



Doug Slater
Director, Regulatory Affairs

Gas Regulatory Affairs Correspondence
Email: gas.regulatory.affairs@fortisbc.com

Electric Regulatory Affairs Correspondence
Email: electricity.regulatory.affairs@fortisbc.com

FortisBC
16705 Fraser Highway
Surrey, B.C. V4N 0E8
Tel: (778) 578-3874
Cell: (778) 214-3842
Fax: (604) 576-7074
Email: doug.slater@fortisbc.com
www.fortisbc.com

July 9, 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. 1

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. 1.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC INC.

Original signed:

Doug Slater

Attachments

cc (email only): Commission Secretary
Registered Parties

FortisBC Inc. (FBC or the Company) Application for a Certificate of Public Convenience and Necessity for the Kelowna Bulk Transformer Addition Project (the Application)	Submission Date: July 9, 2020
Response to Industrial Customers Group (ICG) Information Request (IR) No. 1	Page 1

1.0 Reference: Exhibit B-1, Section 3.1, p. 10

“FBC has experienced high levels of customer load growth in the Kelowna area and it expects electricity demand will exceed system planning reliability criteria by the summer of 2022.”

1.1 Please confirm that forecast summer peak demand of the 138 kV distribution system and not forecast energy requirements determines the need for the Bulk Transformer Addition Project.

Response:

Confirmed. This project addresses peak demand constraints rather than energy requirements.

1.2 Please confirm that the N-1 planning criteria as applied to the forecast peak demand on the 138 kV distribution system determines the need for the KBTA?

Response:

Confirmed.

1.3 Please explain FBC’s analysis, if any, of the impacts of behind-the-meter installations on the 138 kV distribution system? Please comment on the feasibility of load reductions from behind-the-meter installations delaying the KBTA?

Response:

FBC considers the most prevalent “behind the meter” installations to be either measures taken to reduce load, such as demand response, or customer-owned generation such as solar installations that typically enroll in FBC’s Net Metering program. As described in Section 4.2 of the Application, Demand Response was considered in the alternatives analysis. Since the target capacity of the Demand Response pilot was insufficient to support any deferral of the project, this was determined to be not feasible. The impact of solar installations are discussed in the responses to ICG IR1 1.5 to 1.8.

FortisBC Inc. (FBC or the Company) Application for a Certificate of Public Convenience and Necessity for the Kelowna Bulk Transformer Addition Project (the Application)	Submission Date: July 9, 2020
Response to Industrial Customers Group (ICG) Information Request (IR) No. 1	Page 2

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34

1.4 Please comment on the feasibility of demand response measures for delaying the KBTA? Please identify any triggered demand response in the past five years on the 138 kV distribution system?

Response:

Please refer to the response to CEC IR1 9.4 regarding the feasibility of DR measures to defer the Project. FBC has not triggered any demand response in the last five years.

1.5 Please quantify current solar installations in the service area of the 138 kV distribution system? Please identify the quantity of solar power on the 138 kV distribution system that has been modeled in the transmission planning study?

Response:

Among FBC's direct customers in the Kelowna area, there are approximately 175 grid-tie solar installations in service. These systems are connected at secondary distribution voltages. Cumulatively, these systems have a gross peak capacity of approximately 1.65 MW.

Of these systems, 144 have been in service since 2019 or earlier. As such, the impact of these solar installations has largely been captured in actual substation peak load data (by offsetting customer consumption) and hence the load profile for the Kelowna area. Additionally, the total peak capacity of these systems amounts to approximately 0.5 percent of Kelowna area summer peak load. In this manner, the impact of solar power is included in the transmission planning study without the need to manually model solar installations.

1.6 Has FBC conducted a correlation study between the timing of summer peak demand hours, and the corresponding generation of solar installations? If not, why not?

FortisBC Inc. (FBC or the Company) Application for a Certificate of Public Convenience and Necessity for the Kelowna Bulk Transformer Addition Project (the Application)	Submission Date: July 9, 2020
Response to Industrial Customers Group (ICG) Information Request (IR) No. 1	Page 3

1 **Response:**

2 As described in the response to ICG IR1 1.5, solar installations are not manually modeled in
3 transmission studies. As such, it is not necessary to conduct a study of the correlation between
4 summer peak demand and solar generation at this time.

5
6
7
8 1.7 Please identify and explain the availability factor appropriate for modeling solar
9 generation during peak demand hours?

10
11 **Response:**

12 As described in the response to ICG IR1 1.5, solar installations are not manually modeled in
13 transmission studies. As such, FBC has not established an appropriate availability factor for
14 solar generation during peak demand hours.

15
16
17
18 1.8 Please identify the amount of solar generation required by year during the
19 summer peak hour(s) to keep the loading of the existing LEE and DGB
20 transformers within the N-1 system planning reliability limit?

21
22 **Response:**

23 The Kelowna area summer peak load forecast increases by approximately 6 MW per year. As
24 such, solar generation would need to provide firm summer peak load reductions beginning in
25 2022 with an incremental capacity of approximately 6 MW for each year of deferral. Beginning in
26 2027, the solar generation would also be required to provide an incremental load reduction of
27 approximately 4.5 MW per year at winter peak for each year of deferral. In the Kelowna area
28 over the past five years, an average of 0.26 MW of peak solar capacity has been installed per
29 year, which does not approach the pace of the forecast load growth. Further, measures such as
30 storage would likely be required to ensure that variable solar generation provides firm load
31 reductions.

32 Finally, it is unlikely that solar resources would be feasible for significant winter peak load
33 reductions since winter peak in the Kelowna area typically occurs after sunset. Accordingly,
34 solar resources is not a feasible alternative to the proposed Project.

35
36

FortisBC Inc. (FBC or the Company) Application for a Certificate of Public Convenience and Necessity for the Kelowna Bulk Transformer Addition Project (the Application)	Submission Date: July 9, 2020
Response to Industrial Customers Group (ICG) Information Request (IR) No. 1	Page 4

1
2 1.9 Please provide a graph comparing the growth of the peak demand with the
3 growth of energy requirements?
4

5 **Response:**

6 The load growth in the preamble is referring to growth in peak demand. FBC does not forecast
7 energy requirements at the area level and is therefore unable to provide the requested
8 comparison.
9

FortisBC Inc. (FBC or the Company) Application for a Certificate of Public Convenience and Necessity for the Kelowna Bulk Transformer Addition Project (the Application)	Submission Date: July 9, 2020
Response to Industrial Customers Group (ICG) Information Request (IR) No. 1	Page 5

2.0 Reference: Exhibit B-1, Section 3.2, p. 12

"In addition, FBC provides electricity to BC Hydro to service its approximately 8,000 customers in the Duck Lake area..."

2.1 Please file and explain the Duck Lake Wheeling Agreement and any other contracts for electricity service supplied by FBC and required by BC Hydro to service the Duck Lake area?

Response:

The Duck Lake Wheeling Agreement, FBC's Tariff Supplement No. 9, is provided as Attachment 2.1. No other contracts are required for FBC to provide wheeling service in respect of the Duck Lake area.

2.2 Please explain how BC Hydro service to the Duck Lake area is relevant to FBC planning criteria?

Response:

As described in the responses to BCUC IR1 2.3 and 2.3.1, this electricity is supplied from FBC's 138 kV Kelowna system and is included in FBC's peak load forecast for the Kelowna area.

2.3 Please identify the period of time the KBTA Project could be deferred if the BC Hydro Duck Lake area loads were to be removed from the FBC system?

Response:

Hypothetically, if the BC Hydro Duck Lake load were to be removed, the Kelowna area summer peak load would exceed the threshold of 315 MW in 2026 (the forecast is 317 MW for 2026). In this scenario, the KBTA Project could be delayed from 2022 to 2025 (three years).

FortisBC Inc. (FBC or the Company) Application for a Certificate of Public Convenience and Necessity for the Kelowna Bulk Transformer Addition Project (the Application)	Submission Date: July 9, 2020
Response to Industrial Customers Group (ICG) Information Request (IR) No. 1	Page 6

1 **3.0 Reference: BC Hydro West Kelowna Transmission Project found at:**

2 [https://www.bchydro.com/energy-in-](https://www.bchydro.com/energy-in-bc/projects/wktp.html#alternatives)
3 [bc/projects/wktp.html#alternatives](https://www.bchydro.com/energy-in-bc/projects/wktp.html#alternatives)

4 “Alternative 3d: To FortisBC

5 Alternative 3d proposes connecting our Westbank Substation to the FortisBC system
6 and would require the following to be built by BC Hydro:

- 7 - A new substation on Westbank First Nation land or in the City of West Kelowna;
8 - Transmission line to connect the new substation to FortisBC's Saucier substation in
9 Kelowna; and,
10 - Distribution line to connect the new substation with the existing Westbank
11 Substation in the City of West Kelowna.

12 We're working with FortisBC to determine the feasibility of Alternative 3d.”

13 3.1 Please provide a status update of the discussions with BC Hydro regarding the
14 West Kelowna Transmission Project.

15
16 **Response:**

17 Please refer to the response to BCUC IR1 9.2.

18
19
20
21 3.2 Please identify the period of time the KBTA Project could be deferred if a source
22 of supply could be provided at the Saucier substation as contemplated in the
23 reference above?

24
25 **Response:**

26 FBC believes that the question above has erroneously assumed that Saucier would be a point
27 of import into the FBC transmission network. As explained in the response to BCUC IR1 9.2,
28 the BC Hydro proposal would increase, not decrease, peak load on the FBC Kelowna area
29 transmission network, which would intensify the need for the KBTA Project.

30
31
32
33 3.3 Please discuss why BC Hydro's West Kelowna Transmission Project was not
34 identified as one of the options considered as an alternative to the KBTA Project?
35

FortisBC Inc. (FBC or the Company) Application for a Certificate of Public Convenience and Necessity for the Kelowna Bulk Transformer Addition Project (the Application)	Submission Date: July 9, 2020
Response to Industrial Customers Group (ICG) Information Request (IR) No. 1	Page 7

1 **Response:**

2 Please refer to the response to ICG IR1 3.2.

3

4

5

6

7 3.4 Please identify any other potential interconnection points for power purchases
8 from BC Hydro or any upgrades to the BC Hydro transmission and distribution
9 system that may either be an alternative to or delay the KBTA Project?

10

11 **Response:**

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

13

FortisBC Inc. (FBC or the Company) Application for a Certificate of Public Convenience and Necessity for the Kelowna Bulk Transformer Addition Project (the Application)	Submission Date: July 9, 2020
Response to Industrial Customers Group (ICG) Information Request (IR) No. 1	Page 8

4.0 Reference: Exhibit B-1, Section 3.2, p. 13

“While there are no significant condition issues known for these transformers at present, FBC discusses the impact of operating the transformers above normal operating limits in Section 3.5.”

4.1 Please confirm or explain otherwise that the condition of the existing equipment, including 230kV/138 kV transformers at LEE, is not relevant to the need for KBTA project as determined by planning criteria?

Response:

Confirmed.

5.0 Reference: Exhibit B-1, Section 3.3.2, p. 15

“FBC forecasts regional load growth using historical regional load data.”

5.1 Please file the historical regional load data referenced in the quote above, and include any load data on the 138 kV distribution system relied on to determine the need for the KBTA?

Response:

Please refer to the table below which shows historical regional peak load data for the Kelowna area for years 2010-2019. These values are a sum of the non-coincident peaks for all stations within the Kelowna area, including the Duck Lake BC Hydro load.

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.

Region	Season	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
NOK	Summer	261,907	271,395	288,453	305,287	314,110	322,702	310,627	317,920	328,596	323,555
NOK	Winter	293,292	337,299	292,829	320,345	310,325	296,338	324,972	308,413	317,264	342,468

*Values in kVA

5.2 Please file available load data and any analysis of such data for each of the 12 substations serviced by the 138 kV distribution system? If FBC does not use

1 substation specific load data for transmission planning studies, please explain
 2 why not?

3
 4 **Response:**

5 The forecast substation load data used for transmission planning studies is provided in the
 6 tables below:

WINTER PEAK LOAD (MW)

Substation	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Glenmore	40.9	41.3	41.9	42.4	42.9	43.3	43.9	44.4	44.9	45.4	45.9	46.4	46.9	47.5	48.0	48.5	49.0	49.6	50.1
Hollywood	36.2	36.4	36.8	37.3	37.8	38.2	38.6	39.1	39.5	40.0	40.4	40.9	41.3	41.8	42.3	42.7	43.2	43.7	44.2
OK Mission	26.6	26.8	27.2	27.5	27.8	28.1	28.4	28.8	29.1	29.4	29.8	30.1	30.4	30.8	31.1	31.5	31.8	32.2	32.5
Recreation	31.7	32.2	32.5	33.1	33.4	33.9	34.2	34.6	35.0	35.4	35.8	36.2	36.6	37.0	37.4	37.8	38.2	38.7	39.1
Sexsmith	29.2	29.5	29.9	30.2	30.5	30.9	31.3	31.6	32.0	32.3	32.7	33.1	33.4	33.8	34.2	34.6	34.9	35.3	35.7
Saucier	23.8	24.0	24.3	24.3	24.7	25.1	25.4	25.6	25.9	26.2	26.5	26.8	27.1	27.4	27.7	28.0	28.3	28.6	28.9
Joe Rich	3.0	3.0	3.1	3.1	3.2	3.2	3.2	3.3	3.3	3.3	3.4	3.4	3.5	3.5	3.5	3.6	3.6	3.7	3.7
Duck Lake	13.9	14.3	14.7	15.1	15.3	15.5	15.7	15.8	16.0	16.2	16.4	16.6	16.8	16.9	17.1	17.3	17.5	17.7	17.9
DUC BCH	31.1	31.3	31.4	31.6	32.0	32.4	32.9	33.3	33.6	34.1	34.5	34.9	35.3	35.8	36.2	36.6	37.1	37.5	37.9
D.G. Bell	18.2	18.2	18.5	18.7	18.9	19.2	19.4	19.6	19.8	20.1	20.3	20.5	20.7	21.0	21.2	21.4	21.7	21.9	22.2
Lee	7.8	7.8	7.9	8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	9.0	9.1	9.2	9.3	9.4	9.5
Ellison	23.9	24.2	24.4	25.1	25.4	25.7	26.4	26.8	27.1	27.4	27.7	28.0	28.3	28.6	28.9	29.2	29.6	29.9	30.2
Black Moutain	17.7	18.0	18.4	18.7	18.9	19.1	19.3	19.5	19.8	20.0	20.2	20.4	20.7	20.9	21.1	21.3	21.6	21.8	22.1
Big White	13.5	13.6	13.8	13.9	14.1	14.3	14.4	14.6	14.8	14.9	15.1	15.3	15.4	15.6	15.8	15.9	16.1	16.3	16.5
Benvoulin	22.9	23.2	23.4	23.7	24.0	24.3	24.6	24.9	25.1	25.4	25.7	26.0	26.3	26.6	26.9	27.2	27.5	27.8	28.1
Total	340.4	343.9	348.3	352.9	357.0	361.3	365.8	370.3	374.5	378.7	382.9	387.4	391.8	396.1	400.5	404.9	409.4	414.0	418.5

