Alberta Utilities Commission

In the Matter of the Need for the Simonette 733S 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 *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 Simonette 733S Substation Upgrade Needs Identification Document

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 *Simonette 733S Substation Upgrade Needs Identification Document* (Application).

1.2 Application Overview – ATCO Electric Ltd. (ATCO),[2] as the legal owner of electric distribution facilities (DFO) in the Fox Creek area (AESO Planning Area 22, Grande Cache), has requested system access service to serve new industrial loads and load growth in the area. ATCO's request includes a Rate DTS, *Demand Transmission Service*, contract capacity increase of approximately 9.36 MW for the system access service provided at the existing Simonette 733S substation. ATCO's request can be met by upgrading the existing Simonette 733S substation, including replacing the existing 144/25 kV transformer and associated voltage regulator with an LTC transformer of higher capacity, and replacing the existing 144 kV circuit switcher with a 144 kV circuit breaker (the "Proposed Transmission Development", as further described in Section 2.2). The scheduled in-service date for the Proposed Transmission Development is September 9, 2016.

This Application describes the need to respond to the DFO's request for system access service. Having followed the AESO Connection Process,[3] the AESO has determined that the Proposed Transmission Development provides a reasonable opportunity for the DFO to exchange electricity. The Proposed Transmission Development is aligned with

[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.

[2] In this Application, ATCO acts as both the legal owner of distribution facilities (DFO) and the legal owner of transmission facilities (TFO) as applicable to its specific business functions.

[3] For information purposes, refer to note iv of Part C of this Application for more information on the AESO's Connection Process.

the AESO's long-term plan for the area. The AESO, in accordance with its responsibility to respond to requests for system access service, submits this Application to the Commission for approval.[4,5]

1.3 AESO Directions to the TFO – During the AESO Connection Process, the AESO issued various directions to ATCO, as the legal owner of transmission facilities (TFO), including direction to assist the AESO in preparing this Application.[6]

[4] 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.

[5] Note v of Part C of this Application describes the Application scope in more detail.

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

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 (in this case the DFO), a reasonable opportunity to exchange electric energy and ancillary services.

The DFO, in executing its duties as defined under Section 105(1)(b) of the Act, has determined that the Proposed Transmission Development is the preferred development to serve new industrial loads and load growth in the Fox Creek area. The DFO has made the appropriate applications to the AESO to obtain transmission system access service.[7]

Through the AESO Connection Process, the AESO, the DFO, and the TFO have collaborated to determine the characteristics of the Proposed Transmission Development and to assess the impacts that connecting the Proposed Transmission Development and the associated load would have on the transmission system. The AESO has issued directions to the TFO to prepare a Facility Proposal[8] to meet the DFO's identified need.

2.2 Proposed Transmission Development – The Proposed Transmission Development involves upgrading the Simonette 733S substation, including the following elements:

1. Replace the existing 10/13 MVA 144/25 kV transformer and associated 10/13 MVA voltage regulator with a 144/25 kV LTC transformer rated at approximately 50 MVA;[9]
2. Replace the existing 144 kV circuit switcher with a 144 kV circuit breaker; and

[7] For information purposes, some of the duties of the DFO are described in note vii of Part C of this Application.

[8] Also referred to as facility application, or FA, under Commission Rule 007.

[9] The TFO has advised that a transformer size of 30/40/50 MVA would be recommended based on good electric industry practice and under advisement from the legal owner of transmission facilities (TFO) regarding their asset management and inventory practices.

3. 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.[10]

2.3 Proposed Transmission Development Cost Estimates – The AESO directed the TFO to prepare a cost estimate for the Proposed Transmission Development. The TFO estimated the in-service cost of the Proposed Transmission Development, described in Section 2.2, to be approximately $7 million ($2015).[11] In accordance with the ISO tariff, the AESO has determined that there are no system-related costs associated with the Proposed Transmission Development.

2.4 Transmission Development Alternatives – In addition to the Proposed Transmission Development, the following transmission development alternative was examined:

1. Add a second transformer at the existing Simonette 733S substation – This involves adding a 144 kV circuit breaker and a 144/25 kV LTC transformer, rated at approximately 50 MVA, at the existing Simonette 733S substation. The TFO has indicated that the developments for this alternative would entail modifying the 25 kV and 144 kV busses, and expanding the substation and the existing control building. The TFO has further indicated that the substation expansion is constrained by pipelines. This alternative was ruled out by the TFO due to the additional transmission facility development and the associated costs.

