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August 20, 2020

British Columbia Utilities Commission
Suite 410, 900 Howe Street
Vancouver, B.C.
V6Z 2N3

Attention: Ms. Marija Tresoglavic, Acting Commission Secretary

Dear Ms. Tresoglavic:

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 British Columbia Utilities Commission (BCUC) Information Request (IR) No. 1 (Exhibit B-2) – Question 4.4 Replacement

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On July 9, 2020, FBC filed its responses to BCUC IR No. 1 in the above noted proceeding. During the course of responding to IRs from round 2, FBC has identified in the response to BCUC IR1 4.4, (Exhibit B-2) one error (the reference to net energy growth rates should instead refer to gross energy growth rates) in addition to a number of clarifications that it believes will be helpful in understanding the response to that IR and to follow-up questions in round 2. Accordingly, a revised version of the response to BCUC IR1 4.4 is included with this filing.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC INC.

Original signed:

Diane Roy

Attachments

cc (email only): Registered Parties

4.0 Reference: PROJECT NEED AND JUSTIFICATION

Exhibit B-1, Section 3.3.2, pp. 15-16

Kelowna Area Load Forecast

On page 15 of the Application, FBC states:

> Peak load forecasting for system planning purposes differs from forecasting energy and peak load for resource (energy) supply purposes in one important way. Unlike a resource planning forecast, which is a "weather-normalized" forecast used to determine FBC's resource requirements, the forecast for system planning purposes must account for possible weather extremes that directly impact winter and summer peak loads, in order to ensure sufficient capacity under adverse conditions.
>
> FBC accomplishes this through the use of a "1-in-20" year load forecast. 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. This forecast is used as the basis for determining compliance with FBC's transmission planning standards and is also consistent with industry practice.[13]
>
> [13] The success rate of the 1-in-20 forecast is expected to be 95 percent (a 5 percent chance that actual load will be higher). Industry practice requires that a quantitative risk factor, such as the 1-in-20 forecast, be incorporated into transmission planning studies such as the power flow models submitted by FBC to the Western Electricity Coordinating Council (WECC) for application in regional and system-wide transmission planning.

4.4 Please discuss in detail FBC's process for preparing a "1-in-20" year peak load forecast. Please include all underlying calculations and assumptions.

Response:

FBC provides the following clarification on the statement in the first paragraph of the preamble to this question. The paragraph should read as follows:

> Peak load forecasting for system planning purposes differs from forecasting energy and peak load for resource (energy) supply purposes in one important way. Unlike a peak forecast for resource planning purposes, which uses historic average peak loads, the peak forecast for system planning purposes must account for possible weather extremes that directly impact winter and summer peak loads, in order to ensure sufficient capacity under adverse conditions.

Regarding the preparation of the 1-in-20 year peak load forecast, the system-wide 1-in-20 load forecast is developed in a series of steps: The calculation was performed in 2019 using 2018 actual loads which were the most recently available. 2019 and future year values are forecasts.

- The system-wide peak loads, excluding self-generating customers and BC Hydro wheeling losses, for the winter season (November, December, January, February) and the summer season (June, July, August) for each year in the most recent 20 year period (1999-2018) is recorded.
- Historical gross energy growth rates are derived from actual 2000-2018 sales. Forecast gross energy growth rates are used to escalate the peaks into future years as described below.
- The forecast 2020 summer peak, for example, is obtained by first multiplying the 1999 summer peak by the cumulative gross energy growth rates (actual plus forecast) of the subsequent years up to 2020. This calculation is repeated for the remaining 19 "base" years from 2000 to 2018.
- The method yields 20 values for the 2020 summer peaks corresponding to the 20 base years from 1999 to 2018. The maximum peak of these 20 values is defined as the 1-in-20 summer peak for 2020.
- Further escalation of the 1-in-20 summer peak for 2020, using forecast energy growth rates, yields the 1-in-20 forecast peaks over the planning horizon.
- Area peak forecasts are created by allocating the 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, taking into account the need to ensure adequate capacity on the Duck Lake substation based on the peak forecast provided by BC Hydro, as described in the response to BCUC IR1 2.3.1.

