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Utilities Commission

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July 30, 2020

Sent via email/eFile

FBC CPCN FOR THE KELOWNA BULK TRANSFORMER ADDITION PROJECT EXHIBIT A-5

Mr. Doug Slater
Director, Regulatory Affairs
FortisBC Inc.
16705 Fraser Highway
Surrey, BC V4N 0E8
electricity.regulatory.affairs@fortisbc.com

Re: FortisBC Inc. – Application for a Certificate of Public Convenience and Necessity for the Kelowna Bulk Transformer Addition – Project 1599088 – Information Request No. 2

Dear Mr. Slater:

Further to your April 24, 2020 filing of the above noted application, enclosed please find British Columbia Utilities Commission Information Request No. 2. Please file your responses on or before **Thursday, August 20, 2020.**

Sincerely,

Original signed by:

Marija Tresoglavic
Acting Commission Secretary

/aci
Enclosure

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FortisBC Inc.
Application for a Certificate of Public Convenience and Necessity for the
Kelowna Bulk Transformer Addition Project

INFORMATION REQUEST NO. 2 TO FORTISBC INC.

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A. PROJECT NEED AND JUSTIFICATION

34.0 Reference: PROJECT NEED AND JUSTIFICATION
Exhibit B-1, Section 3.3.2, p. 16; Exhibit B-2, BCUC IR 4.4
Kelowna area load forecast

In response to British Columbia Utilities Commission (BCUC) Information Request (IR) 4.4, FortisBC Inc. (FBC) described how the system-wide 1-in-20 load forecast is developed in a bulleted list. The first bullet stated:

> The hour for each peak (excluding self-generating customers and wheeling losses) in January, February, November, December, as well as June, July and August for each year in the period 2000-2019 is recorded.

34.1 Please explain how the historical system-wide peak values are determined.

The second bullet in response to BCUC IR 4.4 stated:

> Historical net energy growth rates are derived from actual 2000-2019 sales. Forecast net energy growth rates are used to escalate the peaks into future years as described below.

34.2 Please explain how the forecast net energy growth rates are determined.

The fourth bullet in response to BCUC IR 4.4 stated:

> The method yields 20 values for the 2020 winter peaks corresponding to 20 base years from 2000 to 2019. The maximum peak of these 20 values is defined as the 1-in-20 winter peak for 2020. The 1-in-20 summer peak is derived in the same manner. The resulting 2020 peaks are then escalated with growth rates to compute the 1-in-20 forecast peaks over the planning horizon.

34.3 Please confirm, or otherwise explain, whether these growth rates are the same as the 'forecast net energy growth rates' referred to above in the second bullet in response to BCUC IR 4.4.

34.3.1 If they are not the same, please explain how the 'growth rates', as referred to in the fourth bullet in response to BCUC IR 4.4, are determined.

On page 16 of FBC's Application for a Certificate of Public Convenience and Necessity (CPCN) for the Kelowna Bulk Transformer Addition Project (KBTA Project) (Application), FBC states:

> After forecasting peak load from historical data, FBC includes the impact of known or highly probable load developments, such as community developments that have an expected connection date and defined loads. It is reasonable to expect that other incremental loads may materialize in the near to medium term. For example, FBC has received transmission service interconnection inquiries related to cannabis, cryptocurrency and data processing facilities. Additionally, electric vehicle (EV) adoption and electrification of transit fleets and new government policy all have the potential to result in further increases to the Kelowna area load forecast.

34.4 Based on the steps FBC described in response to BCUC IR 4.4 regarding how the system-wide 1-in-20 load forecast is developed, please discuss where FBC includes the impact of known or highly probable load developments in developing its peak load forecast.

35.0 Reference: PROJECT NEED AND JUSTIFICATION
Exhibit B-2; BCUC IR 6.9
FBC planning criteria

In response to BCUC IR 6.9, FBC stated:

> There are currently no power system elements in the Kelowna area that are at risk of not maintaining the N-1 planning criteria within the 2020-2030 time period.

35.1 Please provide a list of the power system elements in the Kelowna area where N-1 planning criteria applies.

36.0 Reference: PROJECT NEED AND JUSTIFICATION
Exhibit B-1, Section 3.4.1, p. 19; Exhibit B-2, BCUC IRs 7.3, 7.7
Seasonal peaks forecast to reach emergency limits in N-1 conditions

In response to BCUC IR 7.3, FBC stated:

> The summer emergency rating is 125 percent of the maximum transformer nameplate rating as provided by the manufacturer.

