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FortisBC Inc.

Application for a Certificate of Public Convenience and Necessity for the A.S. Mawdsley Terminal Station Project

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Decision
and Order C-6-23

December 6, 2023

Before:
T. A. Loski, Panel Chair
A. C. Dennier, Commissioner
W. M. Everett, KC, Commissioner

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Executive summary

FortisBC Inc. (FBC) filed an application with the British Columbia Utilities Commission (BCUC) on February 24, 2023 (Application) for a Certificate of Public Convenience and Necessity (CPCN) for the A.S. Mawdsley (ASM) Terminal Station Project (Project), pursuant to sections 45 and 46 of the *Utilities Commission Act*. The Project includes installation of two new 150 MVA 63/161 kV transformers, a site footprint expansion and other alterations at the Warfield Terminal Station (WTS), followed by the subsequent decommissioning of the ASM Terminal Station. Both the ASM Terminal Station and the WTS are located in Trail, BC. The estimated cost of the Project is $35.179 million, including allowance for funds used during construction and the cost of equipment removal.

The BCUC established a written hearing process for the review of the Application, which comprised notice and intervener registration, two rounds of information requests, and final and reply arguments. Five interveners registered in the proceeding: British Columbia Old Age Pensioners' Organization et al., Commercial Energy Consumers Association of British Columbia, Industrial Customers Group, Mr. Murray McConnachie, and Mr. Alan Wait. Mr. Wait later withdrew his intervener status.

The Panel finds that FBC has established the need to: (a) address FBC's current inability to meet the applicable N-1 Transmission System Planning Criteria due to load growth in the Boundary and Similkameen areas, and (b) address the deteriorating conditions of the two power transformers that are currently installed at the ASM Terminal Station.

The Panel finds that the Project is the most appropriate alternative to meet the established project needs. The Panel is satisfied that FBC has identified a wide range of alternatives to meet the Project needs, has properly rejected those which were not feasible or clearly inferior, and properly evaluated the two credible alternatives.

The Panel finds that FBC's consultation with Indigenous communities as well as its engagement with local governments and local communities to date has been adequate.

The Panel is satisfied with FBC's plan to complete the Project and its cost estimate. The Panel finds that the Project is consistent with the objectives of the *Clean Energy Act* and with FBC's approved 2021 Long-Term Electric Resource Plan.

The Panel finds that the Project is in the public interest and that the public convenience and necessity require: the installation of two new 150 MVA 63/161 kV transformers at WTS; related station and transmission modifications at WTS; and decommissioning of the existing ASM Terminal Station. Accordingly, the Panel issues a CPCN to FBC for the Project. The Panel directs FBC to provide a final report within three months of substantial completion of the Project, and material change reports as required.

1.0 Introduction

On February 24, 2023, FortisBC Inc. (FBC) filed an application (Application) with the British Columbia Utilities Commission (BCUC) for a Certificate of Public Convenience and Necessity (CPCN) for the A.S. Mawdsley (ASM) Terminal Station project (ASM Project or the Project), pursuant to sections 45 and 46 of the *Utilities Commission Act* (UCA).[1] A CPCN is required for this Project because it is a system extension that exceeds the materiality threshold of $20 million set for FBC by Order G-120-15.[2]

The Project includes installation of two new 150 MVA transformers at the Warfield Terminal Station (WTS) and the subsequent decommissioning of the ASM Terminal Station. Both the ASM Terminal Station and the WTS are located in Trail, BC. FBC considers that the need for the Project is driven by load growth in the Boundary and Similkameen areas of FBC's service territory, which has resulted in an inability to meet FBC's Transmission System Planning Criteria at the ASM Terminal Station, triggering potential reliability issues. Further, the deteriorating condition of the two existing ASM transformers has resulted in a risk of failure that FBC considers requires immediate attention.[3]

The estimated cost of the Project in as-spent dollars is $35.179 million, which includes allowance for funds used during construction and the cost of equipment removal. FBC expects the Project to be completed by the end of 2026.[4]

1.1 Regulatory Process

By Order G-70-23, dated March 30, 2023, the BCUC established a regulatory timetable for reviewing the Application, which comprised notice and intervener registration, two rounds of information requests (IRs), and written final and reply arguments.

Five parties registered as interveners in the proceeding: British Columbia Old Age Pensioners' Organization et al. (BCOAPO); Commercial Energy Consumers Association of British Columbia (the CEC); Industrial Customers Group (ICG); Alan Wait, and Murray McConnachie. Alan Wait later withdrew his intervener status.[5]

1.2 Legislative and Regulatory Framework

1.2.1 *Utilities Commission Act*

Section 45(1) of the UCA provides that except as otherwise provided, after September 11, 1980, a person must not begin the construction or operation of a public utility plant or system, or an extension of either, without first obtaining from the BCUC a certificate that public convenience and necessity require, or will require, the construction or operation of the plant or system (i.e., a CPCN).

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[1] Exhibit B-1, p. 1.

[2] FortisBC Energy In. and FortisBC Inc. Multi-Year Performance Based Ratemaking Plans for 2014 through 2019 Approved by Decisions and Orders G-138-14 and G-139-14 Capital Exclusion Criteria under PBR – Compliance Filing Order G-120-15 with Reasons for Decision, dated July 22, 2015. Directive 2.

[3] Exhibit B-1, p. 1.

[4] Ibid.

[5] Exhibit C2-2.

Section 46(3.1) of the UCA provides that in deciding whether to issue a CPCN applied for by a public utility other than the "authority" (which is defined in the UCA to mean the British Columbia Hydro and Power Authority (BC Hydro)), the BCUC must consider:

(a) The applicable of British Columbia's energy objectives, which are set out in section 2 of the *Clean Energy Act* (CEA);

(b) The most recent long-term resource plan filed by the public utility under section 44.1 of the UCA, if any; and

(c) The extent to which the application for the certificate is consistent with the applicable requirements under section 6 and 19 of the CEA.

1.2.2 BCUC's CPCN Guidelines

The BCUC's CPCN Guidelines provide general guidance regarding the BCUC's expectation of the information that should be included in a CPCN application while providing the flexibility for an application to reflect the specific circumstances of the applicant, the size and nature of the project and the issues raised by the application.[6]

The BCUC's CPCN Guidelines state that a CPCN application submitted under sections 45 and 46 of the UCA should contain information on the applicant, project need, alternatives and justification, consultation, project description, project cost estimate, provincial government energy objectives and policy considerations, and new service areas.[7]

1.3 Structure of Decision

The structure of this Decision largely follows that of the Application and the BCUC's CPCN Guidelines, as follows:

- Section 2 addresses the Project need and justification;
- Section 3 addresses alternatives and justification;
- Section 4 provides a description of the proposed Project;
- Section 5 outlines the Project costs and rate impact;
- Section 6 addresses consultation and engagement;
- Section 7 addresses alignment with the provincial energy objectives and FBC's long-term resource plan;
- Section 8 provides the Panel determinations; and
- Section 9 outlines reporting requirements for the Project.

Relevant evidence and submissions submitted by the applicant and interveners are summarized in each section.

[6] BCUC 2015 Certificate of Public Convenience and Necessity Application Guidelines (CPCN Guidelines), Appendix A to BCUC Order G-20-15, p. 1.

[7] CPCN Guidelines, pp. 4-9.

2.0 Project Need and Justification

FBC identifies two key drivers of the need for the Project:[8]

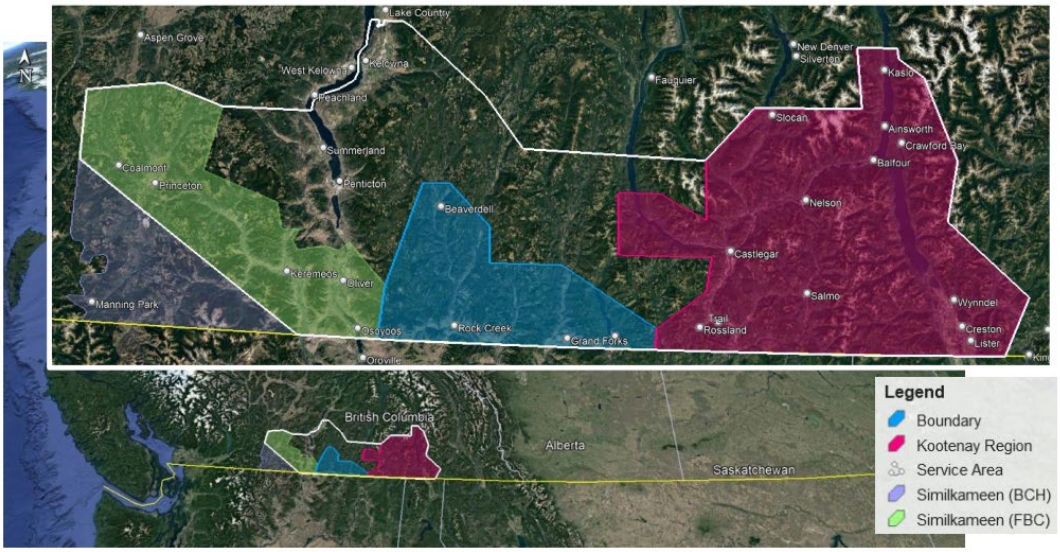
- Potential reliability issues triggered by load growth in the Boundary and Similkameen areas of FBC's service territory resulting in the inability to meet FBC's transmission system planning criteria.
- The deteriorating condition of the two existing transformers at ASM Terminal Station has resulted in a risk of failure that FBC considers requires immediate attention. [9]

The following section provides an overview of the Boundary and Similkameen areas and the associated power supply path through WTS and the ASM Terminal Station. Section 2.2 then describes FBC's transmission system planning criteria, and Sections 2.3 and 2.4 discuss the two key Project drivers identified by FBC.

2.1 System Overview

The Project will serve FBC's customers in the Boundary and Similkameen areas, located in BC's Southern Interior. FBC has more than 26,000 direct customers in these areas, which account for approximately 19 percent of FBC's total summer and winter peak load.[10] FBC's service territory in the Boundary and Similkameen areas is shown in the following figure in blue and green, respectively.

Figure 1: FBC's Service Territory in the Boundary and Similkameen Areas of BC's Southern Interior[11]

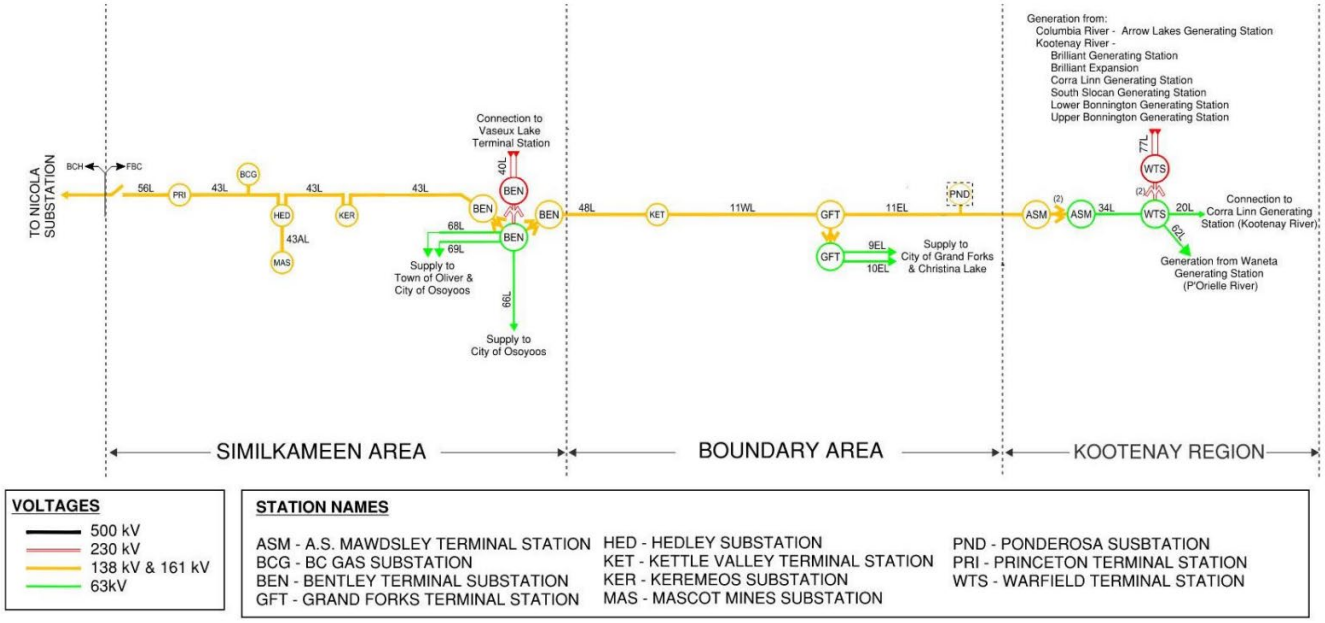


FBC customers in the Boundary and Similkameen areas are supplied with power generated in the Kootenay region (pink area in the above Figure 1), and with power from a transmission interconnection to BC Hydro at Vaseux Lake Terminal Station, which is located north of Oliver, BC.[12]

[8] Exhibit B-1, p. 16.
[9] Ibid., p. 1.
[10] Ibid., p. 13.
[11] Ibid., p. 11, Figure 3-1.
[12] Ibid., p. 11.

