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August 20, 2020

Industrial Customers Group
c/o #301 – 2298 McBain Avenue
Vancouver, BC V6L 3B1

Attention: Mr. Robert Hobbs

Dear Mr. Hobbs:

Re: FortisBC Inc. (FBC)

Project No. 1599088

Application for a Certificate of Public Convenience and Necessity for the Kelowna Bulk Transformer Addition Project (the Application)

Response to the Industrial Customers Group (ICG) Information Request (IR) No. 2

On April 24, 2020, FBC filed the Application referenced above. In accordance with the British Columbia Utilities Commission Order G-107-20 setting out the Regulatory Timetable for review of the Application, FBC respectfully submits the attached response to ICG IR No. 2.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC INC.

Original signed:

Diane Roy

Attachments

cc (email only): Commission Secretary
Registered Parties

1.0 Reference: Exhibit B-2, BCUC IR 1.4.4

"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."

1.1 Please explain how the effect of self-generating customers was excluded from the recorded peaks?

Response:

Please refer to the response to BCOAPO IR2 20.2.

1.2 Please provide a table which shows the amount of self-generation excluded from each of the monthly peaks for each of the identified months from 2015 to 2019.

Response:

Please refer to the response to BCOAPO IR2 20.2.

1.3 Why are wheeling losses excluded from the monthly peak loads, and for which elements on the FBC system are such wheeling losses excluded?

Response:

Please refer to the response to BCOAPO IR2 20.2.

1.4 Please provide a table which shows the amount of wheeling losses, by element if possible, excluded from each of the monthly peaks for each of the identified months from 2015 to 2019.

Response:

Please refer to the response to BCOAPO IR2 20.2.

2.0 Reference: Exhibit B-2, BCUC IR 1.4.4; Exhibit B-5, ICG IR 1.1.9 and ICG IR 1.5.2

"The substation load data is based on the annual "1 in 20" load forecast and distributed among Kelowna substations as described in the response to BCUC IR1 4.4." (ICG IR 1.5.2)

"Forecast net energy growth rates are used to escalate the peaks into future years…" (BCUC IR 1.4.4)

"FBC does not forecast energy requirements at the area level…" (ICG IR 1.1.9)

2.1 Please explain the use of net energy growth rates used to calculate the peaks into future years, and the comment that FBC does not forecast energy requirements at the area level?

Response:

Please refer to the response to BCOAPO IR2 20.5. As explained in the revised response to BCUC IR1 4.4, the growth rates used are gross energy, not net energy.

2.2 Please explain the different growth rates of the Kelowna area summer peak demand forecast as compared to the Kelowna area winter peak demand forecast?

Response:

FBC attributes the higher growth rate in the summer peak load, as compared to the winter peak load, to the fact that new residential and commercial developments typically have significant air conditioning load, which is a major factor driving increases to the summer peak. With the exception of the Big White substation, most areas of the city also see higher demand related to tourism in the summer months (e.g. hotels, wineries, vacation properties, etc.).

2.3 Please identify and explain the growth rates for each substation summer peak demand forecast provided in response to ICG IR 1.5.2?

Response:

The table below shows the annual growth rate for each substation summer peak based on the forecast provided in the response to ICG IR1 5.2. In the early years of the forecast, growth rates vary based on recent growth trends and other adjustments in the distribution load forecast as described in the response to BCOAPO IR2 21.1. In later years, the growth rate for most stations is the same since it is driven by the system peak forecast and the distribution forecast summer regional growth rate without further adjustments.