[10] 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 DFO 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. This is subject to change as routing and/or siting is finalized by the TFO. Distribution facilities that may subsequently be connected to the Proposed Transmission Development are the responsibility of the DFO and are not included in the Application.

[11] Further details of this cost estimate can be found in Appendix B, with an approximate accuracy level of +20%/-10%.

The Proposed Transmission Development, selected as the option with the least transmission facility development and hence lowest cost, forms the basis for the cost estimates and the Connection Assessment described herein.[12]

2.5 Connection Assessment – Power flow, voltage stability and short-circuit analyses were conducted to assess the impact that the Proposed Transmission Development and the associated load would have on the transmission system. Power flow and short-circuit analyses were conducted prior to and following connection of the Proposed Transmission Development and voltage stability analysis was performed following connection of the Proposed Transmission Development. These analyses indicate that the Proposed Transmission Development and the associated load will not adversely impact transmission system performance.[13]

2.6 AESO Forecast and Transmission System Plans – Appendix G is a forecast appendix for the Northwest Region. As shown in Appendix G, the predicted load growth for the Northwest Region in the *AESO 2014 Long-term Outlook* (2014 LTO) is generally aligned with the load to be served by the Proposed Transmission Development. The 2014 LTO also recognized that the Northwest Region contains large amounts of unconventional gas potential, which could affect the load forecast. However, when the 2014 LTO was prepared, there was no information indicating to the AESO that the Grande Cache area specifically was likely to experience significant load growth.[14,15]

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. However, as discussed in Appendix G, the DFO in the Northwest Region has submitted numerous system access service requests

[12] The DFO also examined and ruled out a distribution-based solution, as detailed in Section 4 of the DFO's Distribution Deficiency Report, which is included as Appendix E.

[13] The Connection Assessment is included as Appendix A.

[14] Section 6.3 of the 2014 LTO discusses the Northwest Region, which includes the Proposed Transmission Development area.

[15] The Connection Assessment modelled the loads in the study area by adding the Project load to each study scenario, while maintaining the regional load for the Northwest Region as forecast in the 2014 LTO.

(SASRs) to the AESO since the preparation of the 2014 LTO. During the preparation of the *AESO 2015 Long-term Transmission Plan*, the AESO examined the SASRs associated with the Duvernay play, including the load associated with the Proposed Transmission Development. Therefore, the need associated with the Proposed Transmission Development is consistent with the AESO's long-term plans for the region. Future AESO needs identification documents in the Northwest Region will assume the Proposed Transmission Development will be in-service for the date specified, unless new information indicates otherwise.

2.7 Transmission Dependencies – The Proposed Transmission Development is not dependent on the AESO's plans to expand or enhance the transmission system.

2.8 AESO Participant Involvement Program – The AESO directed the TFO to assist the AESO in conducting a participant involvement program (PIP), in accordance with requirement NID14 and Appendix A2 of Commission Rule 007. Between June and November 2015, the TFO and the AESO used various methods to notify occupants, residents, landowners, government bodies, agencies and stakeholder groups (collectively, the Stakeholders) in the area where the AESO has reasonably determined that transmission facilities could be installed to implement the Proposed Transmission Development. Additionally, the AESO notified the public in the area where transmission facilities could be installed to implement the Proposed Transmission Development, of its intention to file this Application with the Commission for approval. No concerns or objections have been raised regarding the need for the Proposed Transmission Development.[16]

2.9 Information Regarding Rule 007, Section 6.1 - NID13 – The AESO has been advised that the TFO's Facility Proposal addresses the major aspects listed in Commission Rule 007, Section 6.1 - NID13.[17] In consideration of that fact, and as the filing of the Application is combined with the TFO's Facility Proposal, the AESO has not

[16] Further information regarding the AESO's PIP for this Application is included in Appendix C.

[17] Please refer to the letter included as Appendix D of this Application.

undertaken a separate assessment of the sort contemplated in Commission Rule 007, Section 6.1 – NID13.

2.10 Confirmation Date – In the event that the proposed facilities are not in-service by March 9, 2017, which is six months following the scheduled in-service date of September 9, 2016, 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 approval continues to be the AESO's preferred technical solution.[18]

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 SASR;
- the DFO's Distribution Deficiency Report;
- the Connection Assessment;
- 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 electricity. In consideration of these factors, the AESO submits that approval of this Application is in the public interest.

[18] A detailed project schedule can be found in the TFO's Facility Application.

