Alberta Utilities Commission

In the Matter of the Need for the 138 kV Transmission Line 807L Capacity Increase

And in the matter of the *Electric Utilities Act*, S.A. 2003, c. E-5.1, the *Alberta Utilities Commission Act*, S.A. 2007, c. A-37.2, the *Hydro and Electric Energy Act*, R.S.A. 2000, c. H-16, the *Transmission Regulation*, AR 86/2007 and Alberta Utilities Commission Rule 007, all as amended

Application of the Alberta Electric System Operator for Approval of the Needs Identification Document for the 138 kV Transmission Line 807L Capacity Increase

PART A - APPLICATION

1 Introduction

1.1 Application – Pursuant to Section 34 of the *Electric Utilities Act* ("Act"), the Independent System Operator, operating as the Alberta Electric System Operator ("AESO") applies to the Alberta Utilities Commission ("Commission") for approval of this *138 kV Transmission Line 807L Capacity Increase Needs Identification Document* (the "Application"). This Application addresses transmission facilities located in the AESO's Fort Saskatchewan Planning Area ("Area 33"), within the broader Northeast Planning Region. More specifically, the facilities at issue are located in a sub-area of Area 33 referred to herein as the "Beamer Area", which encompasses the existing Beamer 233S, Redwater 171S, Weasel Creek 947S, and Abee 993S substations and the 138 kV transmission lines connected to these substations.

1.2 Application Overview – This Application seeks approval of the need for a capacity increase to the existing 138 kV transmission line 807L ("Preferred Development Option") to alleviate identified constraints and to contribute to the long-term reliable operation of the 138 kV transmission system in the Beamer Area. This Application is organized as follows:

Part A – Application	
Section 1 – Introduction	Describes the Application, its organization, and the AESO directions that were issued to the legal owner of transmission facilities in the Beamer Area, AltaLink Management Ltd. ("AltaLink").
Section 2 – Determination of Need for Transmission Development and Timing of the Transmission Development	Describes (i) the system adequacy and reliability requirements in the Beamer Area; (ii) the AESO's load and generation forecast; and (iii) the basis for the milestones related to the timing of transmission development.

Section 3 – Preferred Development Option	Describes the Preferred Development Option and its estimated cost.
Section 4 – Planning and Environmental Evaluation	Provides a summary of the system studies and the information regarding environmental and land use effects in accordance with Commission *Rule 007 Applications for Power Plants, Substations, Transmission Lines, Industrial System Designations and Hydro Developments* ("Rule 007"), Section 6.1, NID7(9).
Section 5 – Participant Involvement Program ("PIP")	Describes the AESO's PIP.
Section 6 – Milestones and Milestone Monitoring Process	Defines the milestones and the milestone monitoring process requirements proposed in accordance with Section 11(4) of the *Transmission Regulation*.
Section 7 – Schedules	Describes the implementation schedule for the Preferred Development Option following the milestones being met, as well as potential related limitations or constraints on the implementation schedule in accordance with Commission Rule 007, Section 6.1, NID9(2). It also includes project information and next steps consistent with Commission Rule 007, Section 6.1, NID10.
Section 8 – Long-term Transmission Plans	Describes the alignment of the Preferred Development Option with the AESO's long-term plans, as well as the dependency of any future developments on this Application, and vice-versa.
Section 9 – Request to	Pursuant to Subsection 35(1) of the *Electric Utilities*

Combine	*Act*, this section requests that this Application be combined with AltaLink's facilities application for consideration in a single process.
Section 10 – Relief Requested	Describes the relief requested by the AESO.
Part B – Application Appendices	
Appendices A to G	A list of all appendices to the Application and a brief description of each are provided in this part. These appendices provide all the supporting materials and details for the Application.

For information purposes, some of the legislative provisions applicable to the AESO are referenced in Part C of this Application, together with additional considerations relating to this Application.

1.3 AESO Directions to the Transmission Facility Owner ("TFO") – In the process of determining the need for transmission development in the Beamer Area and preparing this Application, pursuant to Section 39 of the Act and Section 14 of the *Transmission Regulation*, the AESO directed AltaLink, in its capacity as the TFO in the area, to assist the AESO in preparing this Application.

