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July 10, 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 a Certificate of Public Convenience and Necessity (CPCN) for Approval of the Lower Mainland Intermediate Pressure (IP) System Upgrade (LMIPSU) Projects (the Application)

Response to the British Columbia Utilities Commission (BCUC or the Commission) Panel Information Request (IR) No. 1

On December 19, 2014, FEI filed the Application referenced above. In accordance with Exhibit A-12 setting out the remaining Regulatory Timetable for the review of the Application, FEI respectfully submits the attached response to Panel IR No. 1.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC ENERGY INC.

Original signed:

Diane Roy

Attachments

cc (email only): Registered Parties

1.0 Reference: Comparable Cost Estimates

Exhibit B-11, BCUC 2.15.1; Exhibit B-1-7, Appendix A-24, p. 22.

Productivity

In response to BCUC IR 2.15.1 FEI stated:

> The NPS 24 pipeline construction productivity, including trench excavation, welding, pipe handling, and trench backfill is now expected to be very similar between the NPS 24 and NPS 30 pipeline sizes.[1]

In Exhibit B-1-7, Appendix A-24, page 22, FEI's consultant WorleyParsons explains:

> The key driver behind all production for this spread is excavation, where typically all production revolves around weld productions. This is due to the heavy congestion and safety guidelines with construction in an urban area.[2]

1.1 Please describe in detail how productivity is estimated. What inputs are used? How do the productivity estimates affect the cost estimate?

<u>Response:</u>

This response addresses Panel IRs 1.1.1 and 1.1.2.

Gas pipeline construction, whether cross-country or urban in location, would involve the following typical pipeline construction process steps which are executed in a linear stepwise fashion:

1. Pre-construction surface preparation and underground utility locates;
2. Pipe hauling and layout on site;
3. Pipe welding and weld integrity verification;
4. Trench excavation (ditching);
5. Lowering pipe into the prepared trench;
6. Trench backfilling; and
7. Post-construction surface restoration.

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[1] Exhibit B-11, BCUC IR 2.15.1.
[2] Exhibit B-1-7, Appendix A-24, p. 22.

A fundamental aspect of the pipeline construction in terms of determining the pipeline capital cost estimate, is the construction productivity which is a function of the pipeline construction process. Construction productivity depends on the pipe specification (size, material, weight, jointing, etc.), terrain (route alignment location), and available construction workspace (above and below ground construction constraints). It is defined as the rate at which the pipeline construction will progress (i.e. the rate at which the construction process steps are executed) to install the complete pipeline and this productivity is typically estimated in metres per day.

For cross-country pipeline construction, where the site access and underground terrain are mostly unconstrained, the pipe welding/jointing is typically the slowest construction process step which limits the overall construction productivity. This is because the construction process steps advance in a linear stepwise fashion and the overall construction cannot progress faster than the slowest process step. In contrast, for urban pipeline construction, where the terrain includes high-density below ground utilities and services and where the above ground construction workspace is constrained by traffic, trees, power lines and property and business accesses, the trench excavation for larger diameter pipe would be the slowest construction process, and therefore limits the overall rate of pipeline construction productivity. The Coquitlam Gate IP pipeline will require the installation of a large diameter pipeline through a densely populated urban environment and along busy road corridors with significant above ground and buried construction constraints. Therefore, the pipeline trench excavation to accommodate the pipe installation will be the limiting construction process and will be the key determinant for the pipeline construction productivity.

There are a number of factors which were considered by the WorleyParsons construction team as inputs to the construction execution planning process to estimate the construction productivity along the 20 km Coquitlam Gate IP pipeline route. With regard to trench excavation, the factors considered included: the required trench width and depth to accommodate the safe installation, welding and operation of the pipe, the above ground and buried obstacles, the excavator size to dig the trench, and capacity of haulage vehicles which could be mobilized and operated on site within the available construction workspace to remove the excavated trench material. The construction productivity for the Preferred Alternative (NPS 30) is included in Appendix A24 of the Evidentiary Update, and the construction productivity for Alternative 4 (NPS 24) is attached as Confidential Attachment 3.1B, provided in the response to Panel IR 1.3.1.