	Summer Growth Rate																		
Name	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Glenmore	0.8%	1.3%	1.9%	1.8%	1.8%	2.1%	1.4%	1.8%	1.8%	1.8%	1.6%	1.7%	1.7%	1.7%	1.6%	1.6%	1.6%	1.6%	1.6%
Hollywood	0.9%	1.1%	1.5%	1.9%	1.9%	2.1%	1.3%	1.8%	1.8%	1.8%	1.6%	1.7%	1.7%	1.7%	1.6%	1.6%	1.6%	1.6%	1.6%
OK Mission	1.9%	1.6%	1.5%	1.1%	2.1%	2.3%	1.4%	1.7%	1.7%	1.8%	1.7%	1.7%	1.7%	1.7%	1.6%	1.6%	1.6%	1.6%	1.6%
Recreation	3.6%	3.2%	2.2%	1.5%	1.8%	2.2%	1.4%	1.9%	1.8%	1.8%	1.6%	1.7%	1.7%	1.7%	1.6%	1.6%	1.6%	1.6%	1.6%
Sexsmith	1.7%	0.9%	2.5%	1.7%	1.7%	2.1%	1.4%	1.9%	1.8%	1.8%	1.6%	1.7%	1.7%	1.7%	1.6%	1.6%	1.6%	1.6%	1.6%
Saucier	2.0%	3.2%	1.2%	0.4%	2.2%	2.4%	1.5%	1.6%	1.7%	1.8%	1.7%	1.7%	1.7%	1.7%	1.6%	1.7%	1.6%	1.6%	1.6%
Joe Rich	1.0%	1.6%	1.3%	1.7%	1.9%	2.1%	1.4%	1.8%	1.8%	1.8%	1.6%	1.7%	1.7%	1.7%	1.6%	1.6%	1.6%	1.6%	1.6%
Duck Lake	17.0%	3.6%	2.6%	3.6%	1.9%	2.1%	1.4%	1.7%	1.8%	1.8%	1.6%	1.7%	1.7%	1.7%	1.6%	1.6%	1.6%	1.6%	1.6%
DUC BCH	0.6%	0.6%	0.6%	0.6%	1.2%	1.2%	1.5%	1.4%	0.9%	1.3%	1.3%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.1%
D.G. Bell	2.0%	1.6%	1.1%	1.9%	1.9%	2.1%	1.4%	1.8%	1.8%	1.8%	1.6%	1.7%	1.7%	1.7%	1.6%	1.6%	1.6%	1.6%	1.6%
Lee	1.0%	1.6%	1.3%	1.7%	1.9%	2.1%	1.4%	1.8%	1.8%	1.8%	1.6%	1.7%	1.7%	1.7%	1.6%	1.6%	1.6%	1.6%	1.6%
Ellison	4.5%	0.6%	0.8%	3.7%	2.1%	-2.0%	6.8%	1.8%	1.9%	1.8%	1.6%	1.7%	1.7%	1.7%	1.6%	1.6%	1.6%	1.6%	1.6%
Black Moutain	2.6%	2.4%	2.8%	1.8%	1.9%	-1.7%	5.3%	1.8%	1.8%	1.8%	1.6%	1.7%	1.7%	1.7%	1.6%	1.6%	1.6%	1.6%	1.6%
Big White	-1.1%	-0.4%	1.2%	4.3%	1.2%	-1.1%	4.0%	2.0%	2.1%	1.8%	1.4%	1.6%	1.7%	1.7%	1.6%	1.6%	1.6%	1.7%	1.6%
Benvoulin	4.7%	1.8%	1.6%	1.6%	1.9%	2.1%	1.4%	1.8%	1.8%	1.8%	1.6%	1.7%	1.7%	1.7%	1.6%	1.6%	1.6%	1.6%	1.6%

2.4 Please identify and explain the growth rates for each substation winter peak demand forecast provided in response to ICG IR 1.5.2?

Response:

The table below shows the annual growth rate for each substation winter peak based on the forecast provided in ICG IR1 5.2. In the early years of the forecast, growth rates vary based on recent growth trends and other adjustments in the distribution load forecast as described in the response to BCOAPO IR2 21.1. In later years, the growth rate for most stations is the same since it is driven by the system peak forecast and the distribution forecast winter regional growth rate without further adjustments.

	Winter Growth Rate																		
Name	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Glenmore	-0.4%	1.1%	1.5%	1.2%	1.1%	1.1%	1.2%	1.2%	1.1%	1.1%	1.1%	1.2%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
Hollywood	-0.3%	0.8%	1.1%	1.4%	1.2%	1.1%	1.1%	1.2%	1.2%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
OK Mission	0.0%	0.7%	1.3%	1.1%	1.3%	1.1%	1.1%	1.2%	1.1%	1.1%	1.1%	1.2%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
Recreation	5.0%	1.4%	0.9%	1.8%	1.0%	1.4%	0.9%	1.2%	1.2%	1.1%	1.1%	1.2%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
Sexsmith	1.8%	0.8%	1.4%	0.9%	1.2%	1.2%	1.1%	1.2%	1.1%	1.1%	1.1%	1.2%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
Saucier	3.4%	1.0%	1.3%	0.0%	1.4%	1.7%	1.1%	1.1%	1.0%	1.1%	1.2%	1.2%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
Joe Rich	0.0%	0.6%	1.3%	1.2%	1.2%	1.1%	1.1%	1.2%	1.2%	1.1%	1.1%	1.2%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
Duck Lake	17.2%	2.7%	2.6%	3.1%	1.2%	1.2%	1.1%	1.2%	1.2%	1.1%	1.1%	1.2%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
DUC BCH	0.6%	0.6%	0.6%	0.6%	1.2%	1.2%	1.5%	1.4%	0.9%	1.3%	1.3%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.1%
D.G. Bell	1.8%	0.1%	1.4%	1.2%	1.2%	1.2%	1.1%	1.2%	1.2%	1.1%	1.1%	1.2%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
Lee	0.0%	0.6%	1.3%	1.2%	1.2%	1.1%	1.1%	1.2%	1.2%	1.1%	1.1%	1.2%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
Ellison	3.2%	1.3%	0.9%	2.8%	1.3%	1.1%	2.8%	1.2%	1.1%	1.1%	1.1%	1.2%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
Black Moutain	1.9%	1.7%	2.5%	1.3%	1.2%	1.1%	1.1%	1.2%	1.2%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
Big White	-0.2%	0.7%	1.4%	1.3%	1.1%	1.1%	1.1%	1.2%	1.1%	1.1%	1.1%	1.2%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
Benvoulin	3.9%	1.2%	1.2%	1.3%	1.2%	1.1%	1.2%	1.2%	1.2%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%

