas Compressor Stations

The total number of compressor stations where piping was inspected versus the total number of compressor stations where the piping was scheduled to be inspected for:
  i.   Routine staff inspection; and
  ii. Certified maintenance inspections

The total number of stations must also be reported so that the data may be normalized for additional comparisons.

Pipeline Type	Facility Piping Inspections		Percentage
	Average Scheduled	Average Conducted	
A. Liquid Pump Station i. Routine Staff Inspections			
Liquid > 50 km	13	13	100%
A. Liquid Pump Station ii. Certified Maintenance Inspections			
Liquid > 50 km	9	9	100%
B. Gas Compressor Station i. Routine Staff Inspections			
Gas > 50 km and < 5000 km	4.3	4.3	100%
Gas > 5000 km	41.3	41.3	100%
B. Gas Compressor Station ii. Certified Maintenance Inspections			
Gas > 50 km and < 5000 km	2.3	2.3	100%
Gas > 5000 km	21.7	21.7	96%
Pipeline Systems	**Total Scheduled**	**Total Inspected**	**Percentage**
21	498	498	100%

4.4 Facility Inspection Effectiveness

2020 Company Performance			
A. Liquid Facilities The total number of reportable incidents at liquid facilities *versus* the total number of liquid facilities.			
B. Gas Facilities The total number of reportable incidents at gas facilities *versus* the total number of gas facilities.			
Pipeline Type	**Reportable Incidents at Facilities**		**Percentage**
	Average Facilities	**Average Incidents**	
A. Reportable Incidents at Liquid Facilities			
Liquid > 50 km	65	0.7	1.1%
B. Reportable Incidents at Gas Facilities			
Gas > 50 km and < 5000 km	62	0.7	1.1%
Gas > 5000 km	1,427	4	0.3%
Pipeline Systems	**Total Facilities**	**Total Incidents**	**Percentage**
21	5,459	24	0.4%

4.5 Assessment of Pipeline Hazards

2020 Company Performance			

The kilometres of pipeline that have been assessed for an integrity hazard *versus* the kilometres of pipeline that are susceptible to the integrity hazard prior to any form of mitigation. For each pipeline the integrity hazard assessment method is to be reported for the following categories:
  A. metal loss;
  B. cracking;
  C. external interference;
  D. material, manufacturing or construction; and
  E. geotechnical and weather related.			

Pipeline Type	**Pipeline Kilometres Assessed for Susceptible Hazards**		**Percentage**
	Average Susceptible	**Average Assessed**	
A. Metal Loss Hazard Assessment			
Gas > 50 km and < 5000 km	1150	314	27%
Gas > 5000 km	2,833	2,833	100%
Liquid > 50 km	731	509	70%
B. Cracking Hazard Assessment			
Gas > 50 km and < 5000 km	617	95	15%
Gas > 5000 km	1,437	1,437	100%
Liquid > 50 km	541	657	121%
C. External Interference Hazard Assessment			
Gas > 50 km and < 5000 km	0.02	130	N/A
Gas > 5000 km	0.3	4586	N/A
Liquid > 50 km	403	1151	286%
D. Material, Manufacturing or Construction Hazard Assessment			
Gas > 50 km and < 5000 km	177	229	129%
Gas > 5000 km	2,719	2,719	100%
Liquid > 50 km	522	658	126%
E. Geotechnical or Weather-Related Hazard Assessment			

Gas > 50 km and < 5000 km	324	324	100%
Gas > 5000 km	3	3	100%
Liquid > 50 km	232	211	91%
Number of Pipelines	**Total Susceptible**	**Total Assessed**	**Percentage**
111	63,729	79,500	125%

4.6   Shutdowns for Hazard Control

2020 Company Performance					
The total number of shutdowns of a pipeline segment or facility to protect the public, property and the environment as a result of: **a.** emergency; **b.** precautionary (i.e. false alarm); **c.** unplanned repair; and **d.** planned integrity testing, maintenance or repair.					
Pipeline Type	**Shutdowns for Hazard Control**				
	a. Emergency	**b.** Precautionary	**c.** Unplanned Repair	**d.** Planned Repair	**Total**
Gas > 50 km and < 5000 km	0	0	27	105	132
Gas > 5000 km	3	0	0	30	33
Liquid > 50 km	4	107	21	355	487
Total	7	107	48	490	652

5   Environmental Protection Performance Measures

5.1   Program Training

2020 Company Performance			
The number of company employees who have received training on the company-wide Environmental Protection Program (EP Program) *versus* the number of employees required by the EP Program to receive training on it.			
Pipeline Type	Employees Receiving Training on the Environmental Protection Program		Percentage
	Average Employees Requiring Training	Average Trained	
Gas > 50 km and < 5000 km	228	220	96%
Gas > 5000 km	795	794	99%
Liquid > 50 km	486	476	98%
Pipeline Systems	Total Employees Requiring Training	Total Trained	Percentage
21	9,578	9410	98%

