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September 5, 2023

Commercial Energy Consumers Association of British Columbia
c/o Owen Bird Law Corporation
Vancouver Centre II
2900 – 733 Seymour Street
Vancouver, BC
V6B 0S6

Attention: Christopher P. Weafer

Dear Christopher P. Weafer:

Re: FortisBC Inc. (FBC)

Application for Approval of a Certificate of Public Convenience and Necessity for the A.S. Mawdsley Terminal Station Project (Application) ~ Project No. 1599424

Response to the Commercial Energy Consumers Association of BC (CEC) Information Request (IR) No. 2

On February 24, 2023, FBC filed the Application referenced above. In accordance with the regulatory timetable established in BCUC Order G-70-23 and Exhibit A-9 [1] for the review of the Application, FBC respectfully submits the attached response to CEC IR No. 2.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC INC.

Original signed:

Sarah Walsh

Attachments

cc (email only): Commission Secretary
Registered Interveners

[1] By letter dated August 23, 2023, the Panel granted FBC an extension to file its responses to IR No. 2 on Tuesday, September 5, 2023.

34. Reference: Exhibit B-7, CEC 1.4.1

4. Reference: Exhibit B-1, page 13 and page 13

The Boundary and Similkameen areas cover a large geographical area. The areas account for approximately 19 percent of FBC's total summer and winter peak load.

Based on 2022 customer data, FBC has approximately 26,000 direct customers in the Boundary and Similkameen areas, which are broken down by rate class in Table 3-1 below.

Table 3-1: FBC Similkameen and Boundary Area Customers by Rate Class

Rate Class	Customer Count
Residential	20,708
Small Commercial / Commercial	3,866
Large Commercial/Industrial	12
Irrigation	725
Lighting	869
Wholesale	3
Total	**26,183**

4.1 Please provide the equivalent table breaking down revenue by rate class.

Response:

While FBC does record revenue by rate class for the service area as a whole, a breakdown of revenue by rate class for the Boundary and Similkameen areas cannot reasonably be provided due to the number of billing variables for each customer class.

34.1 Please provide the breakdown of revenue by rate class for the service area as a whole and include the customer numbers for each rate class.

Response:

The following table provides the 2022 revenue and customer counts for the service area as a whole.

Rate	2022 Revenue ($000s)	2022 Avg. Customers (000s)
Residential	212,478	127,899
Commercial	106,699	16,674
Wholesale	53,923	6
Industrial	47,034	42
Lighting	2,244	1,391
Irrigation	3,404	1,100
Total	425,782	147,112

34.2 Please provide the consumption quantities for both the whole service area, and the Similkameen and Boundary area, if possible.

<u>Response:</u>

The 2022 consumption quantity (total load) for the whole service area was 3,470 GWh and for the Boundary and Similkameen areas were 949 GWh.

35. Reference: Exhibit B-7, CEC 1.4.2

4.2 Please provide total, summer, winter and peak load for each rate class in the Similkameen and Boundary areas served by FBC, and please identify the % they represent of the total FBC total, summer, winter and peak load.

Response:

FBC is not able to break down peak load by rate class for the Boundary and Similkameen areas. FBC's metering equipment does not make this distinction when recording data.

35.1 If possible, please provide the requested breakdown for the area as a whole.

35.1.1 If this is not possible, please explain the methodology by which FBC conducts its Cost of Service analysis and provide the requested information from that basis.

Response:

FBC is not able to break down the peak load by rate class for the service area as a whole because FBC's metering equipment does not make this distinction when recording data.

For the purposes of FBC's Cost of Service analysis, FBC breaks total load (not peak load) of the service area down by rate class, as provided below.

Rate	2022 Load, GWh
Residential	1,320
Commercial	969
Wholesale	575
Industrial	558
Lighting	9
Irrigation	38

36. Reference: Exhibit B-7, CEC 1.5.2 and 1.15.1

5.2 Given that FBC has allowed the N-1 criteria to be exceeded since 2017, what is the frequency of instance where the capability of one of the transformers can be exceed before upgrade action is necessary, and what is the duration of instances where the capability of one of the transformers can be exceed before upgrade action is necessary?

5.2.1 Please confirm or otherwise explain that if the frequency and duration of the instances, where the N-1 criteria is exceeded for one of the transformers, is small, then the probability of a forced outage will likely be exceedingly small, thereby supporting the FBC decision not to react on the initial instances of exceeding the N-1 criteria.

Response:

FBC considers that upgrade action is necessary to ensure compliance with N-1 criteria and should be taken as soon as practical; therefore, the number and duration of instances or joint probabilities of failure related to transformer overloading are not the critical considerations in deciding to take upgrade action.

As explained in the response to CEC IR1 1.1, FBC identified the need for the ASM transformer replacements in the 2020-2024 MRP Application, and later identified the need for a larger ASM project in the 2023 Annual Review. Further, as explained in the response to BCUC IR1 2.21, FBC has been implementing operational changes to manage new load and transformer overloading since 2019; however, these changes are temporary and a permanent solution (i.e., the Project) must be undertaken.

Section 3 of the Application sets out in detail the drivers of the Project need that require FBC to proceed with the CPCN, which includes addressing N-1 system reliability criteria that are further impacted by load growth in the area, but also to address the high failure risk of the transformers at the ASM Terminal Station due to their age and condition.

Please also refer to the response to BCUC IR1 3.5 where FBC explains how it arrived at the conclusion that a Probability of Failure higher than 2 percent for the ASM transformers is not acceptable. Further, and as supported by the Condition Assessment Report prepared by Hitachi (Appendix B to the Application), FBC has considered many factors in its determination that the ASM transformers must be replaced, including the impact of overloading on the transformers and the results of the On-Load Tap Changers' Dissolved Gas Analysis. Please refer to the responses to BCUC IR1 3.6 and 3.6.1 for further details.

5.5 Please provide the probability of both transformers failing at the same time and compare this to the probability of one of the transformers failing.

Response:

The calculated probability of either ASM T1 or T2 failing is 2.35 percent to 2.41 percent.

The calculated probability of both ASM T1 and T2 failing is 0.056 percent.

However, the above calculated probability does not take into account the increasing Risk of Failure over time associated with overloading of the remaining unit.

15.1 Please confirm, or otherwise explain, that to the extent that the probability of failure is in the range of 2.25% to 2.5% for the year, that the Importance level moves from Priority to Urgent.

15.1.1 Please explain whether or not Urgent would be more or less urgent if the probabilities increased above this range or decreased somewhat from this range.

Response:

Not confirmed. FBC does not have access to the detailed interpretation of Figure 7 in Appendix B of the Application, however, as discussed in the response to BCOAPO IR1 7.1, it is FBC's interpretation that a Probability of Failure (PoF) below 2 percent would downgrade the need for intervention from "Urgent" to "Priority". It is FBC's interpretation that power transformers with a PoF over 2 percent and the same "Importance", regardless of how much over 2 percent, would be classified as "Urgent" as per Figure 7 in the Hitachi report (Appendix B).

36.1 Please confirm that the FBC use of N-1 criteria for managing the electrical system is based on the failure of any given single component and does not examine the potential failures of combinations of multiple components.

Response:

The FBC transmission system is planned and reinforced for single contingencies (N-1), whereas multiple components (N-2) contingencies are studied under the transmission planning standards.

36.2 Please confirm that the .056% probability of both ASM T1 and T2 failing at the same time, which would result in an outage for the area serviced for the duration of at least the down time for the transformer most quickly put back into service.

Response:

Currently, the ASM T1 and T2 transformers are operated in parallel. The calculated risk of simultaneous failure, considering the Hitachi evaluation of Risk of Failure for the ASM T1 and T2 transformers, is 0.056 percent. Simultaneous failure would create two major reliability issues:

- The Boundary region would be supplied from the Vaseux Lake Terminal Station via the Bentley Terminal Station up to approximately 200 MW before voltage violation would occur; and
- The Boundary region would be fed radially from the Bentley Terminal Station. Any other transmission contingency events would lead to a blackout of the Boundary region.

Please also refer to the response to BCOAPO IR2 23.2.1.

36.3 Please confirm the capacity for each of the ASM T1 and T2 transformers and compare this to the capacities of two new transformers and the other transformers in the WTS.

Response:

The table below provides the current capacity of each of the ASM T1 and T2 power transformers and compares these current capacities to the new transformers (WTS T3 and T4) and the other existing transformers at WTS. FBC notes that WTS T1 and T2 are shown in both the “current” and "future" columns in the table because their capacities remain unchanged after the completion of the ASM Project.

	Current Power Transformer Capacity Ratings		Future Power Transformer Capacity Ratings	
Operating Voltages	Equip. ID.	Rating[1] (MVA)	Equip. ID.	Rating (MVA)
230 / 63 kV	WTS T1	120/160/200 MVA	WTS T1	120/160/200 MVA
230 / 63 kV	WTS T2	120/160/200 MVA	WTS T2	120/160/200 MVA
63 / 161 kV	ASM T1[2]	60/80 MVA	WTS T3	90/120/150 MVA
63 / 161 kV	ASM T2[2]	60/80 MVA	WTS T4	90/120/150 MVA

1 Ratings are presented as ONAN (oil-natural, air-natural) / ONAF1 (oil-natural, air force level 1) / ONAF2 (oil-natural, air force level 2).

2 ASM T1 and T2 do not have an ONAF2 rating.

36.4 Please provide the anticipated probability of failure for the new transformers and confirm that in WTS there are currently two other transformers capable of providing service, such that any joint probability assessment would be further reduced in percentage probability terms.

Response:

FBC assumes the two new transformers (WTS T3 and T4) will have an individual rate of failure between 0.25 and 0.5 percent, up until around the age of 35 (after the start-up and early operation period ends) based on the CIGRE WG12-05 report "An International Survey of Failure in Large Power Transformers".

The two existing WTS transformers (WTS T1 and T2) are 21 years old and in stable condition. FBC assumes that the two existing transformers have an individual rate of failure between 0.25 and 0.5 percent based on the CIGRE WG12-05 report.

WTS T1 and T2 are not capable of providing service in lieu of WTS T3 and T4 because they are rated for different voltage conversions. WTS T1 and T2 convert 230 kV to 63 kV, whereas WTS T3 and T4 (i.e., the new transformers proposed as part of the ASM Project) will convert 63 kV to 161 kV.

36.5 Please confirm that the Warfield Terminal Station would have the capacity to meet the Boundary and Similkameen load requirements and growth, as well as continuing to provide service to the area currently served by WTS.

Response:

Please refer to the response to BCUC IR2 29.2.

