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March 31, 2015

Via Email
Original via Mail

British Columbia Utilities Commission
Sixth Floor
900 Howe Street
Vancouver, B.C.
V6Z 2N3

Attention: Ms. Erica M. Hamilton, Commission Secretary

Dear Ms. Hamilton:

Re: FortisBC Energy Inc. (FEI)

Application for 2015 and 2016 Revenue Requirements and Rates for the Fort Nelson Service Area (the Application)

Response to the British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 2

On December 3, 2014, FEI filed the Application as referenced above. In accordance with Order G-34-15 setting out the Amended Regulatory Timetable for the review of the Application, FEI respectfully submits the attached response to BCUC IR No. 2.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC ENERGY INC.

Original signed:

Diane Roy

Attachments

cc (email only): Registered Parties

A. OPERATING AND MAINTENANCE (O&M) EXPENSES

1.0 Reference: NON-LABOUR COSTS

Exhibit B-2: BCUC 1.13.1, BCUC 1.15.1

Employee expenses

In response to BCUC IR 1.13.1 FortisBC Energy Inc. (FEI) states:

> Additional trips to Fort Nelson are planned for 2015 and 2016 to meet internal requirements to assess and manage the quality of both O&M and recurring and project capital work. In particular, the assessments and coaching are performed on employees on routine recurring activities such as meter exchanges, service installations and gas odor calls.[1]

The table provided by FEI in response to BCUC IR 1.15.1 shows an average actual employee expense for the years 2009 through 2014 of $11 thousand. Further, the only year where the Approved employee expense amount was comparable to the 2015 and 2016 forecast was 2009 ($24 thousand); however, the actual employee expense for 2009 was only $4 thousand.[2]

1.1 Given the routine and recurring nature of the assessments and coaching activities forecast to be performed, please explain why employee expenses have not been at a level similar to the amount forecast for 2015 and 2016 in any of the past six years.

Response:

As described in the response to BCUC IR 1.13.1, commencing in 2015 there is an internal requirement for managers of FEFN resources to conduct more direct field assessments and work observations than in past years to ensure quality, safety, service and productivity objectives are achieved. This is a new requirement that has been put in place to meet Company objectives to focus on and improve safety and the customer experience in addition to being able to identify productivity improvements.

[1] Exhibit B-2, BCUC IR 1.13.1.
[2] Ibid., BCUC IR 1.15.1.

1.2 What is the likelihood that FEI might experience a variance in forecast versus actual employee expenses for 2015 or 2016 of the size experienced in 2009?

Response:

It is unlikely that the actual employee expenses for 2015 and 2016 will experience a variance from forecast similar to 2009. The Northern Region management team, specifically managers located in Prince George, is required to conduct the field assessments on site on a regularly scheduled basis, as has been forecast.

The 2009 situation was much different in that Fort Nelson had been experiencing high employee turnover prior to that time and had required incremental training expenses as a result, such that employee expenses were $31 thousand in 2006 and $32 thousand in 2007. In 2009, FEI had forecast that the same trend would continue based on the 2006 and 2007 results, but no new hires were required, resulting in the favourable employee expense variance experienced in that year.

1.2.1 What factors could contribute to managers making fewer trips than planned in 2015 and 2016? Please discuss.

Response:

The Northern Region management team provides oversight to several municipalities in the region on a regular basis. The management team prioritizes direct field observations and assessments depending on the resources and the type of work being assessed. Both of these can change year over year. For example, mains and services installation activities can increase or decrease from forecast and are also weather dependent; if there is no planned activity of this type in a particular month an on-site work observation for this type of work would not be required.

1.3 Given the magnitude of the forecast rate increase in 2015, would FEI consider reducing or deferring some of the managers' planned travel in 2015 in order to reduce the increase in O&M for 2015? Please discuss.

Response:

FEI intends to implement the direct work observations and field assessments for Fort Nelson as there is a need in the remote areas to ensure quality, safety, service and productivity objectives are met. On this basis, FEI considers the forecast increase in 2015 employee expenses to be necessary and accordingly would not consider reducing or deferring the activities giving rise to this expense.