2 Determination of Need for Transmission System Development

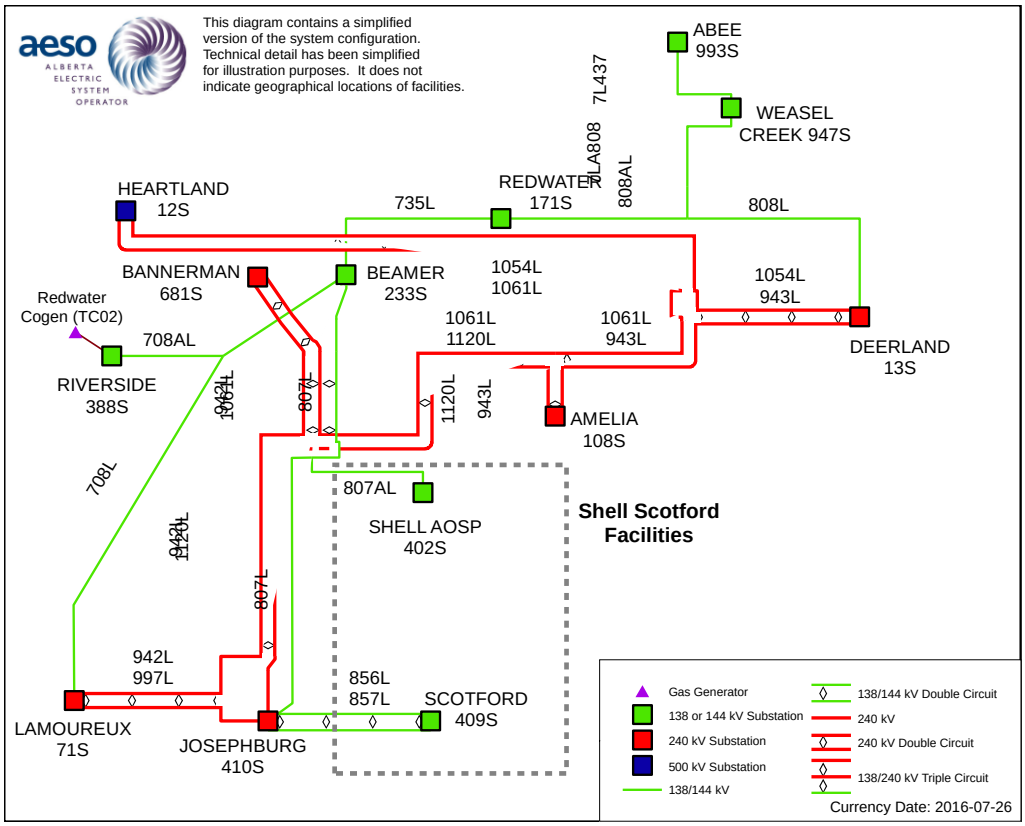
This Section describes (i) the transmission system adequacy and reliability requirements in the Beamer Area; (ii) the AESO's load and generation forecast; and (iii) the basis for the milestones related to the timing of transmission development in the Beamer Area.

2.1 The Beamer Area 138 kV Transmission Network – The Beamer Area is a sub-area of the AESO's Fort Saskatchewan Planning Area. The load in the Beamer Area is supplied by an existing local 138 kV transmission network, which is comprised of four 138 kV substations: Beamer 233S; Redwater 171S; Weasel Creek 947S; and Abee 993S substations, and the associated 138 kV transmission lines connecting to these four substations (See Figure 1). In total there are three 138 kV transmission lines transmitting power to the above referenced substations in the area:

- 708L from the 240/138 kV Lamoureux 71S substation to the 708AL t-tap to the Beamer 233S substation;
- 807L from the 240/138 kV Josephburg 410S substation to the 807AL t-tap to the Beamer 233S substation; and
- 808L from the 240/138 kV Deerland 13S substation to the 808AL t-tap to the Redwater 171S substation.