37. Reference: Exhibit B-7, CEC 1.11.1 and Exhibit B-6, BCOAPO 1.7.1

11. Reference: Exhibit B-1, Appendix B, PDF pages 93-97

Figure 2 – Relative risk of short circuit failure for the transformers

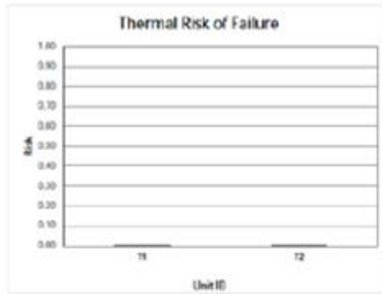


Figure 3 – Relative risk of thermal failure for the transformers

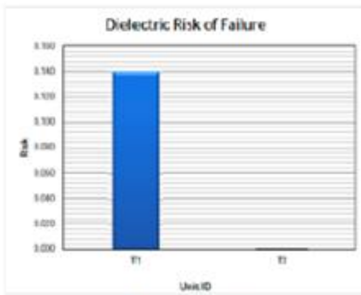


Figure 4 – Relative risk of dielectric failure for the transformers

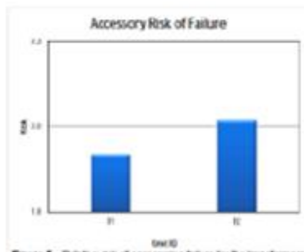


Figure 5 – Relative risk of accessories failure for the transformers

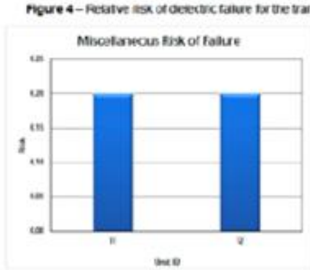


Figure 6 – Relative risk of miscellaneous failure for the transformers

11.1 Please confirm that the risk numbers represent the probability of failure in the year for a single transformer.

Response:

Confirmed. Please refer to the response to BCOAPO IR1 7.1 for further explanation.

"Figure 2 shows a histogram of the transformers as a function of the relative risk of short circuit. Both units are showing low short circuit risk."[1]

"Figure 3 shows there is no associated thermal risk to the transformers."[2]

"Figure 4 shows the distribution of the relative risk of dielectric failure for the population of transformers. The units with the highest risk of dielectric failures are identified in the histogram."[3]

With regard to auxiliary devices (bushings and tap changer), Figure 5 shows that ASM T2 has a higher risk than ASM T1.[4] As shown in Figure 5, both ASM T1 and ASM T2 have an associated risk in this category of approximately 1.8.

"Figure 7 shows a plot of the risk of failure vs. importance for unit. The Urgent, Priority, and Normal boundaries were also shown on this plot, so that the transformer could be categorized. From Figure 7 we see that both transformers are in the Urgent (Red) category. Figure 8 shows a histogram of the failure rate of the transformer, which is a combination of the information from each of the individual risk categories."[5]

37.1 Please confirm that the probability for each of the causes of failure for the ASM T1 and T2 transformers which would create a transformer failure and are therefore subsumed in the individual probability of the T1 and T2 transformer failures.

Response:

Figure 9 of the Hitachi Report confirms that the overall transformer Risk of Failure is a summation of the individual Risk of Failure categories.

38. Reference: Exhibit B-7, CEC 1.5.6

5.6 Please provide the historical data with respect to the frequency of load exceeding one of the transformer's capabilities from 2017 to present and provide the duration for the load exceeding the capabilities of one of the transformers for each instance.

Response:

FBC provides the following table showing the number of instances, hours and percentage of the year where load exceeded the capabilities of one ASM transformer. FBC clarifies that for all of these instances, both transformers were in service and thus not overloaded.

Year	2017	2018	2019	2020	2021	2022
Number of Hours	2,577	1,863	1,589	1,832	1,033	2,047
Percentage of Year	29%	21%	18%	21%	12%	23%
Number of Instances	170	208	178	175	107	212

38.1 With the exception of 2022, the hours of exceedance have been generally declining since 2017. Please explain if there are any specific circumstances in 2022 which impacted the number of hours of exceedance.

Response:

The flow through the ASM transformers is determined by three main factors, of which FBC has limited control:

- The Boundary and Similkameen load (i.e., customer demand). FBC has been seeing increased demand in recent years, specifically with industrial load, which has had an impact on ASM transformer loadings.
- Generation dispatch (with generation from the BC Hydro-owned Waneta hydroelectricity facility (WAN) having the greatest impact). As WAN generation increases, so does the flow along 34 Line and ASM T1 and T2. WAN generation is dispatched by BC Hydro based on provincial system requirements; therefore, FBC does not have control over the WAN generation dispatch.
- System configuration. BC Hydro's system configuration greatly impacts the flows along FBC's system due to the interconnected system with BC Hydro. The 11 Line path, which includes the ASM transformers, is operated closed (not radial) and flows are impacted by flows on the overall BC transmission system and generation output in the Kootenay area.

Due to these three factors, FBC is unable to isolate the specific circumstance(s) that would cause year-to-year fluctuations. Regardless of the year-to-year fluctuations, overloading will continue in the absence of the ASM Project.

38.2 Please provide FBC's understanding as to why the hours of exceedance has been inconsistent, and generally declining since 2017, and please relate to population growth in the area.

Response:

Please refer to the response to CEC IR2 38.1.

38.3 Dividing the number of hours by the number of instances works out to about 9-10 hours per instance, with the exception of 2017, which is 15. Please explain why the average hours per instance was so much higher in 2017.

Response:

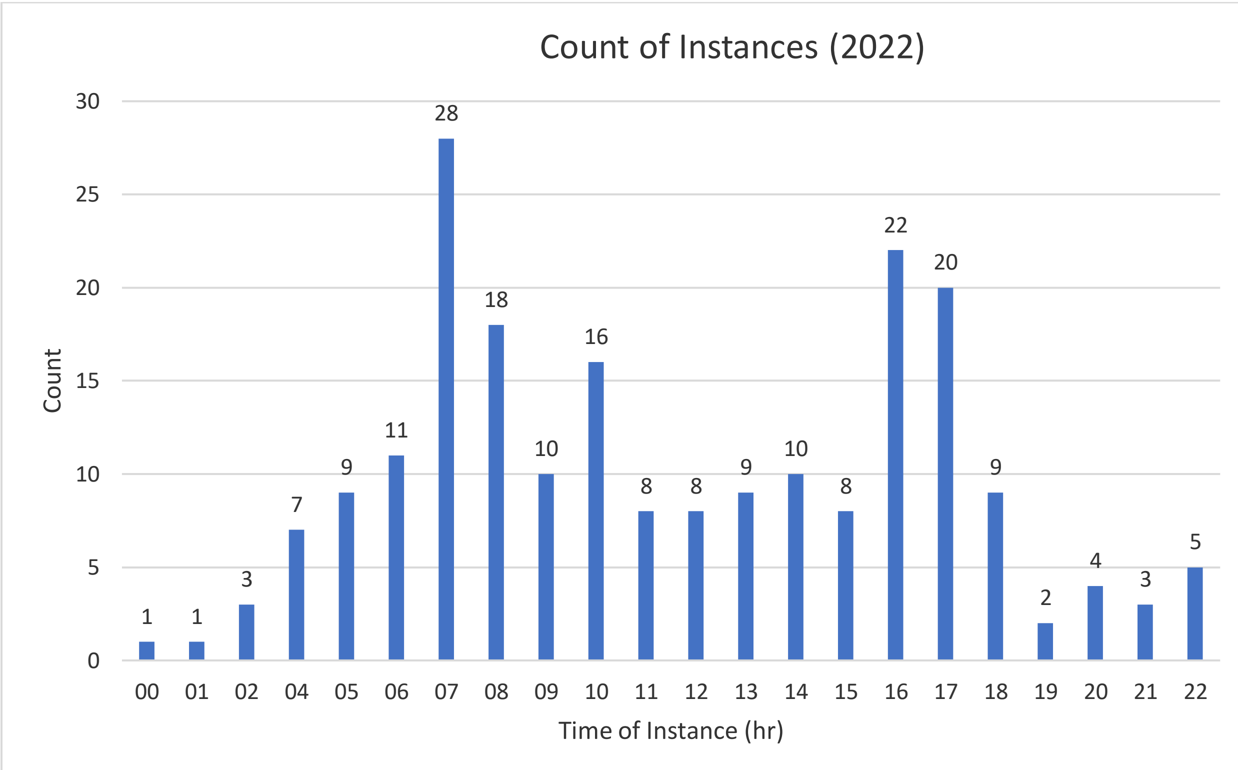
Please refer to the response to CEC IR2 38.1.

38.4 For each year (2017-2022) please provide a scatterplot showing the number of instances occurring in each year and time of day when the instances occurred.

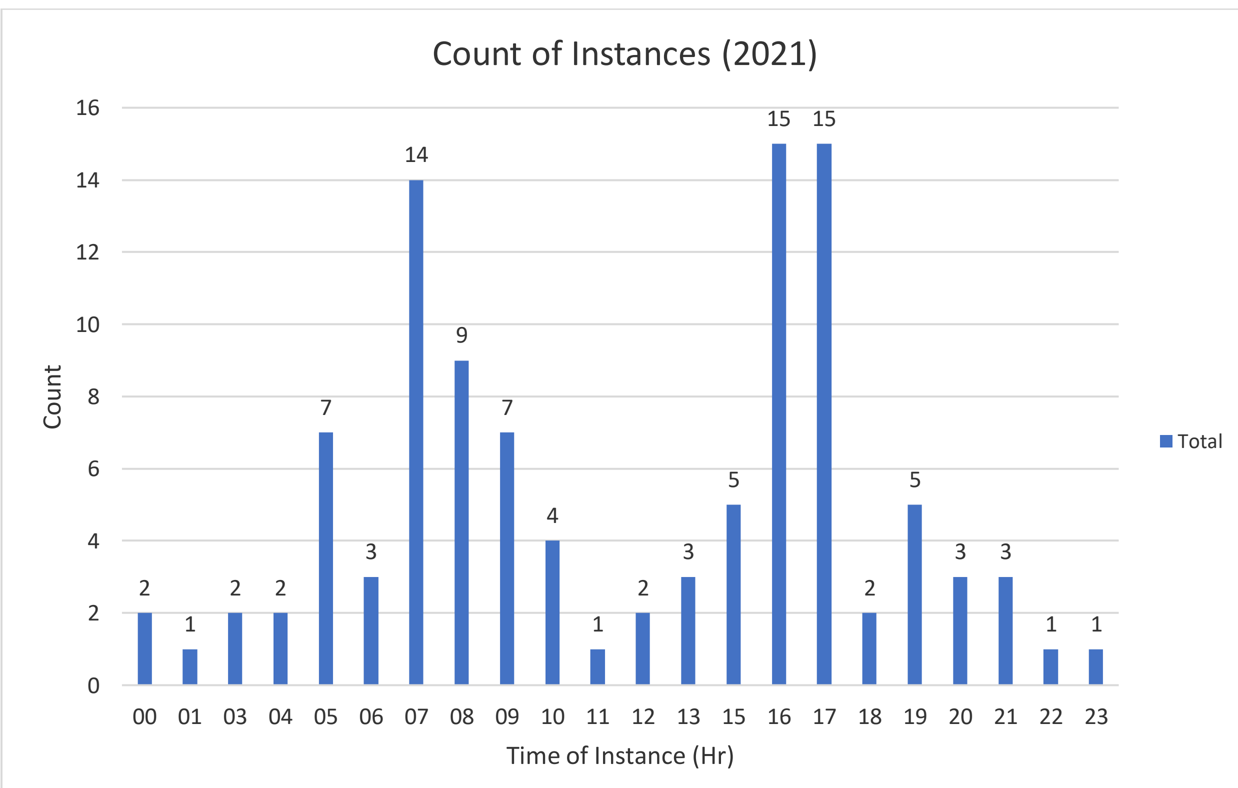
Response:

Please refer to the bar graphs below. In order to present the requested information in a more understandable format, FBC has provided the requested information in bar graphs instead of a scatterplot. The following graphs show the number of instances in which if one ASM transformer would have been out of service, the remaining ASM transformer would have been overloaded and the hour of when the instance started.