B. CAPITAL EXPENDITURES

2.0 Reference: RATE BASE AND CAPITAL EXPENDITURES

Exhibit B-2: BCUC 1.16.1, BCUC 1.17.1.1; Exhibit B-1, Section 7.2.1, Table 7-2, p. 30

Transmission Plant Additions

Table 7-2 on page 30 of the Application shows a 2014 Projected amount for transmission plant capital additions of $601 thousand.[3]

The table provided in response to BCUC IR 1.16.1 shows a 2014 Preliminary Actual amount for transmission plant capital additions of $84 thousand.[4]

FEI states in response to BCUC IR 1.17.1.1 that the 2014 Forecast for transmission plant additions included in the 2014 Application for Deferral Account Treatment was $165 thousand.[5]

2.1 Please describe the 2014 transmission plant capital expenditures which were forecast to be incurred when FEI filed its 2014 Application for Deferral Account Treatment.

Response:

As explained below, the 2014 Projected amount included in the 2015-2016 Revenue Requirements Application was incorrect, while the variance between the 2014 Forecast and the 2014 Preliminary Actual was due to the installation of pipeline protection not being completed as forecast.

The $165 thousand in 2014 transmission plant capital expenditures which were forecast to be incurred when FEI filed its 2014 Application for Deferral Account Treatment for FEFN consisted of the following: $75 thousand for installation of protection over the 168mm pipeline at a creek crossing, $80 thousand for removal of two valves, and $10 thousand for updating records pertaining to one segment of transmission line. FEI, however, was not able to undertake the installation of the pipeline protection in 2014 due to resource constraints resulting from the completion of the Muskwa River Crossing Project in 2014. Due to the existence of the Revenue Surplus/Deficit Account, ratepayers did not pay for this pipeline protection project even though it was forecast. As noted on page 30 of the Application and discussed further in the response to BCUC IR 1.18.2, FEI has now forecast this pipeline protection project to occur in 2015.

[3] Exhibit B-1, p. 30.
[4] Exhibit B-2, BCUC IR 1.16.1.
[5] Ibid., BCUC IR 1.17.1.1.

The $601 thousand 2014 Projected amount for transmission capital plant additions in the 2015-2016 Revenue Requirements Application was incorrect. The 2014 Projected amount included $410 thousand related to Transmission Land Rights. This $410 thousand properly belonged, and also was included in, the 2015 Forecast transmission plant additions. This oversight was corrected when FEI updated the 2014 Projected to 2014 Preliminary Actual additions. Please refer to BCUC IR 1.16.1 for an updated summary of Gross Plant Additions which reflects the Preliminary Actual results for 2014.[6]

The variance of approximately $81 thousand between the 2014 Preliminary Actual transmission plant capital additions of $84 thousand provided in response to BCUC IR 1.16.1 and the 2014 Forecasted transmission plant capital additions of $165 thousand is primarily due to a reduction of approximately $75 thousand associated with the pipeline protection project discussed above.

2.2 Please explain why, at the time of filing the 2015-2016 Revenue Requirements Application (RRA), FEI was projecting 2014 transmission plant capital additions of $601 thousand, which was $436 thousand higher than originally forecast in the 2014 Application for Deferral Account Treatment.

Response:

Please refer to the response to BCUC IR 2.2.1.

2.3 Please explain what changed between the time of filing the 2015-2016 RRA and the filing of FEI's responses to Commission IR No. 1 which resulted in FEI adjusting the 2014 transmission plant additions downwards by $517 thousand.

Response:

Please refer to the response to BCUC IR 2.2.1.

[6] Please also refer to Schedules 44 and 44, Line 11, Column 4 of Attachment 1.2 to the response to BCUC IR 1.1.2, which show the preliminary actual and forecast 2015 additions for Account 461-00 Transmission Land Rights.

FEI states in response to BCUC IR 1.17.1.1 that the approved Fort Nelson Revenue Surplus/Deficit Account will capture the variance between the 2014 revenue that FEFN collects and the actual 2014 costs, including the costs associated with actual capital additions.[7]

2.4 Given the large variance in Forecast versus Projected versus Preliminary Actual 2014 transmission plant additions, please discuss whether it would be appropriate to utilize the Fort Nelson Revenue Surplus/Deficit Account to capture variances between forecast and actual transmission plant additions for 2015 and 2016 to mitigate the risk of potential variances.