3.0 Reference: Exhibit B-2, BCUC IR 1.4.4.1

"If FBC acquired resources to meet the 1-in-20 forecast level, it would result in FBC entering into contacts or procuring resources that would not be fully utilized and add costs to customer rates."

3.1 Does FBC consider a one year deferral of the KBTA project, provided that it also resulted in a corresponding delay to an increase in customer rates, to be meaningful to customers, as long as the forecast summer peak was served in 2022?

Response:

The current project schedule would see the new transformer in service after summer peak in 2022.

The Kelowna summer peak load for year-to-date is 313.1 MW, which exceeds the forecast value of 309.5 MW. This demonstrates that there is continued load growth in the Kelowna area, as peak load has almost reached the 315 MW load level.

FBC submits that further deferral is not possible, as the new transformer is required to be in service before summer 2023 to mitigate the risk of significant customer outages.

4.0 Reference: Exhibit B-2, BCUC IR 1.4.9 and BCUC IR 1.4.10

"Please refer to Attachment 4.10 for fully functioning Excel spreadsheets containing historical load data for each of the three transformers for summer and winter periods from 2015 to 2019. Dates and times of the peak load on each transformer are provided at the top of each column. Peak values are highlighted in yellow."

4.1 Attachment 4.10 appears to capture 15 minute interval peaks. Is the updated table 3-4 provided in the response to BCUC IR 1.4.9 based on 15 minute intervals, one hour averages, or some other period?

Response:

The updated table 3-4 provided in the response to BCUC IR1 4.9 is based on 15 minute interval data.

5.0 Reference: Exhibit B-2, BCUC IR 1.5.1

"To date, FBC has not identified a significant impact on load that is attributable to the COVID-19 pandemic. Energy consumption since mid-March of 2020 is less than 1 percent different from the most recent three year average for the same period after adjusting for weather and load growth. FBC does not believe these changes would result in a materially different peak forecast and therefore has not updated the peak forecast."

5.1 Has the Conference Board of Canada provided updated GDP growth rates for 2020 and 2021 to reflect the effects of the COVID-19 pandemic? If so, please provide these values compared to the pre-pandemic forecasts.

Response:

Yes, the Conference Board of Canada (CBOC) Provincial Outlook for British Columbia dated June 17, 2020 reflects the effects of the pandemic, at -3.8 percent for 2020 and +7.0 percent for 2021. The CBOC GDP values used for the forecast in the Application were 2.7 percent for 2020 and 2.1 percent for 2021 from the Provincial Outlook British Columbia, June 7, 2019. Please note that the CBOC projections are only used to forecast the commercial class which represents approximately 25 percent of the gross load.

FBC also notes that, to date, system-wide energy consumption since mid-March of 2020 remains within the same range in comparison to the most recent three-year average as in the response to BCUC IR1 5.1 and, as set out in the response to ICG IR2 3.1, peak load has exceeded the forecast for the Kelowna area and has almost reached the 315 MW load level.

6.0 Reference: Exhibit B-2, BCUC IR 1.7.3

"FBC's equipment is not dynamically rated, that is, ratings are not adjusted for temperatures different from 40 degrees in summer and 0 degrees in winter."

6.1 Given that the "warmest average daily temperature recorded in the prior 20 years was 27.5C recorded July 30, 2018" (BCUC IR 1.4.5) is it possible to calculate dynamic emergency ratings for the LEE and DGB transformers at the lower summer ambient temperature, and thereby defer the need for the KBTA project?