While a section of 807L from the Josephburg 410S substation to the 807AL t-tap was previously rebuilt to a higher summer/winter capacity of 175/217 MVA, the summer/winter capacity between the 807AL t-tap and the Beamer 233S substation remains limited to 85/90 MVA. Further, at approximately 7 kms in length, 807L has a shorter length compared to the 14 km 708L and the 24 km 808L with the result that power flow on 807L tends to be higher (i.e., closer to the line's maximum thermal capacity during peak load and high transfer conditions), as compared to power flow on the other lines supplying load in the Beamer Area.

Figure 1: Simplified single-line diagram of the Existing Beamer Area 138 kV Transmission Network and its Surrounding Area



2.2 Transmission System Adequacy and AESO Reliability Requirements in the Beamer Area – The AESO has studied the transmission system under forecast load and under various generation dispatch assumptions and transmission contingencies.[1] The studies demonstrate that there are no thermal overloads in the Beamer Area with all transmission elements in service ("N-0") in 2017. However, the study results for 2017 indicate that a section of 807L between the 807AL t-tap and the Beamer 233S substation is prone to overloading under single contingency conditions ("N-1"). The severity of thermal overload increases from 1% in 2017, to 53% in 2020, reaching 66%

[1] As defined in the AESO's *Consolidated Authoritative Document Glossary*, a contingency means the unexpected failure or outage of a system component, such as a generating unit, transmission line, circuit breaker, switch or electrical element. Appendix 1 to each of the Transmission Planning (TPL) standards, within the Alberta Reliability Standards, explains the contingency conditions through categories of events and their expected performance requirements. Additionally, the AESO's Transmission Reliability Criteria are referenced in Part C of this Application.

in 2025 as load in the area continues to grow and major new generation is assumed to be connected in the Fort Saskatchewan Planning Area (e.g., Heartland Gas-Fired Generating Station as discussed in further detail below). Additionally, this section of 807L between the 807AL t-tap and the Beamer 233S substation will experience thermal overload under N-0 conditions following connection of the Heartland Generating Station. The identified constraints are in violation of Alberta Reliability Standards, specifically Transmission Planning ("TPL") Standards TPL-001-AB-0 and TPL-002-AB-0. Accordingly, the AESO has determined that transmission development is required to alleviate the identified constraints. Additionally, no system topology changes are planned over the long-term that could change the need for such development. Planning studies further confirm that load growth in the Beamer Area and the assumed major generation additions in the Fort Saskatchewan Planning Area are the primary drivers of the identified constraints.

2.4 AESO Load and Generation Forecast – Pursuant to its responsibilities under Section 33 of the Act and Section 8 of the *Transmission Regulation*, the AESO has forecast load growth in the Beamer Area. The AESO has also considered current System Access Service Requests in its forecast to establish the timing and location assumptions for future generation sources that are expected to be integrated into the transmission system in the Fort Saskatchewan Planning Area.

The AESO's current forecast is the 2016 Long-term Outlook ("2016 LTO"), which provides the reference case for the AESO's long-term load growth forecast and generation assumptions. While the Beamer Area is winter peaking, based on the AESO's planning assessments summer peak load causes a greater stressed condition. As such, studies consider only summer season.

The highest summer peak load in this area is 93 MW, recorded in 2015 and 2016. The AESO is currently forecasting 109 MW of summer peak load in the Beamer Area by

2017, which is expected to grow to 110 MW in 2020, 112 MW in 2025 and 115 MW in 2035.[2]

The AESO's forecast load growth in the Beamer Area considers the latest substation-level forecasts of FortisAlberta, the distribution facility owner ("DFO") in the area. The near-term load growth in this area is due to industrial development in the area; specifically, two new carbon capture and storage developments and associated pipeline facilities, which are expected to be in-service in the 2017 timeframe. There is, however, uncertainty in respect of the exact timing of these specific load increases at this time. Therefore, forecast load growth may be subject to change as new information becomes available.

