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Via Email
Original via Mail

British Columbia Public Interest Advocacy Centre
Suite 209 – 1090 West Pender Street
Vancouver, B.C.
V6E 2N7

Attention: Ms. Tannis Braithwaite, Acting Executive Director

Dear Ms. Braithwaite:

Re: FortisBC Energy Inc. (FEI)

Application for a Certificate of Public Convenience and Necessity (CPCN) to Construct and Operate a Transmission Pressure Pipeline Crossing of the Muskwa River (the Application) for the Fort Nelson Service Area

Response to the British Columbia Public Interest Advocacy Centre on behalf of the British Columbia Pensioners' and Seniors' Organization *et al* (BCPSO) Information Request (IR) No. 1

On November 29, 2013, FEI filed the Application as referenced above. In accordance with Commission Order G-207-13 setting out the Regulatory Timetable for the review of the Application, FEI respectfully submits the attached response to BCPSO IR No. 1.
If further information is required, please contact the undersigned.

Sincerely,

FORTISBC ENERGY INC.

Original signed:

Diane Roy

Attachments

cc: Commission Secretary
Registered Parties (e-mail only)

1.0 Reference: Exhibit B-1, page 1, AFUDC

1.1 Please provide the current AFUDC rate and explain how it was calculated.

Response:

The current approved AFUDC rate for FEFN for 2013 is 6.38 percent[1]. This rate was calculated based on the 2013 approved FEFN capital structure through Commission Order G-75-13, which updated the rate structure for the Generic Cost of Capital Decision.

Please note that the AFUDC rate applied in 2014 is the forecast rate of 6.27 percent as filed in the FEFN Application for Deferral Account Treatment for 2014 and Changes to the RSAM Rider.[2]

[1] (8.75 percent ROE x 38.50 percent equity thickness) + ((6.87 percent LT debt rate x 56.48 percent LT debt structure) + (3.50 percent ST debt rate x 5.02 percent ST debt structure) / (1 – 25.75 percent tax rate)) = 6.38 percent.

[2] (8.75 percent ROE x 38.50 percent equity thickness) + ((6.83 percent LT debt rate x 55.90 percent LT debt structure) + (1.75 percent ST debt rate x 5.60 percent ST debt structure) / (1 – 26.00 percent tax rate)) = 6.27 percent.

2.0 Reference: Exhibit B-1, page 1, Inclusion in Rate Base

Preamble: The referenced page states:

At the beginning of 2015 the deferral account would be included in rate base, and no further AFUDC would be charged to the deferral account.

2.1 Does FEI propose to include the projects capitalized costs in rate base in January 2015 even in the case that the project is not in-service on January 1, 2015?

Response:

The referenced section in the preamble relates to the Muskwa River Crossing Project Costs deferral account. In regard to that account, FEI's proposal is to have that account included in rate base on January 1, 2015, regardless of whether the project is in-service at that point in time.

In regard to the project capitalized costs for the plant assets, FEI only includes amounts in its actual rate base that were in-service before the end of the prior year. To clarify, if the actual plant capital was not in service as of January 1, 2015, it would continue to reside in a work in progress account and attract AFUDC in 2015. If it actually goes into service in 2015, the capitalized costs would be included in rate base January 1, 2016.

3.0 Reference: Exhibit B-1, page 4, Use of Sandbags

Preamble: The referenced page states:

FEI implemented protection measures to improve the integrity of the north bank of the Muskwa River by selective placement of a large number of 500kg sandbags. The cost of this mitigation was approximately $250 thousand and was recorded as an operating expense in 2013.

3.1 Can FEI provide the approximate number of 500 kg sandbags that it used?

Response:

FEI installed 360 bags of sand and 30 bags of rock.

3.2 Can FEI confirm that the use of such sandbags cannot provide a permanent solution to the pipeline integrity issue?

Response:

FEI confirms the use of sandbags cannot provide a permanent mitigation solution to the pipeline integrity issue.

The use of the sandbags was a temporary bank protection measure undertaken in late 2013 and does not provide a full scale temporary mitigation of the exposed pipeline within the river crossing.

From a river engineering view point, the crossing needs to be replaced, considering the rate of river bed and bank erosion that are directly affecting the pipeline crossing. FEI's understanding is based on the mitigation options and their associated risks as suggested by FEI's consultants, BGC Engineering and Worley Parsons Canada. These suggestions came from their recent review, analysis and assessment of the crossing considering available historical data, bathymetry survey and diver's inspection report of the crossings as recent as 2013.