The following single line diagram illustrates the power supply to the Boundary and Similkameen areas:[13]

Figure 2: Boundary and Similkameen Power Supply Single Line Diagram[14]



As illustrated above, the Boundary and Similkameen areas receive power generated in the Kootenay region by way of WTS and ASM Terminal Station. At WTS, power is transformed from 230 kV to 63 kV by WTS transformers (WTS T1 and WTS T2). Power then flows to ASM Terminal Station by way of 34 Line where it is transformed from 63 kV to 161 kV by ASM transformers (ASM T1 and ASM T2) before travelling to the Boundary and Similkameen areas via 11E Line.[15]

FBC explains that, on average, the Boundary and Similkameen areas are supplied 67 percent of their load in the winter and 75 percent of their load in the summer by the ASM Terminal Station, with the remainder supplied from FBC's transmission interconnection to BC Hydro at Vaseux Lake Terminal Station.[16]

FBC states that load flow through the ASM transformers is determined by three main factors:[17]

- The Boundary and Similkameen area loads (i.e., customer demand);
- Generation dispatch (with generation from the Waneta hydroelectricity facility having the greatest impact); and
- System configuration.

[13] Ibid., p. 12.
[14] Ibid., p. 12, Figure 3-2.
[15] Ibid.
[16] Ibid., p. 2, Exhibit B-4, BCUC IR 2.15.
[17] Exhibit B-10, BCUC IR 28.1.

2.2 FBC's Transmission System Planning Criteria

FBC states that, in alignment with typical industry planning standards, its transmission system planning criteria specify that customer load should be able to be supplied under both normal (N-0)[18] and single contingency (N-1)[19] conditions.[20] FBC identifies that satisfying this planning criteria allows FBC to reliably maintain service.[21]

FBC explains that the N-0 reliability criteria applies to all transmission facilities, while the N-1 reliability criteria applies to all transmission facilities that are part of the FBC interconnected system. The ASM Terminal Station is part of FBC's interconnected system, therefore it is subject to meeting both N-0 and N-1 reliability criteria at all times, which include during minimum and maximum forecast load and generation conditions.[22]

FBC further explains that, based on current peak load conditions, in the event of an outage or failure of one of the ASM transformers (an N-1 event), the remaining ASM transformer would be overloaded and unable to meet customer loads.[23] FBC states that currently, all other parts of the FBC interconnected system achieve N-1 planning criteria, with the exception of the ASM Terminal Station.[24]

2.3 Load Growth and the Peak Load Forecast

FBC states that it has experienced high levels of customer load growth in the Boundary and Similkameen areas, and anticipates these high levels of growth to continue in the future.[25]

FBC uses a "1-in-20" year load forecast for system planning purposes. FBC explains that a "1-in-20" forecast accounts for possible weather extremes that directly impact winter and summer peak load, and using it for system planning purposes ensures sufficient capacity is available under these conditions.[26] The "1-in-20" year load forecast is higher than the expected load forecast under normal conditions, meaning there is a 5 percent probability that loads will be higher than the forecast. FBC explains that this forecast is used as the basis for determining compliance with FBC's transmission planning standards and is also consistent with industry practice.[27] FBC states that it has been using the "1-in-20" year load forecast methodology since at least 2011 and, most recently, in FBC's Kelowna Bulk Transformer Addition (KBTA) project CPCN application,[28] which was approved by the BCUC in Order C-4-20.[29]

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[18] Normal Operation, also referred to as N-0 reliability, means that with all major elements of the power system in service, the network can be operated to meet projected customer demand in order to avoid a load loss (customer outage). Exhibit B-1, p. 17, footnote 3.
[19] N-1 reliability (also referred to as single contingency) means that an outage of a single element with all other elements of the power system in service (i.e., outage of a single transmission line, transformer, generating unit, power conditioning unit like a shunt capacitor bank, a shunt reactor bank, a series capacitor, a series reactor, etc.) results in no load loss. Exhibit B-1, p. 17, footnote 4.
[20] Exhibit B-1, p. 17.
[21] FBC Final Argument, p. 7.
[22] Exhibit B-1, p. 17.
[23] Ibid., p. 10.
[24] Exhibit B-4, BCUC IR 2.6.2.
[25] Exhibit B-1, p. 2.
[26] Ibid., p. 17.
[27] Ibid., pp. 17-18.
[28] Ibid., p. 18.
[29] FortisBC Inc. Application for a Certificate of Public Convenience and Necessity for the Kelowna Bulk Transformer Addition Project, Order C-4-20 and Decision dated November 30, 2020.

FBC provides the historical (2017-2022) and forecast (2023-2027) peak load for the Boundary and Similkameen areas, shown below in Table 1, based on the methodology described above.[30] FBC explains that the forecasts of peak load are based on historical data, which are used in power flow simulations to determine compliance with FBC's transmission system planning criteria, and also include forecast load growth related to electric vehicles (EVs) and load from one known large capacity customer.[31]

Table 1: Boundary and Similkameen Areas' Historical and Forecast Peak Load[32]

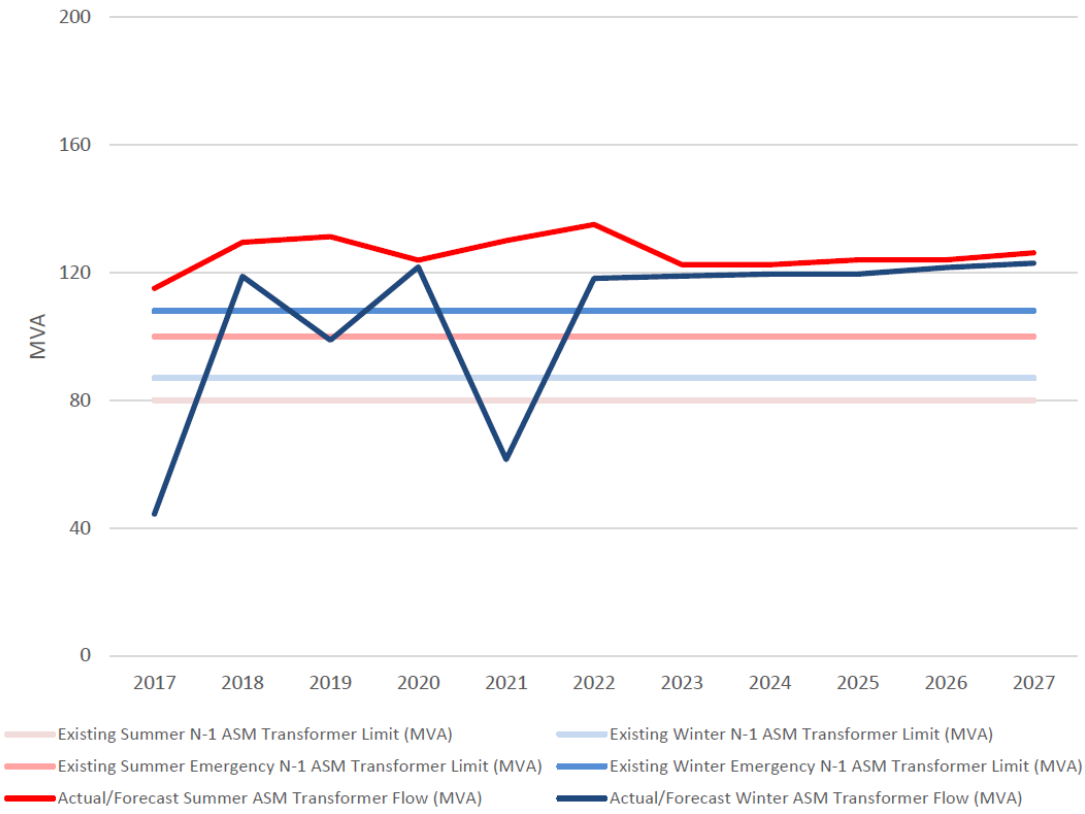
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Summer (MW)	122	121	133	135	148	173	163	163	165	165	168
Winter (MW)	128	131	142	145	163	187	177	178	178	181	183

FBC explains that the area peak load forecasts for the Boundary and Similkameen areas are created by allocating "1-in-20" system peak forecast among FBC's substations. This is done by scaling the distribution planning forecast, which is the sum of non-coincident substation peak forecasts, to the system peak.[33] FBC provides a non-coincident peak forecast for each of the Boundary and Similkameen area substations for both summer and winter from 2023 to 2027. The Ponderosa substation is forecast to have the highest peak load in the area, at 24 MW, for both summer and winter.[34] The peak load forecast from the Ponderosa station is only a percentage of the overall peak load for the entire Boundary and Similkameen region, which, as shown in Table 1, is projected to increase over time.

As previously noted, the ASM Terminal Station supplies power to the majority of the Boundary and Similkameen area load, namely 67 percent and 75 percent of the load in winter and summer, respectively.[35] The following figure illustrates the historical and forecast peak load at ASM Terminal Station alongside the ASM transformer N-1 limits for both winter and summer.[36]

[30] Exhibit B-1, p. 18.
[31] Ibid.
[32] Exhibit B-1, p. 18. Table prepared by the BCUC with data from Table 3-2 and Table 3-3.
[33] Exhibit B-6, BCOAPO IR 5.1.
[34] Ibid.
[35] Exhibit B-1, p. 2.
[36] Ibid., p. 19.

Figure 3: ASM Terminal Station Load Compared to N-1 Transformer Limits[37]



While the above Figure depicts ASM load exceeding N-1 transformer limits from 2017, FBC states that the load at the ASM Terminal Station has been exceeding N-1 transformer limits since at least 2014. Until completion of an assessment performed in 2019, FBC considered situations where load exceeded the ASM N-1 transformer limits to be either anomalous or temporary events for the purposes of transmission planning.[38] Through the 2019 assessment, and following the interconnection of a new industrial load in the Boundary area, FBC identified that the potential to exceed the N-1 ASM transformer emergency limits had increased in both frequency and size due to customer load growth.[39] FBC states that based on actual 2022 data, if one of the ASM transformers had failed and been non-operational through 2022, the remaining transformer would have been overloaded for approximately 23 percent of the year.[40] FBC states that the frequency of these high load situations will only become greater in the future, therefore necessitating the ASM Project at this time.[41]

In 2019, with the increased loading on its system, FBC states that it identified procedures that were effective options for dealing with a potential overload situation of the ASM transformers in the short-term;[42] however, these procedures are not considered by FBC to be sustainable in the long-term and in violation of its transmission system planning criteria.[43]

[37] Exhibit B-1, p. 19, Figure 3-7.
[38] Exhibit B-10, BCUC IR 28.1.
[39] Ibid.
[40] Exhibit B-4, BCUC IR1 2.1.
[41] Exhibit B-10, BCUC IR 28.1.
[42] Ibid., BCUC IR 28.2.
[43] Exhibit B-4, BCUC IR 2.21.

FBC explains that the peak load forecasts for the Boundary and Similkameen areas, which include the ASM Terminal Station, may be higher or lower than anticipated based on the following three factors:[44]

- Frequency and volatility of extreme weather conditions;
- Unanticipated addition or subtraction of large industrial loads in the area; and
- Pace of electric vehicle adoption.