In addition to the above referenced forecast load growth, the AESO has considered several generation connections to the transmission system in the Fort Saskatchewan Planning Area in 2020 and beyond, i.e., Deerland Peaking Power Plant, Williams Strathcona Cogeneration, and Heartland Generating Station. None of these projects are under construction at this time and, as such, specific timing, capacities, and connection assumptions may be subject to change. Accordingly, various generation assumptions were considered in the planning studies, including sensitivity studies for the Heartland Generating Station in 2020 (consistent with its requested commercial operation date). Currently, total existing generation capacity in the Fort Saskatchewan Planning Area is 663 MW, none of which is forecast to retire in the 20-year planning horizon.

2.5 Determination of Timing for Transmission Development – The AESO's planning studies demonstrate that the identified constraints arise as early as summer 2017 under N-1 conditions based on the 2016 LTO. However, such near-term thermal overloads are minor and, as such, will not arise if the actual load is slightly lower than the forecast load in 2017. Therefore, while the AESO is reasonably certain that, in the future, the Preferred Development Option is needed, the timing of the in-service date

[2] The AESO's load growth forecasts and generation assumptions are derived from its corporate forecasts. The AESO's forecasts used in the Beamer Area planning studies are contained in the *AESO 2016 Long-Term Outlook.* Appendix B to this Application contains further information on the AESO's 2016 forecasts. The Beamer Area is contained within the AESO's Northeast Planning Region.

("ISD") for the development is dependent on the specific external factors described in Section 2.4, that are beyond the AESO's control. As such, the AESO has determined it to be appropriate to specify milestones. The proposed milestones are described in Section 6.

Finally, the AESO will use operational measures, as necessary, including system reconfiguration or generation re-dispatch, should constraints arise in the area prior to the implementation of the Preferred Development Option. Consideration of such operational matters is beyond the scope of this Application and will be addressed via operational assessment by the AESO.

3 Preferred Development Option

This Section describes the AESO's Preferred Development Option to alleviate the identified constraints described in Section 2.

3.1 Preferred Development Option – Based on the identified constraints in the Beamer Area, the AESO's Preferred Development Option is to increase summer/winter capacity from the existing 85/90 MVA to 175/217 MVA on the section of 807L between the 807AL t-tap and the Beamer 233S substation. The proposed increased capacity for this section of 807L is consistent with the summer/winter rating of the remaining section of the line from the 807AL t-tap to the Josephburg 410S substation. The preferred Development Option is described below:[3]

1. Increase 807L capacity from 85/90 MVA to 175/217 MVA between the 807AL t-tap and the Beamer 233S substation to make it consistent with the capacity of the remaining section of the line.
2. Modify, alter, add or remove equipment, including any operational, protections, control and telecommunication devices required to undertake the work as planned and ensure reliable integration of the Preferred Development Option with the transmission system.

The AESO's Preferred Development Option will not result in any changes to the existing transmission network configuration, displayed in Figure 1, or any changes to the existing layout of the Beamer 233S substation.

The AESO has not considered any other development options because the AESO's Preferred Development Option is the minimum development required to address the identified constraints and it is reasonable to match the existing capacity of a section of 807L with the remaining section of the line.

[3] Details and configuration of equipment required for the Preferred Development Option is more specifically described in the AESO's Functional Specification, which will be included in the TFO's facilities application. Also, further specifics will be determined as detailed engineering progresses. Routing and/or siting of the transmission facilities do not form part of this Application and will be addressed in the TFO's transmission facility proposal.

3.2 Preferred Development Costs – The total capital cost of the Preferred Development Option to meet the minimum requirements as outlined in this Application is estimated to be in the order of $4 million (+20%, -10%, $2019).[4] The Preferred Development Option does not include any costs classified as participant-related in accordance with the ISO tariff.

[4] See the TFO Capital Cost Estimates included at Appendix C of this Application for further details. For the purpose of preparing the Cost Estimates, the AESO instructed the TFO to assume the ISD to be 2019. The ISD for the Preferred Development Option will be determined in accordance with the milestones described in this Application. Also, note iv of Part C of this Application describes the AESO's responsibilities with respect to transmission cost estimates and reporting.

4 Planning Assessment and Environmental Evaluation of the Preferred Development Option

This Section explains the AESO's planning assessment and factors that were taken into consideration, specifically the transmission system studies and environmental evaluation, in the process of determining the Preferred Development Option.