Further in response to BCUC IR 7.3, FBC stated:

> The winter emergency rating is 135 percent of the summer normal rating.

36.1 Please explain how FBC determined the 125 percent and 135 percent factors noted above.

On page 19 of the Application, FBC states:

> For example, summer emergency limits for LEE [Transformer 3] and [Transformer 4] are both much lower in summer at 159 MW, as compared to their respective winter emergency limits of 189 MW and 195 MW.

In response to BCUC IR 7.3, FBC provided a table of summer and winter normal and emergency ratings

for LEE Transformer 3 (T3), LEE Transformer 4 (T4) and DG Bell Terminal Station (DGB) Transformer 2 (T2). This table is reproduced below:

Line	Particulars		LEE T3	LEE T4	DGB T2
1		Equipment Ratings (MVA)			
2	Maximum Nameplate Rating (40° C)		168	168	200
3	Summer Normal Rating	100% * Line 2	168	168	200
4	Summer Emergency Rating	125% * Line 2	210	210	250
5	Maximum Nameplate Rating (0° C)		199.5	205.8	237.5
6	Winter Normal Rating	100% * Line 5	199.5	205.8	237.5
7	Winter Emergency Rating	135% * Line 3	226.8	226.8	270.0
8					
9		System Load (MW)			
10	Summer Normal Rating	95% * Line 3	159	159	190
11	Summer Emergency Rating	95% * Line 4	199	199	237
12	Winter Normal Rating	95% * Line 6	189	195	225
13	Winter Emergency Rating	95% * Line 7	215	215	256

36.2 Please reconcile the summer and winter emergency limits as described on page 19 of the Application with the summer and winter emergency ratings provided in the table above.

36.2.1 Please clarify which ratings are correct or explain otherwise.

In response to BCUC IR 7.7, FBC provided power flow analysis for various scenarios. For the summer 2022 scenario when either LEE T3 or T4 is out and after the system reconfiguration, FBC provided note (6). Note (6) stated:

> (6) Flow on 60L (DGB-BEV) is 103% of normal rating 92% of emergency rating.

36.3 Please discuss the risks to Kelowna area customers should power flow on 60L (DGB-BEV) reach 103 percent of normal rating, as indicated for the summer 2022 scenario, should LEE T3 or T4 be out.

36.3.1 If applicable, please discuss how FBC is planning for and mitigating these risks.

B. DESCRIPTION AND EVALUATION OF ALTERNATIVES

37.0 Reference: OVERVIEW
Exhibit B-2, BCUC IR 10.3
Description and evaluation of alternatives

In response to BCUC IR 10.3, FBC stated:

> In addition, a condition that may result in premature failure of LEE T4 is a recently observed increase in acetylene concentration over the past five years. Recent trending shows the acetylene concentration is currently 15 ppm, but is now considered stable. The cause of the increase in acetylene concentration is unknown but was likely a result of the acetylene leaching out of the transformer solid insulation after the 2017 unit refurbishment. The transformer will continue to be monitored

37.1 Please explain how the transformer will continue to be monitored.

37.2 Please explain under what conditions, such as increased acetylene concentration, LEE T4 would

be considered to be at risk of premature failure.

38.0 Reference: ALTERNATIVES FOR FURTHER REVIEW
Exhibit B-1, Section 4.3.1, p. 26; Exhibit B-2, BCUC IRs 12.2, 17.7
Ring bus vs. split bus configuration

On page 26 of the Application, FBC lists several advantages of the ring bus configuration over the split bus configuration, including: "Research on substation reliability shows that a ring bus configuration results in a more than 50 percent reduction in outage minutes per year as compared to a split bus configuration."

In response to BCUC IR 12.2, FBC provided the following table:

Event	Year	Annual Outage Minutes
1	2015	147
2	2015	4,265
3	2017	200

38.1 Please confirm, or otherwise explain, whether the annual outage minutes provided in the table above represent the only outages experienced over the past five years.

38.1.1 If yes, please confirm, or otherwise explain, that the total outage minutes for the past five years is the sum of the outage minutes provided in the table above, equating to 4,612 minutes.

38.1.2 If yes, please confirm, or otherwise explain, that the average annual outage minutes for the past 5 years is calculated by taking the total outage minutes provided in the table above and dividing the total by five, equating to 922 minutes.