FBC states that should any of these factors increase peak load in the Boundary and Similkameen areas beyond what is forecast, then the need for the Project becomes even greater.[45] Should any of these factors decrease peak load in Boundary and Similkameen below what is forecast, FBC states that it would still need to proceed with the Project due to the overloading condition that occurs during a contingency event at the ASM Terminal Station.[46]

2.4 Age and Condition of ASM Transformers

In addition to the inability to meet FBC's transmission system planning criteria at the ASM Terminal Station, FBC states that the age and deteriorating condition of both ASM T1 and ASM T2 necessitate completion of the Project.[47] ASM T1 and ASM T2 are 57 and 51 years old, respectively, and the condition of both transformers continues to deteriorate with age, with their risk of failure increasing with each passing year.[48] FBC states that transformers of the same type as ASM T1 and ASM T2, that operated at the transmission level and were previously retired, had an average service life of 53 years,[49] and that those greater than 50 years old, such as ASM T1 and ASM T2, have a higher failure rate.[50]

In 2022, FBC commissioned Hitachi Energy (HE) to perform a comprehensive condition assessment for ASM T1 and ASM T2. In the assessment, HE determined the risk of failure for ASM T1 and ASM T2, by way of HE's risk-of-failure algorithm and a variety of technical and operational information,[51] to exceed FBC's accepted tolerances of 2 percent.[52] This tolerance was adopted by FBC in 2018, based on CEATI[53] industry findings,[54] and applied to transmission assets that are heavily loaded and supply multiple customers and communities.[55] Considering the calculated risk of failure, and the relative importance of each transformer, HE categorized both ASM transformers as having an "Urgent" total risk of failure, meaning that immediate action is needed.[56] Specifically, HE identified the following factors as major contributors to the risk for each unit:[57]

[44] Ibid., BCUC IR 2.13.2, 2.13.3.
[45] Exhibit B-4, BCUC IR 2.13.2.
[46] Ibid., BCUC IR 2.13.3.
[47] Exhibit B-1, p. 21.
[48] Ibid.
[49] Exhibit B-7, CEC IR 10.1.
[50] Exhibit B-1, p. 22.
[51] Ibid., Appendix B, p. 3.
[52] Ibid., p. 21.
[53] Centre for Energy Advancement through Technological Innovation
[54] Exhibit B-1, p. 21.
[55] Exhibit B-11, ICG IR 2.2.
[56] Exhibit B-1, p. 21.
[57] Ibid., Appendix B, p. 18.

- Risk of accessory failure due to their age (82.8 percent);
- Risk of dielectric failure due to various causes (2.9 percent);
- Risk from oil leaks or tank rust and their severity (8.4 percent); and
- Risk of short circuit failure (5.9 percent).

Within the condition assessment, HE determined the remaining insulation life of both transformers based on ambient temperature data, historical loading conditions and other technical attributes.[58] HE determined the remaining insulation life of ASM T1 and ASM T2 to be 15.6 years and 15 years, respectively.[59] Additionally, HE identified that the operation count for the load tap changer (LTC) contacts on both ASM T1 and ASM T2 has exceeded the maximum recommended by the manufacturer.[60] FBC states that the LTC is the second most failed component for this type of transformer, and that the LTCs currently in service have not been supported by the original manufacturer since 2004.[61] FBC explains that the LTCs need replacement, but that this would cost approximately $1.2 million per unit and is therefore not a cost-effective solution given that both transformers are more than 50 years old.[62]

FBC states that given the importance of the ASM transformers in supplying the Boundary and Similkameen areas, it is imperative that the capacity and condition issues be addressed.[63]

Positions of the Parties

BCOAPO agrees that a solution is needed for the potential overloading of the ASM transformers.[64] Similarly, the CEC agrees that FBC is currently unable to meet its transmission system planning criteria, and that additional capacity is needed.[65]

ICG submits that FBC has not been sufficiently transparent regarding the drivers of load growth that underlie Project need, in particular the addition of a new substation (Ponderosa) and the associated load of a crypto currency mining operation served by that substation.[66] ICG urged that the BCUC should examine the circumstances of this load addition to determine whether the single customer should bear some of the cost of the advancement of the ASM Project.[67]

In reply, FBC disagrees with ICG's submission that there has not been sufficient transparency regarding the drivers of Project need.[68] FBC states that the load growth in the Boundary and Similkameen areas is occurring regardless of the addition of one customer. FBC submits that even if this industrial customer were to have caused load to grow somewhat more quickly than otherwise would have been the case, this does not impact the

[58] Ibid., Appendix B, p. 13.
[59] Ibid., Appendix B, p. 16.
[60] Ibid., Appendix B, p. 13.
[61] Exhibit B-1, p. 22.
[62] Exhibit B-7, CEC IR 10.2.
[63] Exhibit B-1, p. 22.
[64] BCOAPO Final Argument, p. 8.
[65] CEC Final Argument, p. 12.
[66] ICG Final Argument, p. 1.
[67] Ibid., p. 1.
[68] FBC Reply Argument, p. 3.

fact that the Project is needed to address load growth in general. FBC submits that if the peak load was less than forecast by FBC (in the hypothetical case that the customer had not been added to the system), the Project would be needed due to the overloading condition that occurs during an N-1 contingency event at the ASM Terminal Station. FBC concludes that "the Project is needed to reliably serve the load of all customers in the Boundary and Similkameen areas."[69] Furthermore, FBC submits that the Project is required to address the condition of the ASM transformers, regardless of load growth.[70]

With respect to the deteriorating condition of the ASM transformers, BCOAPO accepts FBC's argument that the reliability of the ASM transformers needs to be addressed.[71]

The CEC agrees that additional capacity is needed but submits that the ASM transformers have 10 to 15 years of additional life left based on the HE report for the key component analyzed, namely, insulation. The CEC submits while this does not affect the need for the Project, it could potentially affect the alternative analysis making Alternative 6 potentially relevant.[72] The CEC further submits that it would be useful if FBC could find an economical route to gaining some of the remaining life value from the ASM transformers.[73]

FBC disagrees with CEC's assertion that there is life left in the ASM transformers, and that this could impact available Project alternatives.[74] FBC replies that the ASM transformers could not be refurbished to gain additional life as the component that is most at risk of failure (the On-Load Tap Changers) cannot be replaced, even if the ASM transformers have insulation with 10-15 years left.[75]

FBC submits that the risk level of the ASM transformers has been assessed as being both "high" (as the probability of failure in any given year is more than 2 percent), as well as "unacceptable" (due to the criticality of the ASM transformers to FBC's system, the lengthy response time caused by the long-lead times for replacement transformers, and the current condition of the ASM transformers).[76] Finally, FBC submits that running the ASM transformers to failure was not an option considered by FBC as it fails to meet one of the Project objectives to address aging infrastructure.[77]

Panel Discussion

The Panel finds that FBC has established the need to a) address FBC's current inability to meet the applicable transmission system planning criteria due to load growth in the Boundary and Similkameen areas, and b) address the deteriorating conditions of the two power transformers that are currently installed at the ASM Terminal Station. The Panel finds that there is no justification to delay addressing this need.

[69] Ibid., p. 5.
[70] Ibid., p. 4.
[71] BCOAPO Final Argument, p. 10.
[72] CEC Final Argument, p. 12.
[73] Ibid., p. 13.
[74] FBC Reply Argument, p. 8.
[75] Ibid., p. 9.
[76] Ibid., pp. 8-9.
[77] FBC Final Argument, p. 9.

The Panel agrees with FBC and all interveners that the transmission system planning criteria are appropriate for ensuring that FBC can continue to serve all load in the event of an outage or failure of one of the ASM transformers. FBC has appropriately demonstrated that in an N-1 contingency event, the summer peak load flowing through the ASM Terminal Station has exceeded both the normal and emergency rating of a single ASM transformer.

The Panel accepts FBC's "1-in-20" year method for forecasting peak load, which has been used by FBC since at least 2011, has been examined by the BCUC on multiple occasions and is not opposed by interveners. The Panel accepts that the peak load is forecast to continue to exceed the normal and emergency ratings of a single ASM transformer in both the winter and summer going forward.

The Panel disagrees with ICG that the peak load growth is dominated by one industrial customer. The Panel finds that FBC has demonstrated that peak load growth has occurred and is forecast to occur across the Boundary and Similkameen areas and is not only due to the one industrial customer.

The Panel accepts that even though FBC has managed customer load through the ASM transformers operationally, this is not a sustainable solution or reliable long-term.

The Panel accepts that the ASM transformers have operated beyond their expected life and that their risk of failure is increasing every year, and that there is a need to address the deteriorating condition of the two ASM transformers. Notwithstanding the fact that the ASM transformers have insulation with 10-15 years left, the Panel disagrees with the CEC that there is additional life in the ASM transformers as FBC has demonstrated that other components cannot be reasonably replaced and are at the most risk of failure.

The Panel finds that there is no justification to delay addressing these needs due to the projected increased load in the Boundary and Similkameen areas and the increased risk of failures of the deteriorating ASM transformers.

3.0 Description and Evaluation of Project Alternatives

FBC identified and considered the following six alternatives for the Project:[78]

- Alternative 1: Status Quo;
- Alternative 2: Like-for-like Replacement of the ASM Terminal Station Transformers;
- Alternative 3: Rebuild the ASM Terminal Station and Expand the Existing Site Footprint;
- Alternative 4: Build a New Terminal Station at a Greenfield Site and Demolish the ASM Terminal Station;
- Alternative 5: Expand the WTS Site and Demolish the ASM Terminal Station; and
- Alternative 6: Retain the Existing ASM Terminal Station and Add a New Transformer at WTS.

Based on high levels of customer load growth in the Boundary and Similkameen areas and the increased likelihood of transformer failure due to the age and deteriorating condition of transformers at the ASM Terminal

[78] Exhibit B-1, pp. 23-24.

Station, as discussed in Section 2 of this Decision, FBC identified two objectives for the Project with which to compare and evaluate the Project alternatives:[79]

1. Increase the 161 kV capacity of the Boundary and Similkameen areas to maintain safe and reliable service to the customers of this region; and
2. Address the aging infrastructure at ASM Terminal Station (specifically the two aging transformers that are classified at a high risk of failure).

FBC initially considered all six alternatives at an early screening stage. However, it rejected four of these alternatives as not feasible because they did not align with the required Project objectives or were otherwise inferior to other alternatives.[80]

In the sections that follow, Section 3.1 describes the four alternatives that FBC considers non-feasible. Section 3.2 then describes the remaining two alternatives FBC considers feasible, with Section 3.3 reviewing how FBC evaluated the feasible alternatives to determine its preferred alternative.

3.1 Alternatives Considered Not Feasible

FBC's rejected alternatives included Alternative 1 (status quo), Alternative 2 (like-for-like replacement of the ASM transformers), Alternative 4 (building a new terminal station at a greenfield location and demolishing the ASM Terminal Station) and Alternative 6 (retaining the existing ASM Terminal Station and adding a new transformer at WTS).[81] Descriptions of each of these four alternatives and why they were deemed not feasible are summarized below.

Alternative 1: Status Quo

Alternative 1 involves FBC continuing to run the ASM Terminal Station, including the existing ASM transformers. FBC states this alternative is not feasible because it does not address the high probability of failure due to the condition of the aging transformers and does not increase the 161 kV supply capacity, which is necessary for FBC to meet its transmission system planning criteria in the event of a station outage. For these reasons, FBC states the status quo fails to meet the Project objectives and is not a viable option. [82]

Alternative 2: Like-for-Like Replacement of the ASM Transformers

Alternative 2 would replace aging transformers ASM T1 and ASM T2 with in-kind models (80 MVA, 63/161kV). FBC explains that while this option addresses one of the Project objectives (i.e.: relacing the aging transformers) it does not increase the 161 kV supply necessary for FBC to meet its transmission system planning criteria. For these reasons, FBC states this option fails to achieve both Project objectives and is therefore not feasible. [83]

[79] Ibid., p. 23.
[80] Exhibit B-1, p. 24.
[81] Ibid., p. 30.
[82] Ibid., p. 24.
[83] Ibid.