SUMMER PEAK LOAD (MW)

Substation	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Glenmore	43.0	43.6	44.4	45.2	46.0	47.0	47.6	48.5	49.4	50.2	51.0	51.9	52.8	53.7	54.5	55.4	56.3	57.3	58.2
Hollywood	33.5	33.9	34.4	35.0	35.7	36.4	36.9	37.6	38.3	38.9	39.6	40.2	40.9	41.6	42.3	43.0	43.7	44.4	45.1
OK Mission	24.6	25.0	25.4	25.7	26.2	26.8	27.2	27.7	28.2	28.6	29.1	29.6	30.1	30.6	31.1	31.6	32.1	32.7	33.2
Recreation	28.1	29.0	29.7	30.1	30.6	31.3	31.7	32.3	32.9	33.5	34.0	34.6	35.2	35.8	36.3	36.9	37.5	38.1	38.8
Sexsmith	27.5	27.7	28.4	28.9	29.3	29.9	30.4	30.9	31.5	32.0	32.5	33.1	33.7	34.2	34.8	35.4	35.9	36.5	37.1
Saucier	20.3	21.0	21.2	21.3	21.8	22.3	22.7	23.0	23.4	23.8	24.2	24.6	25.1	25.5	25.9	26.3	26.7	27.2	27.6
Joe Rich	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.9
Duck Lake	13.1	13.6	13.9	14.4	14.7	15.0	15.2	15.5	15.8	16.1	16.3	16.6	16.9	17.2	17.4	17.7	18.0	18.3	18.6
DUC BCH	24.9	25.0	25.2	25.3	25.6	25.9	26.3	26.7	26.9	27.2	27.6	27.9	28.3	28.6	29.0	29.3	29.6	30.0	30.3
D.G. Bell	19.1	19.4	19.6	20.0	20.4	20.8	21.1	21.5	21.9	22.3	22.6	23.0	23.4	23.8	24.2	24.6	25.0	25.4	25.8
Lee	7.9	8.0	8.1	8.2	8.4	8.6	8.7	8.8	9.0	9.2	9.3	9.5	9.6	9.8	9.9	10.1	10.3	10.4	10.6
Ellison	24.2	24.4	24.6	25.5	26.0	25.5	27.2	27.7	28.2	28.7	29.2	29.7	30.2	30.7	31.2	31.7	32.2	32.8	33.3
Black Moutain	15.9	16.3	16.7	17.0	17.3	17.0	17.9	18.3	18.6	18.9	19.2	19.5	19.9	20.2	20.5	20.9	21.2	21.6	21.9
Big White	2.6	2.6	2.6	2.8	2.8	2.8	2.9	2.9	3.0	3.0	3.1	3.1	3.2	3.3	3.3	3.4	3.4	3.5	3.5
Benvoulin	23.5	23.9	24.2	24.6	25.1	25.7	26.0	26.5	27.0	27.4	27.9	28.3	28.8	29.3	29.8	30.3	30.8	31.3	31.8
Total	309.5	314.6	319.8	325.5	331.5	336.5	343.3	349.4	355.5	361.6	367.4	373.5	379.7	386.0	392.0	398.3	404.6	411.1	417.6

7
 8 This substation load data is based on the annual “1 in 20” load forecast and distributed among
 9 Kelowna substations as described in the response to BCUC IR1 4.4.

10
 11
 12
 13 5.3
 14
 15
 16
 17

Please identify any previous forecasts of the peak demand on the 138 kV distribution system used for system planning purposes that were not based on a “weather-normalized” forecast? Please file the current forecast of peak demand on the 138 kV distribution system?

FortisBC Inc. (FBC or the Company) Application for a Certificate of Public Convenience and Necessity for the Kelowna Bulk Transformer Addition Project (the Application)	Submission Date: July 9, 2020
Response to Industrial Customers Group (ICG) Information Request (IR) No. 1	Page 10

Response:

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:

....

The need for additional capacity was identified in past transmission planning studies as being driven by Kelowna area load growth. The need was further advanced with the transfer of the BC Hydro Winfield area load to the FortisBC Duck Lake substation in 2011. The required in-service date for this project (based on then current load forecasts) was 2015 and therefore was discussed in the 2012/13 CEP with the intention to develop a CPCN submission and have all engineering complete by the end of 2013. Since then the load forecast has been revised given actual load data available from the BC Hydro Duck Lake load and the new FortisBC substations constructed in recent years. As well, growth rates have been reduced to reflect current economic conditions. The current load forecast indicates that the need for this project is deferred from 2015 to 2019. FortisBC intends to submit an application for a CPCN for this project 2 – 3 years in advance of the expected 2019 in-service date.¹

FBC has been able to defer construction of this project from 2019, however given the construction timeline for the Project, further delay would result in the potential violation of FBC’s planning criteria and operating orders by 2023.

Please refer to the response to ICG IR1 5.2 for the current forecast of peak demand on the 138 kV distribution system.

¹ FBC 2014-2018 Multi-Year PBR Plan Application, page 227.

FortisBC Inc. (FBC or the Company) Application for a Certificate of Public Convenience and Necessity for the Kelowna Bulk Transformer Addition Project (the Application)	Submission Date: July 9, 2020
Response to Industrial Customers Group (ICG) Information Request (IR) No. 1	Page 11

1 **6.0 Reference: Exhibit B-1, Section 3.3.2, p. 15**

2 "... therefore historical load growth can be expected to produce a reasonable "status
3 quo" load forecast."

4 6.1 Please explain whether and/or why a "status quo" load forecast does or does not
5 account for possible weather extremes?

6

7 **Response:**

8 The "status quo" forecast referred to in the question is the energy forecast, which uses historical
9 normalized data to forecast future loads; therefore, weather extremes are not accounted for in
10 this forecast. Weather extremes are not used for the purposes of forecasting FBC energy
11 requirements since they can skew the loads, which increases variability in the forecast.

12

<p style="text-align: center;">FortisBC Inc. (FBC or the Company) Application for a Certificate of Public Convenience and Necessity for the Kelowna Bulk Transformer Addition Project (the Application)</p>	<p style="text-align: center;">Submission Date: July 9, 2020</p>
<p style="text-align: center;">Response to Industrial Customers Group (ICG) Information Request (IR) No. 1</p>	<p style="text-align: center;">Page 12</p>

1 **7.0 Reference: Exhibit B-1, Section 3.3.2, Figure 3-3, p. 17**

2 7.1 Please identify any CPCN granted to meet N-1 planning criteria for summer peak
3 loads?

4
5 **Response:**

6 FBC does not have separate N-1 planning criteria specific to summer peak loads. The system
7 is required to be planned such that all projected customer loads are served during normal and
8 single contingency operation, regardless of the season. The Grand Forks Terminal Station
9 Reliability Project, approved by Order C-2-19, was required for the same purpose of meeting
10 FBC's N-1 planning criteria. In the Grand Forks area, the inability to meet the criteria would first
11 occur during the winter season, while in the Kelowna area load is forecast to first exceed the
12 transformer capacity limit in summer.

13
14

15

16 7.2 Please prepare a load duration curve for summer peak loads on the 138 kV
17 distribution system? Please file a graph of actual daily peak demand for July and
18 August, 2019 for the 138 kV distribution system? Please file a graph of actual
19 hourly peak demand for the day with the highest peak demand?

20

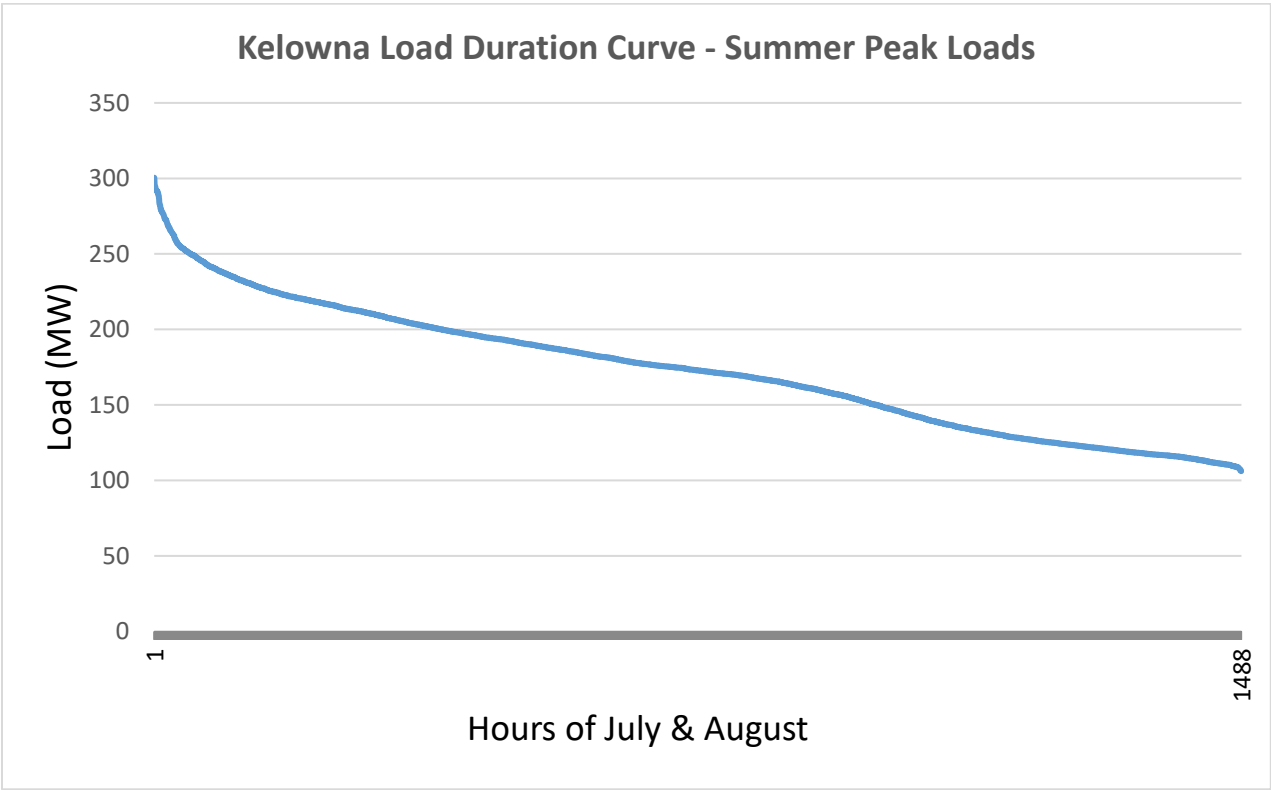
21 **Response:**

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

<p>FortisBC Inc. (FBC or the Company)</p> <p>Application for a Certificate of Public Convenience and Necessity for the Kelowna Bulk Transformer Addition Project (the Application)</p>	<p>Submission Date: July 9, 2020</p>
<p>Response to Industrial Customers Group (ICG) Information Request (IR) No. 1</p>	<p>Page 13</p>

1

Figure 1



2

3

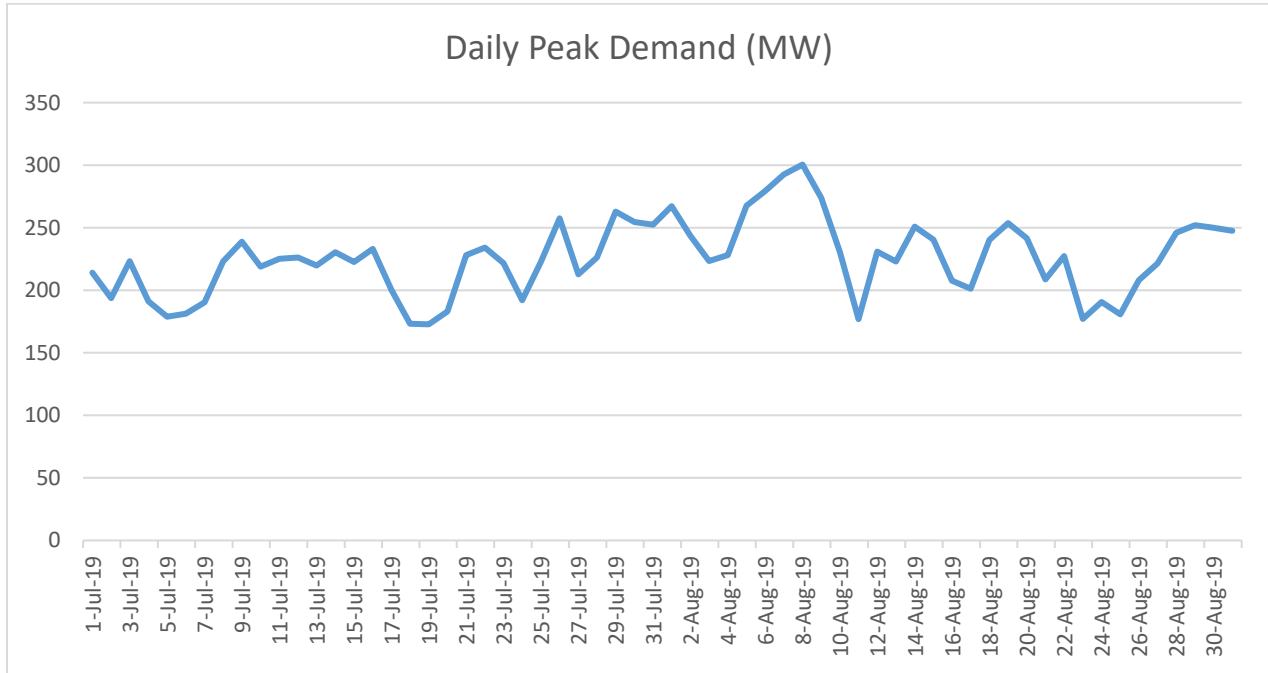
Please refer to Figure 2 below for actual daily peak demand for July and August 2019 (in MW)

4

for the Kelowna area 138 kV transmission system.