In response to BCUC IR 17.7, FBC stated:

> However, the reliability disadvantage of a split bus was evident in the circumstances of the February 2015 outage, caused by the failure of a breaker at LEE. In this instance, the LEE CB CAP1 circuit breaker failed. This failure tripped 50 Line and 46 Line, causing an outage to 24,667 customers until the faulted equipment could be isolated and bypass switches used to feed the customers from a separate line breaker while equipment was repaired. CB CAP1 was isolated and load was restored via 55 Line. If LEE had been configured as a ring bus, the customer outages would not have occurred.

38.2 Please explain how a reduction of 50 percent in annual outage minutes would be of benefit to FBC.

38.3 Please explain how a reduction of 50 percent in annual outage minutes would be of benefit to FBC's customers. In your response please include a discussion on the benefits if outages do not impact customers.

C. PROJECT DESCRIPTION

39.0 Reference: PROJECT ENGINEERING AND DESIGN
Exhibit B-1, Section 5.2, p. 41; Appendix E, p. 1; Appendix G to Appendix E, p. 5; Exhibit B-2, BCUC IR 22.2
Noise mitigation

In BCUC IR 22.2, FBC was requested to confirm that the proactive noise mitigation measures that FBC

intends to implement are to "install 6m high barrier walls around the proposed T2 and the existing T3 and T4 transformers," as recommended by Patching Associates.

In response to BCUC IR 22.2, FBC stated:

> FBC expects that the addition of a third transformer will lower loading on the existing transformers and thereby reduce noise levels. Accordingly, FBC will conduct field diagnostic noise measurements as recommended by Patching Associates prior to considering the implementation of any additional noise mitigation measures provided in the "Noise Control Recommendations (Optional)" section on Page 14 of Appendix E and as documented in Section 11 5.2 on Page 41 of the Application.

39.1 Please explain when FBC will conduct the field diagnostic noise measurement.

39.2 Please explain under what circumstances FBC would implement the noise mitigation measure of installing the "6m high barrier walls around the proposed T2 and existing T3 and T4 transformers" recommended by Patching Associates.

D. PROJECT COST AND FINANCIAL EVALUATION

40.0 Reference: PROJECT COST AND FINANCIAL EVALUATION
Exhibit B-2, BCUC IRs 25.3, 25.4
Project capital cost estimate

In response to BCUC IR 25.3, FBC provided the following table:

Alternative	Project Cost	Low Estimate		High Estimate		
		Cost Decline 20%	Cost Decline 10%	Cost Increase 10%	Cost Increase 20%	Cost Increase 30%
A	$23.288M	$18.630M	$20.959M	$25.617M	$27.946M	$30.274M
B	$17.008M	$13.606M	$15.307M	$18.709M	$20.410M	$22.110M
C	$32.332M	$25.866M	$29.099M	$35.565M	$38.798M	$42.032M

In response to BCUC IR 25.4, FBC stated:

> FBC has not employed probabilistic methods to evaluate its estimation and therefore, cannot quantify the probabilities at the extremes of the estimating ranges. However, from an estimating standpoint, all of the alternatives, and in particular Alternatives A and B, are very similar in nature. The civil works for the site expansion are identical and there are no significant differences in the items identified in the project risk register (Table 5-1) between the alternatives. Therefore, FBC expects that cost variances would be similar in direction and magnitude between the alternatives.

40.1 Based on the similarities between Alternative A and B in civil work, risks and cost range overlap, please discuss the major differences between the two alternatives.

41.0 Reference: PROJECT COST AND FINANCIAL EVALUATION
Exhibit B-2, BCUC IRs 21.1.1, 21.1.2, 23.4
Construction costs

In response to BCUC IR 21.1.1, FBC stated:

FBC typically issues a Request for Proposal (RFP) with material specifications to a variety of vendors for large items such as the circuit breakers and power transformers. As part of the process, FBC completes a formal evaluation of the proposals based on both Commercial and Technical criteria. This review is completed by Procurement and Project Management before a Purchase Order is awarded to the successful candidate.

Similarly, once the engineering packages are complete FBC will issue an RFP for construction services to a group of pre-qualified construction contractors. FBC will then review and award a contract to the successful bidder following a commercial and technical review of the proposals.

In response to BCUC IR 21.1.2, FBC stated:

As part of the procurement process, vendors submit proposals based on drawings and specifications issued by FBC. The contract with the vendor is based on their submission and sets the baselines for cost expectations and scope. The contracts are typically fixed price for the known scope coupled with force account/unit prices for less certain quantity driven activities. During the life of the Project any deviation from the original contract with the vendor will be monitored and controlled by the on-site FBC representative and approved by the Project Manager before proceeding.

