BCPIAC
Public Interest Advocacy Centre

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Our File: 7311.221

30 July 2020

VIA E-FILING

Acting Commission Secretary
Marija Tresoglavic
BC Utilities Commission
6th Floor 900 Howe Street
Vancouver, BC V6Z 2N3

Dear Ms. Tresoglavic,

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

We represent the BC Old Age Pensioners' Organization, Active Support Against Poverty, Council of Senior Citizens' Organizations of BC, Disability Alliance BC, and Tenant Resource and Advisory Centre, known collectively in FortisBC regulatory processes as "BCOAPO et al." ("BCOAPO").

Enclosed please find the BCOAPO's Information Request No. 2 with respect to the above-noted Application.

If you have any questions, please do not hesitate to contact the undersigned.

Sincerely,
BC PUBLIC INTEREST ADVOCACY CENTRE

Original on file signed by

Leigha Worth

Executive Director | General Counsel

Encl.

REQUESTOR NAME	**BCOAPO**
INFORMATION REQUEST ROUND:	**# 2**
TO:	**FORTISBC INC.**
DATE:	**July 30, 2020**
PROJECT NO:	**1599088**
APPLICATION NAME	**Application for a CPCN for the Purchase and Installation of the Kelowna Bulk Electricity Transformer**

20.0 Reference: Exhibit B-2, BCUC 1.4.4

Preamble: The response states:

"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.

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.

Assuming that the weather in 2020 will be similar to the weather of base year 2000, the corresponding January peak in 2020 is obtained by applying to the base year the cumulative growth of years 2000-2019. The 2020 peaks for February, November, and December, as well as June, July, August are obtained in the same manner. The calculation is then repeated for the remaining 19 base years from 2001 to 2019."

20.1 Please confirm specifically what "peaks" the first paragraph is referring to (i.e., are they the peaks for the Kelowna area or FBC's overall system peaks?).

20.1.1 If the "peaks" used are the overall system peaks, please explain why the peaks for the Kelowna area are not used.

20.2 Please explain why self-generating customers and wheeling losses are excluded.

20.3 If available, please cite other instances in BC or elsewhere in North America where a CPCN for a system addition was granted on the basis of evidence provided in the justification that excluded the impacts of self-generating customers and wheeling losses.

20.4 Please explain why net energy growth rates as opposed to peak growth rates are used.

20.4.1 If net energy growth rates are used, please explain what role the historical 2000-2019 peak data referenced in the first paragraph has in developing the peak load forecast.

20.5 Are the energy growth rates used those for the Kelowna area or for FBC's system overall?

20.5.1 If the "energy growth rates" used are for the system overall, please explain why energy growth rates for the Kelowna area are not used.

20.6 Please explain how using the cumulative growth for the years 2000-2019 is consistent with an assumption that "the weather in 2020 will be similar to the weather in the base year 2000".

20.6.1 Isn't the calculation of the resulting growth rate also dependent on the weather in 2019 as it will impact the 2019 value used in the calculation?

20.6.2 Indeed, aren't all 20 calculated growth rates dependent upon the weather and resulting load in 2019?

20.6.3 If the weather was particularly "mild" in 2019 such that energy used was less than "normal", wouldn't this impact all of the growth rates calculations? If not, why not?

20.7 Please explain how the calculation can be performed using 2019 as the base year when 2019 is the last year for which there is historical data.

20.8 What were the resulting 20 winter and summer growth rate values calculated?

20.8.1 Please reconcile the highest winter and summer growth rates with the growth implicit in the winter and summer peak forecasts set out in Table 3-5 (Exhibit B-1).

21.0 Reference: Exhibit B-2, BCUC 1.4.4
Exhibit B-5, ICG 1.5.1 and 1.5.2

Preamble: The response to BCUC 1.4.4 states:

"Area peak forecasts are created by allocating 1-in-20 system peak forecast among FBC's substations. This is done by scaling the Distribution Planning forecast, which is the sum of non-coincident substation peak forecasts to the system peak (the coincident peak). The Kelowna area peak forecast in Table 3-5 is the sum of the load distributed to Kelowna area substation buses in that manner".

The response to ICG states:

"As explained in the response to BCUC IR1 4.4, area peak forecasts are created by taking the total forecast system load in the Resource Planning forecast and distributing this load among FBC substations based on the Distribution Load Forecast prepared by regional engineers".

21.1 The responses make reference to a Distribution Planning forecast and a

Distribution Load Forecast.

21.1.1 Are these both references to the same forecast?

21.1.2 How are the forecast(s) prepared?

21.1.3 Are they consistent with the system peak load forecast?

21.2 Please explain more fully how the "scaling" is done in terms of how is the scaling factor calculated and what is it applied to (For Example - is the Distribution Planning Forecast for the area consistent with the system peak forecast used for resource planning and the difference between the "1 in 20" system peak forecast and the system peak forecast used for resource planning used to "scale up" the Distribution Planning Forecast).