4.0 Reference: Exhibit B-1, page 5, and page 26, Risk Allocation

Preamble: The first referenced page states:

> *However, there remains the possibility that a contractor may propose a Micro-tunneling option that, depending on risk allocation, is more economical than an HDD option. Therefore, FEI wishes to retain flexibility in choosing the crossing methodology to permit the most economical crossing that meets all environmental, technical, and regulatory requirements.*

The second referenced page states:

> *Microtunnelling has been proposed as a potentially viable trenchless technique that, similar to HDD, could be used to install the new gas pipeline crossing and reduce the risk presented by the sub-surface gravel layers.*

4.1 Please elaborate with respect to the first sentence in the first extract indicating exactly and fully, what is meant by "depending on risk allocation."

Response:

Risk allocation is meant to define the degree (allocation) of various project risks that FEI accepts, or the contractor accepts, or is shared.

The general principle is that each party accepts those risks that they are best able to manage and the remaining risks are negotiated to be shared or accepted by either party. This model, properly administrated, should minimize the cost of the construction by compensating for risk events only when they occur. Should certain risk events occur, then the cost of mitigating the risk is minimized by having a process in place.

In the Muskwa River crossing, the primary risk is generally recognized to be the gravel layers under the surface. FEI believes that these gravel layers are manageable if a competent contractor is selected and there is competent oversight by the inspectors. Following the RFQ process, analysis of the responses should provide insight into how the various contractors choose to accept, transfer, or share the various project risks including the gravel layers.

FEI intends to minimize cost to the Project by following the principles noted above.

4.2 Please provide a comprehensive discussion along with any quantification possible about the relative risks for ratepayers of the two potential methods. For example, is it possible to provide an expected value of costs for each of the two methods that takes into account, probabilities and outcomes?

Response:

A risk assessment workshop was completed during September 2013 to identify and quantify the risks associated with the HDD and Microtunnel option crossing methodologies. Table 4-5 of the Application summarizes what was identified during the workshop and provides risk assessment for each of the two methods. The HDD option has a lower number of overall unmitigated risks than the Microtunnel option; i.e., the HDD option has a lower unmitigated risk profile than the Microtunnel method.

The Project team, using expert judgment, also developed a cost estimate in conjunction with the risk assessment. The cost estimate is a Class 3 degree of accuracy as defined in AACE International Recommended Practice No. 10S-90, Cost Engineering Terminology (May 20, 2009), and meets the BCUC guidelines for CPCN Applications as per the 2010 Certificates of Public Convenience and Necessity Application Guidelines Order G-50-10. The Project team found that HDD is the less costly technically acceptable solution. The risk presented by the sub-surface gravel layers is likely the highest risk in terms of potential negative consequences. Solutions considered to manage and reduce the risks of drilling through the gravels are detailed in section 5.3.7.1 of the Application.

The potential likelihood of these risks is further reduced by ensuring that FEI has a constructible design that acknowledges and minimizes the sub-surface risks, selecting a competent contractor that has experience with gravel layers and has the tools necessary to drill through the gravel layers, and having a competent inspection team that will ensure that the contractor is optimizing its construction processes to manage its operations and potential ground conditions.

Further simulation analysis of the Project to provide probabilistic estimate and schedule output would require a Monte Carlo (or similar) simulation. This, however, would require significant additional analysis to provide an expected value of costs for each of the two methods that takes into account probabilities and outcomes. FEI believes the additional cost and time to complete the simulation is not warranted for this project. FEI also believes that there is sufficient value and confidence with the utilized process that did identify the key cost components of the Project including allowances for identified HDD risks, risk responses and feasible mitigation measures and appropriate contingencies.

4.3 Does FEI agree that in terms of potential adverse consequences for ratepayers, "the risk presented by the sub-surface gravel layers" is a major risk for ratepayers in terms of the potential negative consequences and the probability that these negative consequences will be realized?

Response:

The sub-surface gravel layers are the primary risk to the HDD construction and, if not properly managed, will increase the probability of becoming a major risk to ratepayers in terms of the potential negative consequences. FEI believes that these risks can be successfully managed through the design and construction mitigation measures detailed in the response to BCUC IR 1.4.2.

As stated in the response to BCSPO IR 1.4.2, the potential likelihood of these risks is reduced by ensuring that FEI has a constructible design that acknowledges and minimizes the sub-surface risks, selecting a competent contractor that has experience with gravel layers and has the tools necessary to drill through the gravel layers, and having a competent inspection team that will ensure that the contractor is optimizing their construction processes to manage their operations and potential ground conditions.

