Trans Mountain Pipeline ULC (Trans Mountain)
Onshore Pipeline Regulations and Filing Manuals Update
Phase 2 – Engagement Overview
Due Date: March 31, 2025

G. OPR – Pipeline Integrity Topic Paper

This paper describes potential amendments to the OPR to improve the CER's oversight of Pipeline Integrity. Any suggestions for improvement regarding this topic are welcome, and in particular, the CER seeks your comments on proposed improvements related to:

- certain definitions
- the use of new technologies;
- geohazard assessments;
- storage facilities;
- materials traceability; and,
- the quality assurance program.

Background: Integrity

Currently, the OPR applies to onshore pipelines intended for the transmission of hydrocarbons. The OPR does not apply to onshore pipelines intended for the transmission of non-hydrocarbon commodities. Further, for clarity, the OPR does not apply to offshore pipelines.

Due to the wide variety of fluids transported on commodity pipelines, the CER and its predecessor the National Energy Board have regulated onshore non-hydrocarbon commodity pipelines on a case-by-case basis. This approach has included being informed by issues in the OPR that are relevant to non-hydrocarbon commodity pipelines and then drawing upon those issues to impose conditions in certificates and orders that authorize such commodity pipelines. With the emergence of other energy sources transmissible by pipeline, the CER is exploring expanding the application of the OPR to onshore pipelines that transmit gaseous non-hydrocarbon commodities such as carbon dioxide and hydrogen.

The CER is also considering codifying requirements for more comprehensive risk assessments relating to pipelines. The CER notes that although the OPR does not contain a provision requiring companies to conduct geohazardous assessments, it is addressed in the Filing Manual. The OPR also contains at least two references to quality assurance programs, which may need additional detail.

Subtopic 1: Definition of Onshore Pipeline

In the first phase of engagement on the OPR Review, the CER heard that the OPR's performance-based approach acknowledges the vast differences among the many companies regulated by the CER, including differences in the commodities transported. The CER notes that the OPR does not apply to emerging gaseous non-hydrocarbon commodities such as hydrogen and carbon dioxide, but instead are regulated on a case-by-case basis through conditions in certificates and orders. To provide greater regulatory clarity, consistency, efficiency, and certainty, the CER is proposing to amend the definition of onshore pipeline in the OPR to include specific gaseous non-hydrocarbon commodities that are not captured within the current definition.

Objective for Improvement

The objective is to include new requirements in the OPR that apply to CER-regulated onshore pipelines transporting hydrogen and carbon dioxide in a gaseous state instead of imposing authorization-specific conditions that emulate provisions in the OPR that apply to hydrocarbon pipelines. Other commodity pipelines (such as dense phase carbon dioxide, water, or slurry pipelines that fall within the definition of pipeline pursuant to the Canadian Energy Regulator Act) would continue to be regulated on a case-by-case basis pursuant to the applicable provisions of the CER Act and the conditions contained in their specific authorizations.

Proposed Option

The CER is considering amending the definition of onshore pipeline in the OPR to include the transmission of hydrogen and carbon dioxide in a gaseous state.

Discussion Question

g.1) Please provide feedback on the proposed change to the definition of onshore pipeline to include hydrogen and carbon dioxide in a gaseous state.

Response:

Trans Mountain supports the inclusion of hydrogen and carbon dioxide in the definition of onshore pipeline and appreciates the CER anticipating the need for regulatory clarity in advance of projects that may result in transportation of these commodities. Trans Mountain notes that CSA has started to introduce design requirements in section 17 of CSA Z662-23 for hydrogen pipelines and believes that prescriptive requirements for design and operation should be relayed within CSA Z662, not the OPR. The OPR should be limited to program-level requirements.

Subtopic 2: Use of technologies for which no standard is set out in the OPR

In the first phase of engagement on the OPR Review, the CER heard that the OPR should introduce risk-based criteria and notification processes, rather than requiring Commission approvals. It was suggested that this approach would better support innovation. In response to this commentary, the CER is requesting feedback on potential changes to sections 5.1 and 6.5 of the OPR related to technology. Section 5.1 of the OPR currently requires submission of designs, specifications, programs, manuals, procedures, measures or plans for which no standard is set out in the OPR to the Commission for approval. Neither subsection 5.1(1) nor 5.1(2) are expected to change, however, the CER is proposing a new subsection.

Objectives for Improvement

The objective of new requirements will be to help ensure that companies proposing to use technologies for which no standard is set out in the OPR implement them in a manner that is safe and protective of people, the environment, sites of historic or cultural importance, and property.