Response:

Please refer to the response to BCUC IR 2.2.1 where FEI explains that the variance between Projected and Preliminary Actual 2014 transmission plant additions is attributable to an oversight.

FEI does not believe that the use of the Fort Nelson Revenue Surplus/Deficit Account to capture the impact of variances in transmission plant additions for 2015 and 2016 is necessary. This is because FEI believes that the forecasts are reasonable and that the variance in plant additions must be significant to have a material impact on the revenue requirement. For example, to have an approximate impact of 1 percent to the delivery component of the rate in 2015, approximately $700 thousand in transmission plant additions would be required. This would be a very significant variance as compared to the forecast of 2015 transmission plant additions of $399 thousand.

However, although FEI does not believe that this treatment is necessary, FEI would not be opposed to capturing the impact of variances in plant additions in the Fort Nelson Revenue Surplus/Deficit Account. Please also refer to the response to BCUC IR 2.3.2, wherein FEI notes that a deferral account could be an alternative approach for the costs associated with the Transmission Land Rights capital additions that pertain to the updated agreement with the Fort Nelson First Nation.

[7] Ibid.

3.0 Reference: TRANSMISSION PLANT

Exhibit B-1, Section 7.2.1, pp. 30–31; Exhibit B-2, BCUC 1.18.1

Right-of-way Agreement with the Fort Nelson First Nations

In response to BCUC IR 1.18.1 FEI states:

> FEI has operating transmission pipelines that are located within the Fort Nelson Indian Reserve. These transmission pipelines are used to provide service to FEFN customers. It is necessary for FEI to maintain the legal authority to operate and maintain these assets on the Fort Nelson Indian Reserve.[8]

In FEI's presentation in the Streamlined Review Process for the Muskwa River Crossing proceeding FEI provided a map of the Fort Nelson service area indicating there was only one operating transmission pipeline within the Fort Nelson Indian Reserve.[9]

3.1 Please confirm, or explain otherwise, that there is only one FEI operating transmission pipeline located within the Fort Nelson Indian Reserve.

Response:

FEI confirms that there is only one operating transmission pipeline that passes through the Fort Nelson Indian Reserve #2 and that in addition to serving the Fort Nelson First Nation, this pipeline serves all customers in Fort Nelson as well as surrounding areas. The single transmission pipeline is made up of segments constructed at different times, which is why FEI had referred to transmission pipelines rather than a single transmission pipeline. FEI will correct its description in future filings.

3.1.1 If confirmed, please further confirm, or explain otherwise, that, in general, there are three sections to that pipeline: 1) a section which goes from Reserve 5 to Sikanni Road, 2) a section along Sikanni Road, and 3) a section from Sikanni Road to approximately the Alaska Highway near the Muskwa River Crossing.[10],[11],[12]

[8] Ibid., BCUC IR 1.18.1.
[9] Ibid., BCUC IR 1.18.1.
[10] Attachment 18.1, FN 1968 28(2) Permit Agreement, p. 3.
[11] Attachment 18.1, FN IB Agreement 1982 Lot 2313, p. 7.
[12] Attachment 18.1, FN 1983 Sec 28(2) Permit Agreement Lot 2313, p. 8.

Response:

The sections of the transmission pipeline passing through the Fort Nelson Indian Reserve #2 are as follows: 1) an approximately 226 m section of NPS6 pipeline that is located east of the Alaska Highway, 2) an approximately 2,049 m section of NPS4 pipeline that travels northward parallel to Keenay-Yah Road to Sikanni Road, 3) an approximately 489 m section of NPS4 pipeline within Sikanni Road, and 4) an approximately 856 m section of NPS4 pipeline located between Sikanni Road and the Alaska Highway.

In response to BCUC IR 1.18.1 FEI also states:

> FEI is currently negotiating a new consolidated permit under section 28(2) of the Indian Act with the Fort Nelson First Nation and the Ministry of Indian Affairs and Northern Development (representing Her Majesty in right of Canada). As the agreement is not yet finalized, FEI cannot provide a copy of the agreement.[13]

3.2 Please provide the date the agreement is expected to be finalized. What is the likelihood that negotiations will be complete and the agreement finalized before the end of 2015? What factors could contribute to a delay in the finalization of the agreement? Please discuss.