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 to meet the need identified. The AESO understands that the TFO's Facility Proposal will be filed shortly.[19] 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 the *Hydro and Electric Energy Act* and Section 6 of Commission 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 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 to respond to the DFO's request for system access service and provide a preliminary description of the manner proposed to meet that need. 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.

[19] The AESO understands that the TFO intends to file a Facility Proposal relating to this Application to be titled *Application for Alterations to Simonette 733S Substation*.

4 Relief Requested

4.1 The AESO submits that its assessment of the need to meet the market participant's request for transmission 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 March 9, 2017, which is six months following the scheduled in-service date of September 9, 2016, 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 approval 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 to upgrade the Simonette 733S substation, as follows:

A. Replace the existing 10/13 MVA 144/25 kV transformer and associated 10/13 MVA voltage regulator with a 144/25 kV LTC transformer of higher capacity;

B. Replace the existing 144 kV circuit switcher with a 144 kV circuit breaker; and

C. 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 2nd day of December 2015.

Alberta Electric System Operator

Doyle Sullivan, P. Eng.
Director, Regulatory Transmission

PART B – APPLICATION APPENDICES

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

APPENDIX A **Connection Assessment –** Appendix A contains the *Connection Engineering Study Report for AUC Application Simonette 733S Transformer Upgrade Capacity Increase* 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 DFO engaged a consultant to conduct the connection assessment (Study). The AESO defined the Study scope, and provided the system models and Study assumptions. The AESO also reviewed this report and its conclusions, and finds the Study acceptable for the purposes of assessing the impacts of the Proposed Transmission Development on the transmission system.

APPENDIX B **TFO 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 approximate accuracy level of +20%/-10%, which exceeds the accuracy required by Commission Rule 007, NID11.

APPENDIX C **AESO PIP –** Appendix C contains a summary of the PIP activities conducted 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 **Information Regarding Rule 007, Section 6.1 - NID13 –** Appendix D contains a letter provided by the TFO confirming that the seven major aspects of Commission Rule 007, NID13 will be addressed within the TFO's Facility Proposal.

APPENDIX E **DFO Distribution Deficiency Report –** Appendix E contains the DFO's *Distribution Deficiency Report, Simonette 733S* that provides information in support of the DFO's request for system access service, including describing the need for development.

APPENDIX F **AESO Transmission Planning Criteria – Basis and Assumptions –** The AESO has revised the *Transmission Reliability Criteria, Part II Transmission System Planning Criteria,* Version 0, dated March 11, 2005 primarily to remove criteria that are now included in the Transmission Planning (TPL) Standards.[20] Appendix F 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 meet all the performance requirements of the specified TPL standards (TPL-001-AB-0 and TPL-002-AB-0).

APPENDIX G **AESO Northwest Region Forecast Appendix –** Appendix G contains a forecast appendix that has been prepared by the AESO and that presents results from the 2014 LTO for the Northwest Region. It provides seasonal historical and forecasted loads, as well as generation assumptions for the region. The forecast appendix also includes commentary on the characteristics and growth for the region.

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

PART C – REFERENCES

i. **AESO Planning Duties and Responsibilities –** Certain aspects of AESO 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.[21] 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 to meet its distribution planning needs, and 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 [the DFO in this case] wishing to exchange electric energy and ancillary services a reasonable opportunity to do so."

iii. **AESO Planning Criteria –** 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: http://www.aeso.ca/rulesprocedures/17006.html.[22]

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

iv. **AESO Connection Process** – For information purposes, the AESO Connection Process, which changes from time to time, is generally described at: http://www.aeso.ca/connect[23]

[21] 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.

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

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

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*. 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 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 TFO has also been directed by the AESO under Section 39 of the Act to prepare a proposal to provide services to address the need for the Proposed Transmission Development. 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.

vii. **Duties of owners of electric distribution systems –** The duties of DFOs to make decisions about building, upgrading and improving their electric distribution systems are described in Section 105(1)(b) of the Act. The DFO, being responsible for electric distribution system planning, determines its need for transmission system access service based on its own distribution planning guidelines and criteria. While the DFO's plans are considered during the AESO Connection Process, the AESO, in executing its duties to plan the transmission system, does not oversee electric distribution planning or the development of specific DFO planning criteria. The AESO does, however, review the DFO forecasts that are submitted to the AESO, which may be considered in the preparation of the AESO's corporate forecasts.

viii. **Capital Cost Estimates –** The provision of capital costs estimates in the Application is for the purposes of relative comparison and context only. The AESO's responsibilities in respect of project cost reporting are described in the *Transmission Regulation*, including Section 25, and ISO Rule 9.1.