Response:

For clarity, the warmest average daily temperature is recorded over a 24-hour period and is not relevant to the determination of transformer loading levels. Rather, temperatures over a six-hour as well as a fifteen minute period are relevant when examining loading in excess of transformer normal and emergency ratings, consistent with the time frames in FBC's operating procedures.

The warmest temperature recorded at the Kelowna Airport is 39.5C in July, 1994. On July 30, 2018, which was referenced in the response to BCUC IR1 4.5, temperatures at the Kelowna airport peaked at 37C and exceeded 35C for a period of more than six hours. As such, FBC submits that ratings at 40C ambient temperature are appropriate and that it would not be possible to defer the project based on dynamic ratings at 27.5C.

6.2 If possible, please calculate the emergency rating for the LEE and DGB transformers at an average daily ambient of 27.5C.

Response:

Average daily temperature is not an appropriate measure for use in determining peak loads. Peak loads are impacted by the daily high temperature, not the average. For this reason FBC does not believe that this would be a useful exercise and respectfully declines to undertake the calculation requested. Please also refer to the response to ICG IR2 6.1.

6.3 Please provide the loadings of the LEE and DGB transformers at the actual power factors (as derived from the past summer peak power factors) of the substation loads during the summer peak and identify when and for what period

the remaining LEE transformer would be overloaded for a failure of a LEE transformer.

Response:

Please refer to the response to BCOAPO IR2 24.3 where FBC provided the loadings of the LEE and DGB transformers during normal and contingency conditions. As explained in footnote 19 at page 19 of the Application, substation-specific power factors are used in modeling load flows.

FBC estimates the duration of overloading to be 5 hours in 2022 and 7 hours in 2023, with the duration increasing as load increases in future.

7.0 Reference: Exhibit B-2, BCUC IR 1.7.5

7.1 Please discuss the consequences of reconfiguring the system by opening Line 58L at LEE in order to reduce the loading on the remaining LEE transformer for a failure of a LEE transformer during the summer peak in 2022.

Response:

FBC assumes the question is referring to reconfiguration after the outage of a LEE transformer. The premise of the question, that opening 58L at LEE would reduce the loading on the remaining LEE transformer, is incorrect. After an outage of a LEE transformer, the power flow on lines 54L/58L is from DGB to LEE. Opening 58L would increase the post contingency flow on the remaining LEE transformer because 58L does not support the LEE 138 kV bus (please refer to the diagram in the response to BCUC IR1 7.5 showing the normal system configuration). In year 2022, the post contingency flow on the remaining LEE transformer is 195 MVA with 58L in service; when it is opened, the flow increases to 239 MVA.

8.0 Reference: Exhibit B-2, BCUC IR 1.12.2

LEE T4, 2017: "Load tap changer beyond its life expectancy and leaking into the main tank. All three units were replaced."

8.1 Please provide a cost breakdown of the LEE T4 tap changer replacement and the "before" and "after" project reports, including condition assessments.

Response:

Please see the table below for the cost breakdown of the LEE T4 tap changer replacement:

	Cost ($000s)
Station Equipment and Apparatus	$ 1,022
Construction	71
Engineering	24
Project Management	20
Cost of Removal	1
Total	$ 1,138

Please refer to Attachment 8.1A for the "before" report including condition assessment.

Please refer to Attachment 8.1B for the "after" report.

8.2 Please provide the dissolved gas analysis for LEE T4 for the five years preceding the tap changer replacement up to the most recent.

Response:

Please refer to the table below for the requested data.

Sample Date	Fluid Temp. °C	H2	CH4	C2H6	C2H4	C2H2	CO	CO2	O2	N2	Comment
1/21/2012	8	43	31	8	42	54	221	1053	1756	20290	
11/25/2013	28	43	32	9	45	57	247	1220	3125	27411	
1/2/2014	1	44	33	8	46	61	259	1339	9800	54789	
3/17/2014	10	38	27	9	42	55	227	1027	851	17795	
4/2/2014	7	0	1	0	0	1	4	116	12781	42556	Oil filtration PCB decontamination
6/3/2014	20	3	2	0	2	8	31	356	9169	25763	
2/18/2015	26	14	2	1	3	20	39	460	2692	9569	
4/9/2015	11	13	3	0	4	24	44	578	6876	23219	
9/15/2015	15	15	3	1	4	24	59	583	3245	11813	
4/1/2016	15	22	3	1	5	26	68	536	2257	8228	
3/29/2017	11	47	7	1	8	40	102	617	2992	10615	Before LTC replacement
6/27/2017	23	0	1	0	0	1	6	115	2661	6813	After LTC Replacement
11/10/2017	9	2	2	0	1	8	39	306	1982	6540	
5/3/2018	22	3	2	1	2	10	51	322	1621	8444	
5/15/2019	19	4	3	1	3	14	91	545	3838	15494	Stable
7/15/2019	24	4	3	1	3	15	96	616	959	8027	Stable
5/15/2020	19	4	4	1	4	15	124	572	1745	8824	Stable