Proposed Options

The CER is considering the following options to meet the objective outlined above:

- adding a new requirement to section 5.1 to include a notification to the CER where a company plans to use a technology for components, processes, or systems:
    - for which no standard is set out in the OPR, and
    - which has not been independently reviewed and publicly released.

- adding a new requirement that companies establish and implement a process for evaluating a technology for which no standard is set out in the OPR, and which has not been independently reviewed and publicly released.

Discussion Questions

g.2) What would an appropriate review period be for a notification?

Response:

Over the lifecycle of a pipeline, companies undertake a variety of activities to maintain and safely operate their pipelines, including the use of new technologies, which is expressly considered in the CER's Operations and Maintenance Guidance (O&M Guideline).[1] These activities take place without advance notification, unless notification is triggered by specific scenarios (e.g., third-party concerns, additional land requirements, proximity to wetlands).

The CER has not defined what constitutes new technology in its request. An example of what Trans Mountain considers to be new technology is the advancement of a new inline inspection tool. In this example, Trans Mountain would run the tool without any advance notification to the CER as a part of its Integrity Management Program, and it would validate the new tool using numerous methods to evaluate the effectiveness of the tool to identify certain features. Should the CER have an interest in understanding the functionality and effectiveness of a specific new tool, it should consider an information exchange with the company.

Trans Mountain does not support a notification process or review period in the operational context for several reasons:

- Lack of definition for what the CER considers to be new technology - what may be new to one company may be established technology to another company. Similarly there is a lack of discussion around when use of a new technology is no longer "new" (e.g., after one successful tool run, physical work or project-use?)
- A notification requirement could lead to an acceptance process, which affects timing use for any new technology needed during O&M work or construction.
- There is an implication that a notification of new technology use by a company includes the CER in the risk-sharing in the event that the technology is unsuccessful, which is not within the CER mandate;
- Companies have processes to evaluate new technologies and own the risk associated with that technology;
- Advance notification requirement can hinder the timely delivery of necessary operations and maintenance activities already permitted under the O&M Guideline.

In the case of construction of project that takes place under s.214 or s.183 of the CER Act, proponents are required to describe the project components and execution method, and in the circumstance where the project execution utilizes new technology, the proponent is required to describe the technology and demonstrate the reasons for choosing the new technology as opposed to more conventional alternatives. CER Staff and the Commission of the CER would undertake an assessment of any new technology use as part of a decision on the project.

[1] Operations and Maintenance Activities on Pipelines Regulated Under the Canadian Energy Regulator Act: Requirements and Guidance Notes, PDF p.5

g.3) Do you have comments on the proposed approach or suggestions for alternatives?

Response:

While context is needed, a new requirement for companies to establish and implement a process for evaluating a technology for which no standard is set out in the OPR, and which has not been independently reviewed and publicly released, is generally reasonable, and can be built into the existing program requirements of the OPR. The CER can utilize existing tools such as information exchanges to better understand a company's approach in evaluating and under what circumstances it utilizes the technology.

Subtopic 3: Pipeline Design

In this phase of engagement, the CER would like to obtain feedback on additional topics that may not have been discussed in the first phase of engagement. Based on learnings from implementing the OPR and Filing Manuals, the CER has identified an opportunity to improve its oversight of pipeline design. To improve oversight of this area, the CER is considering better-defined requirements related to pipeline design. The intent is to specifically include geohazard assessment and risk assessments to determine supplemental design criteria to address other loadings, dynamic effects, and potential future risks.

Objective for Improvement

The objective of new requirements will be to help ensure that companies appropriately assess, mitigate, and manage risk from pipeline design, through construction and operation and finally, abandonment.

Proposed Options

The CER is considering the following options to meet the objective outlined above:

1. adding a requirement for pipeline design to include supporting risk assessments;
2. adding a requirement for companies to perform geohazards assessments to determine potential risks to the pipeline; and
3. adding a requirement for companies selecting trenchless technology for pipeline installations to notify the CER if the installation occurs under a water body or if the installation is large and occurs over land.

Discussion Questions

g.4) Please provide feedback on the inclusion of these new requirements. Provide feedback on the threshold size of the installation mentioned in option 3.