1

Figure 2

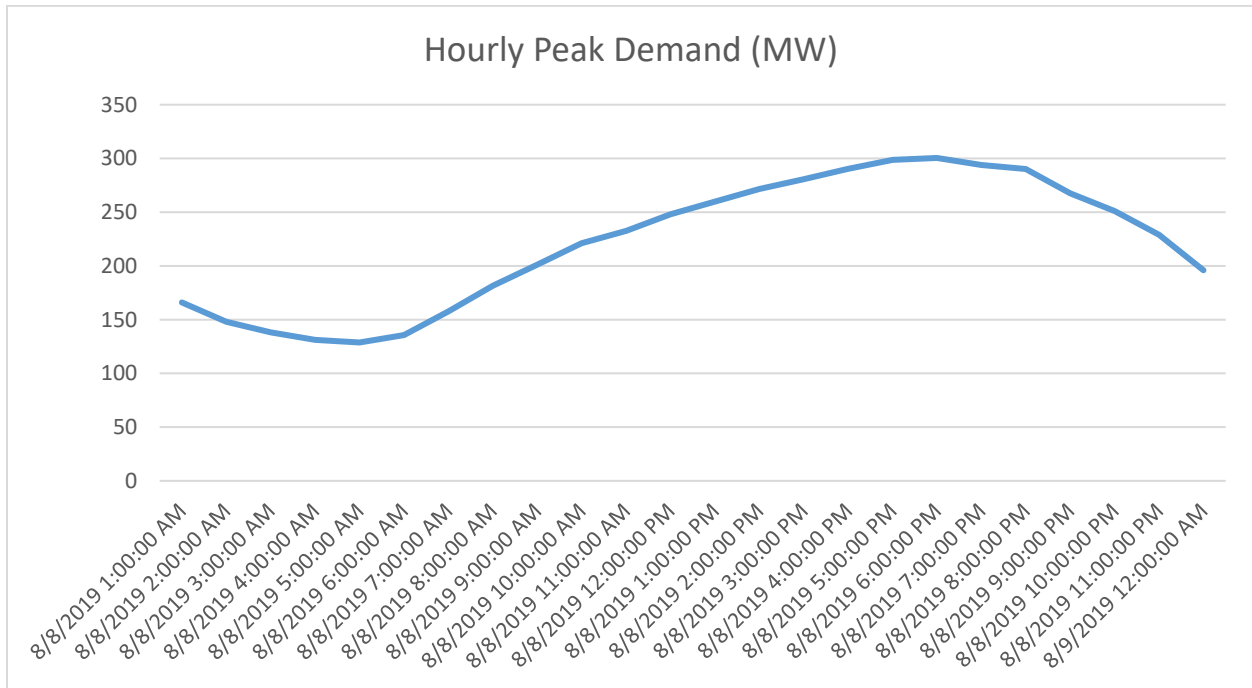


2

3 Please refer to Figure 3 below for actual hourly peak demand (in MW) for August 8, 2019, which
 4 was the day with the highest peak demand in summer 2019.

5

Figure 3



6

FortisBC Inc. (FBC or the Company) Application for a Certificate of Public Convenience and Necessity for the Kelowna Bulk Transformer Addition Project (the Application)	Submission Date: July 9, 2020
Response to Industrial Customers Group (ICG) Information Request (IR) No. 1	Page 15

7.3 Please prepare a graph similar to Figure 3-3 with a forecast peak demand based on low, medium and high forecast peak scenarios?

Response:

For system planning purposes, FBC does not forecast the peak demand based on low, medium and high forecast peak scenarios. Instead the peak forecast is based on historical peaks and escalated by the gross load growth rate.

7.4 Please provide FBC's policy on allowable post-contingency transformer loading?

Response:

The FBC policy on allowable post-contingency transformer loading states the following:

After the loss of a single non-radial element (a single transmission line, transformer, power conditioning unit, or generator), the system shall be within emergency facility ratings and within emergency voltage limits and no loss of load shall occur. No corrective operator action is allowed when determining whether emergency limits have been violated. Normal, fast acting automatic equipment controls, including switching of reactive sources on local voltage control, shall be represented. Slow acting controls such transformer tap changing and automatic generator controls shall not be represented. The system shall be within the stated emergency limits without relying on special relaying schemes such as transfer trip of generation or opening of lines upon overloads or low voltage conditions.

7.5 Please provide a summary of the policies of allowable post-contingency transformer loading used by utilities in the Western Electricity Coordinating Council (WECC) region. If FBC has not conducted a survey of such typical policies, why not? What would be the summer and winter post-contingency transformer limits under such other policies?

FortisBC Inc. (FBC or the Company) Application for a Certificate of Public Convenience and Necessity for the Kelowna Bulk Transformer Addition Project (the Application)	Submission Date: July 9, 2020
Response to Industrial Customers Group (ICG) Information Request (IR) No. 1	Page 16

1 **Response:**

2 Prior to December 2019, all utilities within the WECC region were under the direction of a single
3 Reliability Coordinator, Peak Reliability. The Peak Reliability System Operating Limits
4 Methodology for the Operations Horizon defined the acceptable system performance for the
5 post-contingency state for single contingencies in the operations horizon, which required all
6 facilities to be within their emergency facility ratings and thermal limits. All new Reliability
7 Coordinators within WECC have developed a similar system operating limits methodology
8 document, which means that all utilities in the WECC region are required to follow the same
9 post-contingency transformer loading policy, which is that transformer loading must be within
10 emergency ratings for post-contingency situations. The BC Hydro System Operating Limits
11 Methodology for Planning Horizon also has the same requirement.

12

FortisBC Inc. (FBC or the Company) Application for a Certificate of Public Convenience and Necessity for the Kelowna Bulk Transformer Addition Project (the Application)	Submission Date: July 9, 2020
Response to Industrial Customers Group (ICG) Information Request (IR) No. 1	Page 17

8.0 Reference: Exhibit B-1, Section 3.5, p. 20

“While transformers have an average life of 40 years, if a transformer is lightly loaded throughout its in-service life, the winding insulation can be expected to last longer; conversely, insulation life would be expected to be less than a year if the transformer is overloaded on a consistent basis. Each hour that a transformer is loaded above nameplate rating brings a corresponding increase in winding hotspot temperature that has a substantial negative impact on remaining expected lifespan.”

8.1 Please provide the loading profile upon which the average transformer life of 40 years is based. Please reference the IEEE standard upon which this criterion is based.

Response:

FBC assumes an average transformer life of 40 years, based on the statistical risk of failure, not on loading levels. Based on industry standards, FBC considers that an acceptable risk of failure for a transmission station should be no higher than 2 percent. Per CIGRE WG 12-05, “An international survey on failures in large power transformers”, transmission transformers reach this risk level at around 40 years of age.

8.2 Is it possible to calculate the expected average life of a transformer that is constantly loaded at half rating throughout its life? If so, please provide that calculation.

Response:

FBC, in conjunction with a post-doctorate student from the University of BC Okanagan (UBCO), has developed a program that estimates the life expectancy of transformers based on design parameters, loading and ambient temperatures. The estimated calculation is based on IEEE C57.92 and is modified to improve accuracy and to suit FBC’s operating conditions. Since the program is specific to FBC and is proprietary, FBC declines to provide the calculations.

Considering available design data and annual ambient temperatures for Kelowna, if loaded to 50 percent the life expectancy of one of the LEE transformers is approximately 54 years while the life expectancy of the DGB transformer is approximately 50 years.

8.3 Please quantify, in hours, the reduction in lifetime for a transformer that is overloaded by 5%, 10% and 15% of nameplate rating for 1 hour, 10 hours and 24 hours if the loading prior to the overloading was a) 100% of nameplate rating and b) 50% of nameplate rating.

Response:

FBC quantifies the requested reductions in transformer life in the tables below. For illustration, FBC provides two examples:

- For a transformer previously loaded to 100 percent of nameplate rating, a ten hour period of overloading by 15 percent would reduce the life expectancy of the transformer by 16.3 hours.
- Similarly, for a transformer that was historically loaded to 50 percent of nameplate, a ten hour period of overloading by 15 percent of nameplate rating would reduce the life expectancy by 14.2 hours.

1. Calculations for a daily average ambient temperature of 0°C

a) Prior loading of 100% of nameplate rating

Overload	Overload duration (hour)	Equivalent lifetime reduction (hour)
5%	1	0.38
	10	5.20
	24	23.50
10%	1	0.57
	10	9.50
	24	39.36
15%	1	1.15
	10	16.30
	24	82.32

b) Prior loading of 50% of nameplate rating

Overload	Overload duration (hour)	Equivalent lifetime reduction during the overloading period (hour)
5%	1	0.19
	10	4.40
	24	22.56

FortisBC Inc. (FBC or the Company) Application for a Certificate of Public Convenience and Necessity for the Kelowna Bulk Transformer Addition Project (the Application)	Submission Date: July 9, 2020
Response to Industrial Customers Group (ICG) Information Request (IR) No. 1	Page 19

Overload	Overload duration (hour)	Equivalent lifetime reduction during the overloading period (hour)
10%	1	0.23
	10	7.60
	24	41.04
15%	1	0.28
	10	14.20
	24	73.00

1 **2. Calculations for a daily average ambient temperature of 30°C**

2 a) Prior loading of 100% of nameplate rating

Overload	Overload duration (hour)	Equivalent lifetime reduction during the overloading period (hour)
5%	1	2.50
	10	77.52
	24	224.12
10%	1	3.57
	10	131.58
	24	386.58
15%	1	6.67
	10	222.22
	24	669.77

3 b) Prior loading of 50% of nameplate rating

Overload	Overload duration (hour)	Reduction of lifetime during the overloading period (hour)
5%	1	0.58
	10	60.61
	24	206.45
10%	1	1.04
	10	104.17
	24	357.76

FortisBC Inc. (FBC or the Company) Application for a Certificate of Public Convenience and Necessity for the Kelowna Bulk Transformer Addition Project (the Application)	Submission Date: July 9, 2020
Response to Industrial Customers Group (ICG) Information Request (IR) No. 1	Page 20

Overload	Overload duration (hour)	Reduction of lifetime during the overloading period (hour)
15%	1	1.49
	10	178.57
	24	619.35

1
2
3
4
5
6
7
8
9
10

8.4 Please provide the complete nameplate drawings and/or data for the existing LEE and DGB transformers.

Response:

Please refer to the nameplate drawings provided in Attachment 8.4 for the existing LEE and DGB transformers.

FortisBC Inc. (FBC or the Company) Application for a Certificate of Public Convenience and Necessity for the Kelowna Bulk Transformer Addition Project (the Application)	Submission Date: July 9, 2020
Response to Industrial Customers Group (ICG) Information Request (IR) No. 1	Page 21

1 **9.0 Reference: Exhibit B-1, Section 4.4.1.1, p. 28**

2 “The existing 13 kV distribution bus and equipment would be demolished and removed
3 from the station since the distribution supply is being eliminated.”

4 9.1 Will the removed 13 kV distribution equipment be re-used elsewhere in FBC’s
5 system?
6

7 **Response:**

8 Please refer to the response to BCUC IR1 20.1.
9
10

11
12 9.2 Please provide dimensioned plan and section drawings for the existing and
13 proposed LEE layout, identifying major equipment, under confidential submission
14 if necessary.
15

16 **Response:**

17 The proposed LEE layout with dimensions and equipment labels was provided with the
18 Application in Confidential Appendix A-2. The overall General Arrangement of the existing LEE
19 station (including demolition scope for Alternative A) was provided with the Application in
20 Confidential Appendix A-1.

21 Please refer to the confidential dimensioned General Arrangement drawings provided in
22 Confidential Attachment 9.2 for the existing LEE station.

23 FBC submits that the provision of dimensioned section drawings is beyond the level of detail
24 that is reasonably required for the BCUC to approve the KBTA Project. Furthermore, the detail
25 provided in the section drawings is preliminary and will be refined in the detailed design phase
26 following approval of the CPCN.

27 Attachment 9.2 is being filed confidentially pursuant to Section 18 of the BCUC’s Rules of
28 Practice and Procedure regarding confidential documents as set out in Order G-15-19, on the
29 basis that it contains sensitive technical information pertaining to the Company’s assets. Public
30 disclosure of the technical and engineering information contained in Attachment 9.2 elevates the
31 risk of potential harm to FBC’s assets by persons with malicious intent, which could result in
32 damage to the assets and/or limit, restrict or impair their operation. Disclosure of this
33 information could reasonably be expected to result in harm to the safety of the public, the
34 Company’s employees, and the assets themselves. Confidential Attachment 9.2 is being filed
35 with the BCUC under separate cover and can be made available to registered parties upon
36 providing a signed form of Confidentiality Declaration and Undertaking acceptable to the BCUC.

FortisBC Inc. (FBC or the Company) Application for a Certificate of Public Convenience and Necessity for the Kelowna Bulk Transformer Addition Project (the Application)	Submission Date: July 9, 2020
Response to Industrial Customers Group (ICG) Information Request (IR) No. 1	Page 22

10.0 Reference: Exhibit B-1, Section 4.4.3.2, p. 32

“These 2036 costs have been included in the 40 year financial analysis of this project for comparability to Alternatives A and B.”

10.1 Please provide the “Levelized % Increase on 2019 rates” for Alternative C not including the 2036 costs?

Response:

The levelized percentage increase on 2019 rates for Alternative C, not including the 2036 costs, is 0.58 percent. However, as discussed in the response to BCUC IR1 15.2, the expected costs of the full forty year analysis period have been included to allow for an adequate comparison of the cost of service of each alternative. Alternative C requires the additional fifth terminal transformer in 2036 and as result, that amount should be included in the cost of service and rate impact analysis.

10.2 Please identify changes to Appendices C, C-2 and, C-3 that FBC believes would be necessary before those Financial Schedules could be filed on the public record of this proceeding?

Response:

Appendix C of the Application was filed confidentially on the following basis as outlined in FBC’s cover letter to the Application:²

Appendices B and C include cost estimates, containing capital cost estimates for the Project. The capital spending amounts in these Appendices describe the costs of the various and specific Project components. FBC intends to contract the majority of the construction for the KBTA Project; providing potential bidders with this information could reasonably be expected to prejudice FBC’s negotiating position when procuring contracts and could result in higher costs for the Project.

In light of the above, once redacted to the level required to disclose them on the public record, the financial schedules would be of no value.

Further, there would be no benefit to ICG from the Financial Schedules being amended and placed on the public record of the proceeding since two representatives of ICG have already received access to the confidential appendices.

² Exhibit B-1, Application Cover Letter, p. 2.

Attachment 2.1

DUCK LAKE WHEELING AGREEMENT

BETWEEN

BRITISH COLUMBIA TRANSMISSION CORPORATION

AND

FORTISBC INC.