4.1 Summary of the AESO's System Study Results – System planning studies have indicated that the Preferred Development Option will alleviate the identified constraints in the Beamer Area, described in Section 2, for the 20-year planning horizon. Further, system study results demonstrate that following implementation of the Preferred Development Option, no new constraints arise that would require additional development.

4.2 Information In Regards to Rule 007, Section 6.1 – NID7(9) – The AESO has been advised that the TFO's facilities application will address the aspects listed in Commission Rule 007, Section 6.1, NID7(9).[5] In consideration of that fact, and as the filing of the application is combined with the TFO's facilities application, the AESO has not undertaken a separate assessment of the sort contemplated in the referenced rule.

[5] The TFO's letter to the AESO, dated August 30, 2016, is included in Appendix E of this Application.

5 Participant Involvement Program

The AESO directed the TFO to assist the AESO in conducting a participant involvement program ("PIP"). From July to September 2016, The TFO and the AESO used various methods to notify landowners, occupants, local authorities, agencies and government (collectively, the Stakeholders) in the area where the AESO's Preferred Development Option will be implemented. The TFO did not identify any residents or First Nations in the area where transmission facilities will be installed. Additionally, the AESO did not identify any market participants that could be adversely impacted by the AESO's Preferred Development Option.

The AESO has notified the public in the area where the AESO's Preferred Development Option will be installed of its intention to file this Application with the Commission for approval.

The AESO has not received any concerns or objections regarding the need for development or the AESO's Preferred Development Option to address the need. Further information regarding the AESO's PIP for this Application is included at Appendix D.

6 Milestones and the Milestone Monitoring Process

This section describes the milestones to be followed assuming Commission approval of the Preferred Development Option, to determine the required ISD. This section also describes the process by which the AESO will monitor and determine when the identified milestones are met, as contemplated under Section 11(4) of the *Transmission Regulation*.

6.1 Milestones – The milestones specified below are based on the identified constraints described in Section 2. These constraints arise in the event of load growth in the Beamer Area and/or certain generation connections in the Fort Saskatchewan Planning Area. Consequently, the AESO has determined it to be appropriate to specify both a load growth milestone as well as a generation addition milestone, as follows:

1. **Load Growth Milestone:** Coincident summer aggregate peak load for the Beamer Area reaching 109 MW, measured at Beamer 233S, Redwater 171S, Weasel Creek 947S, and Abee 993S substations (the “Load Growth Milestone”).
2. **Generation Addition Milestone:** Commencement of construction by the TFO of any generation connection(s) in the Fort Saskatchewan Planning Area in which AESO connection studies indicate a thermal overload on the 807L line between the Beamer 233S substation and the 807L t-tap arising as a result of the generation connection (the “Generation Addition Milestone”).

6.2 Milestone Monitoring Process – As set out in Section 9, the AESO is requesting that this application be combined with the related facilities application to be filed by the TFO. To address the matter of milestones being met, the AESO requests that any permits and licences that may be issued by the Commission in respect of the TFO’s facilities application be made subject to appropriate terms and conditions restricting the commencement of construction and development activities until such time as the AESO has determined, in accordance with the monitoring process described below, that either the Load Growth Milestone or the Generation Addition Milestone have been met.

Monitoring of Load Growth Milestone

The AESO will monitor and issue reports on an annual basis to the TFO and Commission to communicate the recorded coincident summer peak load on November 30th of each year. Upon the AESO recording the coincident summer peak load for the Beamer Area, reaching 109 MW ("Triggering Load Level"), measured at the four 138 kV substations (i.e. Beamer 233S, Redwater 171S, Weasel Creek 947S, and Abee 993S), the AESO will confirm to the TFO, and through a public posting to the AESO's website, that the Load Growth Milestone has been met, whereupon the TFO may commence construction activities on the Preferred Development Option.

