Sarah Walsh
Director, Regulatory Affairs

Gas Regulatory Affairs Correspondence
Email: gas.regulatory.affairs@fortisbc.com

Electric Regulatory Affairs Correspondence
Email: electricity.regulatory.affairs@fortisbc.com

FortisBC
16705 Fraser Highway
Surrey, B.C. V4N 0E8
Tel: (778) 578-3861
Cell: (604) 230-7874
Fax: (604) 576-7074
www.fortisbc.com

September 7, 2023

British Columbia Utilities Commission
Suite 410, 900 Howe Street
Vancouver, B.C.
V6Z 2N3

Attention: Patrick Wruck, Commission Secretary

Dear Patrick Wruck:

Re: FortisBC Energy Inc. (FEI)

Application for a Certificate of Public Convenience and Necessity (CPCN) for Approval of the Interior Transmission System Transmission Integrity Management Capabilities Project (Application)

Response to the British Columbia Utilities Commission (BCUC) Information Request (IR) No. 3

On September 20, 2022, FEI filed the Application referenced above. In accordance with the further regulatory timetable established in BCUC Order G-115-23, FEI respectfully submits the attached response to BCUC IR No. 3.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC ENERGY INC.

Original signed:

Sarah Walsh

Attachments

cc (email only): Registered Interveners

28.0 Reference: Exhibit B-18, p. 8

Addition of Pressure Regulating System (PRS) at East Kootenay Exchange Facility

On page 8 of FortisBC Energy Inc.'s (FEI) Rebuttal Evidence to the Residential Consumer Intervener Association (RCIA) Intervener Evidence (FEI Rebuttal Evidence), FEI states:

> The installation of independent pressure control on the YAH TRA 323 will provide FEI with improved operability, reliability and resiliency on its YAH TRA 323 and YAH OLI 610 pipelines, and will also allow for more efficient and economic operation of these pipelines over the long-term. Therefore, while FEI has identified that it needs independent pressure control on the YAH TRA 323 pipeline now to support a longer-term pressure reduction on the YAH TRA 323 pipeline in the event that severe cracking is found, the flexibility provided by the PRS is also important for FEI's operations and FEI would prioritize installing independent pressure control on the YAH TRA 323 pipeline through Sustainment Capital independently of the ITS TIMC [Interior Transmission System Transmission Integrity Management Capabilities] Project. [Emphasis added]

28.1 Please clarify the statement above regarding the use of Sustainment Capital funds to install pressure control on the YAH TRA 323 pipeline independently of the ITS TIMC Project. For example, please explain what regulatory approvals would be sought by FEI if this project funding approach were taken.

Response:

FEI considers independent pressure control to be necessary to mitigate the risk of a rupture in the event that potentially injurious cracking on the YAH TRA 323 pipeline is identified through EMAT ILI; however, regardless of, and independent from, the proposed ITS TIMC Project, independent pressure control on the YAH TRA 323 pipeline would be valuable for the reasons outlined in A12 of FEI's Rebuttal Evidence.

Given the value identified above, should the BCUC not approve a CPCN for the ITS TIMC Project, FEI would instead consider installing the PRS at Yahk Station through its Sustainment Capital prioritization process. Under this process, the benefits and costs of installing the PRS would be compared to other identified potential capital projects, and if there was a high benefit-to-cost value for the station when compared to other potential capital projects, FEI would include the associated cost as part of its regular sustainment capital expenditures. These sustainment capital expenditures would be submitted and reviewed by the BCUC through a future rate setting application or multi-year rate plan application.

For clarity, independent pressure control on the YAH TRA 323 pipeline is not part of FEI's 2023 and 2024 sustainment capital expenditures, which were approved by Order G-352-22 as part of

FEI's Annual Review for 2023 Delivery Rates. Furthermore, FEI does not have plans to prioritize or consider any of the other ITS TIMC Project components (i.e., pipeline alterations, pig barrel modifications, flow control stations) outside of this CPCN process.

28.2 Please explain what actions FEI would take with respect to the scope of the ITS TIMC Project should this Certificate of Public Convenience and Necessity (CPCN) application be denied.