Response:

Trans Mountain's response to each of the proposed options are as follows:

Proposed Option 1:

Under section 4 of CSA Z662, the design of a proposed pipeline must include consideration of many factors (potential loadings, sustained forces, class location, temperature, etc.) as well as design decisions regarding location, pipe grade, wall thickness, to minimize risk to the safety of the public and to protect the environment. Section 3.2 of CSA Z662 describes the risk management process requirements, and Annex B (informative) provides guidelines for risk assessment. Minimization of risk is at the centre of design philosophy for a pipeline project, and accordingly, Trans Mountain supports the requirement to include a risk assessment but believes that the manner in which risk assessment is undertaken should

not be prescribed. For example, for installation of facility piping on a pipe rack within the fence line of a terminal located in an industrial area, the hazards and risks would be generally low, therefore, the risk assessment would also be commensurately limited. For a large-scale installation such as a terminal expansion, where there are nearby receptors, the company would undertake a risk assessment to understand whether the risk under the current design is acceptable under criteria such as the Major Industrial Accidents Council of Canada (MIACC), and/or whether the design of the expansion needs to be adjusted to ensure acceptability to MIACC criteria. Trans Mountain believes that companies should have the flexibility to define the appropriate risk assessment methodology for proposed scopes of work under the purview of the intent of the OPR – safety, security and protection of the environment.

Proposed Option 2:

Geohazard assessments may be undertaken for a variety of reasons: to understand whether there are loadings in relation to an existing pipeline that may require mitigation, to inform the design of a new pipeline through an area susceptible to potential geohazards, or to assess the feasibility of a trenchless (as opposed to traditional trenched) installation.

Geohazard assessments are a component of Trans Mountain's Integrity Management Program required under section 40 of the OPR, and while it supports the requirement to undertake a geohazard assessment for new installations where there is evidence of geohazard issues or loadings, Trans Mountain does not support prescription of the manner in which the geohazard assessment is undertaken.

Proposed Option 3:

Where companies must install a pipeline utilizing trenchless technology (under a water body or otherwise) or if the installation is large and occurs over land, an application either under section 183 or 214 of the *Canadian Energy Regulator Act* would generally be required. To address the CER's *Filing Manual* Guide A requirements, companies are required to describe proposed method of installation – trenched, trenchless or aerial, an assessment of feasibility, and consideration of other options. Information Requests can be posed to the proponent through the Commission's assessment of the application, it may request further information (information requests) of the company. The Commission of the CER must render a decision approving the project, or in the case of a section 183 application, provide a recommendation to the Governor in Council as the ultimate decision maker. For these reasons, the requirement to notify the CER if the installation occurs under a water body or if the installation is large and occurs over land, is redundant and not required.

g.5) Please provide feedback on the impact of these new requirements on safety throughout the lifecycle of the pipeline.

Response:

Trans Mountain supports assessments as detailed in the responses to request g.4), Proposed Options 1 and 2 to ensure that safety of the public and protection of the environment. Trans Mountain notes that that such assessments must be relevant and scalable to the scope of work to avoid administrative burden and cost overruns. Trans Mountain does not support the notification requirement as detailed in response to request g.4), Proposed Option 3, for reasons provided therein.

<u>Subtopic 4: Storage Facilities</u>

Based on learnings from implementing the OPR, the CER has identified an opportunity to improve its oversight of storage facilities.

Objective for Improvement

The objective of new requirements will be to help ensure that companies improve safety for people living, working, or exercising rights near storage facilities.

Proposed Options

The CER is considering the following options to meet the objective outlined above:

1. adding a requirement that storage facilities have an alternate source of power for emergency shut-down, emergency lighting for evacuation, and maintaining other essential services;
2. adding a requirement that storage facilities are designed and constructed to have a secondary containment system capable of containing ignited spills such that the fire does not expose other tanks or adjoining property to ignition;
3. adding a requirement that storage facilities are designed and constructed to have fire detection and fire protection; and
4. adding a requirement that companies have the demonstrable capability to safely extinguish a fire at their storage facilities.

Discussion Question

g.6) Please provide feedback about these proposed options.

Response:

Trans Mountain's response to each of the proposed options are as follows:

Proposed Option 1:

Currently, CSA Z662 clause 4.14.3.3 require pump stations to have emergency shutdown and isolation systems to isolate the station, shutdown pumping equipment and fuel-fired and electrical facilities in the vicinity of headers and pump buildings, and requires these systems to be operable from at least one single manual push-button.[2] In Trans Mountain's view, this requirement also extends to storage facilities that accompany pump units.

Trans Mountain would also encourage the CER, through the CSA, to consider uninterruptible power supply (UPS) as an alternative method to guarantee power supply in lieu of mandating an alternate power source.