Response:

FEI notes that Aboriginal Affairs and Northern Development Canada (AANDC) is the appropriate title of the agency representing Her Majesty in right of Canada.

FEI is filing responses to BCUC IRs 2.3.2 through 2.3.8 as well as BCUC IRs 2.3.12 through 2.3.14 in confidence with the Commission in accordance with the Commission's Confidential Filings Practice Directive. The release to the public of the information in the responses to these information requests may compromise FEI's negotiations with the Fort Nelson First Nation (FNFN) for a permit under section 28 of the Indian Act, which is necessary to operate and maintain FEI's transmission pipeline on the FNFN Indian Reserve #2. Due to the sensitivity of these negotiations and the FNFN's stated opposition to the release of any information related to the negotiations, FEI is requesting that the information not be released to any parties in this proceeding pursuant to section 8 of the Commission's Confidential Filings Practice Directive.

[13] Exhibit B-2, BCUC IR 1.18.1.

Due to FEI's inability to provide all requested information without compromising negotiations with the FNFN, FEI would be supportive of an alternative approach whereby a deferral account is approved to capture the actual costs associated with the agreement with the FNFN. The balance in the account would be reviewed in FEFN's next revenue requirement, at which time the balance would be transferred to plant in service subject to Commission approval. If the Commission were to approve this approach, FEI would adjust its financial schedules in its compliance filing.

3.9 Please explain why each of the above costs should be considered capital as opposed to O&M. Is this treatment consistent with how FEI is treating these costs for financial accounting purposes? If not, why not?

Response:

As Fort Nelson does not pay the FNFN any fees under the existing agreement, any new right of way agreement will be capitalized as it is considered an initial purchase of land rights. The capitalization of these costs is consistent with how FEI is treating these costs for financial accounting purposes.

Although not currently forecast, if the negotiation results in land rights subject to renewals and or extensions, the renewal would be recorded as a prepaid expense and expensed over the useful life of the lease term. This treatment would be consistent with how FEI would treat such costs for financial accounting purposes.

Thus, the actual treatment of costs in both the revenue requirement and for financial accounting purposes can only be determined once the negotiation is complete and the agreement is finalized. In either case, where reasonable to do so, it is FEI's preference to maintain consistent treatment between regulatory and financial accounting.

In response to BCUC IR 1.18.1 FEI provides copies of four agreements in Attachment 18.1:

- FN 1968 28(2) Permit Agreement.
- FN Hydro 1972 Assignment Agreement.

- FN IB Agreement 1982 Lot 2313.
- FN 1983 Sec 28(2) Permit Agreement Lot 2313.

3.10 Please fill in the table below for each right-of-way identified in Attachment 18.1.

Section	Size of Right-of-Way	Original Payment Year	Original Payment Amount	Original Term	Payment amount converted to 2014$	Attachment 18.1 Page Reference

Response:

The requested table for each right of way identified is provided below. Due to the advancement of aboriginal law and changes in land value over time, it is not appropriate to compare costs of the current agreement with previous agreements.

Section	Size of Right-of-Way	Original Payment Year	Original Payment Amount	Original Term	Payment amount converted to 2014$	Attachment 18.1 Page Reference
1968 28(2)	abandoned	1966	$ 126.75	20 years	$ 926.12	Page 10 after the Appendix title page
1972 Assignment	2.731 ha	1962	$ 517.07	Perpetuity	$ 4,053.28	Page 21 after the Appendix title page
1982 &1983	1.18 ha	1983	Construction of approx. 3000 feet of natural gas line along Sikanni Road	20 years	Unknown	n/a

3.11 Please compare the estimated costs for the proposed new agreement to the costs incurred in each of the above agreements.

Response:

Please refer to the response to BCUC IR 2.3.10.