October 6, 2009

Accepted for filing: **APR 12 2010**
Effective: **DEC - 1 2010**
Order No.: **G 19 10**



SECRETARY

B.C. UTILITIES COMMISSION

TABLE OF CONTENTS

	Page
SECTION 1	INTERPRETATION.....1
1.1	Definitions1
1.2	Interpretation.....4
1.3	Governing Law4
1.4	Headings4
1.5	Entire Agreement4
1.6	Severability.....4
SECTION 2	TERM AND TERMINATION5
2.1	Term5
2.2	Termination for Extended Force Majeure5
2.3	Effect of Termination and Survival.....5
SECTION 3	REPRESENTATIONS.....5
3.1	Representation and Warranties of BCTC5
3.2	Representation and Warranties of FortisBC6
SECTION 4	WHEELING SERVICE.....6
4.1	First Nomination6
4.2	Subsequent Nominations6
4.3	Post-Nomination Variations6
4.4	Load Forecasts.....7
4.5	Wheeling Service7
4.6	Wheeling Losses7
4.7	Service Standards.....7
4.8	Future Growth.....8
4.9	No Impact on Other Agreements9
SECTION 5	METERING AND WHEELING AMOUNTS.....9
5.1	Metering.....9
5.2	Tests of Metering Installations.....10
5.3	Access.....10
SECTION 6	RATES AND PAYMENT10
6.1	Contribution to Upgrade Costs10
6.2	Wheeling Charge.....13
6.3	Calculation of Monthly Charges13
6.4	Audit Rights.....16
6.5	Invoicing.....17
SECTION 7	INDEMNITIES17
7.1	Indemnity.....17
7.2	Consequential Damages18

Accepted for filing: **APR 12 2010**
 Effective: **DEC - 1 2010**
 Order No.: **G19 '10**

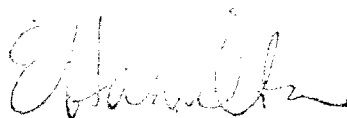


SECRETARY
 B.C. UTILITIES COMMISSION

TABLE OF CONTENTS
(continued)

	Page
SECTION 8 OPERATING COMMITTEE.....	18
8.1 Constitution.....	18
8.2 Limited Authority of Operating Committee.....	18
SECTION 9 DISPUTE RESOLUTION	19
9.1 Disputes	19
9.2 Contract Representatives to Seek Resolution	19
9.3 Presidents to Seek Resolution.....	19
9.4 Resolution by BCUC.....	19
9.5 Arbitration.....	19
9.6 Adjudication in Law and Equity	19
9.7 Shared Costs	19
SECTION 10 REGULATORY	19
10.1 Filing with BCUC	19
10.2 Regulatory Support	19
10.3 Regulatory Review Termination.....	19
10.4 Commission Jurisdiction	20
SECTION 11 CONFIDENTIALITY.....	20
11.1 Confidentiality	20
11.2 Exclusions.....	20
SECTION 12 GENERAL.....	21
12.1 Contract Representatives	21
12.2 Notice	21
12.3 Enurement.....	22
12.4 Time of the Essence	22
12.5 Waiver	22
12.6 Further Assurances.....	22
12.7 Assignment	22
12.8 Force Majeure	22
12.9 Taxes	22
12.10 Counterparts and Electronic Delivery	23

Accepted for filing: **APR 12 2010**
 Effective: **DEC - 1 2010**
 Order No.: **619710**



SECRETARY
B.C. UTILITIES COMMISSION

DUCK LAKE WHEELING AGREEMENT

THIS AGREEMENT is made the 6th day of October, 2009.

BETWEEN:

BRITISH COLUMBIA TRANSMISSION CORPORATION, a
crown corporation incorporated under the laws of British Columbia

("BCTC");

AND:

FortisBC INC., a corporation established by a Special Act of the
Legislature of the Province of British Columbia

("FortisBC");

WHEREAS:

- A. BCTC and FortisBC operate adjacent electrical transmission systems in British Columbia;
- B. BCTC requires transmission capacity to the vicinity of Wood Lake, British Columbia, to provide service to BC Hydro for its growing load in the area under Network Integration Transmission Service; and
- C. Accordingly, BCTC wishes to wheel electricity on a firm basis over certain of FortisBC's transmission facilities to a point at or near FortisBC's Duck Lake Substation where FortisBC's transmission facilities are expected to interconnect with new distribution facilities BC Hydro is proposing to construct, and FortisBC is agreeable thereto, on the terms and conditions set out herein, which are based on the principle of financial equivalency such that this Agreement is intended to yield a financially equivalent outcome for BC Hydro's customers when compared to other alternatives available to BCTC.

IN CONSIDERATION of \$1 and the mutual promises contained in this Agreement, the Parties agree as follows:

**SECTION 1
INTERPRETATION**

1.1 Definitions. In this Agreement:

- (a) "BC Hydro" means British Columbia Hydro and Power Authority;
- (b) "BCUC" means the British Columbia Utilities Commission;
- (c) "Business Day" means any day except a Saturday, Sunday or statutory holiday in British Columbia;

Accepted for filing:

APR 12 2010
DEC - 1 2010

SECRETARY

B.C. UTILITIES COMMISSION


Effective:

619-10

Order No.:

- 2 -

- (d) **"Confidential Information"** means any information disclosed by a Party to the other Party relating to this Agreement, including but not limited to the Nominated Wheeling Demand, information obtained pursuant to Section 6.4, and information identified, at the time of disclosure, as confidential;
- (e) **"Contract Representative"** has the meaning given to that term in Section 12.1;
- (f) **"Contract Year"** means each of: (i) the period between the In-Service Date and the start of the next calendar year; (ii) the last calendar year of the First Wheeling Service Period; and (iii) each calendar year thereafter during the Term;
- (g) **"CPI-BC"** has the meaning given to that term in Section 6.2;
- (h) **"Demand Cap"** has the meaning given to that term in Section 6.3(b);
- (i) **"Demand Limit"** has the meaning given to that term in Section 6.3(c);
- (j) **"Effective Date"** means the date first written above;
- (k) **"electricity"** means inclusively electric capacity and electric energy unless the context requires otherwise;
- (l) **"Extended Force Majeure Event"** has the meaning given to that term in Section 12.8.
- (m) **"First Wheeling Service Period"** has the meaning given to that term in Section 4.1;
- (n) **"Force Majeure"** means acts of God including without limitation, fires, floods, earthquakes, disasters, epidemics and anything else not within a Party's reasonable control including without limitation, war, riots, lockouts, strikes, but excluding a failure to pay money when due under this Agreement;
- (o) **"Good Utility Practice"** means any of the practices, methods and acts engaged in or approved by a significant portion of the electric utility industry during the relevant time period, or any of the practices, methods and acts which, in the exercise of reasonable judgment in light of the facts known at the time the decision was made, could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety and expedition. Good Utility Practice is not intended to be limited to the optimum practice, method or act to the exclusion of all others, but rather to be acceptable practices, methods or acts generally accepted in the WECC region;
- (p) **"GST"** means Goods and Services Tax payable under Part IX of the *Excise Tax Act* (Canada);
- (q) **"In-Service Date"** means, subject to Section 6.1(e), eighteen months from the Effective Date, or such earlier date as FortisBC is able to provide the Wheeling Service;

Accepted for filing: **APR 12 2010**Effective: **DEC - 1 2010**Order No.: **619 10**

SECRETARY

B.C. UTILITIES COMMISSION

- 3 -

- (r) **"Model"** means the financial equivalency model developed by BCTC in connection with matters contemplated in this Agreement;
- (s) **"Monthly Charge"** has the meaning given to that term in Section 6.3;
- (t) **"Nominated Wheeling Demand"** means, subject to Sections 4.1 and 4.3, written notice in the form attached hereto as Appendix B from BCTC to FortisBC of the maximum amount of electricity (in MVA) to be available at the Point of Delivery after wheeling pursuant to this Agreement at any given time, but which amount shall never exceed 57 MVA prior to March 31, 2021 and 67 MVA thereafter;
- (u) **"Operating Committee"** has the meaning given to that term in Section 8.1(a);
- (v) **"Parties"** means the parties to this Agreement, and **"Party"** means either of them;
- (w) **"Planned Outages"** means outages on any part of the FortisBC system that are planned by FortisBC and are expected to impact the Wheeling Service;
- (x) **"Point of Delivery"** means the egress cable terminations on the proposed Duck Lake Substation distribution bus switches shown as DUC DB11-2, DUC DB10-2, DUC DB9-2, DUC DB8-2 on the single line diagram attached as Appendix A;
- (y) **"Point of Supply"** means the point of termination of FortisBC's 72L & 74L transmission lines on the 230 kV bus at BC Hydro's Vernon Terminal Substation;
- (z) **"PST"** means Provincial Sales Tax payable under the *Social Services Tax Act* (British Columbia);
- (aa) **"Substation Costs"** has the meaning given to that term in Section 6.1(b)(i);
- (bb) **"Term"** has the meaning given to that term in Section 2.1;
- (cc) **"Transformer Supply Contracts"** means contract(s) between FortisBC, as purchaser, and Pauwels Canada Inc., as supplier, for the supply and delivery of two 50 MVA transformers, the aggregate purchase price for which (all inclusive) shall not exceed \$2.5 million and containing options to terminate between 10 and 30 weeks after execution at 10% of the purchase price, between 30 and 45 weeks after execution at 30% of the purchase price and between 45 and 58 weeks after execution at 50% of the purchase price;
- (dd) **"TSC Costs"** has the meaning given to that term in Section 6.1(b)(ii);
- (ee) **"WECC"** means the Western Electricity Coordinating Council;
- (ff) **"wheel"** means the receipt of electricity and transmission of electricity, and variations of "wheel" shall have corresponding meanings;
- (gg) **"Wheeling Facilities"** means all facilities, equipment and other assets between the Point of Supply and the Point of Delivery used, in whole or in part, in the provision of the Wheeling Service;

Accepted for filing:

APR 12 2010

Effective:

DEC - 1 2010

Order No.:

G 19 10

B.C. UTILITIES COMMISSION

SECRETARY

- 4 -

- (hh) "Wheeling Charge" has the meaning given to that term in Section 6.2; and
- (ii) "Wheeling Service" has the meaning given to that term in Section 4.5.

1.2 **Interpretation.** For the purposes of this Agreement, except as otherwise expressly provided herein:

- (a) "Agreement" means this agreement, including the Appendices hereto, as it may be supplemented or amended from time to time;
- (b) all references in this Agreement to a designated section, subsection, paragraph, or other subdivision is to the designated section, subsection, paragraph or other subdivision of this Agreement unless otherwise specifically stated;
- (c) the words "herein", "hereof" and "hereunder" and other words of similar import refer to this Agreement as a whole and not to any particular section, subsection, paragraph or other subdivision of this Agreement;
- (d) the singular of any term includes the plural and vice versa and the use of any term is equally applicable to any gender and where applicable to a body corporate;
- (e) all references to money in this Agreement refer to lawful money of Canada and all amounts to be calculated or paid pursuant to this Agreement are to be calculated and paid in lawful money of Canada;
- (f) all references to any statute in this Agreement include any subsequent legislation enacted in substitution thereof and all regulations made thereunder;
- (g) any reference to a corporate or other business entity includes and is also a reference to any corporate or other business entity that is a successor to such entity; and
- (h) the words "include" and "including" and similar expressions mean "including without limitation".

1.3 **Governing Law.** This Agreement shall be governed by and construed in accordance with the laws of the Province of British Columbia, without reference to its conflict of law principles, and, subject to Section 9, the Parties submit and attorn to the exclusive jurisdiction of the courts of the Province of British Columbia.

1.4 **Headings.** The headings in this Agreement are inserted for convenience of reference only and shall not affect the interpretation of this Agreement.

1.5 **Entire Agreement.** This Agreement constitutes the entire Agreement between the Parties and supersedes all prior representations, communications and agreements, oral or written, by and between the Parties with respect to the subject matter of this Agreement.

1.6 **Severability.** Should any provision of this Agreement be void or unenforceable it shall be severed from this Agreement and the remainder of this Agreement shall remain in full

Accepted for filing: APR 12 2010

Effective: DEC - 1 2010

Order No.: 619 '10



SECRETARY

B.C. UTILITIES COMMISSION

- 5 -

force and effect and shall be interpreted and construed as if the severed provision had never formed part of this Agreement.

SECTION 2 TERM AND TERMINATION

2.1 Term. This Agreement shall be in effect from the Effective Date until December 31, 2060 unless earlier terminated pursuant to Section 2.2 or 10.3 (the "Term").

2.2 Termination for Extended Force Majeure. If an Extended Force Majeure Event occurs, the Party not relying on such Extended Force Majeure Event may terminate this Agreement without liability or penalty on written notice to the other Party.

2.3 Effect of Termination and Survival. From and after the expiry or termination of this Agreement for any reason, neither Party shall have any further obligations to or rights against the other Party in respect of this Agreement, except for Section 6.4 which shall survive for six years following expiry or termination but only with respect to periods prior to the expiry or termination, and Sections 6.1(a) and 6.1(f), Section 7 and Section 11 which shall survive indefinitely (except that Section 6.1(a) shall only survive in respect of costs incurred by FortisBC before the termination date).

SECTION 3 REPRESENTATIONS

3.1 Representation and Warranties of BCTC. BCTC represents and warrants to FortisBC that:

- (a) it is duly organized, validly existing and in good standing under the laws of the Province of British Columbia;
- (b) subject to Section 10, it has all regulatory authorization necessary for it to legally perform its obligations under this Agreement;
- (c) the execution, delivery and performance of this Agreement are within its powers, and have been duly authorized by all necessary corporate action on its part, and do not violate any of the terms and conditions in its governing documents, any contracts to which it is a party or any applicable law;
- (d) this Agreement and each other document executed and delivered in accordance with this Agreement constitute legally valid and binding obligations enforceable against it in accordance with their terms, subject to any equitable defenses, bankruptcy principles, or the like;
- (e) it has made its own independent decision to enter into this Agreement as to whether this Agreement is appropriate or proper for it based upon its own judgment, is not relying upon any advice, recommendations, information or other representation (other than as expressly set out herein) provided by FortisBC in doing so; and

Accepted for filing: **APR 12 2010**

Effective: **DEC - 1 2010**

Order No.: **619 '10**



SECRETARY
B.C. UTILITIES COMMISSION

- 6 -

- (f) it has the capacity or ability to perform its obligations set out in this Agreement in accordance with its terms.

3.2 **Representation and Warranties of FortisBC.** FortisBC represents and warrants to BCTC that:

- (a) it is duly organized, validly existing and in good standing under the laws of the Province of British Columbia;
- (b) subject to Section 10, it has all regulatory authorization necessary for it to legally perform its obligations under this Agreement;
- (c) the execution, delivery and performance of this Agreement are within its powers, and have been duly authorized by all necessary corporate action on its part, and do not violate any of the terms and conditions in its governing documents, any contracts to which it is a party or any applicable law;
- (d) this Agreement and each other document executed and delivered in accordance with this Agreement constitute legally valid and binding obligations enforceable against it in accordance with their term, subject to any equitable defenses, bankruptcy principles, or the like;
- (e) it has made its own independent decision to enter into this Agreement as to whether this Agreement is appropriate or proper for it based upon its own judgment, is not relying upon any advice, recommendations, information or other representation (other than as expressly set out herein) provided by BCTC in doing so; and
- (f) it has the capacity or ability to perform its obligations set out in this Agreement in accordance with its terms.

SECTION 4 WHEELING SERVICE

4.1 **First Nomination.** The Nominated Wheeling Demand for the period commencing on the In-Service Date and expiring at the end of the calendar year following the calendar year in which the In-Service Date occurs (the "First Wheeling Service Period") is 39.2 MVA.

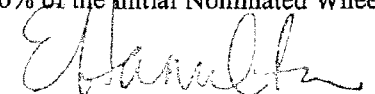
4.2 **Subsequent Nominations.** BCTC shall deliver to FortisBC a Nominated Wheeling Demand for each Contract Year following the First Wheeling Service Period at least 24 months prior to the start of that Contract Year. The Nominated Wheeling Demand for any Contract Year following the First Wheeling Service Period shall not decrease by more than 15% of the Nominated Wheeling Demand from the previous Contract Year.

4.3 **Post-Nomination Variations.** At any time within the 24 months prior to the start of a Contract Year or during a Contract Year BCTC may, on at least one month's prior written notice, increase its Nominated Wheeling Demand for that Contract Year or the rest of that Contract Year, as applicable, provided however that the aggregate of all such increases for any Contract Year may not exceed 20% of the initial Nominated Wheeling Demand for that Contract

Accepted for filing: **APR 12 2010**

Effective: **DEC - 1 2010**

Order No.: **619 '10**



SECRETARY

B.C. UTILITIES COMMISSION

- 7 -

Year and provided that the revised Nominated Wheeling Demand never exceeds 57 MVA prior to March 31, 2021 and 67 MVA thereafter.