The requirement to maintain emergency lighting for evacuation is described the clause 2.7.3 of the *National Fire Code of Canada*, 2020 (NFCC) which is incorporated via CSA Z662 and the *Canadian Occupational Health and Safety Regulations* (COHSR) by reference. Trans Mountain believes that an additional requirement for emergency lighting is redundant.

[2] There is a parallel requirement for compressor stations in CSA Z662-23 section 4.14.2.4. The National Energy Board (NEB), predecessor to the CER, issued Safety Advisory SA 2013-2 Pump or Compressor Station Emergency Shutdown Systems: Power Back-Up, Station Blocking and Emergency Shutdown Device (ESD) requiring all companies under NEB jurisdiction to comply with paragraph 12(a) of the OER and CSA Z662 clauses 4.14.2.4 and 4.14.3.3.

Trans Mountain encourages the CER to look to technical associations such as CSA for CSA Z662 and/or Canadian Commission on Building and Fire Codes for NFCC in relation to these requirements, as additional incorporation into the OPR may be duplicative and may result in conflicting requirements.

Proposed Option 2:

The requirement for tanks to have secondary containment is described in CSA Z662 clause 4.15.1.4.

NFCC, referenced by CSA Z662, also relays the requirements for secondary containment. NFCC clause 4.3.7.3(1) describes the secondary containment volumetric requirements for both single and shared secondary containments.

The requirements of CSA Z662, which contain the requirements for secondary containment, and references the same requirements in the NFCC clause 4.3.7.3, establishes the design requirements for secondary containment for either single or multiple tanks. Further, NFPA 30 *Flammable and Combustible Liquids Code*, which is incorporated through CSA Z662 and NFCC by reference, contains the requirements for fire suppression and extinguishment capability. OPR, specifically section 4(1)(d), is the enabling legislation that incorporates CSA Z662 and NFCC technical requirements.

It is Trans Mountain's view that the technical requirements for single or shared secondary containment structures and fire suppression capability is robustly addressed through referenced code and standards in the OPR, and any additional technical requirement through the OPR is not only duplicative, but it may also conflict with the existing and interconnected technical requirements. Specifically, the code requirements contemplate a shared design that in the event of a tank failure, liquid may migrate to an adjacent tank in a shared secondary containment.

Further, the Commission of the CER has the authority to apply conditions to projects to demonstrate the adequacy and appropriateness of the secondary containment and design which require its acceptance/approval, prior to the commencement of construction.[3] The Commission of the CER also has the authority to require the company to undertake a risk assessment of that design which requires the Commission's acceptance/approval, prior to commencement of construction.[4]

Proposed Option 3:

Please see the response to request g.6) Proposed Option 2.

Proposed Option 4:

Please see the response to request g.6) Proposed Option 2.

[3] Refer to TMEP CPCN OC-065 [C00061-3] Conditions 23 through 25 (Secondary Containment for Edmonton, Burnaby and Sumas Terminals). In all cases, Trans Mountain was required to demonstrate the adequacy of the secondary containment design in mitigating consequences of an accidental release and/or ignition of hydrocarbons, and the ability of the secondary containment areas to contain a release of hydrocarbons from a multiple-tank rupture scenario concurrent with a 1-in-100 year, 24-hour storm event, and include an allowance for water generated from potential firefighting activities and the maximum potential amount of standing water in all areas of the secondary containment system.

[4] Refer to TMEP CPCN OC-065 [C00061-3] Condition 22 (Updated terminal risk assessments) and Condition 129 (Final terminal risk assessments), which were required to consider revised spill burn rates, potential consequences of boil-over, flash fires and vapour cloud explosions; the cumulative risk based on the total number of tanks in the terminal, considering all potential events; and the domino or knock-on effect caused by a release of the contents of one tank on other tanks within the common impoundment areas. Trans Mountain was required that for all risks, the mitigation measures will reduce the risk levels that are as low as reasonably practicable (ALARP) while complying with MIACC criteria.

Subtopic 5: Quality Assurance Program – Traceability

Based on learnings from implementing the OPR and Filing Manuals, the CER has identified an opportunity to improve its oversight of material traceability as part of the Quality Assurance Program.

Objectives for Improvement

The objectives of new requirements will be to help ensure that companies:

1. use only materials meeting applicable standards; and
2. maintain appropriate records in regard to materials used on their pipelines.

