

British Columbia Utilities Commission

In the Matter of

the Utilities Commission Act, RSBC 1996, Chapter 473

and

FortisBC Inc. Application for a Certificate of Public Convenience and Necessity

for the Kelowna Bulk Transformer Addition (KBTA) Project

Final Written Submission

Industrial Customers Group

September 17, 2020

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A. Project

- 1) The KBTA Project involves installing a new 230/138 kV transformer at the F.A. Lee Terminal Station (LEE), with the existing 138 kV split bus being reconfigured to a ring bus configuration. At this time, this increase to 138 kV supply capacity is only needed during the summer peak in the event of the loss of either one of the two 230kV/138 kV transformers at LEE.

B. Project Schedule

- 2) The new transformer is scheduled to be in service by the end of 2022, with Project completion and close-out during the second quarter of 2023.¹

C. Need and Justification

- 3) The need for the KBTA Project rests entirely on the application of N-1 planning criteria to the 138 kV distribution system.² The condition of the existing transformers is not relevant to the N-1 planning criteria.
- 4) The only elements of the Kelowna system that are at risk of not meeting the N-1 planning criteria for the 2020-2030 planning period are one of two LEE transformers (T3 or T4). And even the LEE transformers will meet the N-1 planning criteria in all hours of the year with the exception of 5 hours in 2022 and 7 hours in 2023.³
- 5) The summer peak load is forecast to reach the transformer limit of 315 MW in 2021 and to exceed the limit in 2022.⁴ FBC noted:

At a summer peak load level of 315 MW in case of the outage of LEE T3 or T4, the power flow on the remaining transformer is 191 MVA, 91 percent of its 210 MVA emergency rating. After system reconfiguration, the flow on the remaining transformer is 168 MVA, which is 80 percent of the emergency rating and 100 percent of the normal rating of T3 and T4.⁵

And FBC noted:

“ In summer 2022, the outage of a LEE transformer under peak load conditions

¹ Exhibit B-1, Section 11.1, p. 1 and Section 5.4, p. 42, Project Schedule

² FBC Final Submission para. 11, identifies other public interest considerations; however, the need for the project rests entirely on the application of the N-1 Planning criteria, as confirmed by FBC in response to Exhibit B-5, ICG 1.2. Simply, in the absence of need the project cannot be in the public interest.

³ Exhibit B-11, ICG 6.3

⁴ Exhibit B-1, Section 3.3.2, p. 16, Section 3.4.1, p. 19

⁵ Exhibit B-2, BCUC IR 7.2

would result in overloading of the remaining LEE transformer even after Kelowna network reconfiguration. However, this overloading of the remaining LEE transformer would not be projected to persist for more than six hours over the peak period based on the Kelowna load forecast. As such, there is a low risk that customer load shedding would be required in 2022 under this contingency.”⁶

- 6) FBC generally applies a 0.95 power factor when converting MVA to MW, for example in calculating the normal and emergency system load (MW) rating. FBC states the actual 2019 power factor for LEE is 0.97.⁷ There would appear to be an opportunity to postpone the KBTA project by at least a year through power factor correction, if even on a temporary basis, but this alternative was not explored.

D. Load Forecast

- 7) The forecast of the summer peak demand of the Kelowna 138 kV system and the summer capacity of LEE T3 or T4 are the key inputs to the N-1 planning criteria.
- 8) FBC provided the load forecast methodology in a series of information request responses.⁸ FBC derives historical gross energy growth rates from actual 2000-2018 sales. As a point of reference, FBC provided the historic population load growth of 1.6 percent, which is expected to continue to 2036 as noted in Table 3-2.⁹ Forecast gross average annual growth rates for the summer and winter peak are used to escalate the peaks into future years.¹⁰ The summer and winter growth rates are aligned with population growth rates beyond 2028.¹¹ In the early years, substation growth rates are adjusted for recent growth trends and other adjustments in the distribution load forecast.
- 9) FBC uses a “1 in 20” year load forecast for transmission planning in order to account for extreme weather events. As noted by FBC, this forecast is higher than the expected load forecast under normal conditions, meaning that there is only a 5 percent probability that loads will be higher than the “1 in 20” year forecast.¹² FBC acknowledges that there are no standards, mandatory or other, that prescribe the risk level and confidence bands of a