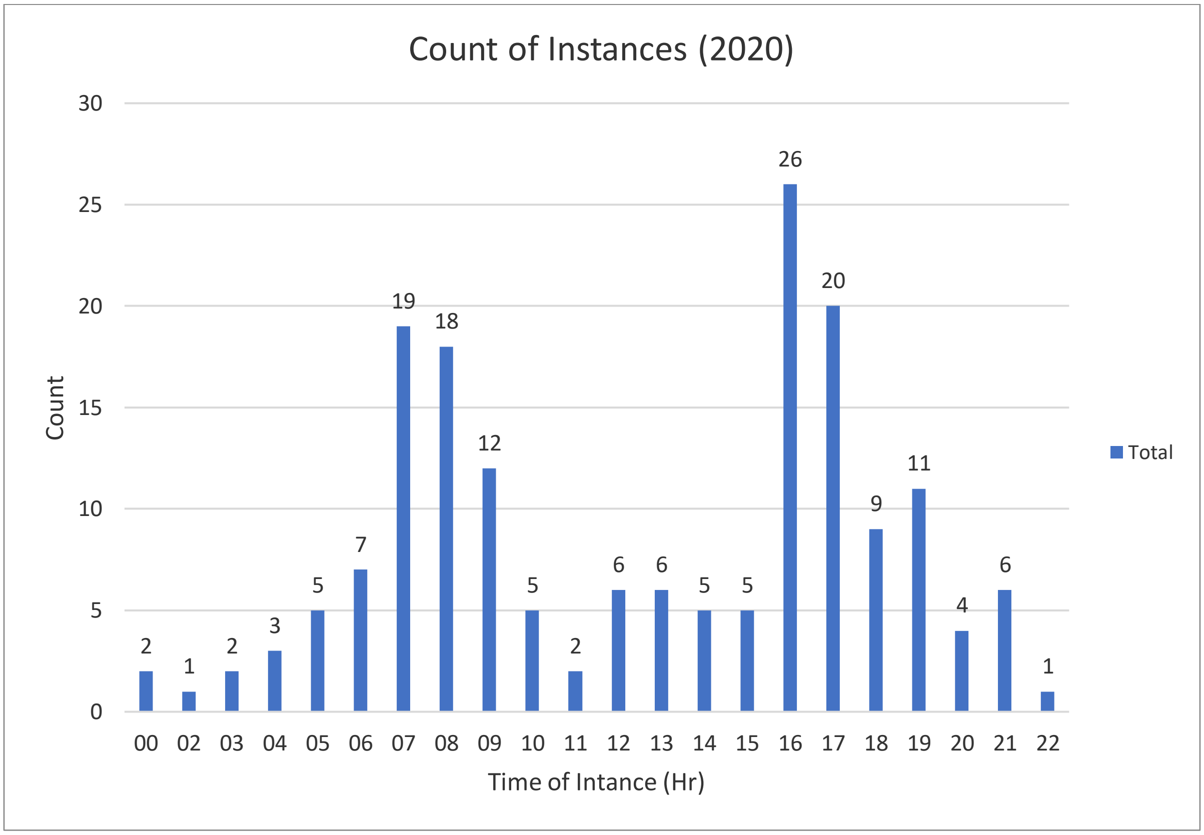
FBC clarifies that for all of these instances, both transformers were in service and thus not overloaded.


Count of Instances (2022)
Count
Time of Instance (hr)
00 01 02 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22
1 1 3 7 9 11 28 18 10 16 8 8 9 10 8 22 20 9 2 4 3 5

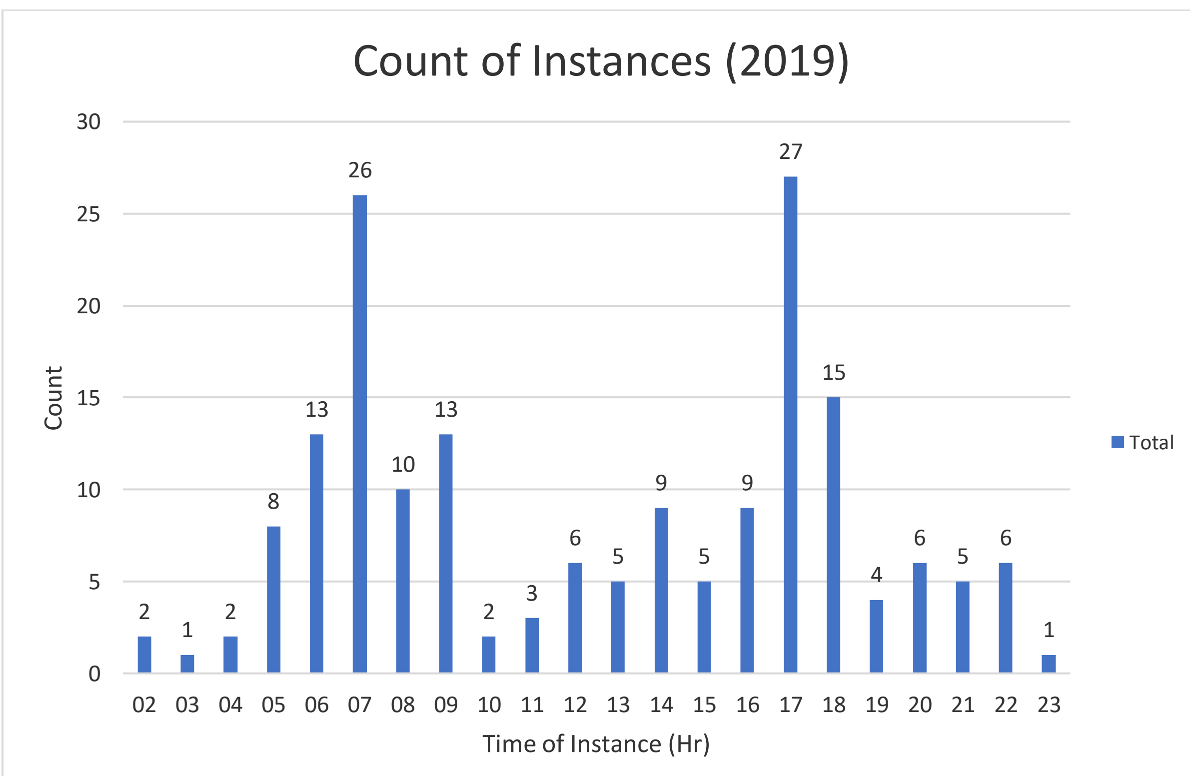
1


Count of Instances (2021)
Count
Time of Instance (Hr)
Total
00 01 03 04 05 06 07 08 09 10 11 12 13 15 16 17 18 19 20 21 22 23
2 1 2 2 7 3 14 9 7 4 1 2 3 5 15 15 2 5 3 3 1 1