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9.0 Reference: Exhibit B-2, BCUC IR 1.21.1 and BCUC IR 1.25.1

"…FBC does not have the capacity to complete the design…" (BCUC IR 1.21.1)

"FBC does not have the internal construction resources to complete such a large project." (BCUC IR 1.21.1)

"The cost estimates for Alternative A and Alternative B are defined to an AACE Class 3 level…" (BCUC IR 1.25.1)

"FBC notes, however, that the accuracy range and cost estimate for any given project is still an estimate based on professional judgement and the information available to the Company at the time. FBC believes that all prudently incurred costs associated with safely and reliably completing necessary capital work is legitimately included in rate base." (BCUC IR 1.25.1)

9.1 Please explain the tendering process and schedule for both engineering and construction?

Response:

Engineering:

Similar to contractor selection (provided in FBC's response to BCUC IR1 21.1.1), an engineering scope of work and FBC standards will be issued to a group of pre-qualified engineering firms in a Request for Proposal (RFP). FBC will then review and award a contract to the successful bidder following a commercial and technical review of the proposals, as well as factoring in the engineering schedule to ensure it meets construction timelines.

Construction:

Construction drawings, work summary, and detailed scope of work are issued in a RFP to obtain competitive estimates. The vendor submissions are then reviewed and scored based on several criteria including cost, schedule, and safety record/safety management plan.

Major material delivery milestones, schedule details received from the awarded contractor, and outage windows/opportunities are used to develop/alter the schedule.

9.2 Please explain how AACE Class 3 estimates are prepared prior to complete design?

Response:

In accordance with AACE International Recommended Practice No. 18R-97 Cost Estimate Classification System, a Class 3 estimate should contain 10-40 percent project definition, which correlates to the percentage of engineering and design complete for the Project.

The estimate methodology incorporates:

- Budget estimate with risks identified;
- Budgetary equipment and material pricing;
- Develop construction labour and equipment crew cost and incorporate in cost estimate; and
- Budgetary pricing on work components (if required).

9.3 Please explain how FBC could have the capacity to tender the construction contracts, and not have the capacity to complete the design?

Response:

FBC does not staff its engineering or construction workforces to meet its peak requirements. Staffing to peak requirements is less efficient since staff would likely be underutilized during certain periods of low work volume. Accordingly, FBC prioritizes its internal resources on sustainment and other engineering activities which are more difficult to contract out. Regardless, contracting the engineering design for the KBTA Project or performing that work internally is not expected to negatively impact the Project.

9.4 Please comment on whether FBC intends to update project costs and/or scope of work after entering into final engineering and construction contracts? If so, does FBC intend to seek approval for such updates?

Response:

Following approval of the Project, FBC will file reports and updates as directed by the BCUC, which may include updates to the Project's cost, scope and schedule. However, it is unnecessary for FBC to reapply for approval of the Project after entering into final engineering and construction contracts. Further, should a material change occur, FEI will file a Material Change report in accordance with the requirements of the BCUC.

9.5 Please comment on whether Commission approval of engineering and construction contracts is appropriate?

Response:

In FBC's view, such approvals are not required. The BCUC's decision on the Application will be based on its determinations of whether the Project is in the public interest and on the reasonableness of the cost estimates. Once approved, responsibility for the prudent management and execution of the Project, including the negotiation of contracts, lies with the utility. While FBC will provide reports and updates to the BCUC as may be directed, approval of the engineering and construction contracts by the BCUC would be unnecessary and burdensome.

9.6 Please confirm that costs not prudently incurred should be excluded from rate base whether incurred by FBC or any contractor or agent of FBC?

Response:

A utility's statutory rights under section 59 of the UCA to have rates set so as to recover its cost of service and to have an opportunity to earn a fair return on its investment extend only to recovering prudently incurred costs. Therefore, a regulator, following an appropriate process, may disallow costs that it finds have been imprudently incurred.