Alternative 4: Build a New Terminal Station at a Greenfield Site and Demolish the ASM Terminal Station

Under Alternative 4, FBC evaluated the possibility of building a new terminal station on a greenfield site and demolishing the existing ASM Terminal Station. FBC notes this alterative could meet both Project objectives by providing an increase of supply capacity and by addressing aging infrastructure. However, upon investigation of multiple potential greenfield sites during the early screening stage, FBC determined that attempting to procure a greenfield location, as opposed to utilizing an existing site that is owned by FBC or subject to a statutory right-of-way in favour of FBC, is not feasible. This infeasibility is due to logistical complexities and cost implications of attempting to procure new land, particularly when FBC can utilize two existing land parcels for the Project. As a result, FBC eliminated this alternative during the early screening stage.[84]

Alternative 6: Retain the Existing ASM Terminal Station and Add a New Transformer at WTS

Alternative 6 includes installation of a third transformer at WTS (WTS T3) while maintaining ASM transformers T1 and T2, resulting in the operation of three transformers in parallel. The addition of a third transformer at WTS would require an extension of the 11E transmission line from ASM to WTS via a new transmission corridor.[85] FBC notes that this corridor would have to go through Teck Metals Ltd.'s (Teck) Warfield Operations and would interfere with its current use of the land and established facilities and infrastructure.[86]

While FBC states this option would provide increases in capacity and redundancy to the transmission system, it is not viable due to complexities and challenges associated with terrain and current land use between the ASM Terminal Station and WTS. Further, this alternative fails to meet the Project objective of replacing aging infrastructure. As a result, FBC rejected this option in the screening stage.[87]

3.2 Feasible Project Alternatives

Following the early screening of identified alternatives, FBC determined that two alternatives, Alternatives 3 and 5, met the Project objectives as they address the risk of transformer failure, increase the 161 kV capacity to the Boundary and Similkameen areas, fulfill FBC's transmission system planning criteria, and maintain reliable service.[88] FBC states that where it identifies more than one feasible alternative, it uses an assessment methodology based on non-financial and financial evaluation criteria to select the preferred alternative (refer to Section 3.3).[89] Descriptions of each feasible alternative are provided below:

[84] Exhibit B-1, pp. 26-27.
[85] Ibid., pp. 29-30.
[86] Exhibit B-8, ICG IR 5.3.
[87] Exhibit B-1, pp. 29-30.
[88] Ibid., p. 30.
[89] Ibid.

Alternative 3: Rebuild the ASM Terminal Station and Expand the Existing Site Footprint

Under Alternative 3, FBC would undertake a full rebuild of the ASM Terminal Station to increase the station capacity.[90] The scope of Alternative 3 includes:[91]

- Replacement of the existing two power transformers at ASM with two new 63/161 kV transformers with a higher capacity rating of 90/120/150 MVA;
- Upgrade of the 63 kV bus structure to a ring bus configuration in order to provide increased reliability and operational flexibility to the system configuration;[92]
- Transmission line work; and
- Other associated substation works.

Under the current configuration, load in the Boundary and Similkameen areas is served from the ASM Terminal Station via the 34 Line and interconnection to BC Hydro at the Vaseux Lake Terminal Substation.[93] As part of the transmission line work under Alternative 3, FBC states that it requires a redundant line from WTS to the ASM Terminal Station as a backup to keep the WTS to ASM Terminal Station path energized during an N-1 contingency event, such as an unexpected outage on the 34 Line. FBC further explains that it cannot rely on other sources under the current configuration (via interconnection to BC Hydro at Vaseux Lake Terminal Station) to prevent a voltage collapse in the Boundary region during a 34 Line N-1 contingency event if the Boundary and Similkameen loads exceed 200 MW. Based on FBC's peak load forecast for the Boundary and Similkameen areas, FBC expects to exceed this load during the life of the Project.[94]

FBC estimates the cost of this transmission work under Alternative 3 to be approximately $2.630 million out of the total capital cost estimate of $43.517 million.[95]

Alternative 5: Expand the WTS Site and Demolish the ASM Terminal Station

Alternative 5 includes the expansion of the existing WTS footprint to replace the ASM Terminal Station. The scope of Alternative 5 includes:[96]

- Installation of two 63/161 kV transformers with a rating of 90/120/150 MVA at WTS;
- Associated transmission and substation works at WTS; and
- Demolition of the ASM Terminal Station, above grade.

3.3 Project Alternatives Evaluation

FBC evaluates Alternatives 3 and 5, based on a consideration of both financial and non-financial factors, ranking Alternative 5 as the highest rated project alternative. FBC states that Alternative 5 meets FBC's transmission

[90] Exhibit B-1, p. 24.
[91] Ibid., pp. 24-26.
[92] Exhibit B-4, BCUC IR 5.2.
[93] Exhibit B-13, BCOAPO IR 26.1.
[94] Based on the peak load forecast provided for the Boundary and Similkameen areas between 2023 and 2040, the winter and summer peak load will exceed 200 MW by 2034 and 2038 respectively. Exhibit B-4, BCUC IR 2.13.1
[95] Exhibit B-10, BCUC IR 30.3.
[96] Exhibit B-1, pp. 27-28.

system planning criteria, improves system reliability, has the potential for future expansion, and delivers the necessary safety performance. Alternative 5 also has limited environmental, archaeological, and community impact, carries less risk during construction and has less long-term maintenance requirements.[97]

FBC's non-financial and financial evaluation criteria are discussed in greater detail in the sections below.

3.3.1 Non-Financial Evaluation

FBC conducted a non-financial evaluation of the two feasible alternatives by considering six categories: infrastructure, safety, environmental, community and stakeholder relations, indigenous impact, and technical. Each category consists of several individual criteria with which to compare and evaluate each feasible alternative. FBC applies an individual weight, in percentage, to each non-financial criterion,[98] and awards a score to each of Alternative 3 and 5 on a scale of 0 (poor choice) to 3 (best choice). [99] FBC then calculates the weighted total score of each alternative by multiplying the score for each criterion with its associated individual weighting and summing the scores. [100] As shown in the following table, based on this evaluation of non-financial criteria, Alternative 5 was determined by FBC to be superior to Alternative 3. [101]

Table 2: FBC's Non-Financial Criteria Evaluation of Alternatives 3 and 5

Category	Criteria	Individual Weight	Alternative 3	Alternative 5
Infrastructure	System Reliability	7.2%	1	2
	Potential for Future Expansion	8.8%	0	2
Safety	Personnel Safety	4.9%	1	3
	Construction Safety	4.9%	2	2
	Ground Grid Safety	5.2%	0	2
Environmental & Archaeological	Ecological	8.1%	1	2
	Air-quality, GHG Reductions	6.8%	2	2
	Archaeology	8.1%	1	2.5
Community & Stakeholder Relations	Land Use & Adjacent Infrastructure	5.4%	2	3
	Community Impact	7.2%	2	3
	Economic Growth	5.4%	3	3
Indigenous	Indigenous Relations	8.0%	2	2
Technical	Land Availability	4.0%	2.5	2
	Constructability	8.0%	1	3
	Operations Accessibility and Operability	8.0%	2	2.5
		Weighted Total:	**1.43**	**2.39**

[97] Ibid., p. 3.
[98] Ibid., p. 33.
[99] Ibid.
[100] Exhibit B-1, p. 39, footnote 27.
[101] Ibid., pp. 33-39.

FBC states that it established the non-financial criteria, scoring approach, and individual weights for the Project through engagement and collaboration among FBC's internal stakeholders, which consider a variety of factors that can evolve and improve over time. These factors include FBC's understanding of existing and emerging issues and risks, prior experience with other projects, the specific attributes of the project area, and feedback received from customers, public stakeholders and Indigenous communities.[102]

FBC acknowledges that its evaluation criteria for the Project differ from the evaluation criteria used in previous projects, such as the evaluation of FBC's KBTA project. With respect to the differences in weightings between the KBTA CPCN application and this Project, FBC explains that individual weightings are determined for each criterion based on the context of each specific project and the importance that criterion has in meeting the objectives of the project. FBC also notes that the difference in weightings between this Project and KBTA project criteria is attributable to the fact that the Project criteria is more refined (i.e., more criteria items) than the KBTA project and that other criteria, such as Indigenous relations, have increased in importance.[103]

3.3.2 Financial Evaluation

FBC also performed a financial evaluation, which considered the capital costs, incremental O&M expenses and levelized rate impacts of each of Alternative 3 and Alternative 5. FBC provides a summary of its financial evaluation of Alternatives 3 and 5 over a 53-year analysis period in the table below:[104]

Table 3: Financial Evaluation of Project Alternatives 3 and 5[105]

	Alternative 3: Rebuild ASM	Alternative 5: Expand WTS
Capital Costs, including AFUDC[29], AACE Class 4, As-spent ($ millions)	43.517	28.378
Incremental O&M Expense in 2027, As-spent ($ millions)	0.014	0.002
Total PV of Incremental Revenue Requirement over 53 Years ($ millions)	57.736	37.372
Levelized Rate Impact over 53 Years (%)	0.82	0.53

FBC confirms that capital cost estimates for each feasible alternative meet the Association of Advancement of Cost Engineering International (AACE International) Class 4 level of Project definition and design.[106] Based on the difference in capital costs tabulated above, Alternative 3 has a higher present value of incremental revenue requirement and therefore a higher impact to customer rates over the 53-year analysis period as compared to Alternative 5. As such, FBC considers that Alternative 5 is preferable to Alternative 3 based on the financial evaluation.[107]

Overall, FBC considers that on the basis of both its financial and non-financial evaluation framework, the preferred solution is Alternative 5.[108]

[102] Exhibit B-4, BCUC IR 7.3.
[103] Ibid.
[104] Exhibit B-1, pp. 39-40.
[105] Ibid., p. 40, Table 4-4.
[106] Ibid., Table 4-4.
[107] Exhibit B-1, p. 40.
[108] Ibid.

Positions of the Parties

BCOAPO notes a concern with the lack of clarity and consistency between the evaluation criteria applied by FBC from project to project. BCOAPO submits that it "is content to rely on the Panel's findings as to whether FBC's use of a novel comparison matrix is appropriate in this process and will ensure this concern is brought to the attention of the Commission Panels in other, more appropriate regulatory processes."[109]

In reply, FBC acknowledges that there are differences between the evaluation criteria used in this Application as compared to the criteria used in other projects but submits that the differences are reasonable and valid. FBC submits that the Project's scoring approach, evaluation criteria and weights were established through the engagement and collaboration of FBC's internal stakeholders. FBC submits that these stakeholders "take into account a variety of factors (which can evolve and improve over time), including understanding of existing and emerging issues and risks, prior experience with other projects, the specific attributes of the project area, and feedback received from customers, public stakeholders and Indigenous communities." This process results in a revised set of evaluation criteria developed specifically for this Application. FBC submits that the BCUC should conclude that the evaluation criteria used were appropriate.[110]

ICG submits that Alternative 6, which included work to build a new transmission corridor between WTS and ASM Terminal Station, was inadequately examined. ICG submits that insufficient information was provided to support FBC's claim of interference with Teck's current use of the land if FBC were to construct a new transmission corridor between WTS and ASM Terminal Station under Alternative 6. ICG recommends the BCUC approve FBC's preferred Alternative 5 under the condition that FBC provide additional evidence that it "has made good faith efforts to negotiate with Teck for access to the 11E line extension between ASM and WTS."[111]

FBC replies that Alternative 6 was considered by FBC and eliminated from further consideration during the initial screening phase due to several factors. FBC submits that in addition to the concerns regarding interference with Teck's current use of land through its Warfield Operations, and the limited availability of usable land, Alternative 6 posed design, construction and operational risks. Further, Alternative 6 failed to address one of the key objectives of the Project, which is replacing the aging ASM transformers. As Alternative 6 had already been determined to be untenable based on these factors, FBC submits that it did not discuss the type of access arrangement with Teck requested by ICG.[112] Therefore, FBC replies that it disagrees with ICG's suggestion that the BCUC approval should be subject to the condition that FBC "has made good faith efforts to negotiate with Teck for access to the 11E line extension between ASM and WTS."[113]

The CEC agrees with FBC that Alternative 1, Alternative 2, and Alternative 4 are not viable options.[114] The CEC submits that if Alternative 6 could delay the purchase of a transformer, this might offset the costs of undertaking an underground transmission option as part of Alternative 6.[115]

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[109] BCOAPO Final Argument p. 21.
[110] FBC Reply Argument, p. 10.
[111] ICG Final Argument, pp. 1-2.
[112] FBC Final Reply Argument, pp. 6-7.
[113] Ibid., p. 3.
[114] CEC Final Argument, p. 15.
[115] Ibid., p. 19.