Jacobs has advised that, while drilling through gravel horizons is difficult, it can be, and has been, done before. The recent 2012 FEI Kootenay River (Shoreacres) HDD crossing successfully installed an approximately 800m long NPS 6 pipeline through similar gravel layers.

4.4 Please provide a high-level summary of FEI's previous experiences with HDD projects, in terms of actual project timing and costs as compared to budgeted/forecasted timing and costs.

Response:

FEI has undertaken a number of HDD crossings which, to the best of our knowledge, have all been successful.

Most of FEI's pipeline installation work involves the installation of polyethylene distribution pipelines. HDD methodology is used to cross under roads, railways, water courses, and to traverse sensitive habitat or difficult terrain. The use of HDD in these circumstances has become routine. Generally due to relatively short distances, there is very low risk associated

with the possibility of unknown ground conditions. Scheduling, completion and costs most often are as expected.

On a less frequent basis FEI has successfully undertaken the installation of transmission pressure, steel pipeline crossings of major water courses. Most recently FEI replaced the 168mm crossings of the Kootenay and Columbia Rivers in the West Kootenays, the 508mm and 610mm crossings of the South Arm of the Fraser River at Delta, and the 323mm crossing of the Bedford Channel at Fort Langley.

When undertaking larger projects, such as the major water crossings mentioned above, FEI attempts to mitigate the risk to its shareholders and customers through contract terms and employing contractors and consultants with demonstrated capabilities. This results in the schedule and cost estimate for the work being established well before the work proceeds. However, even though the best intention is to have a very accurate schedule and cost estimate, an HDD installation over a relatively long distance will increase the possibility of unforeseen sub-surface circumstances. It is not possible or reasonable to know what the ground conditions will be over 100% of the length of the HDD drill path. Based on test holes adjacent or near to the running line, assumptions are made that the ground conditions along the drill path are consistent with those found with the test holes.

A comparison of a relatively small sample of HDD projects to assess or compare the results or accuracy of cost estimates and project schedules may not be possible because of the wide variation of conditions that determine project definition and execution which heavily influence final cost and schedule. Nonetheless, at a very high level, FEI's experience is that HDD projects have been within schedule and forecasted costs when significantly changed conditions (including sub-surface circumstances) were not encountered.

4.5 How or on what basis will FEI make its final determination between the two proposed methods and how can ratepayers be certain that their interests will be taken fully into account in FEI's choice?

Response:

In making the final determination of the two proposed methods, FEI will consider the risks present to the construction, the competency of the contractor selected, how construction risks are allocated to FEI (and ratepayers), the construction schedule, and the revised cost estimate to complete the crossing.

5.0 Reference: Exhibit B-1, page 17, Table 4-1, Project Construction Cost Estimates

5.1 Were all of the estimates in the referenced table provided by the same firm (external) or department (internal)?

Response:

The estimates listed in Table 4-1 of the Application were provided by different external consulting engineering firms specializing in the respective area of expertise for each crossing methodology.

6.0 Reference: Exhibit B-1, page 27, Table 4-2, Summary of Option Cost Estimates And Financial Analysis

6.1 Can FEI confirm that the expected costs of unanticipated sub-surface conditions – including but not limited to litigation risk involving the contractor – are included in the HDD Option cost estimate? If so, please advise as to the amount included and the basis on which the amount was determined; if not, please explain why not.

Response:

FEI has included a contingency in the cost estimate designed to offset potential additional costs to manage construction through unforeseen sub-surface conditions. Please refer to Table 6-2 of the Application and the response to BCUC Confidential IR 1.1.1 for the Project contingency amount.

There remains the possibility of unforeseen costs because of unanticipated sub-surface conditions or other sub-surface construction challenges. This is viewed as unlikely because of FEI's current project knowledge, considered judgment of the Project team, risk assessment, and effective risk mitigation measures being undertaken. FEI has not considered litigation risk as a factor in any portion of its cost estimates as this was not seen as a reasonable risk to measure at this time.

6.2 In FEI's experience or to FEI's knowledge, historically how satisfactorily have HDD projects fared in comparison with the other options with respect to cost overruns and project timing?

Response:

In FEI's experience and knowledge, there is no historical comparison available, nor would such a comparison be reasonable as further explained below.

