

In the Matter of the Need for the Abee 993S Substation Upgrade

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 Regulations made thereunder, and *Alberta Utilities Commission Rule 007*

Application of the Alberta Electric System Operator for Approval of the
Abee 993S Substation Upgrade
Needs Identification Document

Date: September 20, 2019

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PART A - APPLICATION

1 Introduction

1.1 Application – Pursuant to Section 34(1)(c) of the *Electric Utilities Act (Act)*, and in accordance with further provisions set out in legislation,¹ the Alberta Electric System Operator (AESO) applies to the Alberta Utilities Commission (Commission) for approval of the *Abee 993S Substation Upgrade Needs Identification Document (Application)*.

1.2 Application Overview – Enbridge Pipelines (Woodlands) Inc. (market participant), has requested system access service to serve a new demand for electricity in the Thorhild County area (AESO Planning Area 27, Athabasca/Lac La Biche). The market participant’s request includes a new Rate DTS, *Demand Transmission Service*, contract capacity of 13.0 MW at the existing Abee 993S substation. The market participant’s request can be met by upgrading the Abee 993S substation, including adding one 138/4.16 kilovolt (kV) transformer (the “Proposed Transmission Development”, as further described in Section 2.2). The scheduled in-service date for the Proposed Transmission Development is March 1, 2021.

This Application describes the market participant’s request for system access service, and the manner in which the AESO proposes to respond to the request. Having followed the AESO Connection Process,² the AESO has determined that the Proposed Transmission Development provides a reasonable opportunity for the market participant to exchange electric energy and ancillary services. The Proposed Transmission Development is consistent with the AESO’s long-term plans for the Northeast Planning Region, which includes the Thorhild County area. The AESO submits this Application to the Commission for approval in accordance with the AESO’s responsibility to respond to

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 Regulations made thereunder, and Alberta Utilities Commission Rule 007 (AUC Rule 007).

² For information purposes, refer to note iv of Part C of this Application for more information on the AESO Connection Process.

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requests for system access service, and having determined that transmission development is required and is in the public interest.^{3,4}

1.3 AESO Directions to the Legal Owner of Transmission Facilities – During the AESO Connection Process, the AESO issued various directions to the legal owner of transmission facilities (TFO), in this case, AltaLink Management Ltd., in its capacity as general partner of AltaLink, L.P., including direction to assist the AESO in preparing this Application.⁵

³ For information purposes, some of the legislative provisions relating to the AESO's planning duties and duty to provide system access service are referenced in notes i and ii of Part C of this Application.

⁴ Note v of Part C of this Application describes the Application scope in more detail.

⁵ The directions are described in more detail in the following sections of this Application and in Part C, note vi.

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2 Need Overview and Proposed Transmission Development

2.1 Duty to Provide Transmission System Access Service – The AESO, pursuant to its responsibilities under Section 29 of the Act, must provide system access service on the transmission system in a manner that gives all market participants a reasonable opportunity to exchange electric energy and ancillary services.

The AESO, in consultation with the market participant and the TFO, has determined that the Proposed Transmission Development is the preferred option to provide the market participant with a reasonable opportunity to exchange electric energy and ancillary services. In accordance with Section 34 of the Act, the AESO has determined that the Proposed Transmission Development will result in an expansion or enhancement of the transmission system thereby establishing the need for this Application. The market participant has made the appropriate applications to the AESO to obtain transmission system access service.

Through the AESO Connection Process, the AESO, in consultation with the market participant and the TFO, has determined the Proposed Transmission Development and has assessed the impacts that the Proposed Transmission Development and the associated load would have on the Alberta interconnected electric system. The AESO has issued directions to the TFO to prepare a transmission facility proposal⁶ (Facility Proposal) that corresponds with this Application.

2.2 Proposed Transmission Development – The Proposed Transmission Development involves upgrading the Abee 993S substation, including the following elements:

1. Add one 138/4.16 kV transformer with a minimum transformation capability of 14.5 MVA; and
2. Modify, alter, add or remove equipment, including switchgear, and any operational, protection, control and telecommunication devices required to

⁶ Also referred to as facility application, or FA, under AUC Rule 007.