9.7 Please confirm that project costs incurred for capital work that has not been approved by the Commission should be excluded from rate base?

Response:

Not confirmed. The cost estimates in the Application are based on the scope of work identified in the development of AACE Class 3 estimates as provided in the BCUC's CPCN Guidelines. Certain changes in scope may be subsequently identified in the detailed project design phase, which is conducted following receipt of a decision granting a CPCN for the Project, or due to unforeseen conditions during construction of the project. Expenditures for such items, although

not included in an application, are prudent and necessary to ensure the successful execution of the project and as such, should not be excluded from rate base. Please also refer to the response to ICG IR2 9.6.

10.0 Reference: Exhibit B-2, BCUC IR 1.27.4

"Material costs for the Project are based on AACE Class 3 estimates that rely on current budgetary pricing…"

10.1 Please explain the use of "current budgetary pricing" in AACE Class 3 estimates and provide references to the AACE Class 3 Recommended Practice that refer to the use of "current budgetary pricing'?

Response:

FBC's AACE Class 3 estimates use current budgetary pricing, which refers to a combination of vendor budgetary quotes, material contracts already in place, and historical pricing information. Please refer to AACE International Recommended Practice 36R-08 Development of Cost Estimate Plans, under bulk commodity material and process equipment pricing (set out below).

> **Bulk Commodity Material Pricing**: Indicate expected percent of bulk material costs which will be budget quotes, firm quotes, in-house pricing or other sources. Include basis for equipment (process, non-process, electrical, instrumentation) shop inspections and testing. Separately address material supplied to fabricators and material for site installation. A table could be used to summarize this as well. Address any special considerations such as whether a concrete batch plant will be used at site.
>
> **Process Equipment Pricing:** Indicate expected rough percent of equipment costs to be based on budget quotes, firm bids, in-house pricing or other basis. This varies depending on desired estimate accuracy and level of engineering development. A summary of the bidding process may be included such as minimum number of bidders, how bids are normalized for evaluation purposes including exchange rate basis of foreign currencies and bid validity periods. The planned method of estimating shop inspection, testing, witnessing, and related travel requirements should be described. Identify whether electrical and instrumentation/automation equipment are covered under the respective bulk commodity material sections. This should be consistent with the coding/formatting requirements. Freight and vendor representatives for construction, commissioning, and start-up should be separately identified whether or not they are part of the equipment account. Specify whether ladders and platforms will be included with the equipment, "dressed" onsite or offsite and other similar clarifications. E.g.: equipment insulation is in bulk materials if not supplied by the equipment vendor. Provide a current version of the equipment list with targeted items for firm quotes identified. A "priced equipment list" should be specified as an estimate deliverable. Discuss how any design allowances for equipment will be developed such as guidance from the discipline specialists, project execution and procurement

personnel. Design allowances for equipment are discussed here and included with the table of bulk commodity material allowances shown in Appendix A.

10.2 Please identify and explain the AACE Class 3 estimates that rely on current budgetary pricing, and please provide the source of such "current budgetary pricing"?

Response:

Please refer to the response to ICG IR2 10.1.

10.3 Please confirm that the AACE Class 3 estimates, not including contingencies, filed with the Application should determine whether the KBTA project is over or under budget?

Response:

For reporting purposes, the Project's base estimate plus its contingency is the Project's Class 3 estimate and is referred to as the control budget. The Class 3 estimate, when used as a control budget, is always inclusive of contingency. The application of this contingency is typically to achieve a 50 percent probability of project cost underrun versus cost overrun for a given scope. As such, the contingency is always included in the Project's control budget and is expected to be spent.

For further clarity, it is important to note that an AACE Class 3 estimate is not a single point value (the same applies for all other Classes). Thus, a key characteristic of an estimate is its expected accuracy range, represented by +/- percentage values, which represents typical percentage or degree of variation of actual costs from the cost estimate after the application of an appropriate contingency. That is, while the single point budget value is used to measure over and under variation from the project's control budget, the AACE Class 3 estimate should be thought of as a range of values with any value in that range being likely to occur.

In summary, for reporting purposes a single point project control budget value that includes contingency is used to measure over or under variation but the actual cost during project execution is expected to vary within the project specific risk based +/- accuracy range.