Monitoring of Generation Addition Milestone

All generation connection NIDs filed by the AESO in respect of the Fort Saskatchewan Planning Area will consider the impact of the connection on the generation construction milestone and identify those generation connections that result in an 807L overload ("Triggering Generation Connection(s)"). The AESO will direct the TFO to advise the AESO upon commencement of construction activities for the Triggering Generation Connection(s). The AESO will subsequently confirm to the TFO, and through a public posting to the AESO's website, that the Generation Addition Milestone has been met, whereupon the TFO may commence construction activities on the Preferred Development Option to meet an ISD that is coincident with the ISD for the Triggering Generation Connection(s), or as soon as reasonably possible thereafter.[6]

[6] Deerland Peaking Station connection, which has been approved pursuant to Approval No. U2014-447 and Decision 2014-353, is not a Triggering Generation Connection. As indicated by the connection assessment enclosed with the *Deerland Peaking Station Energy Connection* Needs Identification Document, connection of the power plant does not result in thermal overloads on existing 807L under N-0 or N-1 conditions.

7 Preferred Development Option Schedules

7.1 Information In Regards to Rule 007, Section 6.1 – NID9(2) – The TFO has provided a general implementation schedule for the Preferred Development Option.[7] The TFO has advised the AESO of limitations or constraints with respect to its implementation schedule that include avoiding certain construction periods. The AESO expects the TFO, in setting the ISD as described by the Milestone Process in Section 6, to respect any potential limits or constraints that may be applicable to the construction of its project.

7.2 Information In Regards to Rule 007, Section 6.1 – NID10 – The AESO will shortly issue an unconditional direction to the TFO for preparation and submission of the TFO's facilities application to the Commission for the Preferred Development Option. However, if the milestones have not been met by the end of Q1 2022 the AESO will inform the Commission in writing if the need to expand or enhance the transmission system described in this Application continues, and if the Preferred Development Option continues to be the AESO's preferred technical solution.

[7] The TFO's letter to the AESO, dated September 29, 2016, is included in Appendix F of this Application. For the purpose of preparing the Implementation Schedules, the AESO instructed the TFO to assume the ISD to be 2019. The AESO assumes the sequence and duration of the activities, as well as potential related limitations or constraints provided for the Implementation Schedules remains applicable regardless of the actual ISD.

8 Long-term Transmission System Plans

The AESO's Long-term transmission system plans are high-level assessments of transmission capability and required transmission system development in Alberta focusing on broad technical aspects. More detailed studies are performed in preparation of a needs identification document application to ensure that the AESO's preferred development option will address the identified reliability violation in the most efficient manner.

The AESO's existing 2015 Long-term Transmission Plan ("2015 LTP") recommended transmission development in the Fort Saskatchewan Planning Area that aligns with the Preferred Development Option proposed by the AESO in this Application.[8]

8.1 Transmission Development Interdependencies – The Preferred Development Option will alleviate the identified need in the 20-year planning horizon and is independent of any other transmission developments that are currently planned within the Alberta Interconnected Electric System ("AIES") in this timeframe. Future load connections in the Beamer Area will depend on the implementation of the Preferred Development Option for reliable and constraint free access to the AIES. Additionally, future generation connections in the Fort Saskatchewan Planning Area may depend on the implementation of the Preferred Development Option for reliable and congestion free access to the AIES.

[8] 2015 LTP can be found on the AESO website: https://www.aeso.ca/grid/long-term-transmission-plan/

9 Request to Combine this Application with the Facilities Application for Consideration in a Single Process

Pursuant to Subsection 35(1) of the Act, the AESO has directed the TFO to prepare a facilities application to meet the need identified. The AESO understands that the TFO's facilities application will be filed shortly.[9] The AESO requests, and expects the TFO will request, that this Application be combined with the facilities application for consideration by the Commission in a single process. This request is consistent with Section 15.4 of the *Hydro and Electric Energy Act* and Section 6 of Commission Rule 007.

While it is believed that this Application and the facilities application will be materially consistent, the AESO respectfully requests that in its consideration of both, the Commission be mindful of the fact that the documents have been prepared separately and for different purposes. The purpose of this Application is to obtain approval of the need for transmission system development and to provide a preliminary description of the manner proposed to meet that need. In contrast, the facilities application will contain more detailed engineering and designs for the Preferred Development Option and seek approval for the construction and operation of specific facilities.