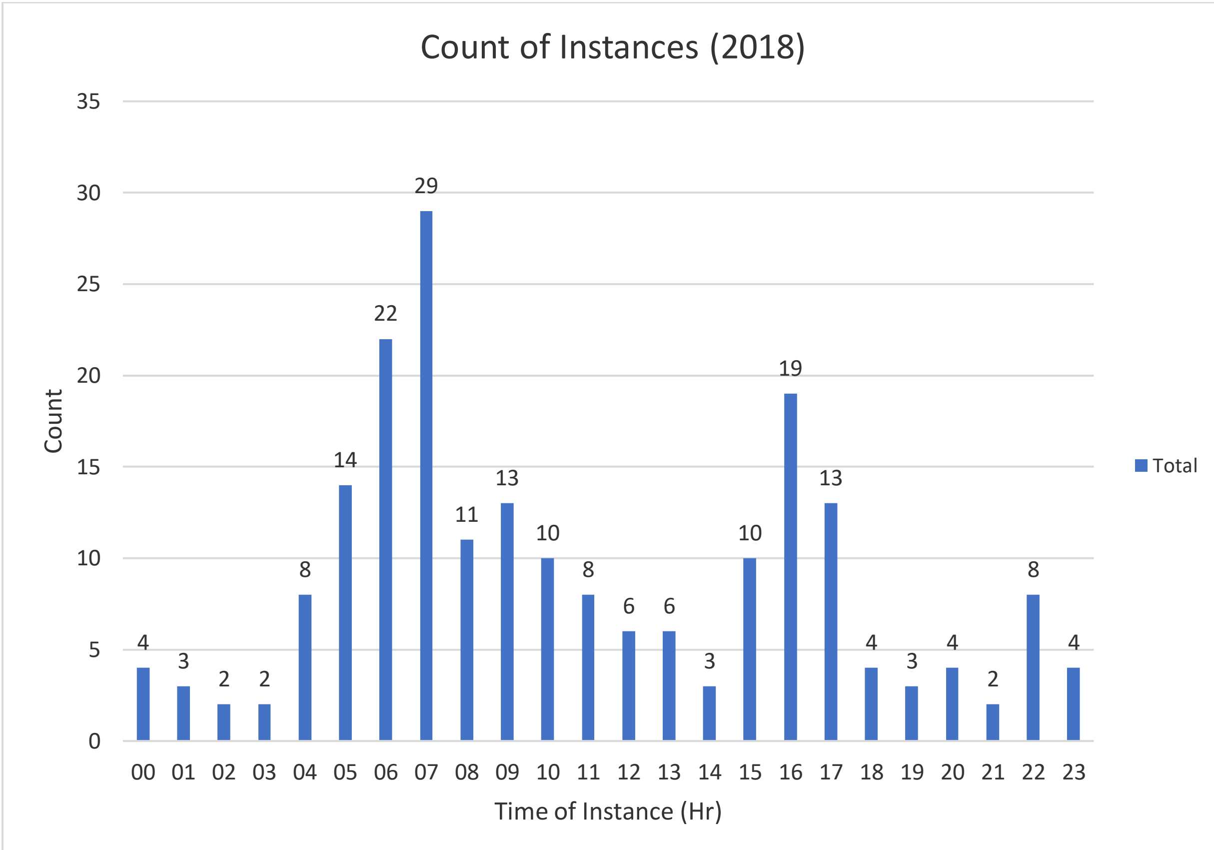
2

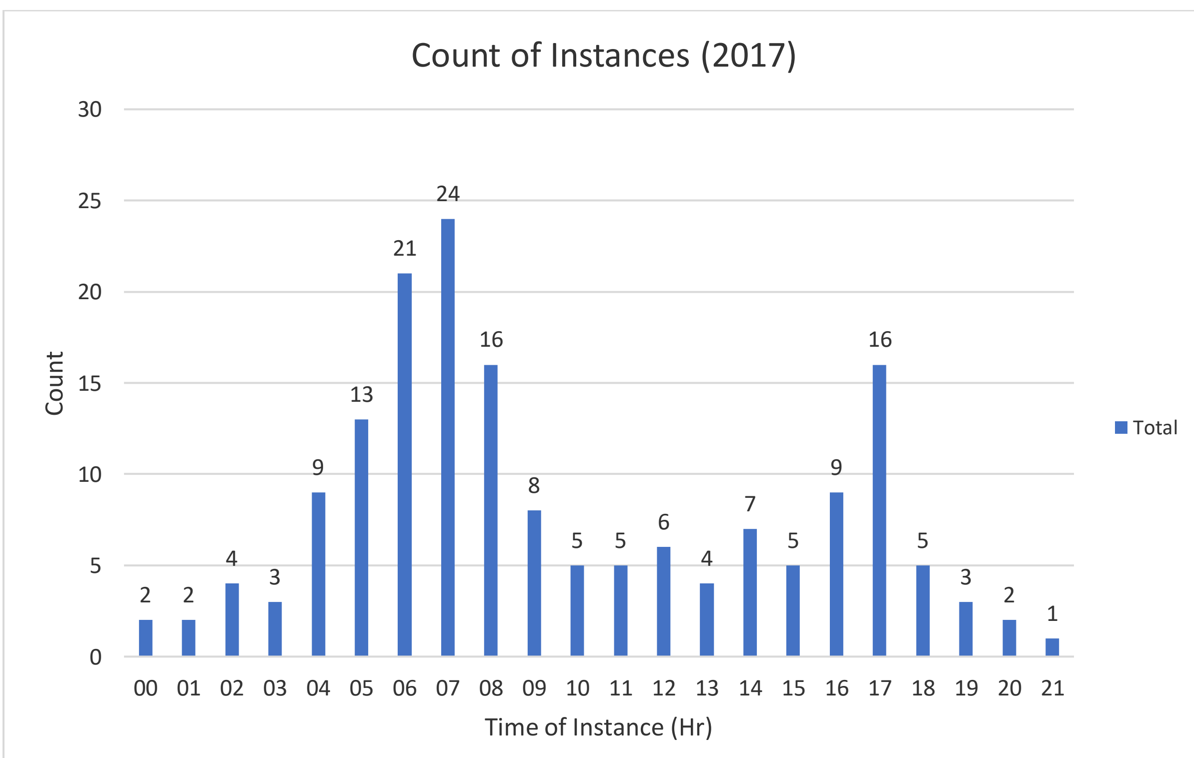


Count of Instances (2020)
Count
Time of Intance (Hr)
Total
00 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22
2 1 2 3 5 7 19 18 12 5 2 6 6 5 5 26 20 9 11 4 6 1



Count of Instances (2019)
Count
Time of Instance (Hr)
Total
02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23
2 1 2 8 13 26 10 13 2 3 6 5 9 5 9 27 15 4 6 5 6 1

1 
Count of Instances (2018)
Count
Time of Instance (Hr)
Total
0
5
10
15
20
25
30
35
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23
4 3 2 2 8 14 22 29 11 13 10 8 6 6 3 10 19 13 4 3 4 2 8 4

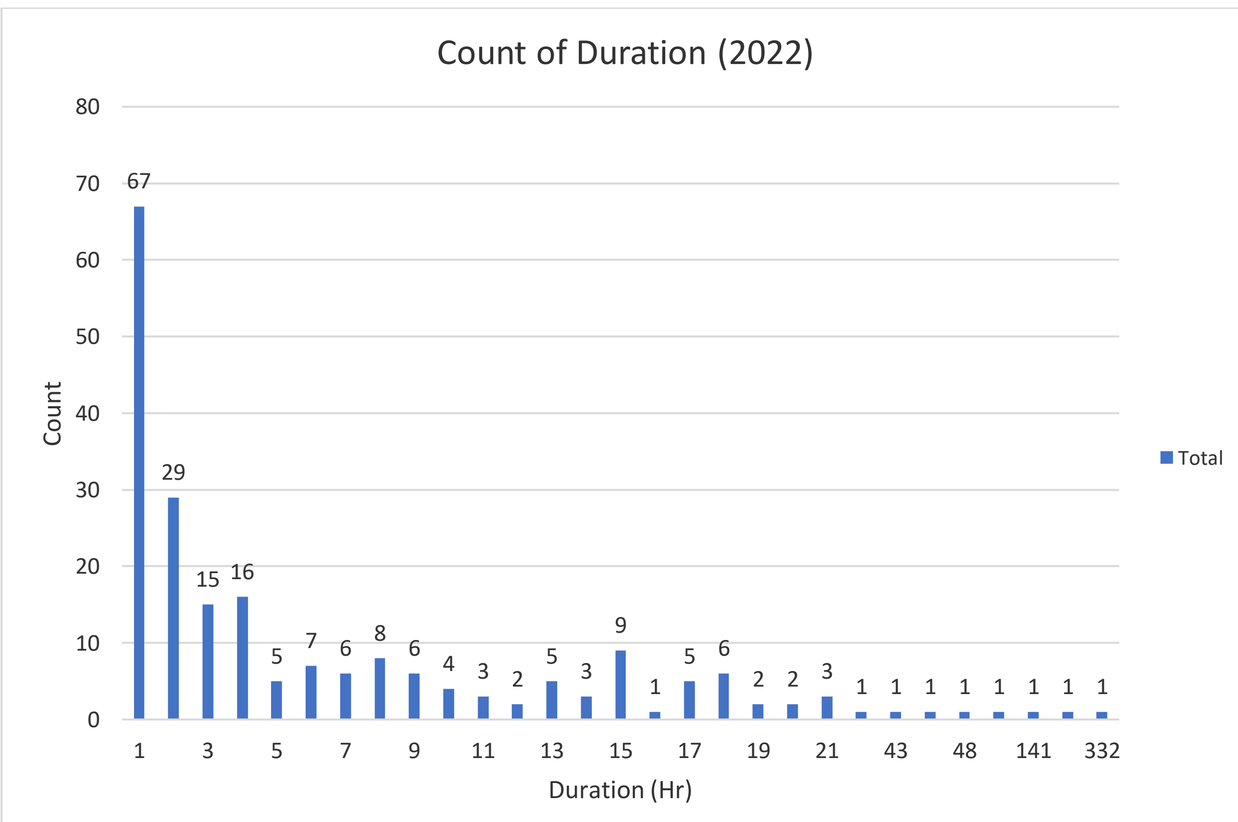
2 
Count of Instances (2017)
Count
Time of Instance (Hr)
Total
0
5
10
15
20
25
30
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21
2 2 4 3 9 13 21 24 16 8 5 5 6 4 7 5 9 16 5 3 2 1

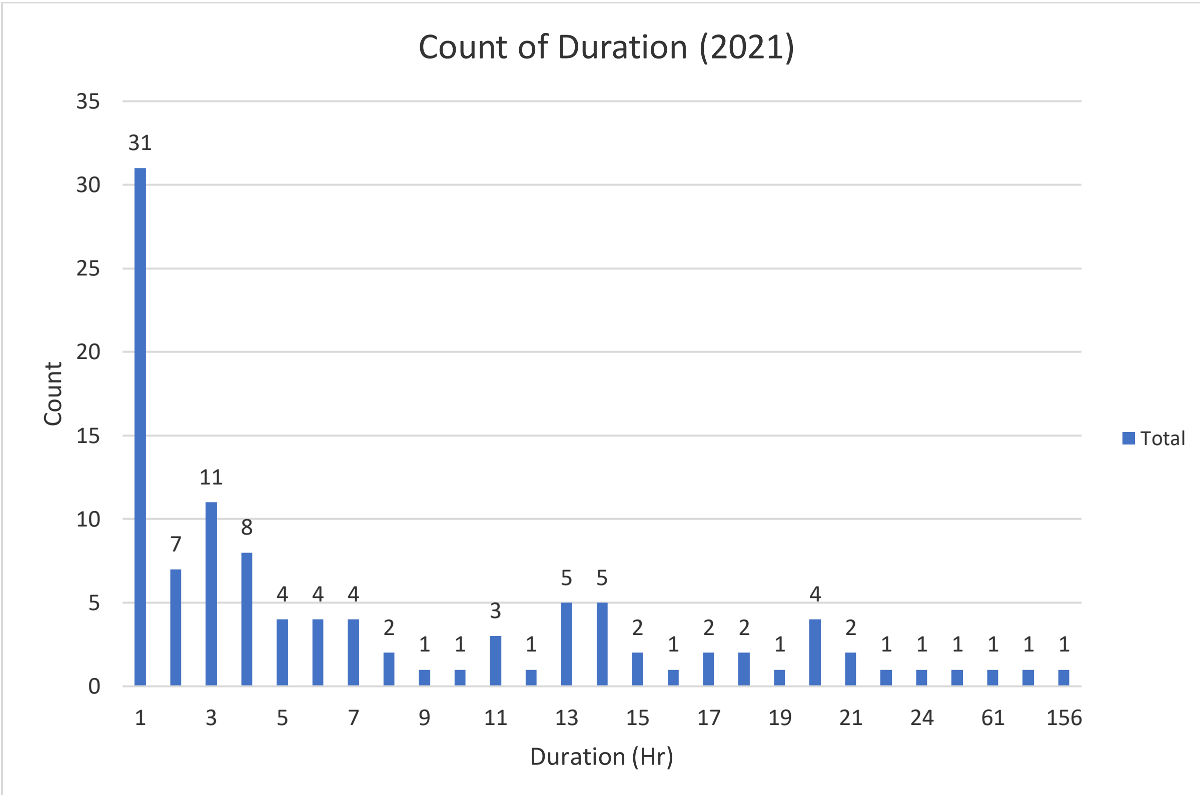
38.5 For each year (2017-2022) please provide a scatterplot showing the durations of each instance occurring in each year when the instances occurred.

Response:

Please refer to the bar graphs below. In order to present the requested information in a more understandable format, FBC has provided the requested information in bar graphs instead of a scatterplot. The following graphs show the number of instances in which if one ASM transformer would have been out of service the remaining ASM transformer would have been overloaded and the total duration (in hours) of each potential overload.

FBC clarifies that for all of these instances, both transformers were in service and thus not overloaded.





Count of Duration (2021)
Count
Duration (Hr)
Total
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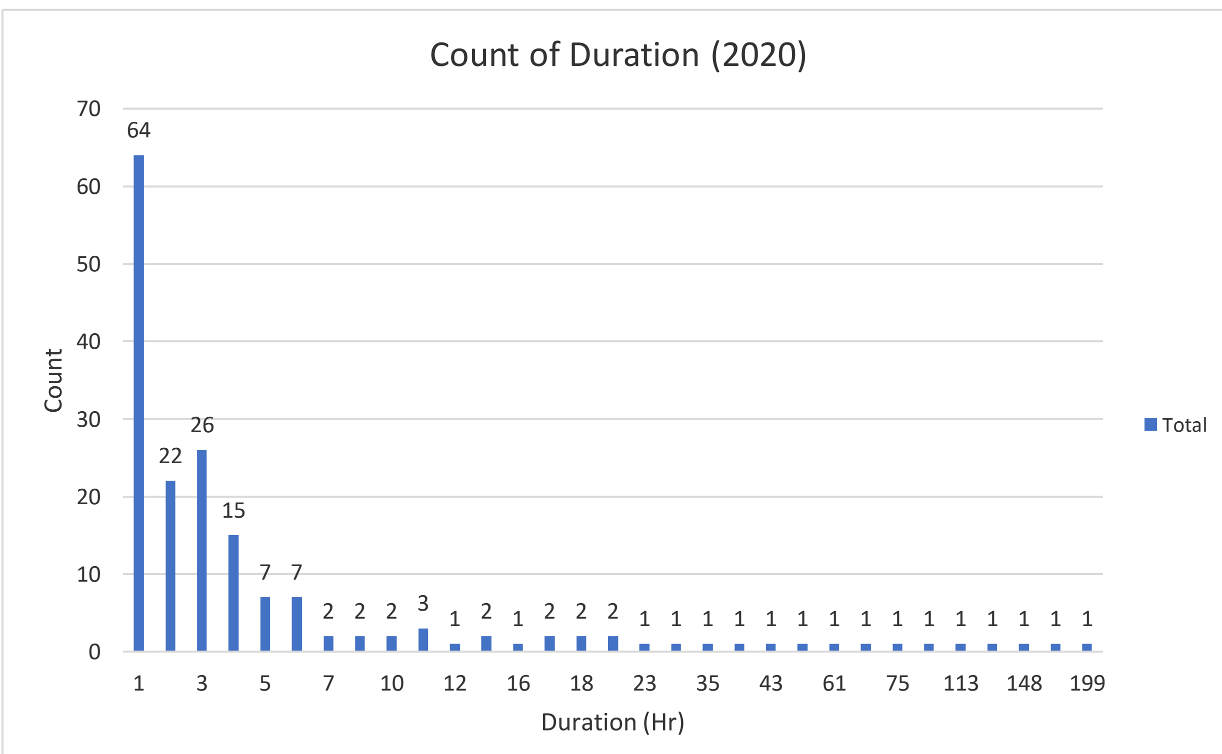
156