21.3 Please clarify whether the forecast set out in Table 3-5 is: i) a forecast of the coincident peak for the Kelowna area or ii) a forecast of the sum of the non-coincident peaks for the substations in the Kelowna area.

21.3.1 Please reconcile the response with the description of the forecast process.

21.3.2 If it is a forecast of the sum of the non-coincident peaks for the substations in the Kelowna area, please explain why this is the appropriate forecast to use for purposes of determining area needs.

22.0 Reference: **Exhibit B-2, BCUC 1.4.13**

22.1 Do the peak load forecast for LEE and DGB assume the same growth rate for both or are individual growth rates forecast for each substation?

22.1.1 If individual growth rates are forecast for each substation, please i) explain how the individual growth rates are forecast and ii) reconcile this with the explanation of the forecast process provided in response to BCUC 1.4.4.

23.0 Reference: **Exhibit B-2, BCUC 1.7.1, 1.7.2 and 1.7.3**

Preamble: Exhibit B-1, pages 16-17 states:

"The summer peak load is forecast to reach the transformer limit of 315 MW in 2021 and to exceed the limit in 2022 as set out in Table 3-5, and the forecast winter peak load will exceed the winter transformer limit of 370 MVA in 2027." (emphasis added)

BCUC 1.7.2 states:

"The summer peak load level of 315 MW is considered to be the summer transformer limit because it is the maximum load that a reconfigured area system can manage while remaining within normal operating limits, as determined by power flow studies. The corresponding winter peak load is 370 MW." (emphasis added)

Exhibit B-1, page 19 states:

"For example, summer emergency limits for LEE T3 and T4 are both much lower in summer at 159 MW, as compared to their respective winter emergency limits of 189 MW and 195 MW".

BCUC 1.7.3 sets out the emergency summer limits for LEE T3 and T4 as 199 MW while the emergency winter limits are reported as 215 MW.

23.1 With respect to pages 16-17 and BCUC 1.7.2, please clarify whether the winter transformer limit is 370 MW or 370 MVA.

23.2 With respect to page 19 and BCUC 1.7.3, please clarify what the winter and summer emergency limits are for LEE T3 and T4.

24.0 Reference: **Exhibit B-2, BCUC 1.7.7**

24.1 Please provide a revised version of the Power Flow Analysis Before Reconfiguration Table showing the % of emergency ratings.

24.2 With respect to the Power Flow Analysis After Reconfiguration results for 2022, are the values shown for DGB when either LEE transformer is out the maximum load that can transferred to DGB?

24.3 With respect to the Power Flow Analysis After Reconfiguration results for 2022, the sum of the individual transformer loadings when all elements are in-service is only 216 MVA whereas the area load forecast is 319.8 MW. Please reconcile.

25.0 Reference: **Exhibit B-2, BCUC 1.7.3 and 1.7.7**

Preamble: BCUC 1.7.3 states:

"For the Kelowna area, the average Power Factor is 0.98, which is close to unity. To be more conservative when modelling load flows, FBC generally applies a 0.95 Power Factor when converting MVA to MW".

25.1 For purposes of the transformer MVA loads to meet the forecast area MW load for the forecast years (2020-2022) set out in the response to BCUC 1.7.7, what Power Factor was used for each year (such that the sum of the transformer loads matches the area load)?

25.1.1 The values used do not appear to be 0.95 per BCUC 1.7.3. If this is the case, please explain why?

26.0 Reference: **Exhibit B-3, BCOAPO 1.3.1 and 1.3.2**

26.1 With respect to BCOAPO 1.3.1, what do the 1,000 housing units per annum translate into in terms of an annual growth rate (%) in housing units for the period through to 2030?

26.2 How does this compare with the historical growth in housing units (i.e. over last 10 or 20 years)?

27.0 Reference: **Exhibit B-3, BCOAPO 1.4.1**
Exhibit B-1, page 15, lines 12-15

Preamble: Exhibit B-1 states:

"FBC forecasts regional load growth using trends in historical regional load data".

27.1 The Application's description of the FBC forecast for regional load growth suggests it is based on historical growth rates whereas the response to BCOAPO 1.4.1 suggests that the forecast for regional load growth involves the use of econometric models for some customer segments and customer surveys for other segments. Please clarify the basis for the regional load growth forecast.

27.2 Is this regional load growth forecast the same as the Distribution Planning Forecast referred to in BCUC 1.4.4?

27.2.1 If not, what is the difference and which one is used in the determination of the 1 in 20 year load forecast for the area?

28.0 Reference: **Exhibit B-3, BCOAPO 1.5.1, 1.6.1, 1.6.2 and 1.6.2.1**
Exhibit B-2, BCUC 1.7.7

28.1 The responses to BCOAPO 1.6.1 & 1.6.2.1 and BCUC 1.7.7 all suggest that not all of the 200 MVA capability of the DGB transformer can actually be used to service the area load. Please confirm that this is the case.

28.1.1 If confirmed, please explain why the response to BCOAPO 1.5.1 suggests that the full capability of DGB (190 MW) can be used to supply area load.