4.0 Reference: TRANSMISSION PLANT

Exhibit B-1, Section 7.2.1, pp. 30–31; Exhibit B-2, BCUC 1.18.2

Replacement of Valve Assembly

In response to BCUC IR 1.18.2 FEI explains:

> **Replacement of Valve Assembly**
>
> The valve assembly forecast to be replaced in 2015 controls the flow of gas out of two transmission pipelines into a short single transmission pipeline that supplies the Fort Nelson Gate Station. This project includes:
>
> - Replacement of the short single transmission line from the valves to the station due to integrity concerns from the pipe being shallow, the pipe coating being in poor condition and stresses imposed by recent development adjacent to the station; and
> - Replacement of the valve assembly because there are valves that are leaking natural gas to the environment, and the valves that are needed to control flow in the pipelines are not operable.
>
> The valve assembly and the transmission pipeline are integral to the only supply into the Fort Nelson Gate Station. The current condition of each poses a risk to ensuring a reliable supply to Fort Nelson and an effective emergency response.[14]

4.1 Please provide a breakdown of the costs to replace the short single transmission line.

Response:

FEI does not have a cost estimate for only replacing the short single transmission line. A comparison of the cost to replace both the short single transmission line and the valve assembly together, compared to replacing the valve assembly only is provided below.

Due to the efficiencies of undertaking all of this work at the same time as discussed in the response to BCUC IR 2.4.4, the cost of replacing the transmission line alone would be greater that the difference in the totals provided below. That is, both projects are necessary and FEI expects that if the projects were staggered, the total cost to complete the two projects would be greater than the $203 thousand forecast in 2015.

[14] Exhibit B-2, BCUC IR 1.18.1.

	Transmission Line and Valve Assembly	Valve Assembly only
Project Management	$5,000	$4,000
Design	$26,700	$14,000
Materials	$24,450	$6,500
Fabrication (off site)	$15,000	$15,000
Fabrication (on site)	$105,000	$54,000
Contingency	$26,850	$14,000
Total	$203,000	$107,500

4.2 Please provide a breakdown of the costs to replace the valve assembly.

Response:

Please refer to the response to BCUC IR 2.4.1.

4.3 Please discuss the urgency and relative importance of these projects.

Response:

As discussed in the response to BCUC IR 1.18.2, for the sections of pipe at the creek crossing and the road crossing, the replacement of the short single transmission line is a mitigating action to prevent the failure of a pipeline system that is the only supply to Fort Nelson. Replacing the pipe also reduces the risk to public and employee safety.

The severity and probability of a failure of the pipe are very difficult to predict, but the probability, and thus risk, of a failure increases over time. Deferring this work would therefore increase risk of a failure of the pipeline, which would interrupt supply to Fort Nelson and pose a risk to public and employee safety.

The replacement of the valve assembly is to ensure that FEI can implement emergency procedures that include the safe control or shutdown of the pipeline system in the event of a pipeline emergency. If the inoperable valves are not replaced, FEI cannot meet its regulatory obligations.

While replacing the transmission line (to prevent an incident) can take precedence over replacing the valves (to ensure emergency response is possible), FEI believes the work should be done at the same time due to the cost advantage of doing the work concurrently, as discussed in the response to BCUC IR 2.4.4.

4.4 Please discuss the advantages and disadvantages of completing these projects at the same time vs. completing the projects one at a time.

Response:

Completing all of the work at the same time has two main cost advantages over staggering the work.

1. By completing all of the work at the same time lower costs are expected because personnel and equipment only have to move in to and out of Fort Nelson once rather than twice ;and,

2. A temporary supply to the Fort Nelson Gate Station only needs to be set up once instead of twice.

In addition, avoiding this duplication reduces the risk to employee safety as there is significantly reduced driving time and work duration and reduces the risk of an accidental interruption of the supply to the gate station and a loss of service to Fort Nelson.

There is a potential minor rate smoothing advantage of staggering the work; however, this may be eroded by the higher expected costs of completing the projects in isolation of one another.

4.5 Please provide the integrity management program criteria and value that supports FEI's determination that the short transmission line requires replacement at this time (e.g. wall thickness in millimeters, and/or depth of cover in inches). Please provide the measurement that shows the short transmission line has exceeded, or is expected to exceed that criteria in the near future, and therefore requires replacement at this time.

Response:

This response also addresses BCUC IR 2.4.7.

FEI has inspected the site where the short transmission line is located and has visually inspected the pipe and coating. This particular portion of the transmission line serving the Fort Nelson Gate Station is believed to have been constructed in 1960. FEI has found that although the transmission line has operated at pressures greater than it is operating now, FEI does not know the material specification of the pipe (e.g. the yield strength of the pipe) and it does not have sufficient information to conclude what the wall thickness is for the entire length of this portion of transmission line.