Count of Duration (2020)
Count
Duration (Hr)
Total
0
10
20
30
40
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7
7
2
2
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3
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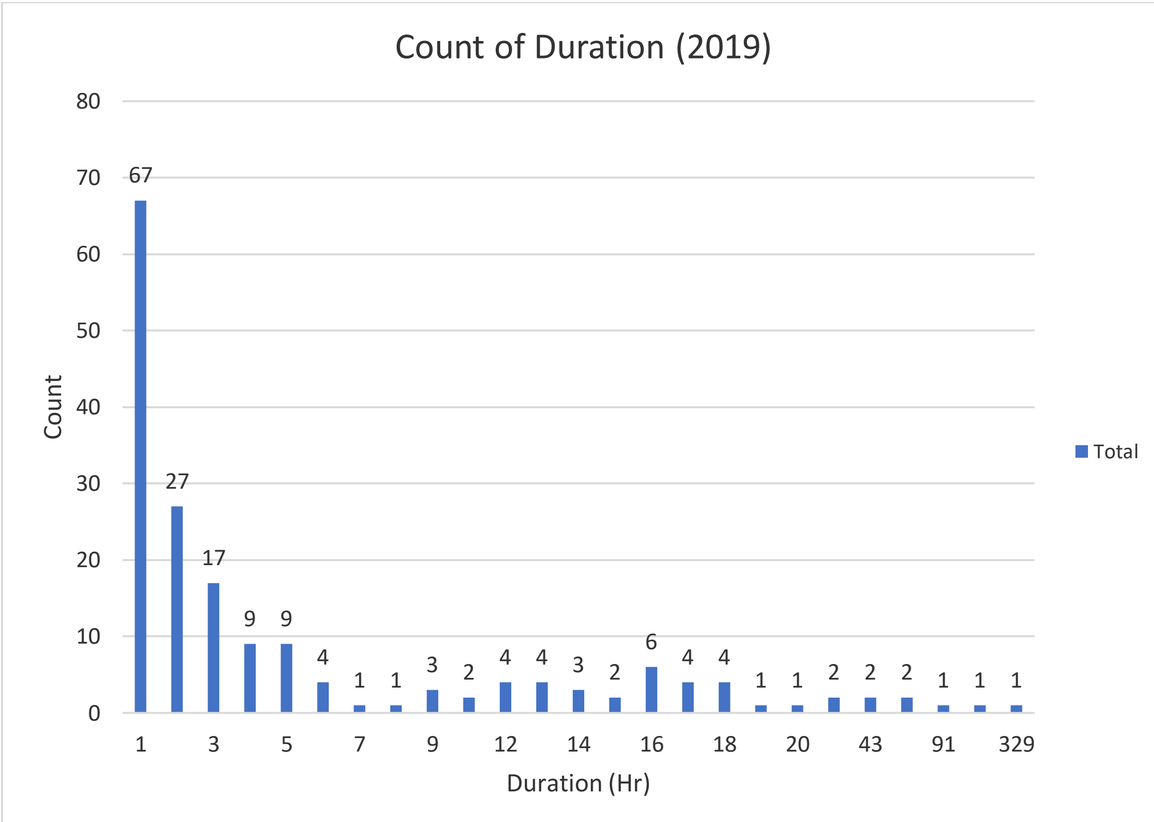
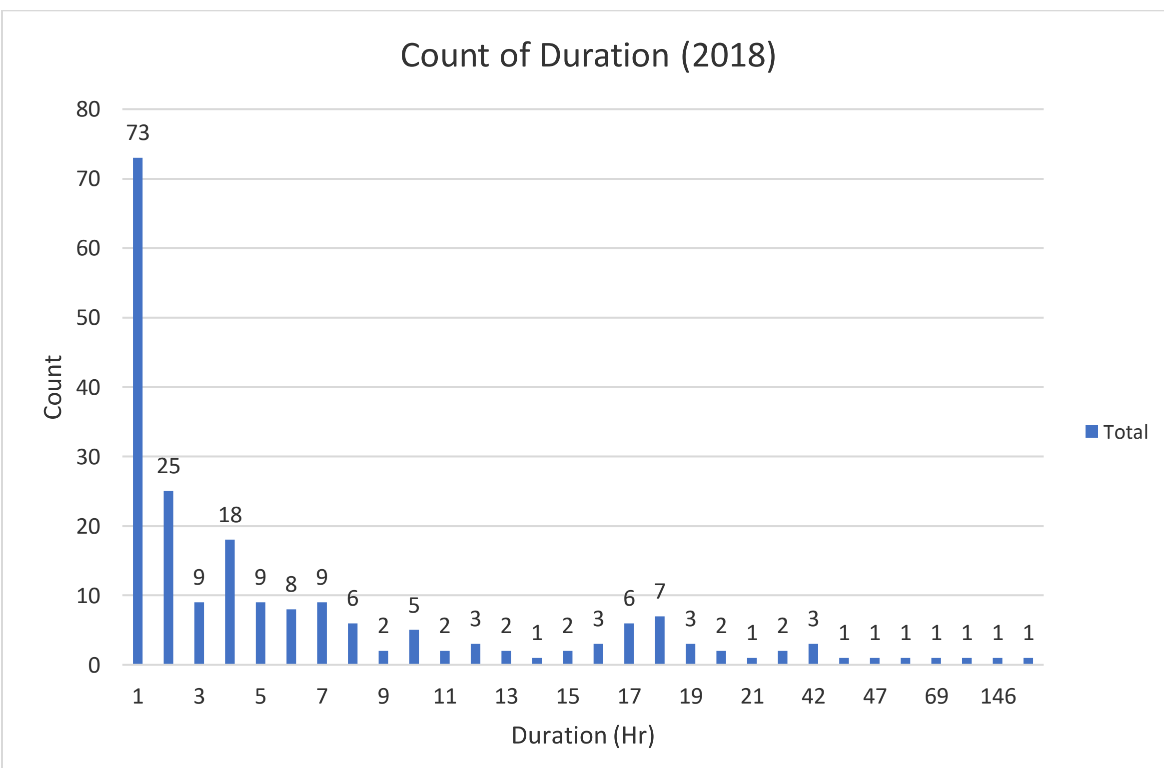
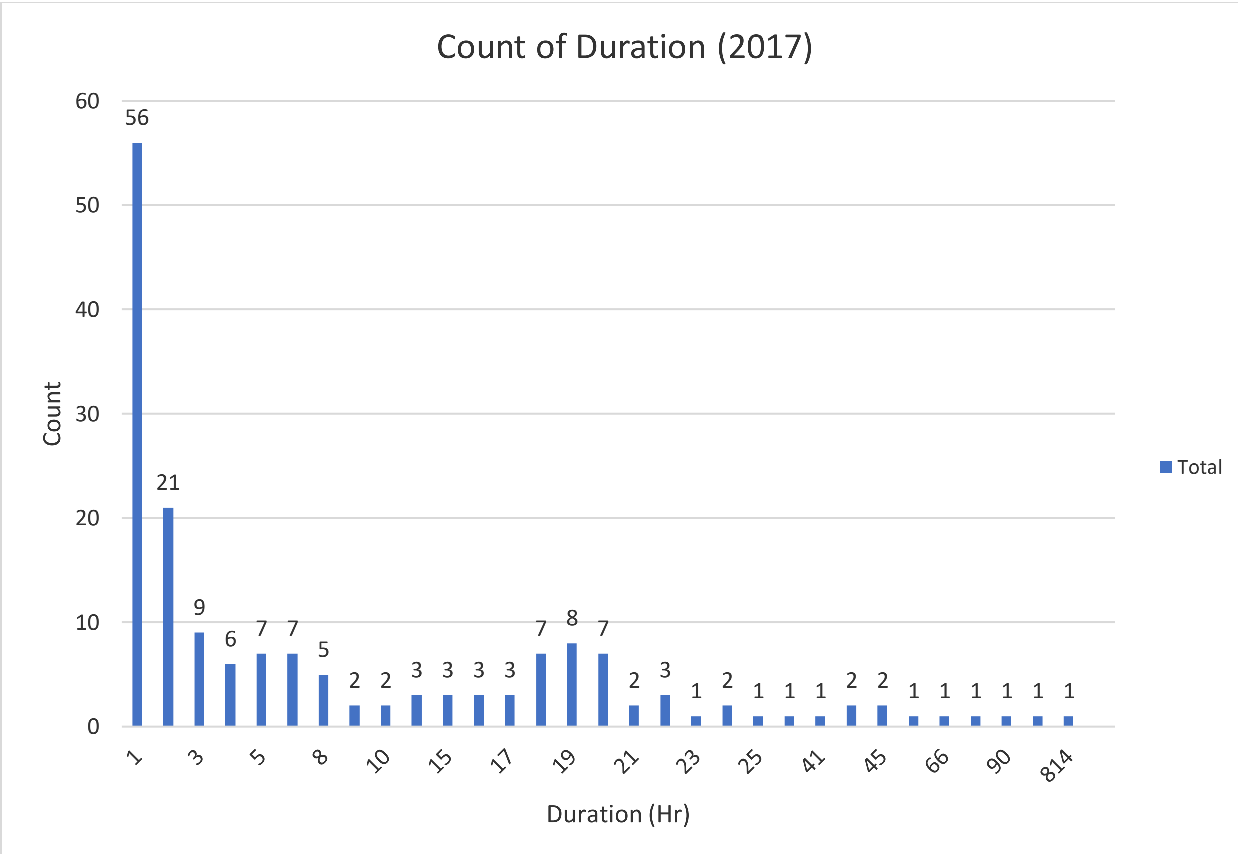


Count of Duration (2019)
Count
80 70 60 50 40 30 20 10 0
67 27 17 9 9 4 1 1 3 2 4 4 3 2 6 4 4 1 1 2 2 2 1 1 1
1 3 5 7 9 12 14 16 18 20 43 91 329
Duration (Hr)
Total



Count of Duration (2018)
Count
80 70 60 50 40 30 20 10 0
73 25 9 18 9 8 9 6 2 5 2 3 2 1 2 3 6 7 3 2 1 2 3 1 1 1 1 1 1 1
1 3 5 7 9 11 13 15 17 19 21 42 47 69 146
Duration (Hr)
Total



38.6 Given that over six years both transformers were in service when the instances of exceedance occurred, and that there is not an instance of transformer overload for the full six years, please explain what would or could "happen" if and when one transformer was down at the time of an instance of exceedance and provide the quantitative consequences for each instance of what would or could "happen".