For the NPS 30 and NPS 24 Project Alternatives there is only a six inch difference in the pipeline diameters; hence, for both pipeline sizes the trench would be formed using a standard 42 inch wide excavator bucket. This trench width is necessary to provide sufficient clearance between the pipeline and the trench wall to avoid damaging the pipeline coating during the pipe lowering procedure. Therefore, because the trench excavation progress will be the limiting factor in determining the construction productivity, and the trench size to be excavated for both the NPS 30 and NPS 24 pipeline sizes will be the same, then the construction productivity will be the same.

Handling and lowering the pipe into the prepared trench would be performed using the same capacity range of cranes, crane trucks and pipe laying equipment for both the NPS 24 and NPS 30 pipeline sizes. There will be some productivity savings (and therefore cost savings) in terms of welding for the NPS 24 compared to the NPS 30 pipe size, but it is not significant enough to impact overall productivity. Further, the cost savings from reduced welding will be partially offset by the greater civil cost for Alternative 4 (NPS 24) as there is a higher amount of sand backfill required due to the trench being essentially the same size for both the NPS 24 and NPS 30 pipe sizes, but the NPS 24 pipe will occupy less volume of the trench.

The pipeline construction productivity estimates (metres per day), directly informed the resources estimate calculations (labour, equipment and materials requirements) to construct the 20 km Coquitlam Gate IP pipeline within the required time frame (i.e. within one construction season from April to November 2018). The total pipeline construction cost estimate comprises the sum of the labour, equipment and material cost estimates to construct the pipeline. Therefore, because the construction productivity is a fundamental aspect of the pipeline construction in terms of determining the construction resources requirements, and this productivity is considered to be the same for the Preferred Alternative (NPS 30) and Alternative 4 (NPS 24), it is also the key driver behind the minimal difference between the NPS 30 and NPS 24 AACE Class 3 total construction cost estimates.

1.2 Considering the difference in pipe diameters, areas, volumes and weights, please explain in detail why productivity is now expected to be very similar between Alternative 4 and Alternative 6.

Response:

Please refer to the response to Panel IR 1.1.1.

2.0 Reference: Comparable Cost Estimates

Exhibit B-11, BCUC 2.15.1;

Timing of Estimates

The Class 3 estimate of Alternative 4 was developed at a later time than the Class 3 estimate of the Preferred Alternative. During the interval between the preparation of the estimates, conditions (such as, but not limited to exchange rates and commodity prices) may have changed.

2.1 Please confirm that, in order to ensure that the Class 3 estimate of Alternative 4 is as comparable as practicable to the Preferred Alternative Class 3 estimate, steps were taken to have the Alternative 4 Class 3 estimate reflect to the greatest extent possible the conditions prevailing at the time the Preferred Alternative Class 3 estimate was developed.

Response:

This response addresses Panel IRs 1.2.1 and 1.2.2.

FEI confirms that the Alternative 4 (NPS 24) AACE Class 3 basis of estimate reflects the conditions prevailing at the time the Preferred Alternative Class 3 estimate was developed. The Alternative 4 AACE Class 3 cost estimate was developed to the same level of project definition (engineering methodology, deliverables and scope) and against the same basis of estimate as the Preferred Alternative Class 3 cost estimate including:

- Pipeline route;
- System interface and stations requirements;
- Engineering scope;
- Estimate base date (Q2 2014);
- Exchange rates;
- Construction labour rates and labor productivities;
- Direct labour strategy;
- Supplier costs for equipment and materials;
- Estimate allowances;
- Estimate assumptions; and

- Estimate exclusions.

As discussed in the response to BCUC IR 2.15.1 the Alternative 4 pipeline construction productivity and the pipeline materials cost (for the NPS 24 pipe and fittings) were revised during preparation of the AACE Class 3 estimate which reduced the Alternative 4 (NPS 24) total cost estimate difference relative to the Preferred Alternative (NPS 30) to approximately 4 percent. The Alternative 4 pipeline materials costs, which were originally pro-rated from the Preferred Alternative NPS 30 materials costs for the AACE Class 4 cost estimate, were revised, based on Q2 2014 vendor pricing. In addition to the Alternative 4 construction productivity and materials costs changes, the Alternative 4 Class 3 trench backfill costs also increased slightly to account for the greater volume of sand backfill required (the proposed trench width is the same for both NPS 24 and NPS 30 but the NPS 24 pipeline will occupy less volume), and which was also captured in the Alternative 4 AACE Class 3 estimate.