4.4 Load Forecasts. By August 31 of each year preceding a Contract Year, BCTC shall provide FortisBC with a forecast of its expected Nominated Wheeling Demand for the next ten Contract Years, provided such forecasts shall not restrict BCTC's ability to deliver Nominated Wheeling Demands that differ from such forecasts in accordance with Sections 4.1, 4.2 and 4.3.

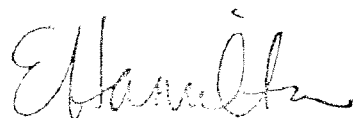
4.5 Wheeling Service. In each hour of each Contract Year, FortisBC shall, in accordance with Good Utility Practice, schedule and wheel from the Point of Supply to the Point of Delivery electricity delivered at the Point of Supply by BCTC, provided however, that FortisBC shall have no obligation to schedule or wheel electricity exceeding the sum of the applicable Nominated Wheeling Demand and the deemed wheeling losses applicable thereto as calculated in accordance with Section 4.6 (the "Wheeling Service").

4.6 Wheeling Losses. Unless otherwise agreed, the deemed wheeling losses in a given hour shall be calculated as 6.08% of the total hourly electricity delivered to BCTC at the Point of Delivery. Unless otherwise agreed, the amount of the deemed wheeling losses shall be delivered to FortisBC at the Point of Supply. FortisBC is not responsible for making up the amount of the deemed wheeling losses.

4.7 Service Standards.

- (a) FortisBC, by March 31 of every calendar year, will report to BCTC the previous year's SAIDI and SAIFI reliability performance of both the Wheeling Facilities and the aggregate FortisBC transmission system (transmission lines and substations) for outages greater than one minute. In the event the latter outperforms the former (net of impacts from outages upstream of the Point of Supply), FortisBC will convene a meeting with BCTC, and the Parties shall agree on measures to be taken by FortisBC in accordance with Good Utility Practice to improve the performance of the Wheeling Facilities. A failure to agree on the appropriate measures shall constitute a Dispute for purposes of Section 9.
- (b) The Wheeling Service is a firm transmission service and FortisBC will not curtail or interrupt the Wheeling Service except: (i) where FortisBC is permitted to disconnect the interconnection of BC Hydro's facilities to the Point of Delivery, whether at that location or further upstream in the FortisBC system, in accordance with the interconnection agreement between FortisBC and BC Hydro governing the interconnection of BC Hydro's facilities at the Point of Delivery; or (ii) in circumstances and during conditions that permit FortisBC to curtail or interrupt Long-Term Firm Point-to-Point Transmission Service provided in FortisBC's Electric Tariff Supplement No. 7 or its equivalent. FortisBC will make any permissible curtailments or interruptions to the Wheeling Service on a non-discriminatory basis, treating the Wheeling Service as equal to Firm Point-to-Point Transmission Service and Firm Transmission Service (as those terms are referred to in FortisBC's Electric Tariff Supplement No. 7).

Accepted for filing: **APR 12 2010**
Effective: **DEC - 1 2010**
Order No.: **619 10**



SECRETARY
B.C. UTILITIES COMMISSION

- 8 -

- (c) FortisBC will, to the extent it is reasonably practical and consistent with Good Utility Practice, schedule Planned Outages in consultation with BCTC. FortisBC will give BCTC at least one month's notice of all Planned Outages. FortisBC will make reasonable efforts to ensure that Planned Outage will be of minimal frequency and duration and cause minimal inconvenience to the provision of the Wheeling Service.
- (d) Without limiting FortisBC's other obligations in this Agreement, if FortisBC is not able to wheel electricity from the Point of Supply to the Point of Delivery, it will use efforts consistent with Good Utility Practice to schedule and wheel electricity delivered by BCTC at other points where the BCTC system and FortisBC system are interconnected to the Point of Delivery to the extent that reliable (on an N-1 contingency basis as understood in accordance with Good Utility Practice in respect of such other points where the BCTC system and FortisBC system are interconnected) transmission capacity on the FortisBC system is available. The Parties agree that if FortisBC schedules and wheels electricity in accordance with Section 4.7(d), the Wheeling Charge, Monthly Charge and deemed wheeling losses for purposes of Section 4.6 shall nevertheless be calculated as though the electricity was delivered by BCTC at the Point of Supply.

4.8**Future Growth**

- (a) The Parties acknowledge that the Wheeling Service contemplated by this Agreement is based on current projections of load growth in the Wood Lake area over the Term, but if load growth exceeds these projections or because of other factors BCTC may wish to contract for additional wheeling in the future. The Parties acknowledge and agree that this Agreement does not commit FortisBC to provide wheeling in addition to the Wheeling Service, and that any wheeling in addition to the Wheeling Service will be subject to the mutual agreement of the Parties at the time, and that if the Parties reach such an agreement it will be based on principles of financial equivalency of the options available to the Parties at the time to provide the required service.
- (b) At least six months prior to FortisBC initiating, committing to or taking any irreversible steps in connection with any modifications, expansions or new connections to the Duck Lake Substation that are reasonably expected to adversely affect FortisBC's ability to modify the Duck Lake Substation without the need for any material expansion so as to provide up to an additional 33 MVA of wheeling to the Point of Delivery, FortisBC shall convene a meeting with BCTC to discuss, in reasonable detail, the scope of the potential modification, expansion or new connection. If within thirty (30) days of such meeting BCTC provides written notice to FortisBC advising that BCTC wishes to explore one or both of:
- (i) an agreement whereby FortisBC would provide additional wheeling service to the Point of Delivery at that time on a financial equivalency basis; and

Accepted for filing: **APR 12 2010**Effective: **DEC - 1 2010**Order No. **619 '10**

SECRETARY

B.C. UTILITIES COMMISSION

- 9 -

- (ii) a payment to FortisBC to preserve that part of the Duck Lake Substation configuration necessary to provide up to an additional 33 MVA of wheeling to the Point of Delivery so as to compensate FortisBC for any incremental costs to be incurred by FortisBC in undertaking its proposed modification, expansion or new connection in a way that does not adversely affect FortisBC's ability to modify the Duck Lake Substation without the need for any material expansion so as to provide up to an additional 33 MVA of wheeling to the Point of Delivery,

then FortisBC and BCTC shall explore, in good faith, the agreement and/or the payment specified in the notice for a period of one-hundred fifty (150) days, or such shorter or longer period as the Parties may mutually agree upon. For certainty, nothing herein obligates a Party to conclude binding agreements in respect of any such agreement and/or payment.

4.9 **No Impact on Other Agreements.** The Parties acknowledge and agree that electricity delivered at the Point of Supply by BCTC for purposes of this Agreement shall not constitute capacity and energy for purposes of determining capacity and energy supplied or delivered pursuant to the general wheeling agreement made as of the 15th day of October, 1986 between BCTC (as assignee of BC Hydro) and FortisBC, as amended or the power purchase agreement made as of the 1st day of October, 1993 between BC Hydro and FortisBC, as amended (the "**Power Purchase Agreement**"), including without limitation for purposes of determining Excess Capacity or Excess Energy (as those terms are defined in the Power Purchase Agreement) for purposes of the Power Purchase Agreement.

SECTION 5 METERING AND WHEELING AMOUNTS

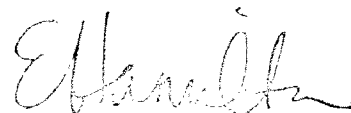
5.1 **Metering.**

- (a) The electricity wheeled under this Agreement shall be measured and recorded at or near the Point of Delivery by energy and demand meters provided, installed and maintained by FortisBC and having one hour integrating intervals, which meters shall be comprised of a 3-element metering scheme with 3 CTs and 3 VTs connected L-N using Measurement Canada approved models, and shall otherwise comply with the requirements of all applicable laws. FortisBC shall advise BCTC of the model, make, ratio and Measurement Canada approval number of the meters.
- (b) FortisBC shall make available to BCTC connectivity for telemetering purposes, including without limitation the second set of secondaries (120V or 115VMC approved secondaries) from the same CTs and VTs of the metering transformers owned by it for the purpose of installing backup metering, telemetering and control equipment and shall make provision for such equipment, including space, a 15A/120V auxiliary power supply and a phone line for metering data download, as applicable. In cases where backup meters are installed, the Parties shall designate one meter to be used for revenue billing purposes.

Accepted for filing: APR 12 2010

Effective: DEC - 1 2010

Order No.: 619 '10



SECRETARY

B.C. UTILITIES COMMISSION

- 10 -

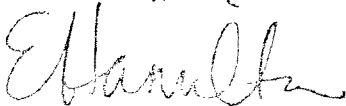
5.2 Tests of Metering Installations.

- (a) Each Party shall, at its expense, test its metering components associated with this Agreement in accordance with the requirement of applicable laws and field test the metering installation at least once every two years. When the Measurements Canada seal for a meter expires, the owner shall arrange for meter re-verification and re-seal. Each Party shall provide the other with copies of all meter test certificates. At the request of one Party, the other shall make additional tests of inspections of such installations, the expense of which shall be paid by the requesting Party unless such additional tests of inspections show the measurements of such installations to be registering outside the prescribed limit of error. Each Party shall give reasonable notice of the time when any such test or inspection is to be made to the other Party, who may have representatives present at such test or inspection. Any component of such installations found to be defective or inaccurate shall be adjusted, repaired, or replaced to provide accurate metering.
- (b) If a meter is found to be not functioning accurately, the amount of electricity wheeled pursuant to this Agreement during the period since the last inspection of such meter indicated it was functioning accurately shall be determined in accordance with the *Electricity and Gas Inspection Act* (Canada) and applicable tariffs.

5.3 Access. Each Party shall have the right by giving reasonable notice to the other Party to enter the property or facilities of the other Party at all reasonable times for the purpose of reading any and all meters installed thereon pursuant to this Agreement, provided the accessing Party shall at all times comply with the other Party's health, safety and other policies and requirements related to accessing the relevant property.

**SECTION 6
RATES AND PAYMENT****6.1 Contribution to Upgrade Costs.**

- (a) Subject to Section 6.1(b), BCTC shall pay for actual costs incurred by FortisBC for the design, construction and associated overhead and carrying costs of new substation assets in the Duck Lake Substation required to provide the Wheeling Service as more particularly set out in Appendix A, including without limitation pursuant to the Transformer Supply Contracts, but never more than \$14 million in the aggregate without BCTC's prior written consent.
- (b) Subject to Section 6.1(d), until such time as BCTC has obtained the approvals contemplated by Section 10.3(ii), (iii), (iv), (v) and (vi) from the BCUC:
- (i) FortisBC shall use its reasonable commercial efforts to minimize the costs it incurs for the design, construction and associated overhead and carrying costs of new substation assets in the Duck Lake Substation required to provide the Wheeling Service while still preserving the In-Service Date (the "Substation Costs"); and

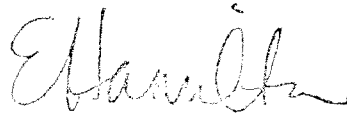
Accepted for filing: **APR 12 2010**Effective: **DEC - 1 2010**Order No. **619 '10**
SECRETARY
B.C. UTILITIES COMMISSION

- 11 -

- (ii) all costs, including associated overhead and carrying costs, incurred pursuant to the Transformer Supply Contracts (the "TSC Costs") shall be at the expense of FortisBC;

but in any event Fortis BC shall not incur costs in excess of \$2.5 million in aggregate for the Substation Costs and the TSC Costs pursuant to Sections 6.1(b)(i) and 6.1(b)(ii).

- (c) Once BCTC has obtained the approvals contemplated by Section 10.3(ii), (iii), (iv), (v) and (vi) from the BCUC, all TSC Costs incurred up until the date of such approval shall be invoiced to BCTC within 30 days of the date of such approval and BCTC shall pay such TSC Costs pursuant to Section 6.5. Any TSC Costs incurred after BCTC has obtained the approvals contemplated by Section 10.3(ii), (iii), (iv), (v) and (vi) from the BCUC shall be invoiced to and paid by BCTC in accordance with Section 6.5.
- (d) If at any time FortisBC, acting reasonably, determines that it must exceed the limits established by Section 6.1(b) in order to preserve the In-Service Date, it shall provide written notice thereof to BCTC, setting out in reasonable detail the relevant costs, their timing and a rationale for why they must be incurred before BCTC has obtained the approvals contemplated by Section 10.3(ii) (iii), (iv), (v) and (vi) from the BCUC. Such notice shall be delivered to BCTC at least thirty (30) days before the first of the costs in excess of the limits established by Section 6.1(b) must be incurred. If BCTC authorizes such additional costs by notice in writing to FortisBC, then the \$2.5 million limit in Section 6.1(b) shall not apply to the additional costs so authorized. If BCTC does not authorize such additional costs by the date on which the first of those costs must be incurred, then the In-Service Date shall be delayed by a period of time equivalent to the time between when the first of such costs must be incurred and the earlier of: (i) the day on which BCTC obtains the approvals contemplated by Section 10.3(ii), (iii), (iv), (v) and (vi); and (ii) when BCTC authorizes such additional costs by notice in writing to FortisBC.
- (e) The parties acknowledge their mutual desire to achieve a December 1, 2010 In-Service Date. To the extent any of the requirements of Section 6.1(b) restrict or limit FortisBC's ability to achieve a December 1, 2010 In-Service Date, FortisBC shall identify and consult with BCTC in connection therewith, and BCTC may waive or provide other relief from those requirements on a mutually acceptable basis so as to increase the likelihood of a December 1, 2010 In-Service Date.
- (f) In the event this Agreement is terminated pursuant to Section 10.3:
- (i) notwithstanding which of BCTC or FortisBC terminate this Agreement, FortisBC shall invoice BCTC:
- (A) on a monthly basis for costs incurred to restore the Duck Lake Substation to substantially the same condition it was in before any work required to provide the Wheeling Service was undertaken, but never more than \$500,000 in the aggregate; and

Accepted for filing: **APR 12 2010**Effective: **DEC - 1 2010**Order No: **619 10**

SECRETARY

B.C. UTILITIES COMMISSION

- 12 -

(B) for:

- (I) the total of all unbilled Substation Costs;
- (II) all costs to terminate the existing contracts relating to the design and construction of new substation assets in the Duck Lake Substation;
- (III) all TSC Costs incurred by FortisBC until the date this Agreement is terminated; and
- (IV) all termination costs in respect of the Transformer Supply Contracts, if applicable,

provided that the amount of such invoice does not exceed the difference between \$2.5 million and the Substation Costs for which FortisBC has already been reimbursed;

(ii) by BCTC, then BCTC shall, in its notice of termination, advise FortisBC:

- (A) that it wishes to assume the Transformer Supply Contracts, in which case Fortis BC shall assign the Transformer Supply Contracts to BCTC and BCTC shall assume such Transformer Supply Contracts and all obligations arising thereunder from and after the termination of this Agreement, and take title and delivery of all equipment and facilities already delivered to FortisBC pursuant thereto; or
- (B) that it does not wish to assume the Transformer Supply Contracts, in which case Fortis BC shall, within two Business Days of receiving BCTC's notice of termination, advise BCTC if FortisBC elects to retain the equipment and facilities already delivered to Fortis BC pursuant to the Transformer Supply Contracts, in which case FortisBC will reimburse BCTC for all TSC costs for which BCTC has already paid FortisBC, if any, and if no such election is made by Fortis BC, then FortisBC shall terminate the Transformer Supply Contracts; and

(iii) by FortisBC, then Fortis BC shall, in its notice of termination, advise BCTC if FortisBC elects to retain the equipment and facilities already delivered to FortisBC pursuant to the Transformer Supply Contracts, in which case FortisBC will reimburse BCTC for all TSC costs for which BCTC has already paid FortisBC, if any, and if no such election is made by Fortis BC, then BCTC shall, within two Business Days of receiving FortisBC's notice of termination, advise FortisBC by notice in writing either to terminate the Transformer Supply Contracts or to assign the Transformer Supply Contracts to BCTC, and if the Transformer Supply Contracts are to be assigned to BCTC, then Fortis BC shall do so and BCTC shall assume such Transformer Supply Contracts and all obligations arising thereunder from and after the termination of this

Accepted for filing: **APR 12 2010**Effective: **DEC 1 2010**Order No.: **619 10**

SECRETARY

B.C. UTILITIES COMMISSION

- 13 -

Agreement, and take title and delivery of all equipment and facilities already delivered to FortisBC pursuant thereto.