<u>Response:</u>

Please refer to the response to BCUC IR1 2.1.

39. Reference: Exhibit B-7, CEC 1.6.1 and 1.6.6

> 6.1 Please explain the benefits of using weather-normalized forecasts for load resource planning.
>
> **Response:**
>
> For the purposes of resource planning, FBC plans to the expected weather normalized forecast (which excludes weather extremes), because this is likely what will be experienced. If extreme weather develops, then FBC is able to secure additional resources if needed. If FBC acquired resources to meet the non-weather normalized forecast level, it could result in FBC entering into contracts or procuring resources that would not be fully utilized and add costs which would then be reflected in customer rates.
>
> 6.6 Please provide a list of the contingencies FBC can bring to compensate for a year which exceeds the capacity forecast using the 1-in-20 years forecast data, and for each contingency capability please provide the quantity and availability in terms of response time and reliability for each of the contingency capabilities.
>
> **Response:**
>
> In the Boundary and Similkameen areas, the relevant single contingencies that cause thermal and voltage violations during N-1 conditions are:
>
> - Transformer outage at the ASM Terminal Station;
> - 40L/BEN T1 outage; and
> - 34L outage.
>
> Please refer to the response to BCUC IR1 2.21 for operational changes that will be performed in the event of an N-1 contingency event.

39.1 The CEC would like to understand the options available to FBC when capacity requirements exceed FBC capabilities. Please provide a list of the additional resources that FBC is able to secure if needed, and for each additional resource please provide quantification for the amount available, the response time, and the reliability data.

Response:

For clarity, the response to CEC IR1 6.1 refers to resource planning, where FBC plans to meet total system load, both energy and capacity, from a combination of generation resources and power supply contracts. The response to CEC IR1 6.6 refers to the physical system limitations in the Boundary and Similkameen areas. FBC assumes that the capacity requirements referenced in this question refer to the supply for FBC's total system load, not the physical infrastructure in the Boundary and Similkameen areas.

FBC's capacity requirements can exceed its resources for various reasons, most commonly generation outages or greater than expected load. FBC has several options to respond to outages and replace lost power. On a short-term, operational basis, FBC can call on operating reserve to cover any power lost for the first 60 minutes of any outage. For any outages longer than 60 minutes in duration or in case of greater than expected load, FBC has the option of purchasing power from the wholesale market, via its Capacity and Energy Purchase and Sale Agreement (CEPSA) contract with Powerex. On a day-ahead basis, FBC may also choose to reduce the amount of surplus WAX capacity that it sells to Powerex under the CEPSA and retain that capacity for its own use. Furthermore, FBC can also increase its usage under the Power Purchase Agreement (PPA) with BC Hydro, if surplus is available.

If the resources described above were unavailable, then FBC would default onto the Imbalance Agreement with BC Hydro, which affords FBC access to BC Hydro supply on an emergency basis. If BC Hydro was unable to provide the needed capacity, then FBC would have no choice but to manually curtail load.

39.2 Please provide a list of the curtailment options FBC is able to secure if needed, and for each additional curtailment resource please provide quantification of the amount available, the response time, and the reliability data.

Response:

Currently no FBC customers have applied to take Interruptible service. However, FBC has at its disposal 9 MW of potential curtailable load. The FBC Control Centre has remote operation of the interconnecting breaker for this load, so curtailment can be implemented remotely in real time, if required. However, the 9 MW of curtailable load would not have a material impact during an overloading situation, and thus the ASM Project is still required to address FBC's N-1 planning criteria.

40. Reference: Exhibit B-7, CEC 1.7.3

> 7.3 Given that EV adoption and/or new government policy favouring electrification may drive greater requirements for related load and capacity, which has not necessarily been a factor in historical 20-years data, does FBC anticipate that it may need to modify historical data-based forecasts particularly for capacity based on future forecast related to evolving electricity usages? Please explain
>
> **Response:**
>
> No. FBC would continue to use historical data-based forecasts as well as develop new methods to add on to or enhance the forecast to capture policies or technological developments not intrinsic in the historical data.

40.1 Please provide a brief discussion of any new methodologies that FBC has developed or is developing to capture the likely changes in EV and other newly developing electric load.

Response:

New forecast methodologies used to capture the likely changes in EV and other newly developing electric load were developed as part of FBC's most recently accepted 2021 Long Term Electric Resource Plan (LTERP).[1] As discussed in Section 3.5 of the 2021 LTERP, the Business As Usual (BAU) forecast is based on traditional load drivers inherent in the actual data, as well as third-party forecasts of the economic drivers of load growth for the FBC service area. The Reference Case load forecast adds new emerging load drivers for EV charging and highly certain industrial loads not inherent in the actuals used for the BAU. The EV charging load forecast is based on the Zero-Emission Vehicle (ZEV) Act light-duty EV sales targets and new highly certain industrial customer loads (such as those from a wastewater treatment facility, a renewable energy facility and long-term increases from a current forestry sector customer) and were determined by FBC key account managers. As shown in Appendices F and G of the 2021 LTERP, the magnitude of the EV charging load is 500 GWh by 2040 while the highly certain industrial loads amount to 55 GWh by 2040.

FBC will continue to consider new methodologies and data sources to refine EV adoption and other developing electric load technology forecasts as the Company develops the next LTERP.

40.2 Please provide FBC's best estimate at this time of the potential quantitative order of magnitude for each of the technology or policy developments that are not in the intrinsic historical data.

[1] BCUC Decision and Order G-380-22.

Response:

Please refer to the response to CEC IR2 40.1.

41. Reference: Exhibit B-1, Appendix B, PDF page 90/236 and B-7, CEC 1.9.1 and 1.9.2

3. Transformer Population Data

The transformer population in the study consists of 2 transformers as listed in **Table 1** below. Included is the relative importance for each transformer that was provided by the customer.

ID No.	Location	Position	Importance	Manufacturer	MVA	Serial Number	YoM
1	ASM	T1	100	CGE	60/80	285738	1965
2	ASM	T2	100	CGE	60/80	287735	1971

Table 1 – Transformers Considered in Fortis BC Transformers Assessment

9.1 Please explain which party determined the Importance level to be 100.

Response:

The "Importance" level of the ASM T1 and T2 transformers was determined by Hitachi based on FBC-provided data.

9.2 Please provide the description, scale and rating methodology for the column entitled 'Importance', and please relate the scale and 100 level to FBCs other Transformers (i.e., what factors create an Importance of 100, and what is the distribution of Transformer Importance in FBC's service territory).

Response:

The Importance of a transformer, determined by Hitachi, is a quantitative value calculated based on:

- The number of customers served;
- The equipment location in the network; and
- The available local or loop redundancy.

This Importance value can range from 1 to 100 and is particular to the FBC system. While a score of 100 indicates an essential unit, a score below this could indicate an area or locally important unit.

Since during peak loading neither one of the ASM transformers could fully supply the required load and they are critical to the FBC system, they were assigned the highest score.

FBC is not able to provide an Importance ranking for each of its transformers as the Importance methodology is proprietary to Hitachi, who was only retained to provide analysis on ASM T1 and T2.

41.1 The evidence in Exhibit B-1, page 90/236, states 'Included is the relative importance for each transformer that was provided by the customer', whereas FBC's IR response indicates that Hitachi determined the Importance level based on information provided by FBC. Please clarify if FBC effectively provided the Importance ranking or if Hitachi independently determined the value based on the criteria of customers, equipment location and available local or loop redundancy.

Response:

The Hitachi Report defines "relative importance" as follows on page 91 of Appendix B:

> The Hitachi Energy approach to fleet risk screening involves a combination of the risk of failure assessment and the relative importance of a transformer to the utility system.
>
> …
>
> This represents the analysis for an example fleet of transformers that have a diverse risk of failure characteristics as well as a diverse relative importance. Using Figure 1, each transformer in the fleet is assigned a risk of failure and a relative importance and displayed on the risk management plot.

Hitachi independently determined the *Importance* ranking of ASM T1 and T2 based on inputs provided to Hitachi, including those described in the preamble and the characteristics of the load served by 11E Line and the ASM Terminal Station, which FBC described in the response to BCUC IR1 3.3.

Hitachi has defined in their correspondence with FBC that "Importance is relative criticality of one transformer compared to other transformers in a fleet. This can be based upon revenue impact, failure impact to system, spare transformer (or not), cost of replacement and so on." Hitachi also explained that "normal values are 50% to 100%".

FBC agrees with Hitachi's assessment that ASM T1 and T2 are important to FBC's system; however, the *Importance* ranking was not a key driver for the Project. For further information on the relevance of *Importance* to the Project need, please refer to the response to CEC IR2 42.1.

41.2 Please provide the specific information that was provided by FBC to Hitachi in determining importance.

Response:

Please refer to the response to CEC IR2 41.1.

41.3 Please explain the meaning of the words 'relative importance' if it is not relative to other transformers in FBC's system. What is the importance relative to?

Response:

Please refer to the response to CEC IR2 41.1.

41.4 Please provide further clarification as to FBC's statement that the importance value is particular to the FBC system. Does this mean that Hitachi does not use similar Importance scales for other utilities?

Response:

Please refer to the response to CEC IR2 41.1.

42. Exhibit B-7, CEC 1.14.2 and 1.14.3

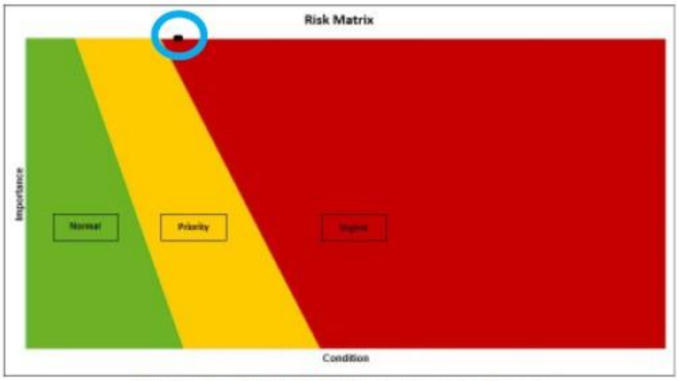


Figure 7 – Risk of Failure vs. Importance

14.3 Please confirm, or otherwise explain, that to the extent that Importance level was reduced by even 20%, the risk would be reduced to the Priority level.

<u>Response:</u>

Not confirmed. Please refer to the response to CEC IR1 9.2.

42.1 The CEC does not find clarification to its questions in the response to CEC 1.9.2, which does not address the implications of a lower Importance Level in the risk analysis. Please elaborate on the implications of a lower Importance Level (i.e. 80%) on the need for the Project.

<u>Response:</u>

Hitachi has provided the following explanation regarding *Importance* in their correspondence with FBC*:*

> A transformer that is very critical (if it fails it will be a significant or costly impact) has a higher importance and thus would be Red for a lower risk of failure. For example, a 4% risk of failure is Yellow for 40% importance and Red for 80% importance. In this example, Red units should be prioritized for action before Yellow or Green units. Each transformer has its own importance number. Actions to improve can reduce the risk of failure or reduce the importance.