FBC replies that Alternative 6 was not considered a viable option as the ASM transformers are at the end of life and need to be replaced. Furthermore, FBC submits underground transmission work carries very high costs ($5 million per kilometre) and this unfavourable financial factor was one of the reasons why undertaking an underground transmission option was not considered by FBC as a viable option.[116]

BCOAPO accepts FBC's initial screening results and the identification of Alternatives 3 and 5 as the feasible alternatives.[117] BCOAPO accepts that Alternative 5 is preferable to Alternative 3 based on consideration of the non-financial evaluation criteria.[118] However, BCOAPO submits that a fair cost comparison between Alternatives 3 and 5 was not performed because FBC had included additional costs to complete transmission work required to meet the N-1 reliability criteria under Alternative 3 but did not include similar costs under Alternative 5.[119] BCOAPO notes that the cost of additional transmission work under Alternative 3 is $2.63 million and would still provide Alternative 5 a considerable cost advantage over Alternative 3. Therefore, BCOAPO agrees with FBC's assessment that Alternative 5 is the preferred alternative based on financial and non-financial criteria.[120]

FBC replies that the financial assessment of Alternative 3 versus Alternative 5 was correctly performed, and it was appropriate to include the cost of the transmission work in Alternative 3. The transmission line work to add redundancy to the 34 Line was only applicable to Alternative 3 at an estimated cost of $2.63 million.[121] However, FBC submits that an outage of the 11E Line would have the same impact under either Alternative 3 or Alternative 5. Significant cost to both Alternatives 3 and 5 would need to be added in order make 11E Line redundant, however this was not included in either alternative, as the objective of the Project was to address the ASM transformers, as opposed to 11E Line.[122]

The CEC acknowledges that the FBC preferred alternative is a good solution based on the evidence on the record and recommends that the BCUC grant the CPCN that FBC has requested specifically for Alternative 5.[123]

Panel Discussion

The Panel finds that the Project is the most appropriate alternative to maintain the safe and reliable service to customers in the Boundary and Similkameen areas considering increasing loads and to address the aging ASM transformers.

The Panel is satisfied that FBC has identified a wide range of alternatives to meet the increasing needs of the Boundary and Similkameen areas and address the aging ASM transformers, has properly rejected those which were not feasible or clearly inferior, and properly evaluated the two credible alternatives. The Panel agrees that the proposed Project is the most appropriate alternative to meet the applicable single contingency in its transmission system planning criteria due to load growth in the Boundary and Similkameen areas, and to

[116] FBC Reply Argument, p. 7.
[117] BCOAPO Final Argument, p. 13.
[118] Ibid., p. 16.
[119] Ibid., pp. 18-19.
[120] BCOAPO Final Argument, p. 21.
[121] FBC Reply Argument, p. 11.
[122] Ibid., p. 12.
[123] CEC Final Argument, p. 17 and 21.

address the deteriorating conditions of the two power transformers that are currently installed at the ASM Terminal Station.

The Panel accepts FBC's evaluation framework used to assess the feasible alternatives identified. The Panel acknowledges BCOAPO's concern regarding the use of a novel comparison matrix in the evaluation of alternatives but concludes that the evaluation criteria used were appropriate. The Panel accepts that having a set of Project-specific non-financial criteria and weights for the purpose of evaluating alternatives is reasonable as each project can have unique considerations. The Panel finds that FBC's approach to incorporate project specific understanding of issues, risks, attributes of the project area and feedback from customers, public stakeholders, and Indigenous communities to develop the evaluation criteria and weights is sensible.

The Panel is satisfied that it was appropriate for FBC to only conduct an in-depth analysis of the two alternatives that FBC demonstrated could meet the Project objectives. In particular, the Panel is satisfied with FBC's assessment that Alternative 6 is not a feasible option since it does not meet one of the Project objectives to address the aging ASM transformers. The Panel rejects ICG's recommendation to add a condition to the approval of FBC's preferred Alternative 5, requiring that FBC provide additional evidence to support it has made adequate negotiation efforts with Teck to access its land between the WTS and ASM stations for a new transmission corridor. The Panel agrees with FBC's approach not to pursue further access arrangements with Teck once Alternative 6 was assessed to be not feasible, as the Panel views that once an alternative has been deemed not feasible, further work is not required to refine the alternative.

The Panel is satisfied that FBC properly evaluated the two credible alternatives, and that Alternative 5, the Project, is the most appropriate alternative to meet the increasing needs of the Boundary and Similkameen areas and address the aging ASM transformers. The Panel is satisfied with the evaluation process that demonstrated that Alternative 5 is superior to Alternative 3 based on the quantitative non-financial evaluation and the financial evaluation. The Panel agrees with BCOAPO that even if the costs of the transmission work under Alternative 3 were removed, Alternative 5 would still have a cost advantage.

4.0 Project Description

This section provides an overview of the Project scope, schedule, risks and environmental and archaeological impacts.

FBC identifies the Project's principal elements as modifications to the land, station, transmission system, distribution system and fibre path.[124] The scope of each of these elements is summarized in the table below:

[124] Exhibit B-1, p. 42.

Table 4: Summary of Project Activities[125]

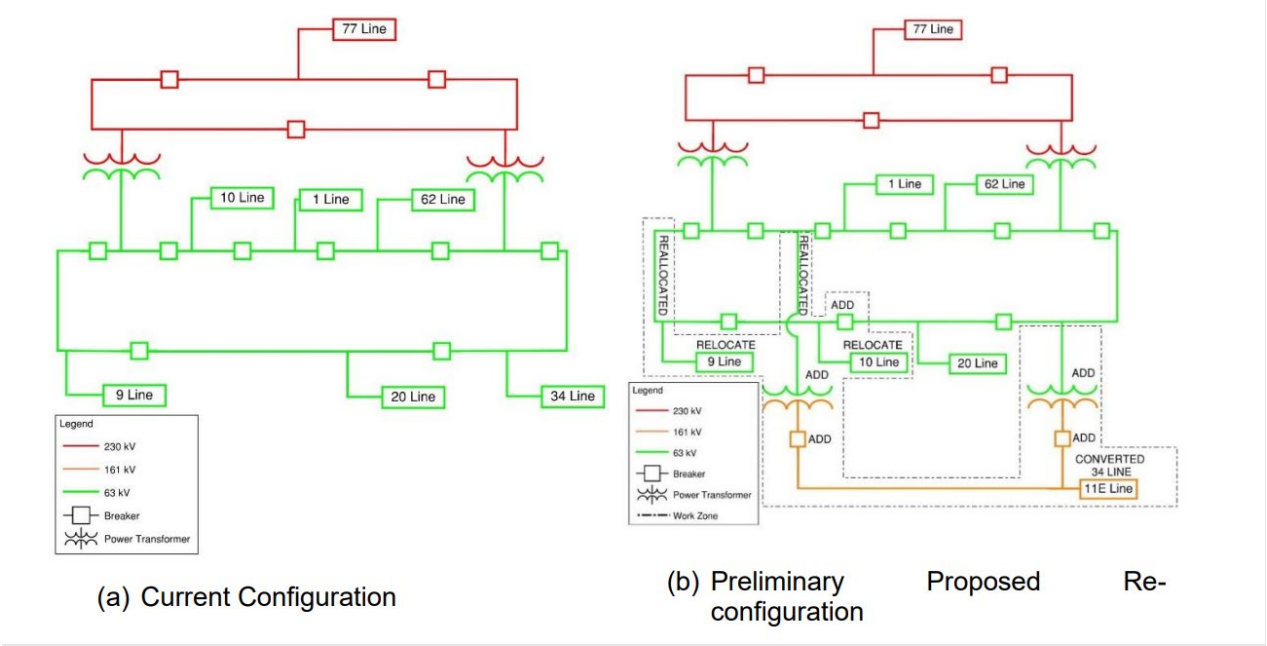
Project Element	Summary of Project Activity
Land Modifications	WTS facilities are located within an FBC statutory right-of-way (SRW), referred herein as SRW1, which is located on a larger parcel of land owned by Teck. SRW1 currently allows for substation works of 63 kV and/or 230 kV infrastructure and will be modified to allow for substation works of 63 kV to 230 kV infrastructure. FBC has entered into an Agreement to Grant with Teck to allow for these substation works. [126] Additional land will also be acquired to accommodate changes to the existing transmission corridor between ASM and WTS (SRW2). The additional land is currently owned by FBC, Teck, and the Ministry of Transportation and Infrastructure (MOTI). FBC has entered into an Agreement to Grant with Teck and will submit a permit application to MOTI for these additional lands. [127] The Agreement to Grant is subject to customary subject conditions that are all within FBC's control (except for CPCN approval by the BCUC). FBC expects that the SRWs will be modified/registered within two to three months of FBC satisfying the subject conditions in the Agreement to Grant.[128] FBC will also require a permit from Canada Pacific Rail (CPR), however, FBC does not anticipate any problems with obtaining the necessary approvals and permits from MOTI and CPR.[129]
Station Modifications	Station modifications at WTS include expansion of the existing footprint to the south and west, and installation of two new 150 MVA, 63 kV/161 kV transformers, with a rating of ONAN/ONAF[130] 90/120/150 MVA, which FBC states is the current industry standard size for transformers in similar applications.[131] Installation of associated equipment, and upgrade of the protection system will also occur. Upon completion of the Project scope at WTS, the existing ASM Terminal Station will be demolished above grade. [132]
Transmission Modifications	Transmission modifications include the relocation of the 34 Line approach and the 9 and 10 Line approach to allow clearance for the required station works and the re-termination of 34 Line at ASM into 11E Line to extend 11E Line back to WTS. [133]
Distribution Modifications	Distribution modifications include the re-routing of Stoney Creek Feeder 1, which is underbuilt on 9 Line, 10 Line and 34 Line structures, once installed. [134]
Fibre Modifications	Fibre modifications include installation of a new fibre cable, and salvage of existing cable, between WTS and FBC's secondary control centre. [135]

[125] Table by the BCUC.
[126] Exhibit B-1, pp. 42-43.
[127] Ibid, p. 43.
[128] Exhibit B-4, BCUC IR 11.0; Exhibit B-10, BCUC IR 31.1.
[129] Exhibit B-4, BCUC IR 11.0; Exhibit B-6, BCOAPO IR 16.1 and 16.2.
[130] Oil Natural Air Natural / Oil Natural Air Forced
[131] Exhibit B-1, p. 30.
[132] Ibid., pp. 44-45.
[133] Ibid., pp. 45-46.
[134] Ibid., p. 46.
[135] Ibid.

FBC anticipates that under the current forecast for WTS, the proposed new 150 MVA transformers will be sufficient until 2051 when the peak demand is forecast to exceed the emergency limits of the transformer. FBC states that it will address the N-1 system planning issues at that time, which could include network reconfigurations that would divert power flow away from the new 150 MVA transformers.[136]

A single line diagram of the current configuration and proposed configuration following completion of the Project is shown in Figure 4 below.

Figure 4: Single Line Diagram of WTS Reconfiguration under Alternative 5[137]



FBC states that the Project schedule has been compiled to meet an in-service target of Q4 2026, assuming the CPCN is granted by December 21, 2023.[138] FBC states that engineering and procurement work for the Project will begin immediately upon BCUC approval, and the construction phase is scheduled to begin with site preparation in March 2024.[139]

FBC explains that the Project construction schedule has accounted for prolonged lead-times based on the current labour and materials supply market.[140] FBC states that there are mitigations available should additional delays materialize such as scheduling float for major equipment supply, construction methodology resequencing, resource levelling, overtime and shift rotations and activity stacking.[141]

[136] Exhibit B-10, BCUC IR 29.1.
[137] Exhibit B-6, BCUC IR 11.1.
[138] Exhibit B-1, pp. 50-51.
[139] Ibid.
[140] Ibid., p. 52.
[141] Ibid.