FEI believes a comparison would provide little useful guidance as each project must be compared on its own specific merits, for example pipeline length, diameter, ground conditions, capability and experience of the construction contractors, state of the technology, owner's risk tolerance, etc.

In the Muskwa River Project, the NPS 6 pipeline diameter to be installed is relatively small. FEI identified the feasible solution alternatives (HDD, Microtunnel, Aerial Bridge, and Isolated Open Cut) to install this crossing and engaged experts in each respective crossing technology to provide advice on estimated costs, construction schedules and risks to project completion. While the site investigations indicate the presence of a gravel layer which can present challenges for trenchless crossings, the expert engaged evaluated the length of the crossing and diameter of the carrier pipe to be well within the capabilities of state of the art HDD equipment and competent contractors.

FEI's subsequent comparative analysis concluded that HDD, using the latest drilling technology, is the most cost-effective viable alternative and the only solution which will meet the Project objective and requirements. State of the art HDD technology was recently used by FEI in 2012 to successfully install a similar diameter but significantly longer pipeline crossing through challenging gravels under the Kootenay River at Shoreacres.

7.0 Reference: Exhibit B-1, pages 28-29, Non-Financial Considerations, and Table 4-3, Impact Assessment

7.1 Can FEI confirm that although the referenced section is entitled "Non-Financial Considerations," the "vulnerabilities" assessed in Table 4-3 could entail material financial consequences for ratepayers?

Response:

FEI confirms the vulnerabilities expressed in Table 4-3 of the Application could entail material financial consequences for ratepayers if the indicators or findings are ignored or inappropriately discounted. Ignoring vulnerabilities, while focusing only on the least cost alternative, may create additional cost and delays due to public opposition or First Nations objections or by some other third party or unforeseen event, all of which are difficult or impossible to quantify in terms of likelihood and/or impact.

7.2 Please explain how the weights associated with the vulnerabilities listed in Table 4-3 were determined.

Response:

The weights listed in Table 4-3 of the Application were completed by FEI personnel familiar with the Project and with expertise in the vulnerability considered.

The weighing is subjective but is especially informative when comparing options that have varying and difficult-to-quantify impacts to First Nations and other stakeholders, the environment, and the other areas considered with this comparison.

7.3 Please confirm that risks associated with encountering unanticipated sub-surface conditions are included in "Construction Hazards." If unable to so confirm, please explain.

Response:

Construction hazards, as noted in Table 4-3 of the Application, would include unanticipated sub-surface materials.

7.4 Please explain why all four options were scored the same with respect to Construction Hazards.

Response:

Each of the four options will be uniquely affected by the known construction hazards at the site. Assessment of the construction hazards is subjective but nonetheless concluded that the known construction hazards affected each option to the same degree. Therefore, each option was ranked as a "3" or "moderate value, good choice". The reason is that with sufficient resources, each option should be able to mitigate known construction hazards. However, it should be noted that the cost to achieve successful mitigation of known construction hazards will be much different.

8.0 Reference: Exhibit B-1, page 44, Table 5-2, Risk Probability and Impact Matrix

Preamble: The five levels shown in the referenced table include (i) very unlikely outcomes with very low impacts, (ii) unlikely outcomes with low impacts, (iii) possible outcomes with moderate impacts, (iv) likely outcomes with high impacts, and (v) very likely outcomes with very high impacts.

8.1 Does FEI agree, for example, that it is possible to have low-probability outcomes that have very high impacts and vice versa? If not, please explain fully.

Response:

FEI agrees with the concept that low-probability outcomes may have very high impacts or vice versa, and Table 5-2 of the Application is not intended to be interpreted otherwise. The values within Table 5-2 were used to score and rank construction risks that have varying likelihoods of occurrence and/or varying potential impacts of occurrence. Feasible mitigation measures were then identified to determine how best to allocate resources to effectively manage the risks (reduce the risk score) during construction. This concept was used to assist in determining Table 5-3 (Risk Control Summary) of the Application.

For each risk identified and as demonstrated in Appendix G of the Application, a rating is provided for both Likelihood and Impact under separate columns. For example, if a risk was evaluated to have a "very low potential impact of occurrence" but a "possible likelihood of occurrence", it would be rated as a "1" for Impact and a "3" for Likelihood.

8.2 How are different probability-impact pairs taken into account by only considering these five pairs? That is, how are very low or low probability outcomes that are associated with very high or high impacts?

Response:

Please refer to the response to BCPSO IR 1.8.1.