⁶ Exhibit B-2, BCUC 8.1

⁷ Exhibit B-2, BCUC 7.3

⁸ Exhibit B-7, BCUC 34.0

⁹ Exhibit B-1, Section 3.3.1, p. 14

¹⁰ Exhibit B-11, ICG 2.2.1, FBC revised its evidence in BCUC IR1 4.4 to clarify that growth rates used to forecast peak demand are based on gross energy, not net energy

¹¹ Exhibit B-11 ICG 2.2.3

¹² Exhibit B-2, BCUC 1.4.1

load forecast. FBC described and revised the steps to prepare the “1 in 20” year forecast.¹³

10) Given the 138 kV distribution system does not meet the N-1 planning criteria in only 5 hours in 2022 and 7 hours in 2023 as noted above, the use of the “1 in 20” load forecast, and the assessment of summer transformer limits, the KBTA Project is extremely unlikely to reduce the frequency or duration of outages in the Kelowna service area. Given FBC’s recent application for a 6.37 percent increase in 2021 rates over 2020 rates¹⁴, ICG submits that the Commission should compel FBC to consider every opportunity to postpone or delay capital expenditures. There is no evidence that FBC has considered, or even identified, any such opportunities. Nevertheless, the ICG accepts that the appropriate transmission planning criteria is that all forecast customer loads are served during N-1 conditions. For that reason, the ICG recognizes that there is need for significant investments in the Kelowna system, but not necessarily additional capacity on the 138 kV system. The ICG will submit below that FBC did not adequately consider alternatives, with the exception of alternatives that all included an additional transformer.

E. Alternatives

11) FBC limited its consideration of alternatives to those with additional transformers because FBC concluded that there were no feasible alternatives that did not include an additional transformer. FBC’s opinion that the only feasible alternative was additional transformation limited the value of the alternative analysis and for that reason should not be accepted by the Commission. FBC confirmed this opinion in Final Argument:

“In these circumstances, without an increase to transformer capacity, customer load will need to be shed to avoid overloading the remaining transformers.”¹⁵

12) The traditional response to load growth in distribution planning studies is to increase the number of transformers. But there are many alternatives other than an increase to transformer capacity that could avoid overloading the remaining transformers and meet the N-1 planning criteria. For example, a joint project with BC Hydro may meet the N-1 planning criteria. Distribution planning studies such as that relied on by FBC should

¹³ Exhibit B-2-1-1

¹⁴ FBC Annual Review for 2020 and 2021 Rates, Exhibit B-2, Section 1.1.2

¹⁵ FBC Final Submission, para, 17

change so as to consider other alternatives. The CPCN Guidelines require the utility to identify alternatives at an early screening stage. Further, the utility is to provide reasons why certain alternatives were not considered further.¹⁶ This early screening stage is a crucial first step in what is to be a two-step process. Before progressing from the early screening stage to the assessment of feasible alternatives, the list of identified alternatives ought to be wide-ranging and comprehensive. It is crucial that all alternatives have been identified. In this case, FBC refers to “alternatives that were identified but rejected at a preliminary stage”, but does not provide a list of identified alternatives, with the exception of gas-fired generation and the DR pilot project, and does not provide adequate reasons why alternatives were not considered further.¹⁷

- 13) In the absence of a full “early screening stage” together with a wide range of potential alternatives and a list of identified alternatives with reasons for no further consideration, the assessment of alternatives carried out by FBC did not fulfill the requirements of the CPCN Guidelines.
- 14) Before the assessment of feasible alternatives, FBC concluded that the only feasible alternatives were alternatives with an additional transformer. In this manner, FBC preempted the “early screening stage” and preempted further consideration of all alternatives except those with one more transformer. Also because FBC concluded that the only feasible alternatives were going to be alternatives with an additional transformer, FBC did not carry-out a full two-step screening process.
- 15) Given Section 2(i) of the CPCN Guidelines, it must be assumed that the only alternatives deemed to be not feasible were those identified in the Application. It follows that there was no or very limited consideration of any alternatives other than yet one more transformer. The limited consideration of other alternatives as is presented in the Application is limited to the demand response pilot program and gas-fired generation.¹⁸ There is no reference to clean, distributed generation such as local solar generation, a joint project with BC Hydro, or to load management, other than to the DR pilot that was

¹⁶ CPCN Guidelines 2(i)

¹⁷ Exhibit B-1, Section 4.2, p. 22-23 and FBC acknowledged that its estimate of 1.75 MW of DR was based on “informal learning” from a BC Hydro commercial DR pilot. (Exhibit B-3, BCOAPO 8.1)

¹⁸ Exhibit B-1, Section 4.2, p.22-23

designed for another purpose.