Response:

If the BCUC did not grant a CPCN for the ITS TIMC Project, FEI would need to consider the BCUC's reasons and assess its options at that time. As cracking threats are time-dependent and must be mitigated, FEI would need to address whatever concerns the BCUC identified in its decision and seek the appropriate approvals to move forward with the Project.

29.0 Reference: Exhibit B-18, pp. 6, 11; Exhibit C2-6, p. 15

Pressure Reduction

On page 11 of FEI's Rebuttal Evidence, FEI states:

> In response to uncertainty about the [Livingston Pattullo] pipeline condition and safety, FEI adopted pressure reduction (1.25 safety factor) to 80 percent of the established operating pressure [EOP].

On page 6 of FEI's Rebuttal Evidence, FEI states:

> …if FEI had the PRS installed in advance of the EMAT [electro-magnetic acoustic transducer] run as proposed, FEI could use it to drop pressure in the YAH TRA 323 pipeline to perform integrity digs and repairs on that line right away, instead of having to use the existing single control valve and impacting the YAH OLI 610 pipeline. As such, FEI would see immediate use of the PRS following the run, regardless of whether it determines the need for a longer-term pressure reduction to 80 percent EOP. [Emphasis added]

29.1 Please explain whether 'established operating pressure' is a defined term within any of the pipeline codes and standards which cover the design, construction and operation of FEI's transmission pipelines. If so, please provide the definition(s).

Response:

FEI is not aware of a definition of "established operating pressure" (or EOP) within the pipeline codes and standards that it regularly references during the design, construction and operation of its transmission pipelines. However, although not defined, "established operating pressure" is a term that has been used in the CSA Z662:23 standard. For example:

Clause 10.3.2.3:

> Where the operating company intends to operate the pipeline system at a pressure that is significantly higher than the established operating pressure, and which can therefore lead to failures in the pipeline system, it shall conduct an engineering assessment to determine which portions can be susceptible to failures and whether such portions are suitable for the intended operating pressure. Note: For example, when the operating company intends to increase the operating pressure of a pipeline system that has historically operated well below its maximum operating pressure, such an engineering assessment is required. [Emphasis added]

Clause 10.10.1.5:

> Where piping is not suitable for continued service at the established operating pressure due to the presence of defects, either the piping shall be operated at

> pressures that are determined by an engineering assessment to be acceptable or the affected piping shall be repaired as specified in Clauses 10.10.2 to 10.12. The engineering assessment shall include consideration of service history and loading, anticipated service conditions (including the effects of corrosive and chemical attack), the mechanism of imperfection formation, imperfection dimensions, imperfection growth mechanisms, failure modes, and material properties (including fracture toughness properties). [Emphasis added]

FEI defines "established operating pressure" within its relevant internal standard, including a description of the process which FEI follows to determine the EOP of its pipelines, as follow:

> **Established Operating Pressure / EOP**: The pressure that is intended to reflect the recent historical trend of pipeline operating pressure due to supply and demand factors. The EOP is the higher of: (1) the pressure below which the pipeline operated 99.5% of the time over the last 18 months, or (2) the highest pressure over a continuous 8-hour period within the last 18 months.

FEI developed this definition through discussion with peer Canadian transmission pipeline operators during the time of FEI's CEPA participation.

29.2 Please explain how FEI will determine the established operating pressure of its ITS transmission pipelines following an electro-magnetic acoustic transducer in-line inspection (EMAT ILI) run.

Response:

To determine the EOP of its transmission pipelines, such as following an EMAT ILI run, FEI evaluates its records of actual operating pressure over the past 18 months relative to the definition of EOP provided in the response to BCUC IR3 29.1.

FEI's analysis of EMAT ILI data typically produces a calculated failure pressure estimate for the crack feature. If this estimated value exceeds the EOP, a pressure reduction to 80 percent EOP would be a typical approach to providing a safety factor for the pipeline until such time as the particular cracking was repaired. If this estimated value happens to be a lower value than the EOP, it is possible that FEI would implement a pressure reduction to lower than 80 percent EOP.