Proposed Options

The CER is considering the following options to meet the objectives outlined above:

1. adding a requirement that materials to be used in the manufacturing, fabrication, construction, and maintenance of the pipeline and pressure vessels be traceable, where traceability means the ability to trace the history, use and location of a pipeline material and its characteristics, including material properties, inspection, and testing data, through recorded identification data throughout the life of the pipeline;
2. adding a requirement that if a company verifies that it has received, installed, or has in service materials that do not meet applicable standards or company specifications, the company must notify the CER;
3. adding a requirement that companies must ensure that materials of steel pipe and components to be installed on the pipeline have proven notch toughness properties for fracture resistance, except under conditions where the pipe and components:
    a. have inherent notch toughness properties; or
    b. are too small to yield meaningful notch toughness results; or
    c. operate at such low stress levels that fracture is not considered to be notch toughness dependent; and
4. adding a requirement that all information with respect to the quality assurance program be retained for at least two years after abandonment.

Discussion Question

g.7) Please provide feedback on the proposed approach.

Response:

Trans Mountain's response to each of the proposed options are as follows:

Proposed Option 1:

Trans Mountain supports this requirement for new or recent installations, as a part of a robust material quality assurance program. However, for historic installations undertaken during a time where traceability was a lesser focus of the industry (i.e., early 1950 installations), this should not be a requirement, and pipelines should continue to be grandfathered under the previous regime.

Proposed Option 2:

Trans Mountain is aware of and makes all efforts to comply with the CER all-company Order MO-003-2018 requiring companies to notify the CER in writing with 15 days of verifying that a pipe or component

received, installed, or in-service has mechanical properties not meeting industry standards or company specifications. It is required to provide the CER the manufacturer, type, grade, year of manufacture, location, product transported and maximum operating pressure for that pipe or component. It is also required, within 60 days of its initial notification, to provide the results of any investigations, any mitigation measures, a timeline to conduct an engineering assessment under CSA Z662 that demonstrates the safety the pipe or component, and a timeline to revise the company's quality assurance program.

In Trans Mountain's view this proposed option is covered as a requirement through the above noted Order.

Proposed Option 3:

Should the CER mandate a requirement for pipe and components to be installed on the pipeline to have proven notch toughness properties, Trans Mountain recommends that the CER include explicitly required properties to demonstrate 'notch toughness', such as absorbed energy and the testing temperature needed for compliance. Trans Mountain suggests that the CER consider exceptions to the requirement for proven notch toughness (i.e., components operating at a reduced MOP, buried pipeline, and pipeline installed with heat tracing are excluded).

Proposed Option 4:

In the case of a decommissioned or abandoned pipeline, there is no relevance for a quality assurance program as the pipeline will be purged, isolated, and void of product, or removed altogether. In both cases, there is no future intended use for the pipeline. Please also see the response to Paper B, request b.3).

Subtopic 6: Definitions connected to operating pressures

Based on learnings from implementing the OPR, the CER has identified an opportunity to improve clarity with respect to the following definitions: Approved Maximum Operating Pressure, Qualified Maximum Operating Pressure, and Amended Maximum Operating Pressure.

Objectives for Improvement

The objective of new requirements will be to help ensure that companies are clear about the CER's expectations regarding maximum operating pressures.

Proposed Options

The CER is considering the following options to meet the objectives outlined above:

1. adding a definition for Approved Maximum Operating Pressure: The maximum pressure for a pipeline system, or designated portion thereof, as approved by the Commission in a Leave to Open Order or a different authorization such as an order or certificate;
2. adding a definition for Qualified Maximum Operating Pressure: The maximum pressure at which a pipeline system is qualified to be operated, not to exceed the design pressure or the approved maximum operating pressure or the amended maximum operating pressure; and
3. adding a definition for Amended Maximum Operating Pressure: The maximum pressure for a pipeline system, or designated portion thereof, as established by revised design criteria, not to exceed the approved maximum operating pressure.

These will result in two consequential impacts:

- since both the Approved Maximum Operating Pressure and the Amended Maximum Operating Pressure are based on design criteria, if a company wishes to increase either one of these Maximum Operating Pressures (MOPs) it will need to apply for the increase to the CER pursuant to section 43 of the OPR; and
- if a company wishes to reduce the MOP as a corrective measure for a class location change, this reduced MOP is now the Amended MOP, and future increases would be subject to s.43, requiring an application for the increase to the CER.

Discussion Question

g.8) What is your feedback on this proposed approach?

Response:

Approved Maximum Operating Pressure (MOP) (Option 1) is clearly understood by industry. Each company has its processes for managing pressure restrictions/reductions to comply with regulatory requirements. It is not clear the value of defining qualified MOP (Option 2) or amended MOP (Option 3), and by creating separate terminology may cause undue confusion. Trans Mountain does not support added definitions in Options 2 and 3.