- 16) The Commission now has an opportunity to require B.C. utilities to change the way distribution grids are planned and operated. At the very least, distribution planning should always include an assessment of clean, distributed generation or load management to address distribution constraints. Moreover, this assessment must go beyond the level of assessment FBC conducted in its preliminary stage. As will be noted below, FBC's list of feasible alternatives is a step-backward from the objectives of the CEA. Given FBC's list of feasible alternatives, there is insufficient evidence for the Commission to consider alternatives other than an additional transformer. It is that second-step of the two step process that provides the analysis necessary to select a project that could advance the objectives of the CEA. In these circumstances, the ICG recommends the Commission deny the Application and direct FBC to consider alternatives aligned with the objectives of the CEA and other than an additional transformer.
- 17) Once FBC concluded that only additional transformer capacity would meet the need, from that point on, the outcome of the alternative analysis in the Application was pre-determined. That is, the alternative analysis in the Application can only be described as an exercise to find the best location for an additional transformer. Other than to find the best location for an additional transformer the alternative analysis performed by FBC is not helpful.¹⁹ The location choice was limited to the LEE and the D.G. Bell Terminal Station (DGB) with the obvious choice being the LEE. This exercise was not as contemplated in the CPCN Guidelines a comparison of the "costs, benefits and associated risks of the project and feasible alternatives."²⁰
- 18) The ICG respectfully submits that before approving the Application the Commission must first conclude that clean, distributed generation, a joint project with BC Hydro, or load management are not feasible alternatives. This analysis must include technical, operational, economic, and timing considerations. In the case of reinforcing BC Hydro's West Kelowna system as an alternative to the KBTA Project, FBC offers the following very limited comment:

Based on FBC's understanding of BC Hydro project costs and timeline,

¹⁹ It does assist with the selection of a ring bus vs split bus configuration but such analysis is not relevant to N-1 planning criteria

²⁰ CPCN Guidelines, section 2(ii)

the possibility of reinforcing BC Hydro's West Kelowna system will not be a feasible option to replace the KBTA Project.²¹

- 19) FBC is now asking the Commission to conclude that reinforcing the BC Hydro West Kelowna system is not a feasible alternative with no analysis placed on the record, and on no more than FBC's comment about its understanding of BC Hydro's project costs and timelines.
- 20) In these circumstances, it must be presumed that reinforcing BC Hydro's West Kelowna system would be technically and operationally feasible. The crucial question that the Commission must consider is whether FBC should have contacted BC Hydro to get their views of the feasibility of reinforcing the BC Hydro West Kelowna system to replace the KBTA Project. There was no need for FBC to rely on its "understanding of BC Hydro project costs and timelines". And the Commission should not now rely on FBC's understanding of the BC Hydro project costs and timelines, without first hearing from BC Hydro. FBC was the applicant and should have sought and then filed BC Hydro's views on the record of this proceeding.
- 21) Regarding local solar generation as an alternative, it is not mentioned in the Application. Moreover, it is apparent that FBC rejected the local solar alternative simply because "winter peak in the Kelowna area typically occurs after sunset."²² No further analysis was performed, and no evidence regarding the feasibility of solar generation is on the record in this proceeding. Solar generation would need to provide approximately 6 MW beginning in 2022 to meet the summer peak load requirement.²³ FBC did not consider solar generation as a means to delay an additional transformer until required to meet winter peak requirements. Again, FBC ought to have consulted, in this case, with third party solar farm developers, regarding the feasibility of local solar generation as an alternative to the KBTA Project.

F. Transformer Location Alternatives

- 22) The recommended alternative (Alternative A) is a third 230/138 kV transformer at LEE, and the use of ring bus configuration. The most significant difference between

²¹ Exhibit B-11, ICG 2.12.2

²² Exhibit B-5, ICG 1.1.8

²³ Exhibit B-5, ICG 1.1.8

Alternatives A and B is that Alternative A would see the existing 138 kV split bus reconfigured into a ring bus configuration. The additional work to establish the ring bus configuration accounts for the Alternative A Project Cost of \$23.288 M and the Alternative B Project Cost of \$17.008M.²⁴ Alternative A will increase rates by 0.54% when in service (2024) and Alternative B will increase rates by approximately 0.40% when in service.²⁵ The 40 year levelized rate increase for Alternative A is 0.39 percent, approximately 0.10 percent higher than Alternative B.