5.2   Site Specific Training

2020 Company Performance			
The number of construction staff, both contractors and employees, with training on the site specific Environmental Protection Plan (EP Plan) *versus* the number of persons working on construction sites.			
Pipeline Type	Construction Staff with Training on the Site Specific Environmental Protection Plan		Percentage
	Average Construction Staff	Average Trained	
Gas > 50 km and < 5000 km	152	151	99%
Gas > 5000 km	2,857	2,857	100%
Liquid > 50 km	2100	2100	100%
Pipeline Systems	Total Construction Staff	Total Trained	Percentage
21	34,681	34,680	100%

5.3 Restoration of Agricultural Land

2020 Company Performance
A. Kilometres of CER-regulated right-of-way on agricultural lands that are restored to a condition similar to the surrounding environment and consistent with the current land use within five years of the in-service date *versus* the total kilometres of CER-regulated right of-way that is disturbed agricultural land.
B. Number of operational excavations on agricultural lands that are restored to a condition similar to the surrounding environment and consistent with the current land use within five years of the excavation *versus* the total number of operational excavations on agricultural land.

Pipeline Type	Pipeline Systems with Disturbed Land	Kilometres of Disturbed Agricultural Land Restored		Percentage
		Average Disturbed Land	Average Restored	
A. CER-Regulated Right-Of-Way on Agricultural Lands that are Restored				
Gas > 50 km and < 5000 km	2	1	1	100%
Gas > 5000 km	3	83	67	81%
Liquid > 50 km	2	109	109	100%
Pipeline Systems	**Total**	**Total Disturbed**	**Total Restored**	**Percentage**
21	7	1,561	1,513	97%
B. Operational Excavations on Agricultural Lands that are Restored				
Gas > 50 km and < 5000 km	4	19	18	95%
Gas > 5000 km	3	470	409	87%
Liquid > 50 km	9	186	155	83%
Pipeline Systems	**Total**	**Total Excavated**	**Total Restored**	**Percentage**
21	16	3,748	3,196	85%

5.4 Resolution of Environmental Issues

2020 Company Performance
The total number of operational environmental issues identified in the EP Program or EP Plan that have been addressed *versus* the total number of operational environmental issues identified in the EP Program or EP Plan over a five-year period.

Pipeline Type	Operational Environmental Issues		Percentage
	Average Identified	Average Addressed	
Gas > 50 km and < 5000 km	69	67	97%
Gas > 5000 km	38	35	92%
Liquid > 50 km	62	62	100%
Pipeline Systems	Total Identified	Total Addressed	Percentage
21	1,269	1,243	98%

5.5 Environmental Inspections

2020 Company Performance
The total number of inspection days by a qualified environmental inspector for newly constructed pipeline *versus* the total number of construction days for all the company's newly constructed pipeline.

Pipeline Type	Pipeline Systems With Construction	Environmental Inspections		Percentage
		Average Construction Days	Average Inspection Days	
Gas > 50 km and < 5000 km	1	10	6	60%
Gas > 5000 km	2	220	274	125%
Liquid > 50 km	3	866	100	12%
Pipeline Systems	Total Pipeline Systems with Construction	Total Construction Days	Total Inspection Days	Percentage
21	6	11,108	2,054	19%

6 Damage Prevention Performance Measures

6.1 Public Awareness of Pipelines

2020 Company Performance		
A. The total number of unauthorized activities by contractors *versus* the total number of authorizations granted to contractors.		
B. The total number of unauthorized activities by municipalities *versus* the total number of authorizations granted to municipalities.		
C. The total number of unauthorized activities by landowners *versus* the total number of authorizations granted to landowners.		
D. The total number of unauthorized activities by others *versus* the total number of authorizations granted to others.		

Pipeline Type	Unauthorized Activities *versus* Authorizations	
	Average Unauthorized Activities	Average Authorizations
A. Contractors		
Gas > 50 km and < 5000 km	2.8	53
Gas > 5000 km	16.3	413
Liquid > 50 km	4	124
B. Municipalities		
Gas > 50 km and < 5000 km	0	6
Gas > 5000 km	0.7	24
Liquid > 50 km	0.9	29
C. Landowners		
Gas > 50 km and < 5000 km	1.5	3.3
Gas > 5000 km	14	147
Liquid > 50 km	6	21
D. Others		
Gas > 50 km and < 5000 km	0.8	50
Gas > 5000 km	2.3	183
Liquid > 50 km	0.6	174
Pipeline Systems	**Total Unauthorized Activities**	**Total Authorizations**
21	262	7147