As detailed in the response to BCUC IR 2.15.1, the impacts of these changes resulted in an overall 7 percent increase in the Alternative 4 AACE Class 3 cost estimate compared to the Class 4 cost estimate. To further understand the impact of these changes, the Coquitlam Gate IP Project Execution Capital Cost Estimate Summary for the Preferred Alternative AACE Class 3 (NPS 30) (that was filed as part of the Evidentiary Update: Confidential Appendix E-3-1-a) and Alternative 4 AACE Class 3 (NPS 24) (that was filed as part of the BCUC IR 2 responses) is presented in the table in response to Panel IR 1.3.3. The side by side comparison presents the cost differences between the AACE Class 3 estimates for pipeline materials costs and pipeline construction costs.

For further clarity, FEI confirms that the Class 3 estimates provided for both the Preferred Alternative 6 and for Alternative 4 can be compared appropriately as each was developed using the same bases of estimate.

2.2 Please describe whether there were any changed conditions, in addition to pipeline construction productivity, that were reflected in the Alternative 4 Class 3 estimate, and the impacts of these changed conditions on the final estimate.

Response:

Please refer to the response to Panel IR 1.2.1.

3.0 Reference: Comparable Cost Estimates

Exhibit B-11, BCUC 2.15.1; Exhibit B-1-1, Appendices E-3-1, A-24, A-25, A-26 and A-27; Exhibit B-1-7, Revised Appendices E-3-1, A-24 and A-25

Basis of Estimates and Capital Cost Estimate Summaries

In the Application FEI provided confidential appendices for the basis of estimate, pipeline basis of estimate, stations basis of estimate, civil basis of estimate and the Coquitlam Gate IP Project Execution Capital Cost Estimate Summary.[3]

In the evidentiary update FEI revised the preferred pipeline route and provided a revised basis of estimate and a revised pipeline basis of estimate. FEI also provided a revised Coquitlam Gate IP Project Execution Capital Cost Estimate Summary.[4]

3.1 Please provide the basis of estimate, the pipeline basis of estimate, the civil basis of estimate, the stations basis of estimate (bases of estimate) and the Coquitlam Gate IP Project Execution Capital Cost Estimate Summary for the Class 3 estimate of Alternative 4.

Response:

This response addresses Panel IRs 1.3.1 and 1.3.2.

The Basis of Estimate and Pipeline Basis of Estimate including updated estimate spreadsheets for the Alternative 4 (NPS 24) AACE Class 3 cost estimate are attached as Confidential Attachments 3.1A and 3.1B respectively. Confidential Attachments 3.1A and 3.1B are being filed confidentially under separate cover on the basis that they contain cost information for the Projects that must be kept confidential in order to preserve FEI's ability to negotiate with bidding parties.

The Civil Basis of Estimate and Facilities Basis of Estimate did not change and can be referenced in Confidential Appendices A-26 and A-25 respectively of the Application (Exhibit B-1-2).

There are no differences between the bases of estimate for the Alternative 4 Class 3 estimate and the Preferred Alternative 6 Class 3 estimate.

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[3] Exhibit B-1-1, Appendices E-3-1, A-24, A-25, A-26 and A-27.
[4] Exhibit B-1-7, Revised Appendices E-3-1, A-24 and A-25.

3.2 Please explain any material differences between the bases of estimate for the Class 3 estimate of Alternative 4 and the Class 3 estimate of the Preferred Alternative.

Response:

Please refer to the response to Panel IR 1.3.1.

3.3 Please compare the latest Coquitlam Gate IP Project Execution Capital Cost Estimate Summary for the Preferred Alternative to the Coquitlam Gate IP Project Execution Capital Cost Estimate Summary for the Class 3 estimate of Alternative 4.

Response:

This response is being filed confidentially under separate cover on the basis that it contains cost information for the Projects that must be kept confidential in order to preserve FEI's ability to negotiate with bidding parties.

Attachment 3.1A

FILED CONFIDENTIALLY

Attachment 3.1B

FILED CONFIDENTIALLY