11.0 Reference: Exhibit B-1, p. 22, Section 4.2(c) Local Generation; Exhibit B-5, ICG IR 1.1.8

"The installation of firm generation resources, such as a gas turbine, near Kelowna and connected to the 138 kV transmission system could increase the Kelowna area transmission capacity and meet the N-1 transmission planning criteria. However, this option was considered and rejected, due to its high capital cost." (Exhibit B-1, p. 22)

"… since winter peak in the Kelowna area typically occurs after sunset. Accordingly, solar resources is not a feasible alternative to the proposed Project." (ICG IR 1.1.8)

11.1 Please confirm that since winter peak in the entire FBC service area occurs after sunset solar resources located anywhere in the FBC service area are unlikely to be a feasible generation alternative to any Project designed to meet load growth? If not confirmed, please describe the circumstances when solar resources could be a feasible generation resource?

Response:

As set out in the response to ICG IR1 1.8, solar generating resources are not a feasible alternative to the proposed Project. As future projects designed to meet load growth will each involve examination of the circumstances at that time, it is not possible for FBC to accurately speculate about the feasibility of solar resources with respect to all future projects. However, FBC confirms that the timing of winter peak in the Kelowna area is likely to be a consideration in assessing the feasibility of solar resources for such projects.

11.2 Please comment on the technical feasibility of a third party owned solar resource as an alternative to the KBTA Project?

Response:

Please refer to the response to ICG IR2 11.1. In addition, the ownership of a solar resource is not relevant to its technical feasibility as an alternative to the KBTA Project.

12.0 Reference: Exhibit B-5, ICG IR 1.3.4

"FBC does not believe that there are any other alternatives that are viable."

12.1 Please identify and discuss any meetings or correspondence with BC Hydro to consider alternatives to the KBTA Project?

Response:

The question to which the quotation above responded concerned "any other potential interconnection points for power purchases from BC Hydro or any upgrades to the BC Hydro transmission and distribution system that may either be an alternative to or delay the KBTA Project".

Since the existing 138 kV BC Hydro line supplying West Kelowna load does not have the capacity to act as a back up to FBC in case of major outages in the FBC System (such as an outage of a LEE transformer), FBC has not had any meetings or correspondence with BC Hydro to consider alternatives to the KBTA Project.

The possibilities for interconnecting BC Hydro and FBC electrical system for the purposes of resolving the supply situation at BC Hydro's West Kelowna load center remains a matter of future discussions.

12.2 In the discussions with BC Hydro, has FBC examined the possibility of reinforcing BC Hydro's West Kelowna system so that it is a source, rather than a load? If not, why not?

Response:

BC Hydro is currently studying alternatives for the West Kelowna Transmission Project. More information can be found on BC Hydro website: https://www.bchydro.com/energy-in-bc/projects/wktp.html

Based on FBC's understanding of BC Hydro project costs and timeline, the possibility of reinforcing BC Hydro's West Kelowna system will not be a feasible option to replace the KBTA Project.

12.3 In the discussions with BC Hydro, has FBC suggested operating the FBC Kelowna area system and the BC Hydro West Kelowna system as a "combined system" so that combined system could benefit from a greater N-1 capacity than each system considered separately? If not, why not? Are there benefits that could be realized from such a coordinated approach?

Response:

Where feasible and appropriate, FBC and BC Hydro have collaborated on system expansion projects to the benefit of both utilities.

For example, FBC's CPCN application for the Okanagan Transmission Reinforcement (OTR) project cited benefits to the then British Columbia Transmission Corporation (BCTC), as described below:

> The OTR Project, combined with BCTC planned transformer upgrades at the Selkirk Substation, will also help address current short-term capacity shortfalls within the BCTC transmission system, resulting in a provincial grid benefit, in addition to resolving the system limitations.[1]

In 2009, BCTC and FBC entered into the Duck Lake Wheeling Agreement in lieu of BCTC constructing network upgrades to serve BC Hydro's designated load in the Woods Lake service area near Kelowna.[2]

FBC has not discussed a collaboration with BC Hydro with respect to the KBTA Project for the reasons explained in the responses to ICG IR2 12.1 and 12.2.

12.4 Please explain why FBC does not believe there are any viable alternatives to the KBTA Project that involve a joint project with BC Hydro?

Response:

Please refer to the responses to ICG IR2 12.1, 12.2, and 12.3.

[1] FBC Application for a Certificate of Public Convenience and Necessity for the Okanagan Transmission Reinforcement Project, Exhibit B-1-1, page 2, lines 24-27. The OTR project was approved by Order C-5-08.

[2] The Duck Lake Wheeling Agreement was approved by Order G-19-10.