23) Alternative C has been included by FBC, but also quickly dismissed, because of the substantial capital cost of \$33.332 million because of associated transmission line reconductoring. A comparison with Alternative C does advance FBC's view that the location for an additional transformer is LEE. It will not be further considered in this Argument.

24) The only remaining issue is then whether the split bus at LEE substation should be reconfigured to a ring bus configuration. The ICG agrees that the split bus configuration would reduce outage frequency and duration. From the limited and inadequate list of "feasible alternatives" presented in the Application, the ICG supports Alternative A.

G. Noise Mitigation

25) The ICG recommends that FBC be directed in the final report to include the results of noise measurement and any mitigation measures.²⁶

H. Project Cost Estimates

26) As noted by FBC, the Project's base estimate plus its contingency is the Project's Class 3 estimate and is considered the control budget.²⁷ FBC then asserts that the AACE Class 3 estimate should be thought of as a range of values with any value in that range being likely to occur. The ICG recommends that interveners being given an opportunity to comment on any variances higher than the "control budget". Any such variances should be considered imprudently incurred in the absence of compelling evidence, accepted by the Commission, that such costs were prudently incurred.

²⁴ Exhibit B-2, BCUC 25.3

²⁵ Exhibit B-2, BCUC 28.1

²⁶ Exhibit B-7, BCUC 39.2

²⁷ Exhibit B-11, ICG 2.10.3

I. Objectives of Clean Energy Act

- 27) In FBC Final Argument, identifies section 2 of the Clean Energy Act, and lists four objectives in the CEA.²⁸ However, an increase to transformer capacity does not achieve any of the CEA objectives identified by FBC. That is, the Application, if approved, will not advance the benefits of the transition to clean, distributed energy resources. Moreover, it will not encourage customers to be more engaged in how they use energy. It will not encourage the switching from one kind of energy source to another that decreases green house gas emissions (Section 2(h)), it will not encourage economic development and the creation of new jobs (Section 2(c)) in the renewable energy sector, and it will not maximize the value, including the incremental value of the resources being clean or renewable resources (Section 2(m)).
- 28) In fact, increasing transmission capacity is contrary to the CEA objectives because it will discourage, not encourage, the switching from one kind of energy source or use to another and the economic development and the creation and retention of jobs. And it will also discourage the incremental value of the resources being clean or renewable. The growth of clean energy requires a change in distribution planning, and the consideration of alternatives to transformer capacity constraints other than an increase to transformer capacity.
- 29) Contrary to the view of FBC that an increase to transmission capacity serves the objectives of the CEA, the Application should be denied because it does not advance the objectives and almost certainly is a step backwards from the objectives of the CEA. Also contrary to the views of FBC, the CEA requires utilities to consider many more alternatives to meet local capacity requirements than just more transformation. Those alternatives should have been considered amongst the list of feasible alternatives because of the CEA as well as for the other reasons identified above.

J. Recommendations

- 30) The CPCN Guidelines require applicants for a CPCN to consider costs and benefits of feasible alternatives. Although the CPCN Guidelines do not define “feasible alternatives”, the Guidelines do presume that the applicant will have considered all

²⁸ FBC Final Submission, para. 13

alternatives before alternatives are determined to be feasible or not. That is, there must be some investigation or analysis of each alternative before undertaking the more rigorous analysis required of the “feasible alternatives” to determine the preferred alternative. In the absence of such “early stage analysis” of most alternatives and very limited “early stage analysis” of local generation and demand responded, the Commission ought not to approve an application for a CPCN.

- 31) The ICG recommends that the Commission not approve the KBTA Project. If the Commission disagrees, then ICG recommends that FBC be directed 1) to further consider alternatives that do not include an increase to transformer capacity, 2) to seek BC Hydro analysis and opinion regarding reinforcing the BC Hydro West Kelowna system as an alternative to the KBTA Project, and 3) to identify and consider all opportunities to postpone the KBTA project for at least a year to allow for other alternatives to be investigated.
- 32) Provide that FBC satisfies the above noted directions, then FBC could seek the CPCN for the KBTA Project based on the record of this proceeding, supplemented with the analysis and opinion of BC Hydro and the analysis of alternatives other than an increase to transformer capacity.