28.1.2 If not confirmed, please reconcile with the response to BCOAPO 1.6.1.

28.2 The response to BCOAPO 1.6.2.1 states that, after the system reconfiguration, the loading on the DGB transformer is 150 MVA. For what forecast year does the 150 MVA apply?

28.3 With respect to Exhibit B-1, Table 3-5, please provide the portion (MWs) of the Kelowna area load that would be served by DGB in the event of an outage at either of the LEE transformers, both before and after reconfiguration in each year from 2020-2028.

28.4 At what point in time in the future is the load that would be served by DGB after reconfiguration expected to exceed 190 MW (or 200 MVA) based on the 1 in 20 load forecast?

29.0 Reference: **Exhibit B-5, ICG 1.5.2**

29.1 Are the substation peak load forecasts set out in ICG 1.5.2, a non-coincident peak load forecast for each substation (i.e., the peak for each substation) or the coincident peak load forecast for each substation (i.e., the peak for the substation at the time of the Kelowna area peak)?

29.2 Are the forecast values in the Application, Table 3-5 simply the sum of the substation forecasts (per ICG 1.5.2) for the respective year?

29.2.1 If not, how do the values in Table 3-5 relate to those provided in response to ICG 1.5.2?

30.0 Reference: **Exhibit B-3, BCOAPO 1.6.1, 1.6.2, 1.6.2.1 and 1.9.1**

Preamble: At present it appears that, in the event of an outage at one of the LEE transformers the system cannot be reconfigured so as to fully utilize the 200 MVA capability of the DGB transformer.

30.1 Please explain more fully why, based on the geographical distribution of the load (per BCOAPO 1.6.1) DGB cannot be used fully to supply the area load whereas the transformers at LEE can.

30.2 Is this limitation on the use of DGB related at all to the location of the lines and breakers serving the area?

30.3 Is it possible through the installation of addition lines/breakers to increase the load that can be transferred to the DGB transformer after reconfiguration?

30.3.1 If not, why not?

30.3.2 If yes, what additional facilities would be required, what would be the associated cost, what would be the increase in the ability to the DGB transformer to carry load after reconfiguration and what would be the new need date for Kelowna system?

30.3.3 If yes, why was this not considered as an alternative?

31.0 Reference: **Exhibit B-2, BCUC 1.16.1, 1.16.5 and 1.16.6**

31.1 There appears to be some overlap in the considerations related to the Safety, Operability, Complexity of Protection and Switching Schemes and Reliability. What are the distinguishing differences that warrant there being four separate criteria for purposes of the evaluation?

32.0 Reference: **Exhibit B-1, page 26**

Preamble: The Application states: “Ring bus is today’s minimum industry standard for this type of terminal substation”.

32.1 What is the basis for the statement that “Ring bus is today’s minimum industry standard for this type of terminal substation”?

33.0 Reference: **Exhibit B-3, BCOAPO 1.8.1**

33.1 What was the estimated DR potential of the largest 53 Commercial and Industrial (C&I) accounts in the Kelowna area?

34.0 Reference: **Exhibit B-4, CEC 1.12.2**
Exhibit B-2, BCUC 1.7.3

Preamble: The response states:

"For example, if the new LEE T2 transformer was rated at 100 MVA, the emergency limit would be approximately 95 MW. With LEE T4 out of service, LEE T2 and LEE T3 would carry the load in parallel with a limitation of 95 MW x 2 = 190 MW. This only represents an incremental capacity increase of 31 MW with regard to the summer N-1 limit" (emphasis added)

34.1 Based on the response to BCUC 1.7.3, please explain why the emergency rating of a 100 MVA transformer is 95 MW as opposed to 119 MW (i.e., 100 MVA * 125% (per BCUC 1.7.3) * 0.95 (Power Factor).

34.2 Please explain why the loads must be carried in parallel such that LEE T3 can only carry 95 MW as opposed to its normal summer rating of 159 MW (per BCUC 1.7.3).

34.3 Please provide the derivation of the 31 MW.

35.0 Reference: **Exhibit B-3, BCOAPO 1.5.1**
Exhibit B-2, BCUC 1.11.3

35.1 Are the N-1 limits set out in Figures 3.3 and 4.1 (Exhibit B-1) based on the emergency or the normal ratings of the transformers?

36.0 Reference: **Exhibit B-2, BCUC 1.12.4, 1.12.4.1, 1.16.6 and 1.17.5**
Exhibit B-3, BCOAPO 1.10.3
Exhibit B-1, page 34, lines 30-35

36.1 The references noted in the preamble all suggest that a split bus configuration requires more work effort on the part of FBC employees than a ring bus configuration due to safety and operational considerations. Can FBC provide an estimate as to what would be the additional annual O&M expense associated with Alternative B (using a split bus configuration) as compared to Alternative A (using a ring bus configuration)?

37.0 Reference: **Exhibit B-3, BCOAPO 1.19.1**
Exhibit B-2, BCUC 1.32.4

37.1 To date, what specific aesthetic improvements has FBC committed to and do these improvements address the issues raised by Letters of Comment or at the virtual Town Hall meeting?

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