The calculation of the system 1-in-20 year peak forecast is demonstrated below.

- 20 years of actual summer peaks, from 1999 to 2018, are shown on the diagonal in dark green.
- The gross energy growth rates from 2000 to 2019 are in the subsequent rows and values are repeated across all columns for a given year.
- The product of the actual peak and the subsequent growth rates is then computed for each column and shown in the final (green) row as the "Equivalent 2020 Peak".
- Finally the maximum equivalent peak is identified and shown in the orange cell as the 1:20 peak.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	Base Years	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**1:20 Peak**
Historic Gross Load Growth Rates	1999	453																				
	2000	102.4%	463																			
	2001	101.1%	101.1%	471																		
	2002	103.3%	103.3%	103.3%	485																	
	2003	101.8%	101.8%	101.8%	101.8%	505																
	2004	101.5%	101.5%	101.5%	101.5%	101.5%	512															
	2005	103.6%	103.6%	103.6%	103.6%	103.6%	103.6%	516														
	2006	101.7%	101.7%	101.7%	101.7%	101.7%	101.7%	101.7%	558													
	2007	100.1%	100.1%	100.1%	100.1%	100.1%	100.1%	100.1%	100.1%	562												
	2008	99.7%	99.7%	99.7%	99.7%	99.7%	99.7%	99.7%	99.7%	99.7%	541											
	2009	102.3%	102.3%	102.3%	102.3%	102.3%	102.3%	102.3%	102.3%	102.3%	102.3%	561										
	2010	95.6%	95.6%	95.6%	95.6%	95.6%	95.6%	95.6%	95.6%	95.6%	95.6%	95.6%	552									
	2011	103.8%	103.8%	103.8%	103.8%	103.8%	103.8%	103.8%	103.8%	103.8%	103.8%	103.8%	103.8%	514								
	2012	98.9%	98.9%	98.9%	98.9%	98.9%	98.9%	98.9%	98.9%	98.9%	98.9%	98.9%	98.9%	98.9%	530							
	2013	102.2%	102.2%	102.2%	102.2%	102.2%	102.2%	102.2%	102.2%	102.2%	102.2%	102.2%	102.2%	102.2%	102.2%	572						
	2014	98.9%	98.9%	98.9%	98.9%	98.9%	98.9%	98.9%	98.9%	98.9%	98.9%	98.9%	98.9%	98.9%	98.9%	98.9%	587					
	2015	98.1%	98.1%	98.1%	98.1%	98.1%	98.1%	98.1%	98.1%	98.1%	98.1%	98.1%	98.1%	98.1%	98.1%	98.1%	98.1%	587				
	2016	100.1%	100.1%	100.1%	100.1%	100.1%	100.1%	100.1%	100.1%	100.1%	100.1%	100.1%	100.1%	100.1%	100.1%	100.1%	100.1%	100.1%	583			
	2017	106.2%	106.2%	106.2%	106.2%	106.2%	106.2%	106.2%	106.2%	106.2%	106.2%	106.2%	106.2%	106.2%	106.2%	106.2%	106.2%	106.2%	106.2%	585		
	2018	98.2%	98.2%	98.2%	98.2%	98.2%	98.2%	98.2%	98.2%	98.2%	98.2%	98.2%	98.2%	98.2%	98.2%	98.2%	98.2%	98.2%	98.2%	98.2%	613	
	2019	104.4%	104.4%	104.4%	104.4%	104.4%	104.4%	104.4%	104.4%	104.4%	104.4%	104.4%	104.4%	104.4%	104.4%	104.4%	104.4%	104.4%	104.4%	104.4%	104.4%	
	2020	101.7%	101.7%	101.7%	101.7%	101.7%	101.7%	101.7%	101.7%	101.7%	101.7%	101.7%	101.7%	101.7%	101.7%	101.7%	101.7%	101.7%	101.7%	101.7%	101.7%	
	Equivalent 2020 Peak, MW	581	580	583	582	595	594	578	614	618	596	605	622	558	582	615	638	650	645	610	**650**	**650**

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