In the case of the ASM Project, a reduction in the *Importance* ranking would not impact the Project need. As described in the Application, replacement of ASM T1 and T2 is driven by the following:

- The forecast load growth in the Boundary and Similkameen areas will continue to exceed FBC's N-1 system reliability planning criterion to reliably maintain service to the area load during peak periods in the event of an outage or failure of one of the ASM Terminal Station power transformers.

- In consideration of the condition of the transformers based on a recent condition assessment report performed by an independent third party, there is a high risk of failure at the ASM Terminal Station.

Finally, given the characteristics of the load served, FBC believes the *Importance* ranking assigned by Hitachi is reasonable and cannot be materially reduced.

43. Reference: Exhibit B-6, BCOAPO 1.7.2 and Exhibit B-1, Appendix B, Figure 7

What does a "high risk of failure" mean (e.g. does it mean a risk/probability of failure greater than 2% as discussed on page 21 of the Application)?

Response:

The Hitachi report (Appendix B) refers to "high risk of failure" in terms of the likelihood of a failure event (i.e., probability of failure) and the associated impact of failure (i.e., "Importance"). Based on Figure 7 in Appendix B, Hitachi has classified ASM T1 and ASM T2 as having a "high risk of failure" based on the probability of failure being greater than 2 percent and the transformers level of "Importance".

43.1 Please discuss the probability of a transformer being able to tolerate higher loads than the nameplate and the limits of frequency of such overloading in the potential degradation of the service life for such transformers.

<u>Response:</u>

Emergency and/or planned overloading of oil-filled power transformers beyond their nameplate rating depends on several factors, including the design, vintage, operation, maintenance program, loading duration and load cycle, and ambient conditions.

Various standards provide methods for calculating the reduction in transformer life due to loading and overloading; however, CEATI Report 30/123 identified that "…North American utilities have been using the IEEE Std.C57.91-2011 for loading of power transformers... IEEE Std. C57.91-2011 is extremely simplified and does not consider the effect of insulation moisture content or other aging markers…".[2] The report proceeds to evaluate various transformer loading models and their corresponding deviations in output. The report concluded that comprehensive loading models calculated a shorter life expectancy than models that did not consider actual condition and aging factors. The CEATI Report indicated that "A large portion of these in-service power transformer units have been characterized by a high failure rate"[3].

While transformer overloading drastically reduces transformer life expectancy, no standard or industry statistics provide guidance for quantifying the increase in risk of failure due to overloading.

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[2] METSCO Energy Solutions. (2019). *Guide For Loading Of In-Service Aged Power Transformers.* CEATI Report No. T183700-30/123. Pg. 7-81. Mississauga, Ontario, Canada.

[3] METSCO Energy Solutions. (2019). *Guide For Loading Of In-Service Aged Power Transformers.* CEATI Report No. T183700-30/123. Pg. 17. Mississauga, Ontario, Canada.

44. Reference: Exhibit B-7, CEC 1.16.1 and 1.16.3

> 16.1 Please explain whether or not FBC has prioritized either of these objectives for this Project.
>
> **Response:**
>
> FBC clarifies that the Project Objectives (outlined in Section 4.1) and the Evaluation Criteria (outlined in Section 4.3) have two separate purposes.
>
> The Project Objectives are the two drivers for the Project and, in order for a project alternative to be considered feasible and to therefore pass the early screening stage, the alternative must meet both objectives. FBC considers both Project Objectives to have equal importance.
>
> The Evaluation Criteria were developed to assess each of the feasible alternatives. FBC notes that the System Reliability criterion assesses the feasible alternatives' abilities to increase capacity to the Boundary and Similkameen areas and to address aging infrastructure issues, both of which are important to maintaining safe and reliable service. Please refer to the response to BCUC IR1 7.1 for a detailed explanation of the rationale for the weights assigned to the Evaluation Criteria and how the Evaluation Criteria were developed.
>
> 16.3 Please identify any parameters or thresholds that FBC established for 'addressing aging infrastructure', and please discuss how these parameters were established.
>
> **Response:**
>
> Please refer to the response to CEC IR1 16.1.

44.1 The CEC does not find any parameters or thresholds related to aging infrastructure in the response to CEC IR 1.16.1. Please identify these or identify where they may be found. If not available, please provide them and/or please indicate that there were none established.

<u>Response:</u>

FBC referred CEC's question in CEC IR1 16.3 back to CEC IR1 16.1 because IR1 16.1 clarifies the difference between the "Project Objectives" and the "Evaluation Criteria". The need to address aging infrastructure is one of the two Project Objectives and forms part of FBC's screening process for determining if an alternative is feasible. The need to address aging infrastructure is binary, in that either an alternative does or does not achieve this objective. For an alternative to be considered feasible and to therefore pass the early screening stage, the alternative must have met the objective to address aging infrastructure. FBC therefore did not establish a specific parameter or threshold in the evaluation criteria related to addressing aging infrastructure. Further, when determining whether an alternative was feasible, as explained in Section 4.2 of the Application, FBC considered different variations for replacing the aging infrastructure, with many of these variations (such as a like-for-like replacement) being deemed infeasible for various reasons.

Both feasible alternatives result in the replacement of the transformers and the preferred alternative was selected in consideration of the Evaluation Criteria. While none of the Evaluation Criteria refer specifically to addressing aging infrastructure, many of the criteria are indirectly related to the replacement of infrastructure as the criteria consider factors such as system reliability, safety, constructability, and operations accessibility and operability.

45. Reference: Exhibit B-7, CEC 1.27.4 and Exhibit B-4, BCUC 1.15.3.2

> 27.4 What contingencies does FBC typically apply in capital projects, and why?
>
> **Response:**
>
> Please refer to the responses to BCUC IR1 15.1, 15.2 and 15.3.
>
> There are two aspects of the Project cost estimate with no contingency:
>
> - Actual CPCN Project Preliminary Engineering costs incurred by FBC prior to January 2023 do not have contingency applied. These costs are actuals and were known at the time of filing the Application.
> - As noted in Section 6.2 of the Application, the contingency of 15 percent on Station construction and removal costs excludes the add-on costs that are calculated on top of the base station estimate. These add-on costs include Material Handling costs, Provincial Sales Taxes, and other indirect costs.

FBC's chosen method follows AACE contingency guidelines using an experienced estimating team who have been involved in many FBC projects. The contingency for the ASM Project was determined based on the level of assessed risk and potential for scope escalation considering the level of design completed as part of the Class 3 estimate and using judgement based on past asset and estimating experience. Past projects used as a guide include the Grand Forks Terminal Station Reliability Project, Ruckles Substation Rebuild Project, and Kelowna Bulk Transformer Addition Project.

45.1 Please provide the range of contingencies that FBC typically applies in its capital projects.

Response:

The range of contingencies for an AACE Class 3 estimate that are typically applied to FBC's projects is 10 to 30 percent depending on the level of risk and uncertainty associated with the project.

45.2 Please elaborate on the particulars of the A.S. Mawdsley Project that warrant the 15% contingency.

Response:

The 15 percent station contingency for the ASM Project includes an allowance for uncertain items that risk evaluation shows will likely result in additional costs. These items will be verified during the detailed design stage, and include:

- Poor soil conditions for construction, including bedrock (Geotechnical study);
- Conflicts with existing utilities (Telus, gas, and water lines) due to locate discrepancies;

- Additional grounding installations due to unanticipated ground study results;
- DC battery system upgrades if the current system cannot support the additional load of new equipment;
- Foreign exchange or raw material escalation (excluding extreme events);
- Design developments and changes within scope; and
- Variations in market and environmental conditions.

46. Reference: Exhibit B-7, CEC 1.28.1 and Exhibit B-4, BCUC 1.16.2 and 1.16.3

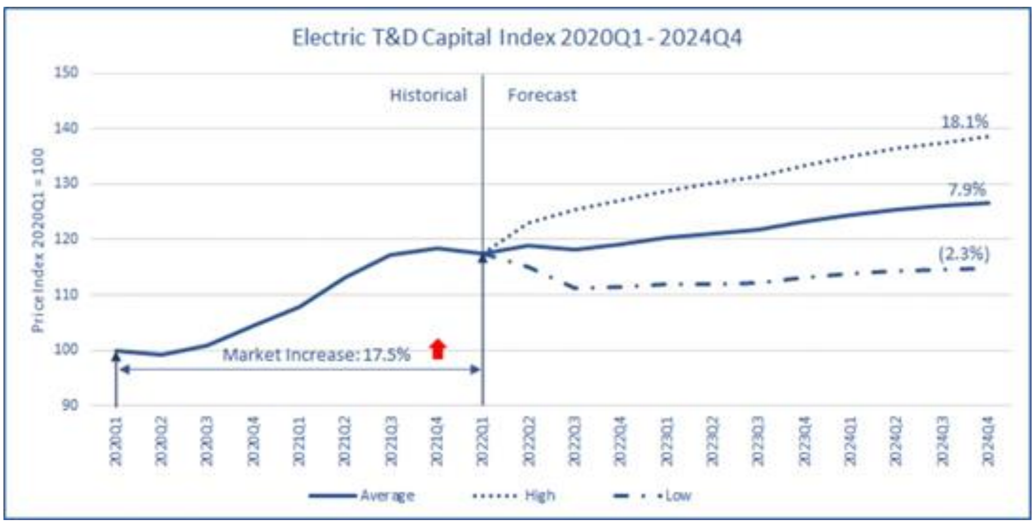
28.1 The CEC has reviewed Appendix G-3 and expects that FBC's escalation was based on the above graphs in which materials are forecast to escalate at a lower rate than Labour. Please confirm or identify any other information that was used.

28.2 Please provide the specific calculations that resulted in the escalation values that were applied.

<u>**Response:**</u>

FBC clarifies it used the first graph on page 2 of the Wood Mackenzie report that forecasts the capital expenditure escalation for all electric Transmission and Distribution costs. FBC did not use the two graphs provided in the preamble that are specific to labor or materials to determine Project escalation.

Please refer to the response to BCUC IR1 16.2 for a calculation of the average cost escalation percentage applied to the total Project cost estimate. FBC confirms no other information was used to determine the Project escalation over the period from 2023 to 2026.



Year	Capital Index (Average) - From Wood Mackenzie Report	YoY Increase (%)	Cumulative Escalation from 2022
2022	119.23		100.00%
2023	123.21	3.34%	103.34%
2024	126.72	2.85%	106.28%
2025		2.85%	109.31%
2026		2.85%	112.42%

46.1 FBC provides the above table as its reference for capital expenditure escalation instead of the two graphs the CEC noted which had separate tables for materials and labour. Please explain, and provide quantification for how the results would change if FBC were to make use of the Tables for Materials and Labour in its analysis.

Response:

Please refer to Table 1 and Table 2 below for the labour only and materials only, respectively, capital indices for electric transmission and distribution utilities across North America based on the Wood Mackenzie Report for the period from Q2 2022 to Q4 2024. Similar to the average aggregate capital index used for the ASM Project and explained in the response to BCUC IR1 16.2, FBC assumed the same percentage increase for 2025 and 2026 as 2024.