FBC provides a risk analysis in which it identifies circumstances that could delay the Project or increase costs. Through this analysis, FBC concludes that the overall risk to the Project schedule, quality, and cost, considering planned mitigation activities, is moderate to low. Further, FBC states that any cost impacts that may arise are expected to be manageable within the Project contingency.[142]

A preliminary site investigation of the WTS site completed by a third-party identified three areas of potential environmental concern containing potential contaminants.[143] FBC states that the preliminary site investigation confirmed there are no records of substation incidents potentially resulting in a release of contaminants and that further investigation within the substation from an environmental perspective is not recommended at this time.[144] As there is a likelihood of impacted surface soils within the footprint of the proposed expansion, FBC states that a soil management plan is required. FBC has engaged with an external Qualified Environmental Professional (QEP) who will commence the collection of the necessary soil samples to develop a soil management plan upon approval of the Application.[145] Initial discussions with Teck indicate that its licensed landfill can be used for soil disposal, however, if the tested soil exceeds the landfill's leachable hazardous waste criteria, FBC states that the soil will be sent to an alternate receiving facility in Swan Hills, Alberta, where FBC's QEP has established working relationships.[146]

With respect to archaeological impacts, FBC states that Nupqu Resource Limited Partnership (Nupqu) was retained to complete an Archaeological Overview Assessment (AOA) of the Project. The AOA concluded that the Project footprint includes a mix of low to high archaeological potential, with the preferred alternative containing fewer areas with "high" archaeological potential than the other feasible alternatives.[147] Nupqu recommended that an Archaeological Impact Assessment (AIA) be completed for areas where there is high archaeological potential, which requires a permit under section 12.2 of the *Heritage Conservation Act*.[148] As part of obtaining the *Heritage Conservation Act* permit, FBC states that it engaged with 11 different Indigenous communities, providing them the opportunity to participate in the AIA. FBC further states that Nupqu completed the AIA on April 18, 2023 and is in the process of developing a report describing the results and recommendations.[149] FBC states that an initial draft of the report is expected to be received in Q4 2023, at which time it will be sent to Indigenous communities for review.[150] Nupqu recommended that no further archaeological work be required for the Project footprint.[151]

Positions of the Parties

The CEC notes that both the summer and winter loads at the WTS are growing but not exceeding the N-1 limits of the new 150 MVA transformers for a considerable period of time.[152] The CEC accepts FBC's description of the

[142] Ibid., pp. 52-54.
[143] Ibid., p. 61.
[144] Ibid.
[145] Exhibit B-4, BCUC IR 20.1.
[146] Ibid., BCUC IR 20.2.1.
[147] Exhibit B-1, p. 62.
[148] Ibid.
[149] Exhibit B-4, BCUC IR 21.3.
[150] Exhibit B-10, BCUC IR 35.2.
[151] Exhibit B-4, BCUC IR 21.3.
[152] CEC Final Argument, p. 7.

Project, FBC's assessment of Project risks, FBC's assessment of potential environmental impacts to be remediated and the process for conducting remediation, and FBC's approach to archaeological impacts.[153]

BCOAPO submits that it is satisfied with FBC's explanation of why 150 MVA was selected as the appropriate size for the new WTS transformers.[154] BCOAPO submits that it is satisfied with FBC's explanation regarding the Project scope.[155]

Panel Discussion

The Panel is satisfied with FBC's plan to complete the Project, including the selection of the size of the transformers to be installed at WTS. FBC has prepared its plan to an appropriate level of detail, consistent with information categories set out in the BCUC's CPCN Guidelines. The Panel finds that FBC has adequately considered the Project risks and planned appropriate mitigation steps. The Panel finds that FBC has adequately assessed potential environmental impacts to be remediated and presented a suitable anticipated process to conduct such remediation, as well as an acceptable approach to assess archaeological impacts.

5.0 Project Cost and Rate Impact

5.1 Project Cost

The forecast total cost of the Project is $35.179 million, which includes $3.171 million of allowance for funds used during construction (AFUDC) and $1.092 million of removal costs.[156] The capital cost meets the AACE International Class 3 level of project definition and design and has an expected accuracy of between -20 and +30 percent.[157] A summary of the estimated Project capital costs are provided in Table 5.

Table 5: Breakdown of the Project Cost Estimate ($ millions)[158]

Line	Particular	2022 $	As-Spent $	Reference
1	Station Construction Costs	20.453	22.270	Section 5.1.2
2	Transmission and Distribution Construction Costs	1.771	1.925	Section 5.1.3 and 5.1.4
3	Fibre Construction Costs	0.148	0.161	Sections 5.1.5
4	Removal Costs	0.984	1.092	Sections 5.1.2 to 5.1.5
5	Project Management and Owner's Costs	2.004	2.182	Sections 5.3
6	**Subtotal Project Capital Cost**	**25.361**	**27.631**	**Sum of Line 1 to 5**
7	Contingency	3.318	3.615	Section 6.2
8	**Subtotal Project Capital Cost w/Contingency**	**28.679**	**31.247**	**Sum of Line 6 to 7**
9	CPCN Preliminary Engineering Costs	0.751	0.760	Section 6.4.1
10	AFUDC	-	3.171	Conf. App. H, Sch 6, Ln 26 + 31 (2024-2026)
11	**Total Project Cost**	**29.430**	**35.179**	**Sum of Line 8 to 10**

[153] Ibid., pp. 25-27.
[154] BCOAPO Final Argument, pp. 22-23.
[155] Ibid., p. 23.
[156] Exhibit B-1, pp. 55–56.
[157] Ibid., p. 55.
[158] Ibid.

In developing its capital cost estimate, FBC includes:

- A total contingency estimate of $3.318 million in 2022 dollars (approximately 13.1 percent of the base capital cost estimate of $25.361 million in 2022 dollars).[159] This contingency was developed based on applying a contingency of 15 percent for the station construction and removal costs before materials handling and provincial sales tax, and a contingency of 10 percent for the transmission, distribution and fibre modification components.[160]
- A total escalation of $2.568 million[161] to convert the capital cost estimate and contingency from 2022 dollars to as-spent dollars over the period from 2023 to 2026.[162] Of the total escalation of $2.568 million, $2.271 million corresponds to the escalation on the capital cost estimate and $0.297 million corresponds to contingency.[163] The escalation was derived based on a market report developed by Wood Mackenzie for FBC.[164]

FBC clarified the contingencies used on various components within projects reflect the amount of uncertainty and variability that remain in the detailed design stage[165] and the level of assessed risk and potential for specific scope escalation for that component of project work.[166] FBC confirmed that its chosen method follows AACE International contingency guidelines and past FBC practices.[167]

5.2 Rate Impact

FBC states that all assets are expected to enter rate base in 2027 and to evaluate the rate impact of the Project, a 53-year analysis period was used.[168] The 53-year analysis period is based on an estimated three-year construction period (from 2024 to 2026) plus a 50-year post-Project period commencing in 2027.[169] 50 years is the average service life of the station equipment in FBC's transmission plant based on FBC's most recently approved depreciation study, and station equipment represents more than 90 percent of the total capital costs entering FBC's rate base.[170]

For the Project, FBC performed a financial analysis based on the total Project costs of $35.179 million plus future incremental O&M, wheeling, property tax and sustainment capital costs over the 53-year analysis period.[171] The present value of the incremental revenue requirement of the Project is approximately $44.138 million and through this financial analysis, FBC determined the levelized rate impact to be 0.63 percent over the 53-year analysis period.[172]

[159] Ibid.
[160] Ibid., pp. 55–56.
[161] Calculated as: Table 5, Line 9 (31.247-28.679= 2.568).
[162] Exhibit B-1, p. 56.
[163] Ibid.
[164] Ibid.
[165] Exhibit B-4, BCUC IR 15.2.
[166] Ibid., BCUC IR 15.1.
[167] Exhibit B-4, BCUC IR15.3; Exhibit B-10, BCUC IR 32.1; Exhibit B-12, CEC IR 45.1.
[168] Exhibit B-1, pp. 56–57.
[169] Ibid., p. 56.
[170] Ibid., pp. 56–57.
[171] Ibid., p. 57.
[172] Ibid.

The Project will have incremental rate impacts from 2025 to 2027.[173] FBC provided an estimate of the annual incremental revenue requirement in millions and annual rate impact in percentage terms to FBC's customers due to the Project from 2025 to 2027 when compared to 2023 approved rates.[174] The results are summarized in Table 6 below.

Table 6: Summary of Project Annual Rate Impact [175]

Line	Particular	2025	2026	2027
1	Incremental Revenue Requirement compared to 2023 Approved ($ millions)	0.290	0.357	2.458
2	***Annual Rate Impact compared to 2023 Approved Rates (%)***	***0.07%***	***0.08%***	***0.58%***

FBC estimates the rate impact of the Project in 2027, the year when all construction is complete and all assets are expected to be in service, to be 0.58 percent, which equates to an annual bill increase of $7.80 for an average residential customer using 11,000 kWh of energy.[176]

Positions of the Parties

BCOAPO notes that "the contingency allowance of 13.1% is at the low end of the 10% to 30% range of contingencies for an AACE [International] Class 3 estimate typically applied to FBC's projects but does not otherwise take a position on the quantum of the contingency included in the Application."[177]

The CEC submits the Project cost estimate and rate impacts are appropriate and the level of rate impact is acceptable given the anticipated benefits for customers in the areas affected.[178] However, the CEC notes that the selection of a 53-years life for the Plant in Service is likely shorter than the expected life should be, based on the useful life of the current ASM T1 and T2 transformers.[179] The CEC requests that FBC re-examine the appropriate life for this equipment in appropriate future applications dealing with this subject.[180]

FBC replies that the selection of a 53-years analysis period was based on an estimated three-year construction period plus a 50-year post-Project period commencing in 2027. FBC submits that 50 years is the average service life of the station equipment in FBC's transmission plant, which was determined based on FBC's most recently approved depreciation study. FBC disagrees that the 53-year analysis period used is too short, or needs to be re-examined and submits it reflects the expected life of the new assets as well as the financial lifecycle of the ASM Project.[181]

[173] Ibid., p. 60.
[174] Ibid.
[175] Ibid. Table 6-3.
[176] Exhibit B-1, p. 60.
[177] BCOAPO Final Argument, p. 25.
[178] CEC Final Argument, pp. 23-25.
[179] CEC Final Argument, p. 24.
[180] CEC Final Argument, p. 24.
[181] FBC Reply Argument, p. 14.

Panel Discussion

The Panel is satisfied with FBC's cost estimate for the Project. The cost estimate was prepared in accordance with the CPCN Guidelines and to an AACE International Class 3 level of accuracy. The Panel also accepts FBC's contingency calculation and notes that it is consistent with both AACE International contingency guidelines and past FBC's practices. The Panel notes that there is no evidence on record to support a longer useful life for the station transformers. The Panel is satisfied with FBC's selection of a 53-years analysis period which considers the construction period and the average service life of station transformers based on FBC's approved depreciation study.

6.0 Project Consultation and Engagement

Section 3 of the BCUC's CPCN Guidelines outlines the information expected from an applicant regarding consultation and engagement with First Nations and the public. This includes: a summary of consultation activities to date; issues and concerns raised; the applicant's assessment of the sufficiency of the consultation process; and a statement of planned future consultation.[182]

The following subsections provide an overview of FBC's consultation and engagement activities with Indigenous communities and key public stakeholders.

6.1 Indigenous Consultation and Engagement

Based on the nature of the Project and the approvals required, FBC states that it does not expect that the Project will trigger the Crown's Duty to Consult. However, FBC states it will engage with Indigenous communities.[183] This section provides a summary of FBC's engagement with Indigenous communities.

FBC used the Province of British Columbia's Consultative Areas Database (CAD) to generate a list of potentially affected Indigenous communities with asserted interests in the Project area. [184] Table 7 below provides the list of Indigenous communities identified through the CAD search.