13.0 Reference: Exhibit B-5, ICG IR 1.5.3

"As noted in the response to BCUC IR1 4.2, FBC has been using a "1 in 20" peak load forecast for planning purposes since at least 2011. The following discussion of the Kelowna 138 kV system was included in FBC's 2014-2018 PBR application, and describes the expectations regarding its timing based on earlier forecasts:"

13.1 Please provide a table which compares the Kelowna area loads on a year-by-year basis from the initial year in the load forecast referenced in FBC's 2014-2018 PBR application with actual and forecast Kelowna area loads to 2025. Please also "weather normalize" the load forecast referenced in FBC's 2014-2018 PBR application so that it may be more readily compared against the actual loads to separate the effects of load growth and weather.

Response:

A table comparing the forecast and actual Kelowna summer peak loads is given below:

	Summer Peak Load (MW)									
Kelowna Load	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Forecast	296.7	286.6	290.6	301.5	309.5	314.6	319.8	325.5	331.5	336.5
Actual	281.4	288.1	301.0	300.5	313.1					

FBC notes the following with respect to the table above:

- 2014 and 2015 forecast values are not available.
- The forecast numbers for 2016 through 2019 are based on re-forecasting an annual basis.
- 2020 actual figures are updated to July 30, 2020.
- As described in Section 3.3.2 of the Application, and in the response to CEC IR1 5.1 and BCUC IR1 4.4.1, FBC does not weather-normalize the load forecasts for system planning purposes because it must account for possible weather extremes.

13.2 Please provide any other Kelowna area load forecasts submitted by FBC in any application or proceeding since the FBC 2014-2018 PBR application?

Response:

FBC submitted a system-wide peak load forecast in its 2016 Long Term Electric Resource Plan. FBC has not submitted a Kelowna area load forecast since its 2014-2018 PBR Application.

14.0 Reference: Exhibit B-5, ICG IR 1.7.1

"while the Kelowna area load is forecast to first exceed the transformer capacity limit in summer."

14.1 Please confirm that with this Application FBC is seeking, for the first time, a CPCN where the load "is forecast to first exceed the transformer limit in summer."

Response:

Not confirmed. Capacity constraints are of greater importance in summer than in winter for the Okanagan area, which contains the majority of FBC's customers and load. Specifically, FBC previously received BCUC approval for the construction of two new substations in the Kelowna area based on summer capacity constraints.

In its application for the Black Mountain Substation, approved by Order C-7-07, FBC stated that:

> Based on the forecast for the distribution feeders serving this area, the peak load will exceed the summer capacity of Hollywood Transformer 3 in the summer of 2008. For this reason, Hollywood Transformer 3 can not supply back up capacity to Hollywood Transformer 1 under situations of contingency. [3]

In its application for the Benvoulin Substation, approved by Order C-1-09, FBC stated:

> The need for a new substation in the south/central area of Kelowna is driven by increasing demand, which in this area, peaks in the summer. The growing load in the Kelowna area would have overloaded the transformers (summer load rating of 28 MVA) at Hollywood Substation in the summer of 2008…[4]

[3] Black Mountain Substation CPCN Application, Exhibit B-1, page 21, lines 1-4.
[4] Benvoulin Substation Project CPCN Application, Exhibit B-1, page 10, lines 1-5.

15.0 Reference: Exhibit B-5, ICG IR 1.7.2

"Please refer to Figure 1 below for a load duration curve for Kelowna 2019 summer peak loads. The Y-axis shows load in MW and the X-axis shows the total hours in the months of July and August."

15.1 Please provide the number of hours for which the forecast 2022 and 2023 summer peak loads will exceed the N-1 capability of the Kelowna area system.

Response:

An Expected Energy Not Served (EENS) analysis based on the 2019 load duration curve for Kelowna summer peak load showed that there could be loss of energy for 5 hours in 2022 and 7 hours in 2023 in the event of a LEE transformer outage. Based on FBC's operating procedures, no curtailment of load would be expected in 2022, but the potential transformer overloading in 2023 exceeds six hours, which could result in the need for load curtailment.

15.2 Please perform a Loss of Load Probability (LoLP) analysis for the forecast 2022 and 2023 summer peaks.

Response:

Loss of Load Probability (LoLP) analysis is typically used in generation adequacy planning and is not used by FBC for transmission planning purposes. For transmission planning, a more suitable analysis is Expected Energy Not Served (EENS). Please refer to the response to ICG IR2 15.1.

15.3 Is FBC aware of any utilities that use LoLP analysis in combination with the N-1 criterion in order to schedule system improvements so that investment is balanced with economic impact?

Response:

FBC is not aware of any utilities using LoLP analysis in combination with the N-1 criterion.