6.2 Wheeling Charge. Subject to Section 6.3, the charge applicable to the Wheeling Services (the "Wheeling Charge") during any Contract Year "n" shall be:

$$WC(n) = 12 \times SWR \times 1000 \times NWD \times (CPI_{(Jan, n)} / CPI_{(Jan FWSP)}),$$

where WC(n) is the Wheeling Charge during Contract Year "n"; "WR" means the wheeling rate as determined by the Model (initially \$1.6887/kVA, but to be finally determined in accordance with the Model within three months of the In-Service Date and after the aggregate amount of all payments made pursuant to Section 6.1(a) is known), "NWD" means the amount of MVA specified in the Nominated Wheeling Demand for Contract Year n, $CPI_{(Jan, n)}$ is the Consumer Price Index for British Columbia, All Items (Not Seasonally Adjusted) ("CPI-BC") as published by Statistics Canada, for January of Contract Year "n" (or, in the case of the first Contract Year, the first complete calendar month of that Contract Year if the first Contract Year does not begin on January 1), and $CPI_{(Jan FWSP)}$ is the CPI-BC as published by Statistics Canada, for the first complete month of the First Wheeling Service Period, provided in each case that if the CPI-BC ceases to be published by Statistics Canada, or the basis therefor is changed materially, there shall be substituted an available replacement index that most nearly, of those then publicly available, approximates the intent and purpose of the CPI-BC that has so ceased or changed, and this Agreement shall be amended as necessary to accommodate such replacement index, all as determined by written agreement between the Parties or failing agreement, by dispute resolution in accordance with and adjusted or replaced in accordance with Section 9.

If when calculating WC(n) for any given Contract Year the CPI-BC for January of that Contract Year has not been published by Statistics Canada, the most recent CPI-BC immediately prior to that January that has been published by Statistics Canada shall be used and FortisBC may prepare its invoices on the basis of such WC(n), provided that once the actual CPI-BC for January of that Contract Year has been published by Statistics Canada, all invoices which have been calculated as aforesaid shall be recalculated using such published CPI-BC and the Parties shall make all necessary payment adjustments between them.

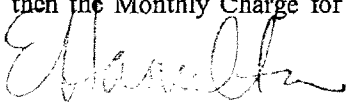
6.3 Calculation of Monthly Charges. BCTC shall pay to FortisBC for each month of a Contract Year an amount equal to one-twelfth (1/12) of the Wheeling Charge for that Contract Year (the "Monthly Charge"), provided however, that if at any, and each time, during a Contract Year:

- (a) FortisBC is not able to provide the Wheeling Service for all of the Nominated Wheeling Demand for reasons other than Force Majeure or Planned Outages, then the Monthly Charge for the month in which such event occurs shall be multiplied by a fraction, the numerator of which is the number of hours during that month that the Wheeling Service for all of the Nominated Wheeling Demand was available, and the denominator of which is equal to all of the hours in that month;
- (b) actual electricity deliveries at the Point of Delivery exceed the Nominated Wheeling Demand but are equal to or less than 67MVA (the amount of such actual deliveries, including the Nominated Wheeling Demand, being the "Demand Cap"), then the Monthly Charge for the month in which such event

Accepted for filing: **APR 12 2010**

Effective: **DEC - 1 2010**

Order No.: **G19 '10**


SECRETARY
B.C. UTILITIES COMMISSION

- 14 -

occurs and in all subsequent months of that Contract Year shall be equal to the sum of:

- (i) one-twelfth (1/12) of the Wheeling Charge for that Contract Year
- (ii) the product of 125%, the applicable WR (as defined in Section 6.2 and if expressed in kVA, would need to be multiplied by 1000) and the amount of such excess deliveries up to and including 20% of the Nominated Wheeling Demand; and
- (iii) the product of the amount then specified in FortisBC's Electric Tariff for Short-Term Non Firm Service (which at the Effective Date is \$4.68/kVA as specified in Schedule 102 and if expressed in kVA, would need to be multiplied by 1000) and the amount of such excess deliveries beyond 20% of the Nominated Wheeling Demand, if any,

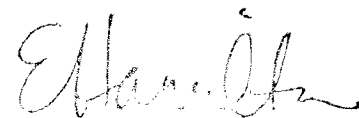
and this Section 6.3(b) shall not apply again in that Contract Year unless any subsequent actual deliveries in that Contract Year at the Point of Delivery that exceed the Nominated Wheeling Demand but are equal or less than 67MVA are in excess of the then current Demand Cap, and in that event this Section 6.3(b) shall apply in order to calculate a new Monthly Charge for the month in which such event occurs and in all subsequent months of that Contract Year as though no prior Demand Cap for that Contract Year had been established, and for certainty, no such recalculation shall impact or adjust Monthly Charges for prior months;

- (c) actual electricity deliveries at the Point of Delivery exceed 67MVA (the amount of such actual deliveries, including the first 67MVA, the "Demand Limit"), then:
 - (i) on the first such occurrence, the Monthly Charge for the month in which such event occurs and in all subsequent months of that Contract Year shall be equal to the sum of:
 - (A) one-twelfth (1/12) of the Wheeling Charge for that Contract Year;
 - (B) the product of 125%, the applicable WR (as defined in Section 6.2 and if expressed in kVA, would need to be multiplied by 1000) and the lesser of: (x) the amount of the deliveries in excess of the Nominated Wheeling Demand up to and including 20% of the Nominated Wheeling Demand; and (y) 67 MVA less the Nominated Wheeling Demand; and
 - (C) the product of the amount then specified in FortisBC's Electric Tariff for Short-Term Non Firm Service (which at the Effective Date is \$4.68/kVA as specified in Schedule 102 and if expressed in kVA, would need to be multiplied by 1000) and the amount of such excess deliveries beyond the amount of such excess deliveries used in the calculation pursuant to Section 6.3(c)(i)(B),

Accepted for filing: APR 12 2010

Effective: DEC - 1 2010

Order No.: 619 '10



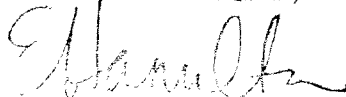
SECRETARY

B.C. UTILITIES COMMISSION

- 15 -

- (ii) on the second such occurrence, provided it does not occur during the Contract Year immediately following the Contract Year in which the first such occurrence occurs, the Monthly Charge for the month in which such event occurs and in all subsequent months of that Contract Year shall be equal to the sum of:
- (A) the product of the amount then specified in FortisBC's Electric Tariff for Long-Term Firm Service (which at the Effective Date is \$3.47/kVA as specified in Schedule 101 and if expressed in kVA, would need to be multiplied by 1000) and 67MVA; and
 - (B) the product of the amount then specified in FortisBC's Electric Tariff for Short-Term Non Firm Service (which at the Effective Date is \$4.68/kVA as specified in Schedule 102 and if expressed in kVA, would need to be multiplied by 1000) and the amount of such excess deliveries beyond 67MVA; and
- (iii) on the third such occurrence, or a second such occurrence that occurs during the Contract Year immediately following the Contract Year in which the first such occurrence occurs, the Monthly Charge for the month in which such event occurs and in all subsequent months of the Term shall be equal to the sum of:
- (A) the product of the amount then specified in FortisBC's Electric Tariff for Long-Term Firm Service (which at the Effective Date is \$3.47/kVA as specified in Schedule 101 and if expressed in kVA, would need to be multiplied by 1000) and 67MVA; and
 - (B) the product of the amount then specified in FortisBC's Electric Tariff for Short-Term Non Firm Service (which at the Effective Date is \$4.68/kVA as specified in Schedule 102 and if expressed in kVA, would need to be multiplied by 1000) and the amount of such excess deliveries beyond 67MVA,

and in each such instance this Section 6.3(c) shall not apply again in that Contract Year unless any subsequent actual deliveries in that Contract Year at the Point of Delivery are in excess of the then current Demand Limit, and in that event this Section 6.3(b) shall apply in order to calculate a new Monthly Charge for the month in which such event occurs and in all subsequent months of that Contract Year or the Term, as applicable, as though no prior Demand Limit for that Contract Year or Term, as applicable, had been established, but in no case shall a second or subsequent occurrence in any one Contract Year where actual electricity deliveries at the Point of Delivery exceed 67MVA constitute a second or third occurrence for the purposes of Sections 6.3(c)(ii) or 6.3(c)(iii), and for certainty, no such recalculation shall impact or adjust Monthly Charges for prior months. For certainty, Sections 6.3(c)(ii) or 6.3(c)(iii) only refer to a second or subsequent occurrence where actual electricity deliveries at the Point of Delivery exceed 67MVA in a different Contract Year;



Accepted for filing: APR 12 2010

Effective: DEC - 1 2010

Order: 619 70

SECRETARY

B.C. UTILITIES COMMISSION

- 16 -

- (d) the Nominated Wheeling Demand for that Contract Year is increased pursuant to Section 4.3, and provided that Sections 6.3(b) and 6.3(c) do not apply to that Contract Year, then the Wheeling Charge for the balance of that Contract Year shall be recalculated in accordance with Section 6.2 with "NWD" equal to such new Nominated Wheeling Demand; and
- (e) The Nominated Wheeling Demand for that Contract Year is increased pursuant to Section 4.3, and provided Section 6.3(b) applies to that Contract Year, and further provided that the increased Nominated Wheeling Demand exceeds the Demand Cap, then the amounts payable under 6.3(b) shall continue to be payable as provided for therein, and BCTC shall, commencing with the month the Nominated Wheeling Demand is so increased and for all subsequent months of that Contract Year, pay FortisBC an additional monthly charge equal to:

$$\$WR \times 1000 \times AA \times (CPI_{(Jan, n)} / CPI_{(Jan FWSP)})$$

where "WR" and " $(CPI_{(Jan, n)} / CPI_{(Jan FWSP)})$ " have the meanings given to them in Section 6.2; and "AA" means the increase in the Nominated Wheeling Demand beyond the Demand Cap.

Section 6.3(a) does not affect or limit FortisBC's obligations under Section 4.7(b). If "WR" (as defined in Section 6.2), once finally determined in accordance with Section 6.2 is different than the initial WR, FortisBC shall credit or invoice BCTC on its next invoice as necessary to adjust for the overage or shortfall invoiced to BCTC for previous months during that Contract Year.

For greater certainty, the Parties agree that Section 6.3(c) is intended to discourage BCTC from relying on this Agreement for the delivery of electricity at the Point of Delivery in excess of 67 MVA. Notwithstanding any other provision of this Agreement, nothing herein shall be construed as relinquishing or limiting any ability of BCTC or its customer BC Hydro to purchase Point-to-Point Transmission Service, as referred to in FortisBC's Electric Tariff Supplement No. 7, from FortisBC for the transmission of electricity in excess of 67 MVA available under this Agreement to the Point of Delivery at the price then specified in FortisBC's Electric Tariff for such Point-to-Point Transmission Service. The Parties further agree that Section 6.3(c) of this Agreement shall have no effect on BCTC's or BC Hydro's eligibility to receive pricing discounts in accordance with, or to make use of any other provisions of, a FortisBC tariff that is in effect at such time for such Point-to-Point service in excess of 67 MVA.

6.4 Audit Rights.

- (a) FortisBC shall provide BCTC, and/or a third party designated by BCTC, with reasonable and timely access to the books and records relevant to the Wheeling Service, and costs of the design, construction and associated overhead costs of new substation assets in the Duck Lake Substation required to provide the Wheeling Service, and to the premises where such books and records are located, to enable appropriate reviews, audits, inspections, examinations and monitoring to be conducted of the operations of FortisBC relating thereto, to verify, among other matters FortisBC's invoices (an "Audit"). FortisBC shall, and shall ensure that all of its personnel, provide full co-operation and assistance to BCTC in

Accepted for filing: **APR 12 2010**

Effective: **DEC - 1 2010**

619 10



SECRETARY

B.C. UTILITIES COMMISSION

- 17 -

conducting each Audit. Each Audit shall be scheduled to the extent reasonable, so as to minimize disruption to FortisBC's business operations.

- (b) Subject to paragraph (c) below, BCTC shall pay for all of its own costs and expenses incurred in connection with an Audit, and for greater certainty FortisBC shall pay for all costs and expenses incurred by FortisBC and all of its personnel in connection with the performance of its obligations as set out in this Section.

(c) Audit Discrepancies

- (i) Notwithstanding paragraph (b) above, where an Audit reveals one (1) or more material failures to meet the requirements of this Agreement, FortisBC shall pay for all costs and expenses of such Audit, and the Parties shall make such adjustments between them as required to rectify the failure; where an Audit reveals no material failures to meet the requirements of this Agreement, BCTC shall pay for all costs and expenses of FortisBC in co-operating and assisting in the conduct of such Audit.
- (ii) FortisBC shall ensure that any and all Audit findings concerning all failures to meet the requirements of this Agreement are promptly corrected by FortisBC to the reasonable satisfaction of BCTC.

6.5 Invoicing. FortisBC shall invoice BCTC for the amounts payable pursuant to Sections 6.1 and 6.3 within 30 days after the end of the applicable month. BCTC shall, within 30 days of receipt of the relevant invoice, pay all undisputed invoiced amounts to FortisBC without any right of set off in respect of monies payable by FortisBC to BCTC and, in respect of any invoiced amounts which BCTC disputes, initiate dispute resolution in accordance with Section 9. Interest shall accrue on all invoiced amounts not so paid by BCTC in accordance with Schedule 1 of FortisBC's Electrical Tariff, as amended and replaced from time to time, provided however, that interest shall not accrue on invoiced amounts which BCTC disputes and are determined to be amounts not payable in accordance with Section 9.