The key components of FEI's Asset Design activity within FEI's Integrity Management Program (IMP) are intended to ensure that assets have been designed in compliance with applicable codes, standards and regulations, and can meet constructability, reliability, maintainability, and operability requirements in a safe, efficient, economic and environmentally and socially responsible manner.

When steel pipe that has unknown properties is found, either the properties of each pipe joint must be determined by testing or the pipe must be assumed to have specific maximum properties as per Clause 5.6.4 of CSA Z662-11 Oil and Gas Pipeline Systems. The maximum properties specified by CSA Z662 would not permit the pipeline to operate at the pressure required to supply the Fort Nelson Gate Station. To determine the properties of the pipe, each pipe joint of the transmission line would require complete excavation and the removal of samples. This would be equivalent to excavating the entire pipeline while operating a temporary supply to the Fort Nelson Gate Station. It is therefore expected to be more cost effective to replace the pipe of unknown qualities with new pipe.

In accordance with FEI's Geotechnical and Hydrotechnical Management activity within its IMP, FEI attempts to prevent and/or mitigate failure incidents caused by geohazards. Evolving geotechnical and hydrotechnical hazards are identified and mitigated before they result in damage incidents that could lead to failures with significant consequences. When the site was inspected recently, FEI found that the transmission line did not appear to be straight, although it is believed that the transmission line was straight at one time. The short single transmission line is located in very wet, bog like material and it is surmised that the stockpiling of material to form a berm nearby (for the recent development adjacent to the station) may have caused ground movement and associated pipe deflection, which may have created bending stress in the pipe wall that, when added to the hoop stress due to internal pressure, may result in a high stress condition that may lead to failure of the pipe. It is not possible to provide a calculation that confirms that the pipe has exceeded a permissible total stress as the initial state of the pipe is unknown, the correct pipe specifications are unknown, and any curvature is difficult to measure unless the pipe is exposed. However, bending of any pipe in an uncontrolled manner and after it has been subjected to a pressure test is not is accordance with the requirements of CSA Standard Z662 Oil and Gas Pipeline Systems. An alternative to replacement of the pipe would be to take it out of service and conduct a new hydrostatic pressure test; however, this

would require the transmission line to be taken out of service for 3 to 5 days and there is a possibility the test would not be successful.

In accordance with FEI's Depth of Cover Management activity within its IMP, FEI endeavors to operate and maintain underground gas piping with depth of cover in accordance with the design and construction requirements for each installation and proactively monitors for changes on TP pipelines concurrent with other IMP Activities. Locations found not to meet current design and construction depth of cover requirements are assessed and mitigated as needed to ensure that the gas piping is adequately protected from anticipated external loads and potential damage risks. Depth requirements are established in various sources, including CSA Z662, BC regulations, and BC Ministry of Transportation, as reflected in FEI standard CON 02-05 "Piping Cover". When FEI inspected the site, FEI found that the transmission line has locations where the depth of cover does not meet the 0.6 metre requirement that is also contained in CSA Standard Z662 Oil and Gas Pipeline Systems.

In accordance with FEI's Cathodic Protection activity within its IMP, FEI mitigates failure incidents potentially caused by pipe condition through the use of cathodic protection, in conjunction with pipeline coatings. When deficiencies are identified, the FEI's Cathodic Protection activity requires that appropriate corrective work is initiated and completed. When FEI inspected the pipe coating, it was found to be poorly bonded to the pipe, and extensive corrosion was found under the coating. Based on these findings, it is believed that additional cathodic protection current would not be sufficient to mitigate corrosion growth and mitigation would require recoating or replacement of the pipe.

FEI believes that the issues identified and discussed above strongly support the need to replace the transmission line.

4.6 Please confirm, or explain otherwise, that FEI has explored other options to prolong the life of this short transmission line, for example rehabilitation (i.e. dig, recoat and cover).

Response:

FEI has not explored other options to prolong the life of this short transmission line because FEI believes that replacement is the only option due to the issues discussed in response to BCUC IR 2.4.5. As such, FEI has not evaluated the costs and benefits associated with other options. Further, based on FEI's experience with transmission pipelines of this nature, the cost associated with rehabilitating this pipeline would be far greater than replacing the existing

pipeline with pipe of known quality and condition, especially when considering the small diameter of the transmission line and the unknowns associated with it.