All scope changes will be controlled through the FBC Change Management Program. Change Notices are used to identify the scope change and mutually agreed upon by both the vendor and FBC before proceeding. This Change Notice identifies the out-of-scope work required to complete the task and the financial impact to the Project.

The Project Manager will be responsible for monitoring the Project, approving scope changes, and forecasting financials to monitor and track costs for the duration of the Project. The Project Engineer will approve any design changes, and the Construction Manager will be the FBC on site representative, which will monitor scope, quality assurance, and safety.

In response to BCUC IR 23.4, FBC stated:

Material delivery time of major equipment such as circuit breakers and the power transformer are the largest risk foreseen at this time. To mitigate this risk, FBC has created an internal task force to identify critical long-lead items, communicate with vendors and monitor the supply chain. In addition, FBC will consider earlier order times and will include scheduled flexibility in the project schedule.

41.1 Please discuss how a material delay on long lead items would affect the fixed price negotiated in the vendor contracts and explain how FBC would account for any material delays.

42.0 Reference: PROJECT COST AND FINANCIAL EVALUATION
Exhibit B-2, BCUC IR 27.3
Project contingency

In response to BCUC 27.3, FBC stated:

The construction and removal contingencies were initially set at the same values for both applications. A CPI [Consumer Price Index] increase of 4.2 percent was added to the contingency for the Grand Forks Terminal Application to convert the construction estimate from 2016 dollars to 2018 dollars.

42.1 Please confirm, or explain otherwise, whether a CPI increase was applied to the contingencies in this Application.

42.1.1 If not confirmed, please explain why it is not required in this Application.

43.0 Reference: PROJECT COST AND FINANCIAL EVALUATION
Exhibit B-1, Section 6.4.2, p. 55; Exhibit B-2, BCUC IRs 23.4, 28.1
Incremental revenue requirements and rate impact

On page 55 of the Application, FBC states:

> At the time of filing, FBC's proposed 2020-2024 Multi Year Rate Plan (MRP) is awaiting BCUC approval. The bulk of FBC's O&M expense under the proposed MRP is determined by escalating a Base O&M amount annually by inflation and customer growth. The assets that are the subject of this Application are included in the Base O&M amount and upon completion of the Project, FBC will pass the O&M savings to customers by adjusting the Base O&M downward by approximately $28 thousand.

43.1 FBC's 2020-2024 Multi-Year Rate Plan (MRP) was approved by BCUC Decision and Order G-166-20 dated June 22, 2020 (MRP Decision and Order). Please discuss whether the MRP Decision and Order will affect the project's O&M expense. Please quantify any impacts and include updated financial schedules as necessary.

In response to BCUC IR 23.4, FBC stated:

> Material delivery time of major equipment such as circuit breakers and the power transformer are the largest risk foreseen at this time. To mitigate this risk, FBC has created an internal task force to identify critical long-lead items, communicate with vendors and monitor the supply chain. In addition, FBC will consider earlier order times and will include scheduled flexibility in the project schedule.

In response to BCUC IR 28.1, FBC provided the following table:

Item	Alternative A	Alternative B	Alternative C
2024 Cost of Service Rate Increase	0.54%	0.40%	0.74%
2024 Bill Impact *Avg. Residential Customer Using 11,000KWH*	$ 6.87	$ 5.05	$ 9.35
40 Year Levelized Rate Increase	0.39%	0.29%	0.75%
40 Year Levelized Bill Impact *Avg. Residential Customer Using 11,000KWH*	$ 4.96	$ 3.69	$ 9.49

43.2 Please discuss what affect, if any, material delays on long-lead items would have on the rate increases provided in the table above.

E. CONSULTATION

44.0 Reference: CONSULTATION
Exhibit B-2; BCUC IR 33.2
Engagement with Indigenous communities

In response to BCUC IR 33.2, FBC stated:

> While this letter was drafted shortly after the filing of the Application, in preparing these responses to Information Requests, FBC determined that the letter had inadvertently not yet been sent. The letter was sent to Indigenous communities by email on June 27, 2020, confirming the Application filing date, providing information on how to contact

the BCUC, and extending a further offer to host a conference call or meeting, if requested.

44.1 Please discuss if there has been any additional communication with Indigenous communities regarding the KBTA Project since the June 27, 2020 email.

44.1.1 If so, please provide details of any additional communications.