SECTION 7 INDEMNITIES

7.1 Indemnity. Each Party (the "Indemnifying Party") shall indemnify, hold harmless and defend (with counsel satisfactory to the other Party, acting reasonably) the other Party and each of its successors, assigns, subsidiaries, shareholders, affiliates, officers, directors, employees and agents (collectively, the "Indemnified Parties") from and against all liabilities, actions, claims, losses, costs, damages, penalties and expenses (including, without limitation, legal fees on a solicitor and own client basis) of any kind or nature whatsoever which may at any time be brought against, incurred or suffered by the Indemnified Parties directly or indirectly relating to:

- (a) any of the Indemnifying Party's representations and warranties in this Agreement not being true on the Effective Date; or
- (b) any breach by the Indemnifying Party of any of its covenants or other obligations in this Agreement.

Accepted for filing: **APR 12 2010**

Effective: **DEC - 1 2010**

619 10



SECRETARY

UTILITIES COMMISSION

- 18 -

7.2 **Consequential Damages.** Notwithstanding Section 7.1, in no event whatsoever will either Party be liable to the other Party, or its successors, assigns, subsidiaries, shareholders, affiliates, officers, directors, employees of agents, for consequential, exemplary, incidental, indirect, special or other similar damages including but not limited to lost profits, lost business revenue, loss of use, down time or other commercial or economic loss of any kind.

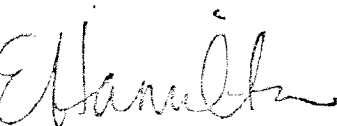
SECTION 8
OPERATING COMMITTEE

8.1 **Constitution.**

- (a) The Parties will establish a committee (the "**Operating Committee**") composed of one (1) representative from each Party to carry out the administration and operational aspects of this Agreement. Each Party will advise the other in writing of its initial appointments to the Operating Committee, and each Party will advise the other in writing of any replacements. Either Party may request the participation of a third party at an Operating Committee meeting to provide advice and input on operational matters, provided always that the Parties both consent to such participation, such consent not to be unreasonably withheld.
- (b) The Operating Committee will:
 - (i) exist for the duration of this Agreement;
 - (ii) meet by mutual agreement no less often than once per year, such agreement not to be unreasonably withheld or delayed;
 - (iii) keep a written record of its meetings and determinations;
 - (iv) require all Operating Committee representatives to participate to conduct a meeting;
 - (v) conduct its meetings at a mutually acceptable location or via telephone conference call; and
 - (vi) act reasonably, and use all reasonable efforts to expeditiously resolve issues for which the Operating Committee is responsible.

8.2 **Limited Authority of Operating Committee.**

- (a) The Operating Committee will perform such functions as the Parties direct including resolving and advising the Parties on technical issues including such issues as metering requirements.
- (b) Any technical advice provided by the Operating Committee will be in accordance with Good Utility Practice.
- (c) The Operating Committee has no authority to amend this Agreement.

Accepted for filing: **APR 12 2010**Effective: **DEC - 1 2010**Order No: **G 19 '10**

SECRETARY

B.C. UTILITIES COMMISSION

- 19 -

**SECTION 9
DISPUTE RESOLUTION**

9.1 Disputes. If any dispute, question or difference of opinion between the Parties arises out of or under the Agreement ("Dispute"), then a Party may give to the other Party a notice ("Dispute Notice") specifying the Dispute and requiring its resolution under this Section 9. All Disputes must be resolved in accordance with the provisions of this Section 9, provided however, that any Party may apply to a court of competent jurisdiction for any interim relief by way of restraining order, injunction or other equitable remedy.

9.2 Contract Representatives to Seek Resolution. If the Dispute is not resolved within 5 Business Days after a Dispute Notice is given to the other Party, each Party shall cause its Contract Representatives to negotiate in good faith to attain a resolution of the Dispute.

9.3 Presidents to Seek Resolution. If the Dispute is not resolved within 5 Business Days of the Dispute being referred to the Contract Representatives, the Presidents of the Party shall negotiate in good faith to attain a resolution of the Dispute.

9.4 Resolution by BCUC. If the Dispute is not resolved within 10 Business Days of the Dispute being referred to the Presidents, then either Party may submit the Dispute to the BCUC for resolution.

9.5 Arbitration. If the BCUC is unable or unwilling to resolve a Dispute submitted to it in accordance with Section 9.4, then either Party may submit the Dispute to arbitration administered by the British Columbia International Commercial Arbitration Centre pursuant to its Rules for Domestic Commercial Arbitration Proceedings. The number of arbitrators shall be three (3). The place of arbitration shall be Vancouver, British Columbia, Canada. The language used shall be English.

9.6 Adjudication in Law and Equity. The arbitrator must adjudicate the dispute, and may grant remedies, in both law and equity.

9.7 Shared Costs. Each Party shall bear its own costs of legal representation and presentation of its case. The other costs of the arbitration, including the fees and expenses of the arbitrator and administrative fees and charges, shall be shared equally by the Parties.

**SECTION 10
REGULATORY**

10.1 Filing with BCUC. The Parties shall cooperate so as to jointly file this Agreement with the BCUC within a reasonable time after the Effective Date for purposes of seeking their respective required regulatory approvals. BCTC shall be responsible for preparing and leading the application.

10.2 Regulatory Support. Both Parties shall take all reasonable steps to secure their respective required regulatory approvals.

10.3 Regulatory Review Termination. Either Party may terminate this Agreement without liability or penalty immediately upon written notice to the other Party if the BCUC has not accepted or approved in accordance with the Utilities Commission Act: (i) this Agreement

Accepted for filing: **APR 12 2010**Effective: **DEC - 1 2010**Order No.: **619 '10**
SECRETARY
B.C. UTILITIES COMMISSION

- 20 -

as a FortisBC rate schedule; (ii) the amounts to be paid by BCTC pursuant to Section 6.1; (iii) a rate schedule for BCTC that permits it to charge the amounts to be paid by BCTC pursuant to Section 6.3 to BC Hydro; (iv) the Point of Delivery as a point of delivery, and the Wheeling Facilities as part of the transmission system, for purposes of Network Integration Transmission Service provided by BCTC to BC Hydro pursuant to BCTC's Open Access Transmission Tariff; (v) that sufficient consultation, and accommodation if required, with First Nations has been completed for this Agreement; and (vi) this Agreement and all transactions and applications contemplated hereby for any other reason, in each case without condition or material variation, on or before March 31, 2010.

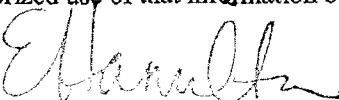
10.4 Commission Jurisdiction. This Agreement and all the terms and conditions contained in it shall be subject to the provisions of the *Utilities Commission Act* (British Columbia) and to the jurisdiction of the BCUC.

SECTION 11 CONFIDENTIALITY

11.1 Confidentiality. Subject to Section 11.2, each Party will keep in confidence all Confidential Information disclosed to it by the other Party, and will not use or disclose any such Confidential Information for any purpose other than as required to perform its obligations under this Agreement. Each Party shall take all reasonable steps to ensure that any Confidential Information in its possession or control is adequately protected against further disclosure or unauthorized access and is not used for any purpose other than in connection with this Agreement.

11.2 Exclusions. Section 11.1 does not apply to any information which:

- (a) is or becomes in the public domain through no action or failure on the part of the receiving Party;
- (b) is generally disclosed to third parties without restriction on such third parties on use or disclosure;
- (c) is relevant in respect of any litigation or Dispute resolution proceedings between or among the Parties, but only to the extent disclosure is required to prosecute or defend such proceedings;
- (d) is required to be disclosed by law; or
- (e) a Party discloses to its professional advisors, consultants and other agents (each an "Agent") provided:
 - (i) such disclosure is limited on a strictly need-to-know basis and is made for purposes of serving the needs and advancing the interests of the Party;
 - (ii) such disclosure is made on the basis that the information will be maintained in confidence by the Agent; and
 - (iii) the disclosing Party will be responsible for any breach of confidentiality or unauthorized use of that information by its Agents.

Accepted for filing: **APR 12 2010**Effective: **DEC - 1 2010**Order No. **619 10**SECRETARY
B.C. UTILITIES COMMISSION

- 21 -

**SECTION 12
GENERAL**

12.1 Contract Representatives. To assist with the administration of this Agreement and the resolution to Disputes, if any, each Party shall nominate a representative from its management to be responsible for the administration of this Agreement (each, a "Contract Representative"). Each Party may change its Contract Representative from time to time by written notice to the other Party in accordance with Section 12.2. A Contract Representative may delegate his or her role to another management representative in the event of an absence or another reason preventing the Contract Representative from carrying out his or her role by written notice to the other Party in accordance with Section 12.2.

12.2 Notice. Any communication or notice required or desired to be given pursuant to this Agreement shall be in writing and actually delivered (including by facsimile or e-mail) to the other Party addressed as follows:

If to BCTC:

British Columbia Transmission Corporation
Suite 1100, Four Bentall Centre
1055 Dunsmuir Street
PO Box 49260
Vancouver, BC
V7X 1V5
Attention: Manager, Transmission Contracts
Fax: 604-699-7539

with a copy to:

British Columbia Transmission Corporation
Suite 1100, Four Bentall Centre
1055 Dunsmuir Street
PO Box 49260
Vancouver, BC
V7X 1V5
Attention: General Counsel
Fax: 604-699-7426

If to FortisBC:

FortisBC Inc.
100 Bingay Road
PO Box 130
Trail, BC
V1R 4L4
Attention: Superintendent, System Control Centre
(250) 368-4955

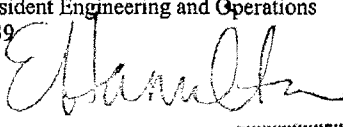
with a copy to:

FortisBC Inc.
100 - 1975 Springfield Road
Kelowna, BC
V1Y 7V7
Attention: Vice-President Engineering and Operations
Fax: 1-866-614-1339

Accepted for filing: **APR 12 2010**

Effective: **DEC - 1 2010**

Order No: **619 10**


SECRETARY

B.C. UTILITIES COMMISSION

- 22 -

or at such other address as such Party may from time to time designate by notice delivered in accordance with this Section 12.2. Any notice shall be deemed to have been given on the day delivered, if delivered by hand, and within four Business Days following the date of posting, if mailed; provided that if there shall be at the time or within four Business Days of mailing a mail strike, slow-down or other labour dispute that might affect delivery by mail, then the notice shall be effective only when actually delivered. If faxed, notice will be deemed to have been given and received on the Business Day following the date of faxing. If given by email, notice will be deemed to have been given only upon receipt by Party giving notice from the Party receiving notice confirmation by return email that the Party receiving notice has received such notice.

12.3 Enurement. This Agreement shall enure to the benefit of and be binding upon the Parties and their respective successors and permitted assigns.

12.4 Time of the Essence. Time is expressly declared to be of the essence of this Agreement.

12.5 Waiver. Any waiver by a Party must be made in writing and shall be limited to the particular instance and shall not extend to any other instance or matter in this Agreement or in any way otherwise affect the rights or remedies of such Party.

12.6 Further Assurances. The Parties agree to use all reasonable efforts to execute and deliver all such other and additional instruments or documents and to do all such other acts and things as may be necessary to give full effect to this Agreement.

12.7 Assignment. Neither Party shall have any right to transfer or otherwise assign this Agreement or any rights, powers, duties or obligations hereunder to any other person or entity without the prior written consent of the other Party hereto, which is not to be unreasonably withheld. Notwithstanding the foregoing, BCTC may on written notice to FortisBC, and provided BC Hydro agrees in writing with FortisBC to assume all of BCTC's obligations hereunder, assign all of its right, title and interest in and to this Agreement to BC Hydro.

12.8 Force Majeure. A Party shall not be considered in default in performing any obligation under this Agreement to the extent it is prevented or delayed in performing such obligation by Force Majeure. A Party relying upon Force Majeure shall give prompt written notice to the other Party of any such Force Majeure and shall use all reasonable efforts in accordance with Good Utility Practice to mitigate the effect of the Force Majeure. A Party shall not be relieved of any obligation for delay caused by Force Majeure if, by any act or omission, the Party has contributed materially to the delay. Where a time or period of time is stipulated for the performance of any obligation and Force Majeure has been relied upon as delaying such performance, the time or period of time for such performance shall be extended by the length of time the Force Majeure operates to delay or prevent such performance, but if any such delay continues or is reasonably expected to continue for more than five (5) years (an "**Extended Force Majeure Event**"), a Party not relying on such Extended Force Majeure Event may terminate this Agreement in accordance with Section 2.2. No Force Majeure affects or limits FortisBC's obligations under the last sentence of Section 4.7(b).

12.9 Taxes. Each of the Parties hereto agrees that it will account for any GST and PST payable by it in respect of the transactions referred to herein.

Accepted for filing: **APR 12 2010**Effective: **DEC - 1 2010**Order No.: **619 10**

SECRETARY

B.C. UTILITIES COMMISSION

- 23 -

12.10 **Counterparts and Electronic Delivery.** This Agreement may be executed in counterparts and if so executed such counterparts shall be read and construed together as if they formed one document. A counterpart signed by a Party and delivered electronically shall have the same effect as a counterpart originally signed and delivered by such Party.

IN WITNESS WHEREOF the Parties have executed this Agreement on the date first above written.

**BRITISH COLUMBIA
TRANSMISSION CORPORATION**

Per: _____

Authorized Signatory

FORTISBC INC.