Table 1: Calculation of Escalation Factor in Percentage for Labour

Year	Capital Index (Labour) - From Wood Mackenzie Report	YoY Increase (%)	Cumulative Escalation from 2022
2022	107.46		100.00%
2023	110.85	3.15%	103.15%
2024	114.21	3.03%	106.28%
2025	117.67	3.03%	109.50%
2026	121.24	3.03%	112.82%

Table 2: Calculation of Escalation Factor in Percentage for Materials

Year	Capital Index (Materials) - From Wood Mackenzie Report	YoY Increase (%)	Cumulative Escalation from 2022
2022	149.97		100.00%
2023	155.53	3.71%	103.71%
2024	159.42	2.50%	106.30%
2025	163.41	2.50%	108.96%
2026	167.49	2.50%	111.69%

Please see Table 3 below which compares the total escalation as well as total Project costs in as-spent dollars using the average aggregate capital index (as-filed) and using separate capital indices of labour and materials only costs[4]. As Table 3 shows, the difference in the total Project costs is small at approximately $93 thousand if individual labour and material costs indices are used instead of the average aggregate capital index. The total escalation in terms of percentage of the total base cost estimate remains at 8 percent (when rounded to a whole number).

[4] For costs such as vehicles or land rights, which are neither labour nor material, the average aggregate capital index is used for escalation.

Table 3: Escalation Using Capital Index (Average) Compared to Capital Index (Labour and Materials) From Wood Mackenzie Report

	Escalation Using Capital Index (Average) [1]	Escalation Using Capital Index (Labour and Materials)	Difference
Base Cost ($ million)	32.601	32.601	-
Escalation ($ million)	2.577	2.670	0.093
As-Spent ($ million)	35.179	35.271	0.093
% Escalation on Base Cost	8%	8%	0%

Note:
[1] The values in this column are from BCUC IR1 16.1, Table 1, Line 11

46.2 Please confirm that the Capital Index used by FBC includes inflation, and identify any other escalators that FBC expects are or could be included in the index.

Response:

The Capital Index from the Wood Mackenzie Report used by FBC is based on aggregated capital expenditures from utilities across North America for electric transmission and distribution projects. As explained on page 2 of the Wood Mackenzie Report (Appendix G-3 of the Application), the capital index from the report incorporates over 150 indices of various categories that are related to utilities' capital expenditures, and are customized to the trade and labour activities specific to British Columbia. These indices would have included the inflation factor impacting each category. As shown on page 4 of the Wood Mackenzie Report, some of the indices incorporated by Wood Mackenzie include:

- Average Hourly Earnings (AHE);
- Employer Costs for Employee Compensation (ECEC);
- Spot Price Metal (SPM);
- Producer Price Index (PPI);
- Average Weekly Earnings (AWE); and
- Industry Margin (IM).

Please refer to the responses to BCUC IR1 16.4 and 16.5 for a more detailed discussion of FBC's use of the Wood Mackenzie Report rather than a general inflation forecast (e.g., CPI) of 2.0 percent, based on the Bank of Canada inflation target.

Additionally, please refer to the response to BCUC IR2 33.2, which shows that escalation factors (annualized) used for the ASM Project are similar to recent FBC and FEI CPCN projects, ranging from 2.0 to 3.0 percent per year. The difference of 1.0 percent in the escalation factors used would have a minimal impact on the overall Project cost.

47. Exhibit B-4, BCUC 1.16.3 and 1.16.3.1

Please confirm, or explain otherwise, that a two percent inflation adjustment was applied on top of the cost escalation already applied to the incremental O&M, property tax, and the future sustainment capital costs during the post-project analysis period.

16.3.1

If confirmed, please provide the total escalation that was applied to the incremental O&M, property tax, and the future sustainment capital costs in dollars and percentage and explain why this is appropriate.

Confirmed. At the time of preparing the Application, FBC estimated the incremental O&M, property tax, and Project cost estimate in 2022 dollars. In order to convert these estimates from 2022 dollars to as-spent dollars, FBC applied both escalation as well as inflation, as explained further below:

Incremental O&M: As noted on page 58 of the Application, FBC expects the incremental O&M to be incurred from 2027 onwards when all assets have entered FBC's rate base. In order to convert the incremental O&M from 2022 dollars to as-spent dollars, FBC first applied the cumulative cost escalation percentage (as set out in the response to BCUC IR1 16.2) to convert the incremental O&M from 2022 dollars to 2026 dollars.

Beyond 2026, FBC then applied the two percent inflation over the 50-year post-Project analysis period to convert these estimates from 2026 dollars to as-spent dollars. Please refer to Table 1 below which provides the incremental O&M estimates in 2022 dollars as well as the cumulative escalation and inflation used to calculate the as-spent dollars.

Table 1: Total Escalation Applied to Incremental O&M (in $000s and %) from 2027 to 2034

$000s	2027	2028	2029	2030	2031	2032	2033	2034
Incremental O&M (2022$)[1]	1.9	1.9	1.9	1.9	1.9	(6.3)	1.9	183.3
Escalation	0.3	0.3	0.4	0.4	0.5	(1.7)	0.6	58.1
Escalation (%)	15%	17%	19%	22%	24%	27%	29%	32%
As-spent Dollars[2]	2.2	2.2	2.3	2.3	2.4	(8.0)	2.5	241.4

Notes to Table:

1. As noted on page 58 of the Application, the incremental O&M is estimated over an eight-year window based on a breaker replacement every eight years. As such, Table 1 above provides the incremental O&M estimates over the eight-year period in 2022 dollars, plus escalation to as-spent dollars to the individual years from 2027 to 2034.
2. The incremental O&M in as-spent dollars from 2027 to 2034 aligns with Line 1 of Schedule 2 of Confidential Appendix H.

Table 2: Total Escalation Applied to Incremental Property Tax (in $000s and %) to 2027

$000s	2027
Property Tax - General, School and Other (2022$)	405.9
Escalation	59.5
Escalation (%)	15%
As-spent Dollars[1]	465.4

47.1 The CEC has reviewed FBC's response to BCUC 1.16.3.1. Please confirm the CEC's understanding that the escalation after 2026, as shown above, contains the aggregate specific escalation estimates up to 2026, and from 2026 on to 2034 it represents only the inflation of 2% for each year over the cumulative escalation to 2026.

Response:

Confirmed. Please also refer to the response to BCUC IR2 33.3 for an example showing the cumulative inflation calculated to 2027.

47.2 The escalation of 15% from 2022 to 2027 was, as shown above, applicable to property taxes. Please confirm that this source for escalation was applied to O&M as well as property tax.

Response:

Please refer to the response to BCUC IR2 33.3.

47.3 Please confirm that the sole source of the escalation factors was from the Wood Mackenzie Report for project capital costs.

Response:

Confirmed. However, please refer to the response to CEC IR2 46.2 which explains that the escalation factors provided by the Wood Mackenzie Report incorporated over 150 indices and are customized specific to British Columbia.

Please also refer to the response to BCUC IR2 33.2 which shows that the escalation factors are similar to other FEI and FBC CPCN projects, even though different sources/references were used.

48. Reference: Exhibit B-7, CEC 1.29.1 and 1.30.1

29.1 Please explain whether or not the Project capital and incremental sustainment capital included in the Project will result in any reduction to the capital or sustainment capital that would otherwise be required for either the ASM or the WTS substation or the ASM substation in the absence of the Project.

29.1.1 If yes, please explain whether or not FBC has or will incorporate these savings into its financial analyses and/or MRP such that ratepayers are not being charged for services that will no longer be required.

Response:

FBC did not analyze the potential capital or sustainment capital that would be required for either the ASM Terminal Station or WTS in the event that the Project was not undertaken, as FBC determined that the Status Quo alternative was not feasible and it was therefore rejected in the screening stage.

With regard to the impact of the Project on FBC's future sustainment capital requirements, FBC would incorporate these requirements into its sustainment capital plans once the Project is in-service and would file for approval of sustainment capital expenditures as part of its future revenue requirement applications.

30.1 Please specifically describe the types of O&M savings that will occur from eliminating those O&M savings associated with the ASM substation, and elaborate on why the additional O&M costs will more than offset those savings.

Response:

FBC expects that ongoing maintenance will be optimized as a result of the Project through the consolidation into one location (i.e., WTS). This consolidation is anticipated to create efficiencies in the following areas:

- Maintenance mobilizing and de-mobilizing;
- Administration;
- Annual inspections, testing, and oil sampling;
- Annual operating costs (snow removal, switching, herbicide); and
- MRS testing requirements due to less electrical apparatus that must be maintained to these requirements.

However, consolidation of the 63 kV/161 kV voltage conversion into WTS also results in increased costs in certain areas, which are expected to offset the above-described O&M savings. The 63 kV/161 kV at WTS would involve different equipment and configuration, resulting in slightly higher O&M costs.

48.1 Please explain whether or not FBC's MRP implicitly assumes the costs associated with the continuation of existing assets.

Response:

The MRP Decision and Order G-166-20 approved the continuation of the current process to review Major Projects outside of the MRP and annual review processes. This process, as explained on page 132 of the MRP Decision, is as follows:

> FortisBC states, as in the case of the Current PBR Plans, it will continue to seek approval of Major Projects by way of CPCN or an application under section 44.2 of the UCA. FortisBC is also proposing that the approved CPCN thresholds for FEI and FBC of $15 million and $20 million, respectively, continue for the proposed MRP term. FortisBC also submits it will bring forward any changes to O&M or Regular capital as a result of a Major Project in the appropriate rate-setting proceeding. [Emphasis added]

Although the ASM Project was not explicitly referenced in the MRP Application, the steps to incorporate changes to O&M or Regular capital as a result of this CPCN Project remain the same and will be reviewed, including any savings in maintenance costs, and reflected in a future rate setting application (i.e., after CPCN approval).

48.2 Please confirm that all changes arising from the Project such as reduced maintenance would be identified in the next RRA application.

Response:

Please refer to the response to CEC IR2 48.1.

49. Reference: Exhibit B-7, CEC 1.17.3.2

> 17.3.2 Please advise whether or not FBC has evaluated an alternative using battery capacity to compensate for instances exceeding transformer capacity and failure of one transformer.
>
> **Response:**
>
> Addressing all or some of the capacity concerns in the Boundary and Similkameen area through other stations would not alleviate the need to increase the capacity of the ASM transformers because they transfer power that is generated in the Kootenays to the Boundary and Similkameen area.
>
> There are no other substations that can perform the ASM transformers' function.
>
> FBC has investigated battery capacity as an alternative supply to support load demand and manage outages. In the case of the ASM Project, battery capacity is not a practical or economical solution. Battery compensation would only reduce system load impacts on the ASM power transformers; it would not reduce the hydro-generation power transformed by the ASM power transformers and would not address the risk of aging transformers at the ASM Terminal Station.

49.1 Please elaborate on the hydro-generation power transformed by the ASM power transformers, and why this cannot be addressed by battery supply compensation temporarily.

Response:

The ASM transformers transform power generated by the hydro-generation in the Kootenay region to the FBC Transmission System and Bulk Electric Network. Although some of this hydro-generation supplies the load in the Boundary and Similkameen areas, this power supply is also transferred outside of the Boundary and Similkameen areas.

Battery supply compensation is not a source of power generation. Batteries are a power storage apparatus, which require power generated from another source to supply the power they store. The batteries will increase the load demand due to their power draw during standby and recharge.

Further, battery compensation does not:

- address the need for increased capacity of the ASM power transformers; or
- address the risk of aging transformers at the ASM Terminal Station.

49.2 Please explain whether or not the battery compensation could permit FBC to service load in the event of a temporary exceedance, and if not please explain why.

Response:

Please refer to the response to CEC IR2 49.1.