[9] The AESO understands that the TFO intends to file a Facility Proposal relating to this Application to be titled *807L Transmission Line Rebuild (Capacity Increase)*

10 Relief Requested

10.1 Approval is in the Public Interest: Having regard to the factors set out in Section 38 of the *Transmission Regulation* and, in particular, Subsections 38(d) and (e), the AESO submits that:

- its assessment of the need for 138 kV transmission system reinforcement in the Beamer Area is technically complete; and
- the Preferred Development Option (i) meets the identified need; (ii) satisfies Alberta Reliability Standards; (iii) is consistent with the AESO long-term forecasts and area transmission system plans; and (iv) is in the public interest.

Accordingly, the AESO respectfully submits that approval of the Application is in the public interest.

10.2 Request – For the reasons set out herein, and pursuant to Section 34 of the Act, the AESO respectfully requests the following:

1. that the Application be combined and considered with the TFO's related facilities application in accordance with Section 15.4 of the *Hydro and Electric Energy Act*;
2. that the Commission approve this Application subject to the milestones described herein, including the Preferred Development Option comprised of the following:

    a. increase 807L capacity from 85/90 MVA to 175/217 MVA between the 807AL t-tap and the Beamer 233S substation to make it consistent with the remaining section of the line; and

    b. modify, alter, add or remove equipment, including any operational, protections, control and telecommunication devices required to undertake the work as planned and ensure reliable integration of the Preferred Development Option with the transmission system;

3. that any permits and licences in respect of the TFO's facilities application be issued subject to appropriate terms and conditions restricting the commencement of construction and development activities until such time as the AESO has

advised the TFO that either the Load Growth Milestone or the Generation Addition Milestone has been met; and

4. such further and other relief as the Commission may deem appropriate to give effect to the foregoing.

In the event that the Proposed Transmission Development is not in service by the end of Q1 2022, the AESO will inform the Commission if the need to expand or enhance the transmission system described in this Application continues, and if the Preferred Transmission Development continues to be the AESO's preferred technical solution.

All of which is respectfully submitted this 30th day of September, 2016.

Alberta Electric System Operator

Sept 30th, 2016

Sami Abdulsalam, P. Eng.
Director, Transmission System Projects

PART B – APPLICATION APPENDICES

The following appended documents support the Application (Part A). The appendices include work undertaken by the AESO in the execution of its duties to plan the transmission system and in the preparation of this Application.

APPENDIX A **AESO Planning Studies –** Appendix A contains the *807L Capacity Increase Planning Study Report*, which describes the suite of studies performed by the AESO in support of this application.

APPENDIX B **AESO Load and Generation Forecast –** Appendix B contains the AESO's *807L Capacity Increase 2016 Long-term Outlook (2016 LTO) Load and Generation Forecasts* used in the *807L Capacity Increase Planning Studies Report* contained in Appendix A.

APPENDIX C **TFO Capital Cost Estimates –** Appendix C contains the TFO-prepared capital cost estimates referred to in this Application. The estimates have been prepared by the TFO according to the AESO's direction. The estimates are prepared to an approximate accuracy level of +20%, -10%, which is a more stringent level of accuracy than required under Commission Rule 007, NID8.

APPENDIX D **AESO Participant Involvement Program –** Appendix D provides a summary of the PIP activities conducted regarding the need for the transmission reinforcement to address the identified constraints and the Preferred Development Option described in this Application.

APPENDIX E **Commission Rule 007, Section 6.1, NID7(9)** – Appendix E contains a letter provided by the TFO confirming that the aspects of Commission Rule 007, Section 6.1, NID7(9) will be addressed within the TFO's facilities application.

APPENDIX F **Commission Rule 007, Section 6.1, NID9(2)** – Appendix F contains a letter provided by the TFO to specify Implementation Schedules, including an ISD consistent with the ISD outlined in Appendix C for the purpose of preparation of the cost estimates, as well as potential limitations or constraints that may be encountered in achieving that ISD.