Per: _____

Authorized Signatory

Accepted for filing: **APR 12 2010**

Effective: **DEC - 1 2010**

Order No.: **619 10**


SECRETARY
B.C. UTILITIES COMMISSION

Attachment 8.4

800-4-A-ARTIST
OR 503-251-1234 FAX 503-251-1235
6770 NE 17th Ave. Portland, OR 97218

[illegible][illegible]

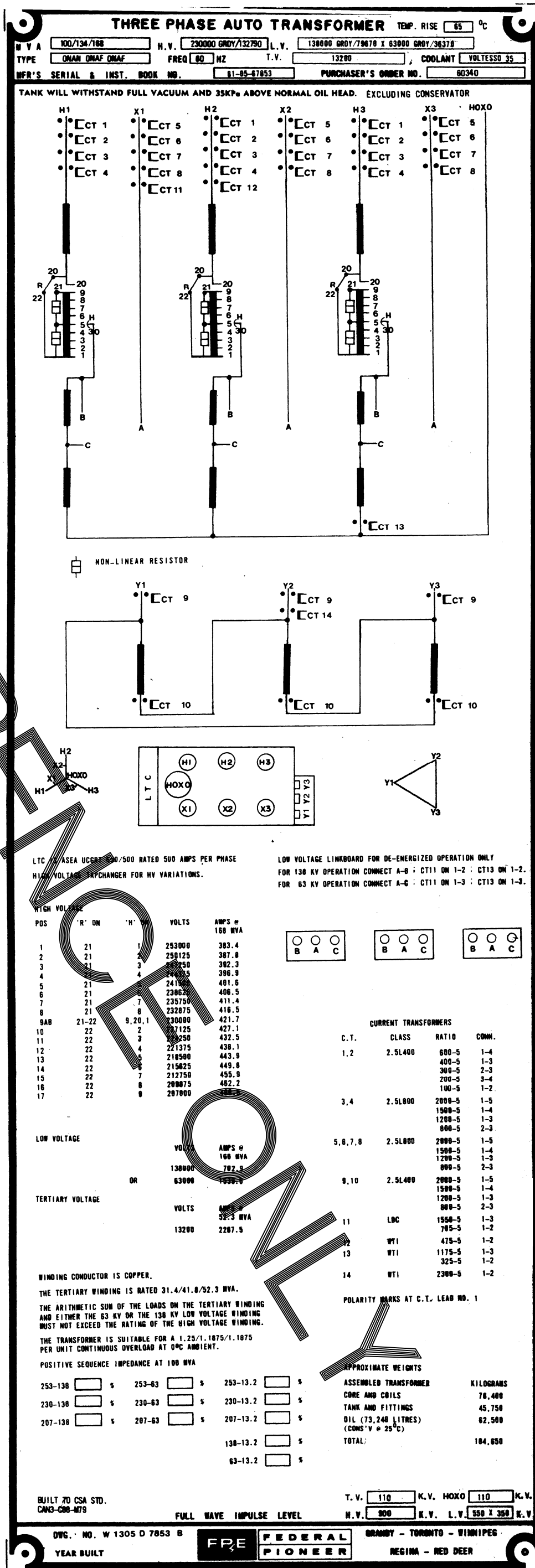
THE INFORMATION NOTED BELOW ARE NOT STAMPED IN SPACE INDICATED;
IMPEDANCE AFTER TEST

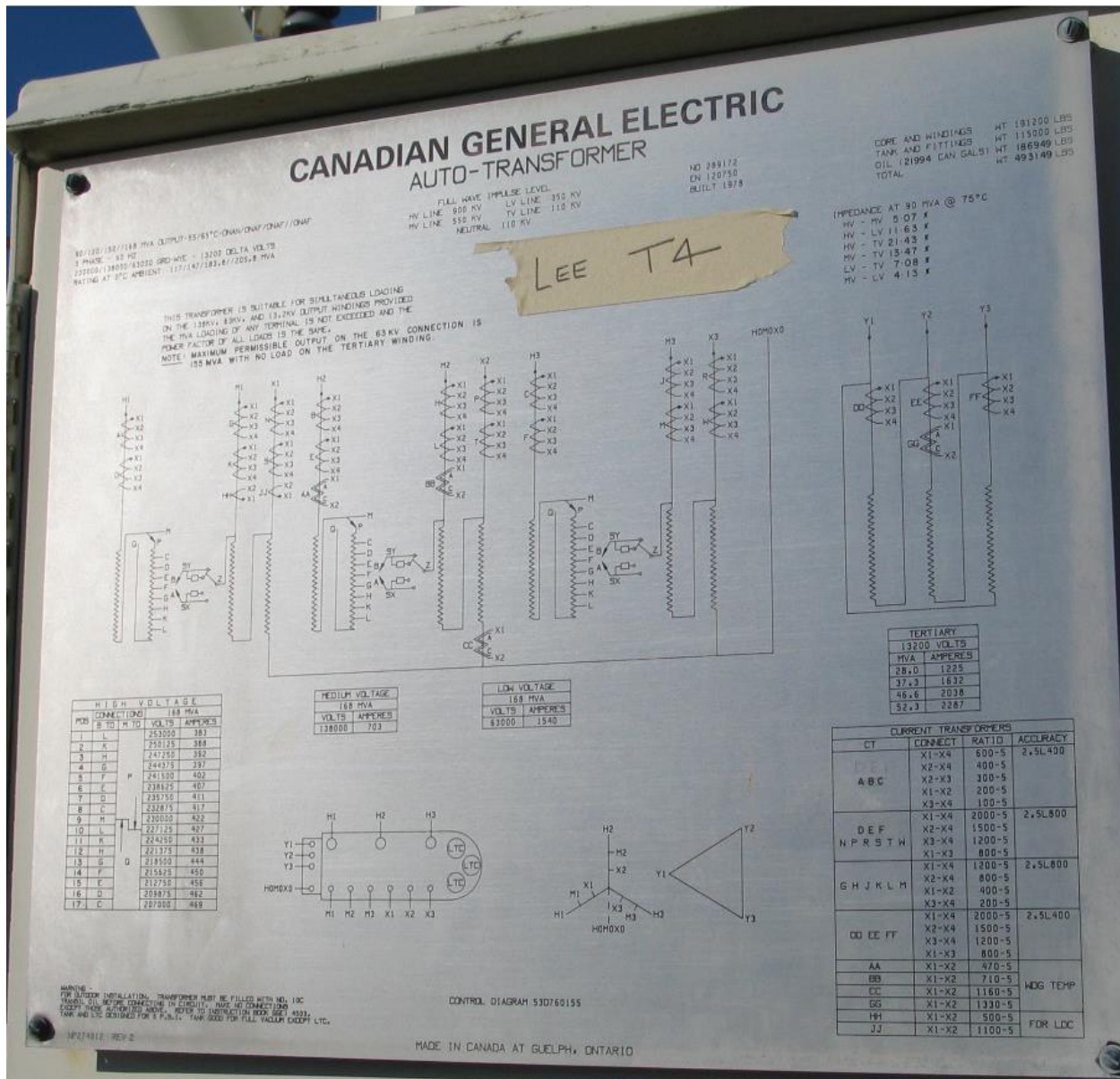
FEDERAL PROJECT 119917ED
GRANTY-TO: **WEST KOOTENAY**
BY **G. Paul** DATE **11/19/75**

5.07 330-138
GUARANTEED IMPEDANCE **18.64** **1/30-1/23**
ACTUAL IMPEDANCE **18.64** IN ACTION TEST

FOR REFERENCE

FOR REFERENCE ONLY
JUNE/07







THREE-PHASE AUTO-TRANSFORMER

HV: 230/132.8 kV Grd Y

LV: 132/76.21 kV Grd Y

TV: 25 kV

FREQUENCY: 60 Hz

SERVICE: CONTINUOUS

SERIAL NUMBER: 97043130

PLANT OF MANUFACTURE: PAUWELS CANADA INC

CONTRACT NUMBER: LPT04018

YEAR OF MANUFACTURE: 2004

STANDARD: CSA-C88-M90

POWER RATING

COOLING METHOD	TEMP RISE [C]	HV	LV	TV
ONAN	65	120	120	0.5
ONAF	65	160	160	0.5
ONAF	65	200	200	0.5

POSITIVE-SEQUENCE IMPEDANCE AT
120 MVA, 85°C

LTC POS	H-X	X-Y	H-Y
17	7.67	24.72	34.32

ZERO-SEQUENCE IMPEDANCE AT
120 MVA, 85°C

LTC POS	H-X	X-Y	H-Y
17	6.92	22.09	28.65

LOAD TAP-CHANGER:

MR 3 x MI-601-170/B-18353W
RATED 600 AMPERES PER PHASE

UNIT IS SUITABLE FOR SIMULTANEOUS VECTORIAL LOADING OF ALL CIRCUITS PROVIDED THAT THE TV IS LOADED WITH INDUCTIVE REACTIVE POWER AND THE MAXIMUM LOADING OF THE HV & LV CIRCUIT IS AS SHOWN IN THE TABLE BELOW:

STEP-DOWN/STEP-UP OPERATION

	ONAN	ONAF	ONAF	
HV	102.2/91.5	136.2/128.3	170.3/163.9	MVA
LV	91.7/102.0	128.6/135.9	164.2/169.9	MVA
TV	45	45	45	MVA _r

LIGHTNING IMPULSE LEVEL [kV]

	WINDINGS	BUSHINGS
H1 H2 H3	850	1 050
X1 X2 X3	550	550
Y1 Y2 Y3	150	150
HOX0	110	110

INSULATING LIQUID: VOLTESSO N36

MINERAL OIL TO CSA C50: CLASS A, TYPE 11
LESS THAN 1 ppm PCBs AT TIME OF SHIPMENT

MVA _r		THREE-PHASE AUTO				CUP	
INGS		HIGH-VOLTAGE LOAD TAP-CHANGER - LTC				C.T.	
0		LTC POS	'K' ON	'A' ON	VOLTS	AMPS AT 200 MVA	1,2,3
0		1	+	1	253 000	456	
0		2		2	251 563	459	
0		3		3	250 125	462	
0		4		4	248 688	464	
		5		5	247 250	467	
		6		6	245 813	470	
		7		7	244 375	473	4,5,6
1		8		8	242 938	475	
ENT		9		9	241 500	478	
		10		10	240 063	481	
X3		11		11	238 625	484	8,9
•	CT4	12		12	237 188	487	
•	CT5	13		13	235 750	490	
•	CT6	14		14	234 313	493	
•	CT7	15		15	232 875	496	
		16		16	231 438	499	10,11
		17A		17	230 000	502	
		17	- +	K	230 000	502	
		17B		1	230 000	502	
		18		2	228 563	505	12
		19		3	227 125	508	13
		20		4	225 688	512	14
		21		5	224 250	515	15
		22		6	222 813	518	
		23		7	221 375	522	
		24		8	219 938	525	
		25		9	218 500	528	POLAR
		26		10	217 063	532	CT CO
		27		11	215 625	536	WTI -
		28		12	214 188	539	LDC -
		29		13	212 750	543	
		30		14	211 313	546	
		31		15	209 875	550	
		32		16	208 438	554	
		33		17	207 000	558	
LOW VOLTAGE		VOLTS		AMPS AT			

ENERGY IS OUR BUSINESS

THREE-PHASE AUTO-TRANSFORMER

HV: 230/132.8 kV Grd Y
 LV: 132/76.21 kV Grd Y
 TV: 25 kV
 FREQUENCY: 60 Hz
 SERVICE: CONTINUOUS

SERIAL NUMBER: 97043130
 PLANT OF MANUFACTURE: PAUWELS CANADA INC
 CONTRACT NUMBER: LPT04018
 YEAR OF MANUFACTURE: 2004
 STANDARD: CSA-C88-M90

POWER RATING

COOLING METHOD	TEMP RISE [C]	HV	LV	TV
ONAN	65	120	120	0.5
ONAF	65	160	160	0.5
ONAF	65	200	200	0.5

POSITIVE-SEQUENCE IMPEDANCE AT 120 MVA, 85°C

LTC POS	H-X	X-Y	H-Y
17	7.67	24.72	34.32

ZERO-SEQUENCE IMPEDANCE AT 120 MVA, 85°C

LTC POS	H-X	X-Y	H-Y
17	6.92	22.09	28.65

LOAD TAP-CHANGER:
 MR 3 x MI-501-170/B-1835.3W
 RATED 600 AMPERES PER PHASE

UNIT IS SUITABLE FOR SIMULTANEOUS VECTORIAL LOADING OF ALL CIRCUITS PROVIDED THAT THE TV IS LOADED WITH INDUCTIVE REACTIVE POWER AND THE MAXIMUM LOADING OF THE HV & LV CIRCUIT IS AS SHOWN IN THE TABLE BELOW:

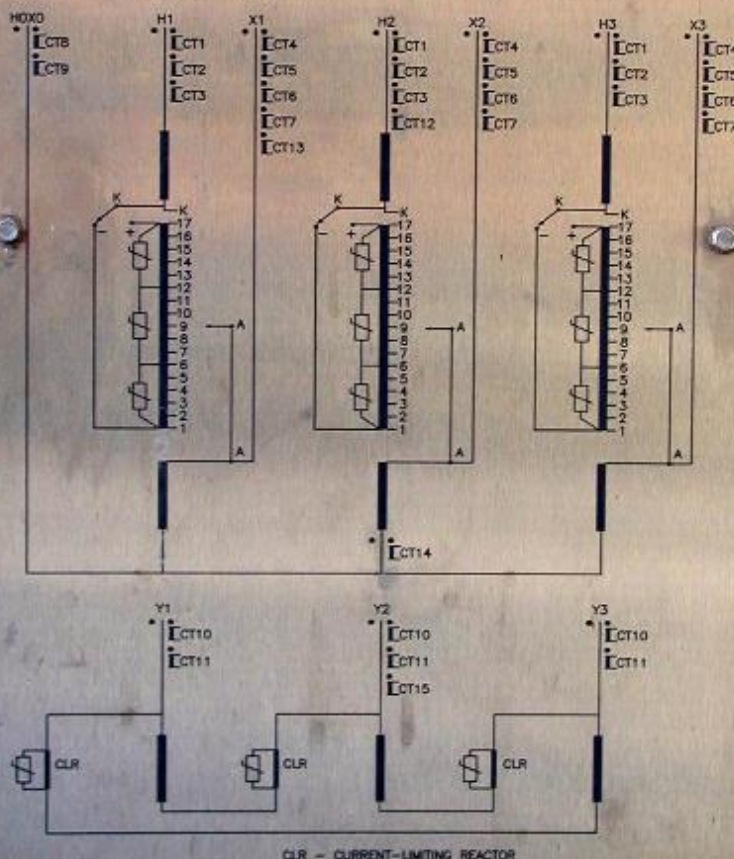
STEP-DOWN/STEP-UP OPERATION

	ONAN	ONAF	ONAF	
HV	102.2/91.5	136.2/128.3	170.3/163.9	MVA
LV	91.7/102.0	128.6/135.9	164.2/169.9	MVA
TV	45	45	45	MVA

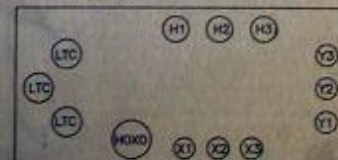
LIGHTNING IMPULSE LEVEL (kV)

	WINDINGS	BUSHINGS
H1 H2 H3	850	1 050
X1 X2 X3	550	550
Y1 Y2 Y3	150	150
H0X0	110	110

INSULATING LIQUID: VOLTESSO N36
 MINERAL OIL TO CSA C50: CLASS A, TYPE 11
 LESS THAN 1 ppm PCBs AT TIME OF SHIPMENT



CLR - CURRENT-LIMITING REACTOR



CURRENT TRANSFORMERS			
C.T.	CLASS	RATIO	CONNECT
1,2,3	2.5L800	600:5	1-5
		400:5	1-4
		150:5	1-3
		100:5	1-2
4,5,6,7	2.5L800	1200:5	1-5
		800:5	1-4
		300:5	1-3
		200:5	1-2
8,9	2.5L800	1200:5	1-5
		800:5	1-4
		300:5	1-3
		200:5	1-2
10,11	2.5L800	2000:5	1-5
		1500:5	1-4
		1200:5	1-3
		400:5	1-2
12	WTI	600:5	1-2
13	LDC	900:5	1-2
14	WTI	400:5	1-2
15	WTI	1200:5	1-2
POLARITY MARKS AT CT LEAD No. 1			
CT CONTINUOUS CURRENT RATING FACTOR = 1.33			
WTI - WINDING TEMPERATURE INDICATOR CT			
LDC - LINE-DROP COMPENSATOR CT			

Attachment 9.2

FILED CONFIDENTIALLY