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undertake the work as planned and ensure proper integration with the transmission system.⁷

2.3 Proposed Transmission Development Cost Estimate – The AESO directed the TFO to prepare a cost estimate for the Proposed Transmission Development. The TFO has estimated the cost of its scope of work to be approximately \$4 million.⁸ In accordance with the ISO tariff, the AESO has determined that all costs associated with the Proposed Transmission Development will be classified as participant-related.

2.4 Transmission Development Alternatives – In addition to the proposed Transmission Development, the AESO, in consultation with the market participant and the TFO, examined one other transmission development alternative to respond to the market participant's request for system access service:

1. **Upgrade the Abee 993S substation** – This alternative involves upgrading the existing Abee 993S substation, including replacing the existing 138/4.16 kV transformer T1 with a 138/4.16 kV transformer of higher capacity. This alternative was ruled out as serving both existing and new load from a single transformer did not meet the market participant's requested reliability or operational requirements.

The Proposed Transmission Development was selected as the preferred transmission alternative and forms the basis for the cost estimate and the connection assessment described herein.

2.5 Connection Assessment – Power flow, voltage stability, and short-circuit studies were conducted to assess the impact that the Proposed Transmission

⁷ Details and configuration of equipment required for the Proposed Transmission Development, including substation single-line diagrams, are more specifically described in the AESO's Functional Specification included in the TFO's Facility Proposal. Also, further details will be determined as detailed engineering progresses and the market participant's operating requirements are finalized. Routing and/or siting of transmission facilities do not form part of this Application and are addressed in the TFO's Facility Proposal. Line numbering and substation names provided here are for ease of reference and are subject to change as engineering and design progresses. Market participant facilities that may subsequently be connected to the Proposed Transmission Development are the responsibility of the market participant and are not included in the Application.

⁸ The cost is in nominal dollars using a base year of 2019 with escalation considered. Further details of this cost estimate, which has an accuracy level of +20%/-10%, can be found in Appendix B.

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Development and the associated load would have on the transmission system. Power flow and short-circuit studies were conducted prior to and following connection of the Proposed Transmission Development, and voltage stability studies were performed following connection of the Proposed Transmission Development.⁹

The connection assessment did not identify any system performance issues prior to and following connection of the Proposed Transmission Development. Based on the study results, the Proposed Transmission Development will not adversely affect the performance of the transmission system.

2.6 AESO Forecast and Transmission System Plans – The AESO’s corporate forecast for the Northeast Planning Region is consistent with the load associated with the Proposed Transmission Development.¹⁰ The AESO’s corporate forecasts are used by the AESO to assess the adequacy of the regional transmission system and as a basis for identifying the need for transmission system expansion or enhancement. The need associated with the Proposed Transmission Development is consistent with the AESO’s long-term plans for this region.

2.7 Transmission Dependencies – The Proposed Transmission Development does not require the completion of any other AESO plans to expand or enhance the transmission system prior to connection.

2.8 AESO Participant Involvement Program – The AESO directed the TFO to assist the AESO in conducting the AESO’s participant involvement program (PIP). Between May 2019 and June 2019, the TFO and the AESO used various methods to notify stakeholders about the need for development and the AESO’s preferred option to respond to the system access service request. In September 2019, the AESO notified stakeholders of its intention to file this Application with the Commission. The AESO has not received any indication of concerns or objections regarding the AESO’s preferred

⁹ The connection assessment is included as Appendix A.

¹⁰ The *AESO 2017 Long-term Outlook* provides forecasting information for the Northeast Planning Region, which includes the Proposed Transmission Development area.

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option to respond to the system access service request or the need for the Proposed Transmission Development.¹¹

2.9 Information Regarding AUC Rule 007, Section 6.2.1, NID15(2) – The AESO has been advised that the TFO’s Facility Proposal addresses the requirements of AUC Rule 007, Section 6.2.1, NID15(2).¹² In consideration of this fact, and as the filing of the Application is combined with the TFO’s Facility Proposal, the AESO has not undertaken a separate assessment of the sort contemplated in AUC Rule 007, Section 6.2.1, NID15(2).