29.3 Please confirm, or explain otherwise, that FEI's ITS transmission pipelines operate at 80 percent of the established operating pressure at certain times of the year, for example as a result of seasonal fluctuations in demand.

29.3.1 If confirmed, please clarify whether the proposed PRS are only required should the ILI run occur when the pipeline is operating above 80 percent of the established operating pressure.

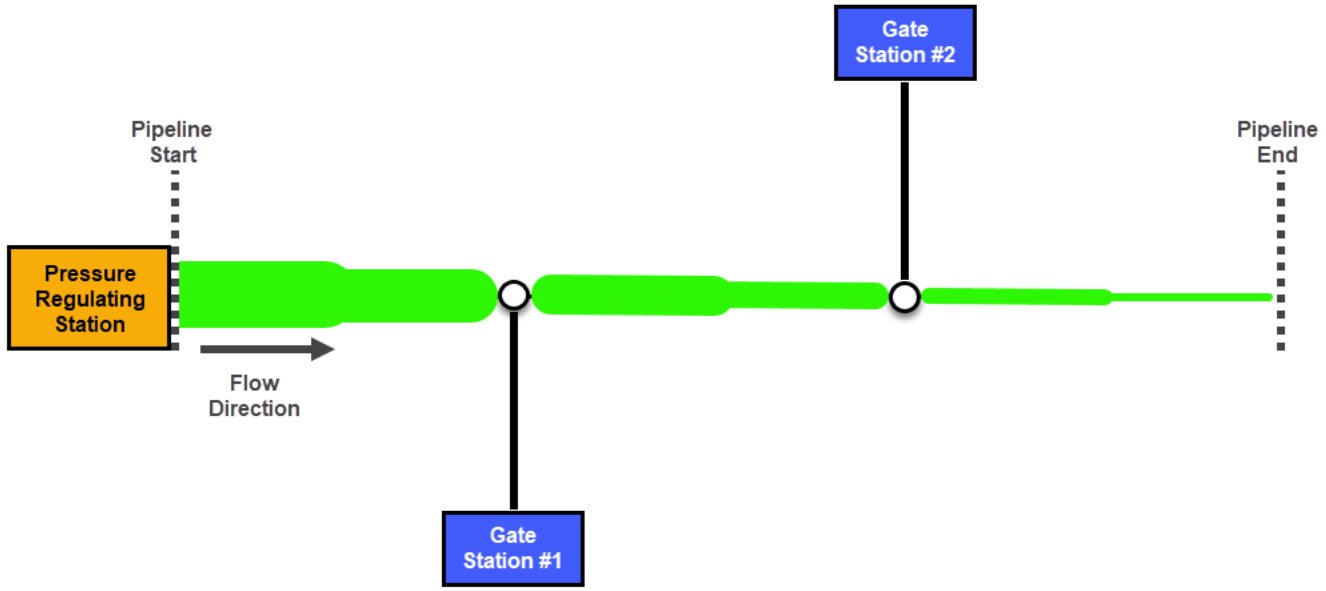
Response:

Segments of the ITS transmission pipelines may operate at or below 80 percent of the EOP at certain times of the year.

As illustrated in the figure below, a pressure regulating station sets the pressure into the pipeline. Pressure (represented by the thickness of the green line) at the start of the pipeline is highest following the pressure regulating station and reduces over the length of the pipeline due to friction and other factors.

Under normal operating conditions, the pressure at the start of the pipeline would typically be expected to be at or near its full operating pressure (i.e., typically referred to as maximum operating pressure or MOP, which is higher than 80 percent of the EOP), with a pressure degradation profile that reaches 80 percent of EOP at a certain point along the line. As the pressure regulating station is not set to restrict pressure (e.g., to 80 percent of EOP), pressure in the pipeline can change quickly and over time (e.g., system upsets, demand changes) up to its full operating pressure (i.e., to exceed 80 percent of EOP).