4.6.1 If confirmed, please discuss the advantages and disadvantages of these alternatives and provide an estimate of these costs.

Response:

Please refer to the response to BCUC IR 2.4.6.

4.7 Please elaborate on the stresses imposed by the recent development adjacent to the station. For example, what are the stresses, what are they caused by and how do they cause an integrity concern?

Response:

Please refer to the response to BCUC IR 2.4.5.

Having bending of the pipe occur during operation raises concerns that imperfections may have been created in the pipe and no proof exists as to whether they will continue to withstand the operating conditions of the transmission line.

4.8 Please quantify and discuss the amount of natural gas that is leaking into the environment due to leakage at the valve assembly.

Response:

FEI is unable to quantify accurately the amount of natural gas that is leaking into the environment from the numerous valves that exist within the valve assembly, as this would require making a number of assumptions that would have a high degree of inaccuracy.

The leakage is not great but is readily detectable. The valves need to be either replaced or removed in order to comply with section 37 of the *BC Oil and Gas Activities Act*, which requires that spillage must be prevented and, if a spillage occurs, the cause or source of the spillage must be remedied and the spillage must be contained or eliminated.

4.9 Please discuss in what way the valves that are needed to control flow in the pipelines are not operable and what FEI is currently doing to mitigate their non-operability.

Response:

The valves are primarily required for maintenance to be conducted on the pipelines and for emergency response. The valves are not operable in the sense that they are stuck in place and cannot be used to shut off one of the two pipelines as described below.

The valve assembly discussed is located at the downstream end of where two pipelines connect together to supply the single transmission line. If it is necessary to carry out maintenance on one of the two pipelines or shut in one of the two pipelines due to integrity concerns (i.e. emergency response), the valve assembly would allow FEI to choose which pipeline will continue to operate and at the same time eliminate any impact one pipeline has on the other, thus allowing FEI to maintain natural gas flow towards the Fort Nelson Gate Station while taking one pipeline out of service.

In accordance with standard industry practices, FEI has attempted to free up the valves so that they operate but has not had success. The result is that if an emergency situation arose that impacted one pipeline the same situation would impact the second pipeline. In this case, all of the supply to the station could be lost as opposed to losing approximately half the supply to the Fort Nelson Gate Station. Therefore, FEI believes there is no mitigation for this scenario other than to replace the valve assembly.

4.10 Please confirm, or explain otherwise, that FEI has explored other options to prolong the life of the valve assembly, for example rehabilitation (i.e. reseal assembly and repair controls).

Response:

FEI confirms that it has considered other options to prolong the life of the valve assembly; however, considering the design and construction activities and modifications that would be necessary to rehabilitate the existing valve assembly, the cost of the alterations required to the existing piping could be significantly greater than replacing the valve assembly.

One of the risks in attempting to rehabilitate any existing piping (including valve assembly), especially piping that has been in service for a long time, is that during the rehabilitation other issues can be discovered that cause difficulties to completing the work. These issues can lead to much higher costs and longer construction duration compared to installing a complete new assembly with materials of known quality and condition.

Another option is to remove the valves and repair them. However, it is not possible to know if these valves can be repaired until they are removed. Nor is it possible to wait for the valves to be repaired and re-installed from point of removal due to high costs.

Given the financial and scheduling risks associated with other options as discussed above, FEI believes that it is in the best interest of customers and the Company to proceed with the valve assembly replacement as proposed.

4.10.1 If confirmed, please discuss the advantages and disadvantages of these alternatives, and provide an estimate of these costs.

Response:

Please refer to the response to BCUC IR 2.4.10.

4.11 Please provide the integrity management program technical criteria and value that supports FEI's determination that the valve assembly requires replacement. Please provide the measurement that shows the valve assembly has exceeded, or is expected to exceed that criteria in the near future, and therefore requires replacement at this time.

Response:

Please refer to the responses to BCUC IR 1.18.2 and BCUC IR 2.4.8 to 2.4.10, which provide criteria and justification for the replacement of the valve assembly.