2.10 Confirmation Date – In the event that the proposed facilities are not in-service by September 1, 2021, which is six months following the scheduled in-service date of March 1, 2021, 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 technical solution described in this Application continues to be the AESO’s preferred technical solution.

The AESO has been advised that the TFO’s Facility Proposal addresses the requirements of AUC Rule 007, Section 6.2.1, NID17(2).¹³ In consideration of this fact, and as the filing of this Application is combined with the TFO’s Facility Proposal, the AESO has not undertaken an implementation schedule of the sort contemplated in AUC Rule 007, Section 6.2.1, NID17(2).

2.11 Approval is in the Public Interest – Having regard to the following:

- the transmission planning duties of the AESO as described in Sections 29, 33 and 34 of the Act;
- the market participant’s request for system access service and the AESO’s assessment thereof;

¹¹ Further information regarding the AESO’s PIP for this Application is included in Appendix C.

¹² Please refer to the letter included as Appendix D of this Application.

¹³ *Ibid.*

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- the AESO's engineering connection assessment;
- the TFO's cost estimate for the Proposed Transmission Development;
- the TFO's confirmation that it has addressed AUC Rule 007, Section 6.2.1, NID15(2);
- information obtained from AESO PIP activities; and
- the AESO's long-term transmission system plans,

it is the conclusion of the AESO that the Proposed Transmission Development provides a reasonable opportunity for the market participant to exchange electric energy and ancillary services. In consideration of these factors, the AESO submits that approval of this Application is in the public interest.

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3 Request to Combine this Application with the Facility Proposal for Consideration in a Single Process

3.1 Pursuant to Subsection 35(1) of the Act, the AESO has directed the TFO to prepare a Facility Proposal corresponding with this Application. The AESO understands that the TFO's Facility Proposal will be filed shortly.¹⁴ The AESO requests, and expects the TFO will request, that this Application be combined with the Facility Proposal for consideration by the Commission in a single process. This request is consistent with Section 15.4 of *Hydro and Electric Energy Act* and Section 6 of AUC Rule 007.

3.2 While it is believed that this Application and the Facility Proposal will be materially consistent, the AESO respectfully requests that in its consideration of each, 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 a needs identification document that describes the market participant's request for system access service and the manner in which the AESO proposes to respond to the request, including a description the Proposed Transmission Development which is required to provide the market participant with a reasonable opportunity to exchange electric energy and ancillary services. In contrast, the Facility Proposal will contain more detailed engineering and designs for the Proposed Transmission Development and seek approval for the construction and operation of specific facilities.

¹⁴ The AESO understands that the TFO intends to file a Facility Proposal relating to this Application to be titled *Enbridge Abee 993S Substation Upgrade*.

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4 Relief Requested

4.1 The AESO submits that its assessment of the need to meet the market participant's request for system access service is technically complete and that approval is in the public interest.

4.2 In the event that the proposed facilities are not in service by September 1, 2021, which is six months following the scheduled in-service date of March 1, 2021, 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 technical solution described in this Application continues to be the AESO's preferred technical solution.

4.3 For the reasons set out herein, and pursuant to Section 34 of the Act, the AESO requests that the Commission approve this Application, including issuing an approval of the need to respond to the market participant's request for system access service, and for transmission developments at Abee 993S substation, as follows:

- A. Add one 138/4.16 kV transformer; and
- B. Modify, alter, add or remove equipment, including switchgear, and any operational, protection, control and telecommunication devices required to undertake the work as planned and ensure proper integration with the transmission system.

All of which is respectfully submitted this 20th day of September, 2019.

Alberta Electric System Operator

"Electronically Submitted by"

Robert Davidson, P.Eng.
Director, Transmission Connection Projects

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PART B – APPLICATION APPENDICES

The following appended documents support the Application (Part A).

APPENDIX A **Connection Assessment** – Appendix A contains the *AESO Engineering Connection Assessment – Abee 993S Substation Upgrade* that assesses the transmission system performance prior to and following the connection of the Proposed Transmission Development. As part of the AESO Connection Process, the AESO defined the study scope, and provided the system models and study assumptions to the market participant who engaged a consultant to conduct the connection assessment studies. The AESO reviewed the results of the connection assessment studies prepared by the consultant, and finds the results of the connection assessment acceptable for the purposes of assessing the impacts of the Proposed Transmission Development on the transmission system.