Figure 1: Example Pressure Schematic for Transmission Pipeline



In contrast, when considering the need to operate the pipeline at a reduced pressure to establish a safety factor over potentially injurious cracking, FEI must be able to confidently maintain that pressure across the entire pipeline and avoid any overpressure events that could lead to failure of the crack. This is achieved by setting the pressure regulating station to discharge gas at 80 percent of the EOP. The following excerpt is taken from CSA Z662:23, Clause 4.18.1.1:

> Pressure-control systems shall be installed where supply from any source makes it possible to pressurize the piping above its maximum operating pressure. Such pressure-control systems shall maintain pipeline pressure at or below the maximum operating pressure under normal operating conditions.

FEI must maintain any engineering-established pressure reduction for the entire timeframe required to address the integrity concern(s) driving the pressure reduction. The examples included in A15 of FEI's Rebuttal Evidence illustrate that the timeframes for maintaining a pressure reduction can typically range from several weeks to months or even years, depending on site-specific and line-specific factors.

FEI requires the proposed PRS at the Yahk Station to ensure that pressure on the YAH TRA 323 does not exceed 80 percent of the EOP anywhere on the pipeline, regardless of whether segments of the pipeline may be operating at or below 80 percent of the EOP at the time when the need for a pressure reduction is identified.

On page 15 of RCIA's Evidence, Ryall Engineering Limited (REL) states:

> Considering FEI is not planning to conduct the initial EMAT ILI on the YAH TRA 323 pipeline until 2030, a 35-day delay will not introduce unacceptable risks (again, the immediate pressure reduction will be made and the severe cracking will be addressed over a period of several months if not years after the independent pressure control is installed). [Emphasis added]

29.4 Please confirm, or otherwise explain, that FEI is not planning to conduct the initial EMAT ILI on the YAH TRA 323 pipeline until 2030.

Response:

FEI plans to conduct the initial EMAT ILI on the YAH TRA 323 pipeline in 2030. However, as discussed in the response to BCUC IR1 4.2, FEI may undertake the initial EMAT ILI run earlier than 2030 if possible, depending on the results of earlier scheduled initial EMAT inspections.

29.4.1 Please explain whether FEI anticipates that the operating pressure of the YAH TRA 323 pipeline will be 80 percent of the pipeline's current established operating pressure by the date of the initial EMAT ILI run, for example due to reduction in demand or system reconfiguration. Please discuss the continued need for the PRS under this scenario.

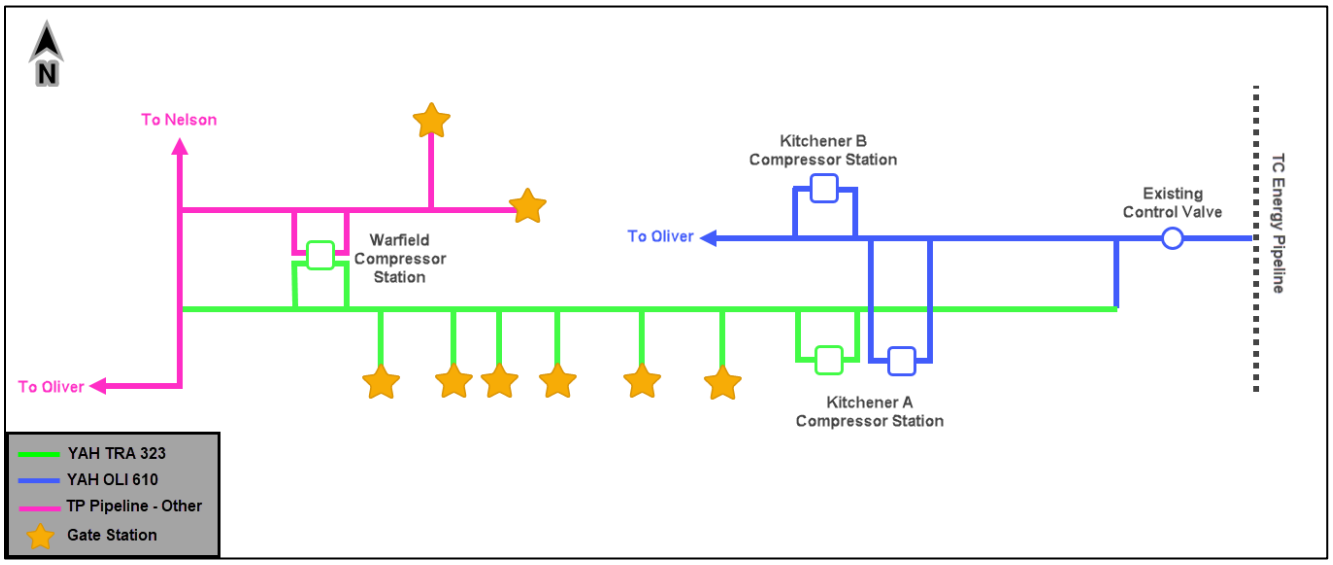
Response:

FEI does not anticipate that the operating pressure of the YAH TRA 323 pipeline will be at or below 80 percent of the pipeline's current established operating pressure by the date of the initial EMAT ILI run for the reasons outlined below. As such, for the reasons outlined in the response to BCUC IR3 29.3, there is a continued need for a PRS at the Yahk Station.

First, as explained in the response to BCUC IR3 29.1, FEI determines the established operating pressure of a pipeline using pressure information from the previous 18-month period. Further, certain segments of the pipeline may have different established operating pressures if pressure is altered at some point along the line (e.g., compression). As such, FEI clarifies that if cracking requiring a pressure reduction is found following the initial EMAT ILI run on the YAH TRA 323 pipeline in 2030, FEI will determine the required safe operating pressure based on the pipeline's recent operating pressure information, as opposed to today's operating pressure information.

Second, the YAH TRA 323 pipeline has a maximum operating pressure of 7,136 kPa and can flow gas bi-directionally. For most of the year, FEI flows gas east to west, receiving gas from TC Energy at a minimum contractual delivery pressure of 5,171 kPa and feeding communities as far west as Osoyoos, depending on the time of year. When required, the gas pressure may be increased up to the maximum operating pressure of 7,136 kPa at the Kitchener A Compressor Station to ensure sufficient inlet pressure to tail-end gate stations. As such, the only way the entirety of the YAH TRA 323 pipeline could be operating at or below 80 percent of the pipeline's current established operating pressure is if FEI sets the existing control valve to limit the inlet pressure to the YAH TRA 323 and YAH OLI 610 pipelines to 80 percent of the EOP of the YAH TRA 323 pipeline. Under this operating scenario, the Kitchener and Warfield Compressor Stations would need to operate more frequently and with higher horsepower utilization, resulting in higher O&M costs (comprised of fuel costs and carbon taxes). Further, as discussed in A12 of FEI's Rebuttal Evidence, this unnecessary pressure restriction on the YAH OLI 610 pipeline would limit FEI's ability to supply the maximum load of 105 MMSCFD at Kingsvale and down to the CTS on colder days, resulting in higher gas costs to secure the balance of supply for the CTS in the open market. These incremental gas costs would be similar to those provided in A16 of FEI's Rebuttal Evidence under the discussion of Events 29 and 31. Please refer to the figure below which provides a simplified schematic of the YAH TRA 323 pipeline.

Figure 2: Simplified Schematic of the YAH TRA 323 Transmission Pipeline



30.0 Reference: Exhibit B-18, pp. 25-26

Heavy Wall Pipeline Segment Modification

On pages 25 and 26 of FEI's Rebuttal Evidence, FEI states:

> …FEI is subject to the Pipeline Act, Oil and Gas Activities Act (OGAA) and Pipeline Regulations, which incorporate CSA Z662…
>
> **CSA Z662:19 Oil and gas pipeline systems** (excerpts only)
>
> 10.3.2.2
>
> Where an engineering assessment, the operating company's integrity management program, or observation indicates that portions of the pipeline system are susceptible to failure, the operating company shall either implement measures preventing such failures or operate the system under conditions that are determined by an engineering assessment to be acceptable.
>
> As explained further in Section 3.5.2 of the Application, together, the statutory and regulatory obligations FEI is subject to align with its efforts to take additional measures to mitigate the risk of failure on the 8 ITS pipelines due to cracking threats… Consistent with FEI's statutory and regulatory obligations, FEI has considered the impact of heavy wall segments on ILI performance, and FEI's post-EMAT integrity decision-making and response, and is proposing to remove only 3 of 65 heavy wall segments on the 8 ITS pipelines. [Emphasis added]

30.1 Please discuss whether or not FEI's ITS pipeline infrastructure would remain in compliance with legislation, regulatory and code requirements should FEI adopt RCIA's proposed approach to defer proactive removal of heavy wall segments.

Response:

FEI's ITS pipeline infrastructure may not remain in compliance with statutory, regulatory and code requirements should FEI be directed to adopt RCIA's proposed approach by deferring proactive removal of the 3 heavy wall segments. In particular, FEI references Clause 13.1 of the FortisBC Energy Inc. General Terms and Conditions effective November 1, 2018 and adopted by BCUC Order G-135-18:

> FortisBC Energy will use its best efforts to provide the constant delivery of Gas and the maintenance of unvaried pressures.

As explained in FEI's Rebuttal Evidence, RCIA's proposed approach would expose FEI's customers to: (1) an increased risk of interrupted gas supply for an extended period of time that could span several months of the year (Event 1); and (2) higher gas costs as a result of needing

to secure the balance of supply for the CTS (Events 29 and 31) if FEI is not able to plan, schedule and complete its activities to run EMAT tools and address cracking prior to the winter.

As FEI has not yet conducted baseline EMAT runs on the ITS, it does not yet know the number of cracks that will need to be addressed or the engineering inputs that will be available through the EMAT tool (e.g., tool-reported crack depth, crack-length, estimated type of crack, etc.) and subsequent integrity dig activities (e.g., field-assessed crack depth, crack-length, type of crack, lab-assessed results if in-ditch methods cannot be safely implemented, assessments of potential tool bias and resulting determination and implementation of responses, calculations of estimated failure pressure for cracks, etc.). As such, FEI is not able to estimate how much time will be required to assess identified cracks in order to maintain compliance with statutory, regulatory and code requirements.

Completing proactive repairs at Events 1, 29 and 31 provides FEI, at this stage of project development, with an appropriate degree of confidence that it can plan, schedule, and complete its activities to run EMAT tools and to address cracks without either interrupting supply to its customers or incurring unplanned and much higher gas costs to secure the balance of supply for the CTS.

30.2 Please summarize correspondence with the BC Energy Regulator regarding FEI's plans to proactively remove heavy wall segments before undertaking EMAT ILI runs, if any.

Response:

Between 2018 and 2019, the BC Energy Regulator (formerly the BC Oil and Gas Commission) undertook the "Aged Assets Information Collection" initiative. The BC Energy Regulator requested that FEI "Prepare and present to BC OGC Integrity Management Group information on FortisBC's Stress Corrosion Cracking (SCC) Management Plan for all selected pipelines for which SCC has been identified through direct inspection".

On August 22, 2019, as requested, FEI presented its SCC management practices, current and planned to the BC Energy Regulator. The presentation included FEI's planned adoption of EMAT tools on its system and, importantly, identified FEI's plan for "Removal of tight bends and large wall thickness transitions to minimize tool speed excursion which can lead to reduction/loss in data quality".

Further, to support the BC Energy Regulator's understanding of the timeline of implementing EMAT ILI on its system, FEI outlined the process of "CPCN development for BCUC approval of expenditures", including the following description of system modifications to prevent speed excursions: "Remove problematic bends and wall thickness transitions impacting speed

excursions". FEI also identified other components that have been included within the Project scope, including modifying launching and receiving barrels, installation of pressure control stations, and system modifications (e.g., pipeline looping).

The BC Energy Regulator provided written support for FEI's TIMC projects in a letter dated November 16, 2020, attached as Appendix C to the Application.