APPENDIX G AESO Transmission Planning Criteria – Basis and Assumptions – The AESO has revised the Transmission Reliability Criteria, Part II System Planning, Version 0, dated March 11, 2005 mainly to remove all criteria that are now included in the TPL Standards.[10] Appendix G contains the Transmission Planning Criteria – Basis and Assumptions, Version 1, which includes the applicable thermal and voltage limits in support of the TPL standards. Planning studies that are included in this Application is in accordance with all the performance requirements of the specified TPL Standards (TPL-001-AB-0 and TPL-002-AB-0).

[10] TPL Standards are included in the current Alberta Reliability Standards.

PART C – REFERENCES

i. **AESO Planning Duties and Responsibilities and Duty to Forecast Need –** Certain aspects of the AESO's duties and responsibilities with respect to planning the transmission system are described in the Act. For example, Section 17, subsections (g), (h), (i), and (j), states the general planning duties of the AESO. [11] Section 33 of the Act states that the AESO "must forecast the needs of Alberta and develop plans for the transmission system to provide efficient, reliable, and non-discriminatory system access service and the timely implementation of required transmission system expansions and enhancements". As stated in subsection 34(1) of the Act, when the AESO determines that an expansion or enhancement of the capability of the transmission system is or may be required to meet the needs of Alberta and is in the public interest, the AESO must prepare and submit to the Commission for approval a needs identification document that describes the constraint or condition affecting the operation or performance of the system and indicates the means by which or the manner in which the constraint or condition could be alleviated. Where, as in this case, the AESO has identified a need to reinforce the transmission system to relieve anticipated reliability violations, it has set about to determine a reasonable solution to meet the identified need. In determining the means by which, or the manner in which, the constraint or condition affecting the operation or performance of the transmission system could be alleviated, the AESO has applied engineering judgments and made assumptions as necessary. Such judgments and assumptions being required and permitted by its prescribed responsibilities and authorities under the Act. In accordance with Section 11 of the *Transmission Regulation*, the AESO has considered technical, economic, environmental and other factors as necessary in determining its preferred option for system expansion. Given that the timing of the ISD for the development in this case is dependent on specific external factors that are beyond the AESO's control, pursuant to subsection 11(4) of the *Transmission Regulation*, the AESO has determined it to be appropriate to specify milestones.

ii. **AESO Planning Criteria** – The AESO is required to plan a transmission system that satisfies applicable reliability standards. TPL standards are included in the Alberta Reliability Standards and are described at: http://www.aeso.ca/rulesprocedures/17006.html[12]

In addition, the AESO's *Transmission Planning Criteria – Basis and Assumptions* is included in Appendix G.

[11] The legislation and regulations refer to the Independent System Operator or ISO. "AESO" and "Alberta Electric System Operator" are the registered trade names of the Independent System Operator.

[12] This link is provided for ease of reference and does not form part of this Application.

iii. **Application for Approval of the Need for Expansion or Enhancement of the Capability of the Transmission System –** This Application is directed solely to the question of the need for expansion or enhancement of the capability of the transmission system as more fully described in the Act and the *Transmission Regulation*. This Application does not seek approval of those aspects of transmission development that are managed and executed separately from the needs identification document approval process. Other aspects of the AESO's responsibilities regarding transmission development are managed under the appropriate processes, including the ISO Rules, Alberta Reliability Standards and the ISO Tariff, which are also subject to specific regulatory approvals. While the Application or its supporting appendices may refer to such other processes or information from time to time, the inclusion of such information is for context and reference only**.**

Any reference within the Application to market participants or other parties and/or the facilities they may own and operate or may wish to own and operate is not intended to constitute an application for approval of such facilities, and the responsibility for seeking such regulatory or other approval remains the responsibility of such market participants or other parties.

iv. **Capital Cost Estimates** – Capital costs estimates provided in the Application are planning cost estimates used by the AESO for the sole purpose of comparing transmission development options. Where only a single transmission development option has been studied, capital cost estimates are provided for context. Project costs will be determined by the TFO as part of its transmission facilty proposal. The AESO's responsibilities with respect to project cost reporting are described in the *Transmission Regulation*, including Section 25, and Section 9.1 of the ISO rules.