APPENDIX B **Capital Cost Estimates** – Appendix B contains detailed cost estimates corresponding to the Proposed Transmission Development. These estimates have been prepared by the TFO at the direction of the AESO, to an accuracy level which exceeds the accuracy required by AUC Rule 007, NID16.

APPENDIX C **AESO PIP** – Appendix C contains a summary of the PIP activities conducted, in accordance with requirements of NID19 and Appendix A2 of AUC Rule 007, regarding the need to respond to the market participant’s request for system access service. Copies of the relevant materials distributed during the PIP are attached for reference.

APPENDIX D **TFO Information Regarding AUC Rule 007, Section 6.2.1, NID15(2) and NID17(2)** – Appendix D contains a letter provided by the TFO confirming that the requirements of AUC Rule 007, NID15(2) and NID17(2) will be addressed within the TFO’s Facility Proposal.

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PART C – REFERENCES

- i. **AESO Planning Duties and Responsibilities** – 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), describe the general planning duties of the AESO.¹⁵ 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.” Where, as in this case, the market participant (refer to note ii below) is requesting system access service, and the AESO has determined that the request requires or may require the expansion or enhancement of the capability of the transmission system, the AESO must prepare and submit for Commission approval, as per Section 34(1)(c), a needs identification document that describes the need to respond to requests for system access service, including the assessments undertaken by the AESO regarding the manner proposed to address that need. Other aspects of the AESO’s transmission planning duties and responsibilities are set out in Sections 8, 10, 11, and 15 of the *Transmission Regulation*.
- ii. **Duty to Provide Transmission System Access** – Section 29 of the Act states that the AESO “must provide system access service on the transmission system in a manner that gives all market participants [Enbridge Pipelines (Woodlands) Inc. in this case] wishing to exchange electric energy and ancillary services a reasonable opportunity to do so.”
- iii. **AESO Planning Criteria** – In accordance with the Act, the AESO is required to plan a transmission system that satisfies applicable reliability standards. Transmission Planning (TPL) standards are included in the Alberta Reliability Standards, and are generally described at: <https://www.aeso.ca/rules-standards-and-tariff/alberta-reliability-standards/>¹⁶

In addition, the AESO’s Transmission Planning Criteria – Basis and Assumptions is included in Appendix A.
- iv. **AESO Connection Process** – For information purposes, the AESO Connection Process, which changes from time to time, is generally described at: <https://www.aeso.ca/grid/connecting-to-the-grid/connection-process/>¹⁷

¹⁵ 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.

¹⁶ This link is provided for ease of reference and does not form part of this Application.

¹⁷ This link is provided for ease of reference and does not form part of this Application.

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v. **Application for Approval of the Need to Respond to a Request for System Access**

Service – This Application is directed solely to the question of the need to respond to a request for system access service, as more fully described in the Act and the *Transmission Regulation*, and the AESO’s determination of the manner in which to respond to the request. 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 other processes or information from time to time, the inclusion of this 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, does not constitute an application for approval of such facilities. The responsibility for seeking such regulatory or other approval remains the responsibility of the market participants or other parties.

vi. **Directions to the TFO** – Pursuant to Subsection 35(1) of the Act, the AESO has directed the TFO, in its capacity as a legal owner of transmission facilities, in whose service territories the need is located, to prepare a Facility Proposal to meet the need identified. The Facility Proposal is also submitted to the Commission for approval. The AESO has also directed the TFO, pursuant to Section 39 of the Act and Section 14 of the *Transmission Regulation*, to assist in the preparation of the AESO’s Application. The TFO has also been directed by the AESO under Section 39 of the Act to prepare a service proposal to address the need for the Proposed Transmission Development.

vii. **Capital Cost Estimates** – The provision of capital costs estimates in the Application is for the purposes of relative comparison and context only. The requirements applicable to cost estimates that are used for transmission system planning purposes are set out in Section 25 of the *Transmission Regulation*, AUC Rule 007, and Section 504.5 of the ISO rules, *Service Proposals and Cost Estimating*.