Table 7: CAD Generated List of Potentially Affected Indigenous Communities[185]

Indigenous Communities	
Ktunaxa Nation Council	Penticton Indian Band
Lower Similkameen Indian Band	Shuswap Indian Band
Okanagan Indian Band	Splats'in First Nation
Okanagan Nation Alliance	Upper Nicola Indian Band
Osoyoos Indian Band	

[182] BCUC CPCN Guidelines, Section 3, pp. 5-6.
[183] Exhibit B-4, BCUC IR 25.1
[184] Exhibit B-1, p. 67.
[185] Ibid., p. 68, Table 8-1.

FBC used the list of Indigenous communities, identified above, for engagement activities. In November of 2022, FBC notified these nine communities by notification packages, which included a Project description letter, a kmz file[186] of the proposed work, and a notice that Environmental Management and AOA reports were not completed but would be sent upon request. Upon completion, the AOA and Environmental Management reports were sent to the communities who requested them.[187]

Following issuance of Project notification packages, FBC received replies from five Indigenous communities, which are tracked in the Project's Indigenous engagement log and summarized below:[188]

- The Penticton Indian Band and Okanagan Indian Band each requested that further engagement be deferred to the Osoyoos Indian Band, which requested a 60-day period to review FBC's notification letter before they responded. This request was granted, and the review period passed without comment.
- Ktunaxa Nation Council and the Splats'in requested to receive copies of the AOA report and environmental assessment reports, which were provided by FBC.

During the proceeding, FBC provided the following update on its engagement activities since filing the Application:

- In addition to the nine identified Indigenous communities, FBC has also provided Application information and a notice of filing to the Colville Confederated Tribe and Adams Lake Indian Band, who were not identified by CAD, but by the archeological consultant on the Project.[189]
- No other issues or concerns have been raised by Indigenous communities with FBC. [190]

FBC states that it continues to monitor for feedback from Indigenous communities, and remains committed to timely, meaningful engagement, should any Project feedback or concerns from Indigenous communities be received.[191]

In addition to the engagement activities summarized above, FBC has been engaging with local Indigenous communities regarding procurement opportunities. FBC identifies that it has had initial engagement with the Lower Kootenay Band to discuss procurement opportunities related to the Project, including civil works opportunities.[192] FBC has also engaged with Kakin Resource Corporation, which is fully owned by the Tobacco Plains Indian Band. A general overview of the Project and timelines were discussed to identify potential procurement opportunities such as participating in the request for proposals for the Project and/or subcontracting opportunities.[193]

[186] Keyhole markup language zipped file
[187] Exhibit B-4, BCUC IR 26.2.
[188] Exhibit B-1, pp. 68-69.
[189] Exhibit B-4, BCUC IR 25.2.
[190] Exhibit B-10, BCUC IR 36.1.
[191] FBC Final Argument, p. 22.
[192] Exhibit B-4, BCUC IR 27.3.
[193] Exhibit B-10, BCUC IR 36.1.

FBC states its approach to Indigenous procurement for the Project is similar to the approach used for past projects.[194] FBC states that it will continue to work with local Indigenous businesses through the life of the Project to find potential opportunities.[195]

6.2 Public Engagement

FBC has identified the following stakeholders as being potentially affected by the Project:[196]

- City of Trail;
- City of Rossland;
- Village of Warfield;
- Regional District 1 Kootenay Boundary, Area B;
- Teck;
- Webster School; and
- Residents in the subdivision neighbouring the ASM Terminal Station.

In November 2022, FBC initiated engagement activities by sending Project notification letters to the affected local governments, as well as residents within 250 metres of both the ASM Terminal Station and WTS sites. The notification letter included a map of the Trail area with WTS and the ASM Terminal Station work sites identified. In the subdivision neighbouring the ASM Terminal Station, the Project notification letters were hand delivered in order to discuss and answer questions directly with the community.[197]

After the Project notification letters were issued, FBC received only a small number of inquiries and responses, which are tracked in its stakeholder consultation log.[198]

FBC states that it will provide construction notification letters to the City of Trail, the Village of Warfield, the City of Rossland, Regional District of Kootenay Boundary, James L. Webster School and the area residents. Based on the current Project schedule, construction is estimated to begin in the spring of 2024 with FBC planning to send construction notifications in approximately February 2024.[199]

During the proceeding, FBC provided an update confirming that it has not conducted any further public engagement activities beyond what has been described herein and that no issues or concerns have been raised by local governments or stakeholders since the filing of the Application.[200]

[194] Exhibit B-4, BCUC IR 27.1.
[195] Ibid., BCUC IR 27.6.
[196] Exhibit B-1, pp. 65-66.
[197] Ibid., p. 65.
[198] Ibid., p. 67.
[199] Exhibit B-4, BCUC IR 24.2.
[200] Ibid., BCUC IR 22.1, 24.1; Exhibit B-10, BCUC IR 36.4.

FBC states that it continues to monitor for feedback from local government and stakeholders, and remains committed to timely, meaningful engagement, should any Project feedback or concerns from local government or stakeholders be received.[201]

Positions of the Parties

The CEC submits that FBC's approach to consultation and engagement with the public and Indigenous communities is appropriate.[202]

BCOAPO generally submits that FBC has engaged with the affected First Nations and public in an appropriate manner but notes that the First Nations engagement process is not yet complete. BCOAPO expects that FBC will engage in meaningful consultation, and if necessary, the commencement of accommodation negotiations with interested First Nations following their review of the yet-to-be-completed Nupqu's AIA Results and Recommendations Report.[203]

In its reply, FBC agrees that "engagement for the Project is not yet complete, and confirms that it will continue to maintain open lines of communication and collaborate with Indigenous communities on any outstanding interests or concerns brought forward throughout the remainder of the Project, including planning, construction and restoration".[204] FBC also notes BCOAPO's submission that the evidence on record demonstrates FBC has engaged with affected First Nations in an appropriate manner.[205]

Panel Discussion

The Panel finds that FBC's consultation with Indigenous communities to date has been adequate and notes that FBC has committed to continuing engagement and collaboration with Indigenous communities for the remainder of the Project.

The Panel finds that FBC's engagement with local governments and local communities to date has been adequate. FBC has made appropriate efforts to date to contact parties who might be affected by the Project and has committed to continued engagement.

7.0 Provincial Energy Objectives and the Long-Term Resource Plan

Section 46 (3.1) of the UCA provides that in deciding whether to issue a CPCN, the BCUC must consider:

(a) The applicable of British Columbia's energy objectives, which are defined in section 2 of the CEA;

(b) The most recent long-term resource plan filed by the public utility under section 44.1, if any; and

(c) The extent to which the application for the certificate is consistent with the applicable requirements under sections 6 and 19 of the CEA.

[201] FBC Final Argument, p. 22.
[202] CEC Final Argument, p. 28.
[203] BCOAPO Final Argument, p. 29 and p. 31.
[204] FBC Reply Argument, p. 14.
[205] Ibid.

FBC states that sections 6 and 19 of the CEA are not applicable to the Project as it does not involve either the construction or extension of generation facilities, nor is FBC a prescribed public utility for the purpose of section 19 of the CEA.[206] The Project's alignment with British Columbia's energy objectives, and FBC's most recent long-term resource plan are addressed in the following sections.

7.1 British Columbia's Energy Objectives

BC's energy objectives are set out in section 2 of the CEA. FBC states that the ASM Project is aligned with, or advances, the objectives of the CEA outlined in Table 8 below.[207]

Table 8: British Columbia's Energy Objectives[208]

Item	Objective	FBC Comments
(c)	To generate at least 93% of the electricity in British Columbia from clean or renewable resources and to build the infrastructure necessary to transmit that electricity;	The Project is aligned with this energy objective, as the infrastructure involved is for the purpose of transmitting electricity within the Province.
(g)	To reduce BC greenhouse gas emissions in accordance with certain targets;	While the Project does not directly affect greenhouse gas emissions, it advances this objective as it increases the available transmission capacity necessary to accommodate incremental load switching from higher emitting sources of energy to electricity.
(h)	To encourage the switching from one kind of energy source or use to another that decreases greenhouse gas emissions in British Columbia;	The Project increases capacity in the Boundary and Similkameen areas, which is necessary to accommodate incremental load switching from higher emitting sources of energy to electricity.
(k)	To encourage economic development and the creation and retention of jobs; and	The Project will benefit the local economy during the construction phase and will ensure adequate transmission capacity is available to support future economic growth.
(m)	To maximize the value, including the incremental value of the resources being clean or renewable resources, of British Columbia's generation and transmission assets for the benefit of British Columbia.	The Project increases available transmission capacity for the benefit of FBC's customers which are located within the province.

Further, FBC states that while the Project does not directly affect the remaining objectives, it indirectly advances certain of them, and does not hamper the advancement of the others by the applicant or other proponents through other projects or initiatives.[209]

[206] *Clean Energy Act* [SBC 2010] Chapter 22.

[207] Exhibit B-1, pp. 71-72.

[208] Ibid. Table prepared by the BCUC.

[209] Ibid.

7.2 Long-Term Resource Plan

FBC's most recent long-term resource plan is the 2021 Long Term Electric Resource Plan (2021 LTERP), which was filed on August 4, 2021, pursuant to section 44.1 of the UCA. By Order G-380-22, dated December 21, 2022, the BCUC found the 2021 LTERP to be in the public interest and accepted it.[210]

The Project was identified in Section 6.4 of the 2021 LTERP as two separate projects required for system reinforcement within the 2024-2029 timeframe. Table 6-3 in the 2021 LTERP set out the replacement of ASM T1 in the 2024-2025 timeframe and ASM T2 in the 2028-2029 timeframe. The 2021 LTERP explained that its system reinforcement projects were identified based on load forecasting, transmission system planning criteria and power flow and other transmission planning studies, and also noted that project timing is reassessed frequently based on updated load forecasts; consequently, the timing of projects may be either advanced or delayed.[211]

Since the filing of the 2021 LTERP, FBC has identified that the ASM Terminal Station requires an upgrade to higher MVA transformers (both ASM T1 and ASM T2) within a three-year window, as opposed to the timeframes initially identified in the 2021 LTERP. This is due to load growth that has occurred and is anticipated in the Boundary and Similkameen areas, to allow FBC to reliably meet its transmission system planning criteria. Further, based on the recently completed condition assessment report, the conditions of the ASM T1 and ASM T2 transformers are such that they have been assessed as having a high risk of failure due to their respective ages.[212]

Positions of the Parties

The CEC submits that the Project is clearly aligned with, or not inconsistent with, both BC's Energy Objectives and the CEA.[213] In addition, the CEC submits that FBC's advancing of the Project from the timing anticipated in the FBC 2021 LTERP is appropriate, given the load growth in the relevant area and the capacities and conditions of the equipment currently serving the area.[214]

Panel Discussion

The Panel finds that the Project aligns with BC's energy objectives as outlined in section 2 of the CEA and is consistent with FBC's 2021 LTERP.

The Panel agrees with FBC's assessment that the ASM Project aligns with BC's energy objectives as outlined in section 2 of the CEA, specifically 2 (c), (g), (h), (k) and (m), and that sections 6 and 19 of the CEA are not applicable.

The Panel is satisfied with FBC's demonstration of the need to advance the Project schedule, relative to FBC's 2021 LTERP. The Panel notes that the 2021 LTERP was accepted by the BCUC as being in the public interest, and the Project was included in this LTERP. The Panel accepts that the Project schedule is advanced due to the need

[210] Decision and Order G-380-22, FortisBC Inc. 2021 Long Term Electric Resource Plan and 2021 Long Term Demand Side Management Plan, dated December 21, 2022 (FBC 2021 LTERP).
[211] Exhibit B-1, p. 72.
[212] Ibid.
[213] CEC Final Argument, p. 28.
[214] Ibid.

for FBC to meet the applicable transmission system planning criteria because of actual and expected load growth in the Boundary and Similkameen areas, and to address the deteriorating conditions of the two power transformers installed at the ASM Terminal Station.

8.0 CPCN Determination

Positions of the Parties

BCOAPO recommends that the BCUC approve FBC's Application.[215]

The CEC recommends that the BCUC grant the CPCN that FBC has requested specifically for Alternative 5.[216]

ICG recommends approval of FBC's preferred alternative with the condition that FBC provide evidence that it has made good faith efforts to negotiate with Teck for access to the 11E line extension between ASM and WTS.[217]

Panel Determination

The Panel finds that the Project is in the public interest and that the public convenience and necessity require: the installation of two new 150 MVA 63/161 kV transformers at WTS; related station and transmission modifications at WTS; and the decommissioning of the existing ASM Terminal Station.

In Section 2.0 of this Decision, the Panel set out its finding that there is a need for the Project to meet the applicable single contingency (N-1) transmission system planning criteria due to load growth in the Boundary and Similkameen areas, and to address the deteriorating conditions of the two power transformers that are currently installed at the ASM Terminal Station. In Section 3.0, the Panel found that the Project is the most appropriate alternative to meet this need. In Section 7.0, the Panel set out its finding that the Project is consistent with BC's energy objectives as set out in section 2 of the CEA and is consistent with FBC's 2021 LTERP.

For the foregoing reasons, the Panel, pursuant to section 45 and 46 of the UCA, issues a CPCN to FBC for the Project, specifically for:

(a) The installation of two additional 150 MVA, 63/161 kV transformers at WTS;

(b) The required WTS modifications, including expanding the WTS footprint, reconfiguring the 63 kV ring bus and adding a 161 kV two breaker bus;

(c) Reconfiguring the 63 kV egress at WTS for 34 Line, 9 Line and 10 Line;

(d) Converting 34 Line to 161 kV rating, then connecting 11E Line from the ASM Terminal Station to WTS by repurposing 34 Line as an extension to 11E Line; and

(e) Demolishing the ASM Terminal Station, above grade.

[215] BCOAPO Final Argument, p. 31.
[216] CEC Final Argument, p. 1.
[217] ICG Final Argument, p. 2.

9.0 Project Reporting

The Panel directs FBC to provide the following reports:

1. Material Change Report

    a. A material change is a change in FBC's plan for the Project that would reasonably be expected to have a significant impact on the schedule, cost or scope, such that:

        i. The Project schedule and/or the in-service date is delayed by 3 months or longer;

        ii. The total Project cost exceeds 30 percent of the estimated Project cost provided in Table 6-1 of the Application; or

        iii. There is a change to the Project scope provided in section 5 of the Application.

    b. In the event of a material change, FBC must file a material change report with the BCUC explaining the reasons for the material change, FBC's consideration of the Project risk and the options available, and actions FBC is taking to address the material change. FBC must file the material change report as soon as practicable and in any event within 30 days of the date on which the material change occurs.

2. Final Report:

    a. A Final Report is to be filed within three months of substantial completion of the Project. The report is to include:

        i. the final cost of the transformers;

        ii. a complete breakdown of the final costs of the Project;

        iii. a comparison of these costs to the estimates provided in Table 6-1 of the Application;

        iv. an explanation of all material cost variances for any of the cost items provided in Table 6-1 of the Application that exceed 10 percent; and

        v. details of any further consultation conducted, any issues raised, and measures undertaken by FBC to resolve the identified issues.

DATED at the City of Vancouver, in the Province of British Columbia, this 6th day of December 2023.

Original signed by:

T. A. Loski
Panel Chair / Commissioner

Original signed by:

A. C. Dennier
Commissioner

Original signed by:

W. M. Everett, KC
Commissioner

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ORDER NUMBER
C-6-23

IN THE MATTER OF
the *Utilities Commission Act*, RSBC 1996, Chapter 473

and

FortisBC Inc.
Application for a Certificate of Public Convenience and Necessity
for the A.S. Mawdsley Terminal Station Project

BEFORE:
T. A. Loski, Panel Chair
A. C. Dennier, Commissioner
W. M. Everett, KC, Commissioner

on December 6, 2023

CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY

WHEREAS:

A. On February 24, 2023, pursuant to sections 45 and 46 of the *Utilities Commission Act* (UCA), FortisBC Inc. (FBC) filed an application (Application) with the British Columbia Utilities Commission (BCUC) for a Certificate of Public Convenience and Necessity (CPCN) for the A.S. Mawdsley (ASM) Terminal Station Project (Project);

B. The Project includes installation of two new 150 MVA 63/161 kV transformers with the required site footprint expansion and other alterations at the Warfield Terminal Station (WTS) and the subsequent decommissioning of the ASM Terminal Station. Both the ASM Terminal Station and the WTS are located in Trail, BC;

C. By Order G-70-23, dated March 30, 2023, the BCUC established a regulatory timetable for the review of the Application, which consisted of public notice, intervener registration, two rounds of information requests and final and reply arguments;

D. British Columbia Old Age Pensioners' Organization et al.; Commercial Energy Consumers Association of British Columbia; Industrial Customers Group; Alan Wait; and Murray McConnachie registered as interveners in the proceeding. Alan Wait later submitted a withdrawal of intervener status; and

E. The BCUC has considered the Application, evidence and submissions in this proceeding and determines that certain approvals are warranted.

NOW THEREFORE for the reasons set out in the Decision issued concurrently with this order and pursuant to sections 45 and 46 of the UCA, the BCUC orders as follows:

1. A CPCN is issued to FBC for the Project, authorizing the following:
   (a) The installation of two additional 150 MVA, 63/161 kV transformers at WTS;
   (b) The required WTS modifications, including expanding the WTS footprint, reconfiguring the 63 kV ring bus and adding a 161 kV two breaker bus;
   (c) Reconfiguring the 63 kV egress at WTS for 34 Line, 9 Line and 10 Line;
   (d) Converting 34 Line to 161 kV rating, then connecting 11E Line from the ASM Terminal Station to WTS by repurposing 34 Line as an extension to 11E Line; and
   (e) Demolishing the ASM Terminal Station, above grade.

2. FBC is directed to file Project reports as outlined in Section 9 of the Decision.

DATED at the City of Vancouver, in the Province of British Columbia, this 6th day of December 2023.

BY ORDER

Original signed by:

T. A. Loski
Commissioner

FortisBC Inc.
Certificate of Public Convenience and Necessity
of the A.S. Mawdsley Terminal Station Project

LIST OF ACRONYMS

ACRONYM	DESCRIPTION
2021 LTERP	2021 Long Term Electric Resource Plan
AACE International	Association of Advancement of Cost Engineering International
AFUDC	Allowance for Funds Used During Construction
AIA	Archaeological Impact Assessment
AOA	Archaeological Overview Assessment
Application	Application for a Certificate of Public Convenience and Necessity for the A.S. Mawdsley Terminal Station Project
ASM	A.S. Mawdsley
ASM Project or the Project	A.S. Mawdsley Terminal Station Project
BC Hydro	British Columbia Hydro and Power Authority
BCOAPO	British Columbia Old Age Pensioners' Organization et. al
BCUC	British Columbia Utilities Commission
CAD	Consultative Areas Database
CEA	*Clean Energy Act*
CEATI	Centre for Energy Advancement through Technological Innovation
CEC	Commercial Energy Consumers Association of British Columbia
CPCN	Certificate of Public Convenience and Necessity
CPR	Canada Pacific Rail
EVs	Electric vehicles
FBC	FortisBC Inc.
HE	Hitachi Energy
ICG	Industrial Customers Group
KBTA	Kelowna Bulk Transformer Addition
kV	Kilovolt
LTC	Load Tap Changer

ACRONYM	DESCRIPTION
MOTI	Ministry of Transportation and Infrastructure
MVA	Megavolt Amperes
MW	Megawatt
Nupqu	Nupqu Resource Limited Partnership
O&M	Operations and Maintenance
QEP	Qualified Environmental Professional
SRW	Right-Of-Way
Teck	Teck Metals Ltd.
UCA	*Utilities Commission Act*
WTS	Warfield Terminal Station

FortisBC Inc.
Certificate of Public Convenience and Necessity
of the A.S. Mawdsley Terminal Station Project

EXHIBIT LIST

Exhibit No.	Description
COMMISSION DOCUMENTS	
A-1	Letter dated March 7, 2023 – Appointing the panel for review of the FBC Application for CPCN of the A.S. Mawdsley Terminal Station Project
A-2	Letter dated Mach 30, 2023 – BCUC Order G-70-23 establishing a regulatory timetable
A-3	Letter dated May 2, 2023 – BCUC request to FBC regarding notice of the Application
A-4	Letter dated May 9, 2023 – BCUC approving Intervener Request from Mr. McConnachie
A-5	Letter dated May 9, 2023 – BCUC approving Intervener Request from Mr. Wait
A-6	Letter dated May 11, 2023 – BCUC Information Request No. 1 to FBC
A-7	**CONFIDENTIAL** – Letter dated May 11, 2023 – BCUC Confidential Information Request No. 1 to FBC
A-8	Letter dated August 3, 2023 – BCUC Information Request No. 2 to FBC
A-9	Letter dated August 23, 2023 – BCUC response to FBC extension request to file Information Request No. 2 response
A-10	Letter dated October 10, 2023 – BCUC response to CEC extension request
APPLICANT DOCUMENTS	
B-1	**FORTISBC INC. (FBC) –** Application for Certificate of Public Convenience and Necessity (CPCN) of the A.S. Mawdsley Terminal Station Project dated February 24, 2023
B-1-1	**CONFIDENTIAL** – Letter dated February 24, 2023 - FBC Application for CPCN of the A.S. Mawdsley Terminal Station Project confidential Appendices
B-2	Letter dated April 21, 2023 – FBC submitting confirmation of public notice in compliance with Order G-70-23
B-3	Letter dated May 3, 2023 – FBC submitting response to Exhibit A-3

B-4	Letter dated June 8, 2023 – FBC submitting response to BCUC Information Request No. 1
B-4-1	**CONFIDENTIAL –** Letter dated June 8, 2023 – FBC submitting confidential Attachment 2.7 to BCUC Information Request No. 1 response
B-5	**CONFIDENTIAL** – Letter dated June 8, 2023 – FBC submitting confidential response to BCUC Confidential Information Request No. 1
B-6	Letter dated June 8, 2023 – FBC submitting response to BCOAPO Information Request No. 1
B-7	Letter dated June 8, 2023 – FBC submitting response to CEC Information Request No. 1
B-8	Letter dated June 8, 2023 – FBC submitting response to ICG Information Request No. 1
B-9	Letter dated August 22, 2023 – FBC submitting extension request to file Information Request No. 2 response
B-10	Letter dated September 5, 2023 – FBC submitting response to BCUC Information Request No. 2
B-11	Letter dated September 5, 2023 – FBC submitting response to ICG Information Request No. 2
B-12	Letter dated September 5, 2023 – FBC submitting response to CEC Information Request No. 2
B-13	Letter dated September 5, 2023 – FBC submitting response to BCOAPO Information Request No. 2

INTERVENER DOCUMENTS

C1-1	**MCCONNACHIE, MURRAY (MCCONNACHIE**) – Letter dated April 14, 2023 submitting request to intervene
C2-1	**WAIT, ALAN (WAIT)** – Letter dated May 1, 2023 submitting request to intervene
C2-2	Letter dated July 18, 2023 – Wait submitting withdrawal of intervener status
C3-1	**COMMERCIAL ENERGY CONSUMERS ASSOCIATION OF BC (CEC)** – Letter dated May 3, 2023 request to intervene by Chris Weafer
C3-2	Letter dated May 18, 2023 – CEC submitting Information Request No. 1 to FBC
C3-3	Letter dated August 3, 2023 – CEC submitting Information Request No. 2 to FBC
C3-4	Letter dated October 10, 2023 – CEC submitting extension request to file Final Argument

C4-1 **BRITISH COLUMBIA OLD AGE PENSIONERS' ORGANIZATION, DISABILITY ALLIANCE BC, COUNCIL OF SENIOR CITIZENS' ORGANIZATIONS OF BC, AND THE TENANT RESOURCE AND ADVISORY CENTRE (BCOAPO) –** Letter dated May 5, 2023 submitting request to intervene by Leigha Worth

C4-2 Letter dated May 18, 2023 – BCOAPO submitting Information Request No. 1 to FBC

C4-3 Letter dated August 3, 2023 – BCOAPO submitting Information Request No. 2 to FBC

C5-1 **INDUSTRIAL CUSTOMERS GROUP (ICG)** – Letter dated May 4, 2023 request to intervene by Robert Hobbs

C5-2 Letter dated May 18, 2023 – ICG submitting Information Request No. 1 to FBC

C5-3 Letter dated August 3, 2023 – ICG submitting Information Request No. 2 to FBC