



Alberta Utilities Commission

In the Matter of the Need for the Deerland Peaking Station Energy Connection

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 Deerland Peaking Station Energy Connection 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 the further provisions set out in legislation,¹ the Alberta Electric System Operator (AESO) applies to the Alberta Utilities Commission (Commission) for approval of the *Deerland Peaking Station Energy Connection Needs Identification Document* (Application).

1.2 Application Overview – This Application describes the need for transmission development arising from a request from Maxim Power Corp. (the “market participant”) for transmission system access service for its proposed 189.6 MW gas-fired Deerland Peaking Power Station, located in the Fort Saskatchewan area (Facility). Connection of the Facility to the transmission system will require a new 138 kV circuit between the market participant’s proposed Skaro 109S substation and the existing Deerland 13S substation (the Proposed Transmission Development, as further described in Paragraph 2.2). The expected in-service date for the new connection is Q1, 2016.

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 electricity and is consistent with the AESO’s long-term transmission forecasts and plans for the area. The AESO, in accordance with its responsibility to plan the transmission system, submits this Application to the Commission for approval.^{3, 4}

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

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.

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1.3 AESO Directions to the TFO – During the AESO Connection Process, the AESO issued various directions to AltaLink Management Ltd. (AltaLink), as the legal owner of transmission facilities (TFO), including direction to assist the AESO in preparing its needs identification document.⁵

⁵ 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 a reasonable opportunity to exchange electric energy and ancillary services.

The market participant has requested connection of its Facility to the transmission system, thereby establishing the need for transmission development. Through the AESO Connection Process, the AESO, the TFO and the market participant have collaborated to determine the characteristics of the Proposed Transmission Development and the AESO has assessed the impacts of connecting the Facility to the transmission system and issued directions to the TFO to prepare a Facility Proposal ⁶ to meet the market participant's need.

2.2 Proposed Transmission Development – The Proposed Transmission Development includes the following major elements:

1. add a new 138 kV circuit from the market participant's proposed Skaro 109S substation to the existing Deerland 13S substation;
2. add a new 138 kV breaker to Deerland 13S substation;
3. re-terminate the existing 138 kV transmission line 815L at Deerland 13S substation; and
4. modify, alter, add or remove equipment, including switchgear, and any operational, protections, control and telecommunication devices required to undertake the work as planned and ensure proper integration with the transmission system.⁷

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

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 transmission 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

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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 in-service cost of the Proposed Transmission Development described in Section 2.2 to be approximately \$5 million (\$2016).⁸ 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, which entails a 138 kV radial connection to the Deerland 13S substation, the following two connection alternatives were identified.

1. A 138 kV tap connection to the existing 138 kV transmission line 815L – this alternative would require modifications to 815L, terminal protection replacements and telecommunications at Deerland 13S and Bruderheim 127S substations to support a three-terminal network configuration, and either a capacity upgrade to 815L or the installation of a remedial action scheme. This alternative was ruled out due to protection complexity and the need for a remedial action scheme.
2. A radial 240 kV connection to the Deerland 13S station – this alternative would require significant installation of new, and modification of existing 240kV transmission facilities including relocating the existing 9L960 and 9L961 terminations at Deerland 13S; at least one new 240 kV breaker at Deerland 13S; a new short single circuit 240 kV transmission line; and modifications and augmentation to line 815L.⁹ This alternative was ruled out due to the inherent higher cost.

Proposal. The new 138 kV circuit is currently estimated to have a length of approximately 300 metres. This is subject to change as routing is finalized by the TFO. 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 Further details of this cost estimate can be found in Appendix B, with an approximate accuracy level of +20%/-10%.

⁹ The connection alternatives are detailed in Appendix A, Section 5.

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The Proposed Transmission Development was selected as the least complex, least cost option and forms the basis for the cost estimates and the Connection Assessment described herein.

2.5 Connection Assessment – Power flow, transient stability and short circuit analyses were conducted to assess the impact of the Proposed Transmission Development on the transmission system.¹⁰ Load and generation assumptions used in the analyses align with the AESO *2012 Long-term Outlook Update (2012LTOU)* corporate forecast. While the AESO has since updated its corporate forecast in the *2014 Long-term Outlook*, the updated forecast would not materially alter the connection assessment results or conclusions.

Under Category A (N-0) and Category B (N-1) conditions, the power flow analysis indicates that no thermal overloads or voltage criteria violations would result from connection of the Facility to the transmission system. Furthermore, power flow results indicate the connection of the Facility would mitigate existing Category B thermal constraints on 807L while the Facility was running.

Thermal overloading was observed under the studied Category C5 (N-2) contingency; the AESO will develop appropriate mitigation measures to alleviate Category C5 constraints, if required.

Transient stability analysis demonstrates stable performance by the Facility and other area generating facilities following the Facility connection.

Consequently, the AESO has determined that the Proposed Transmission Development will not adversely affect the transmission system.

2.6 Transmission Interdependencies – There are no transmission interdependencies associated with the Proposed Transmission Development. Future AESO needs identification documents in the area will assume the Proposed

¹⁰ The Connection Assessment is included as Appendix A.

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Transmission Development will be in-service for the date specified, unless new information indicates otherwise.

2.7 AESO Participant Involvement Program – The AESO directed the TFO to assist the AESO in conducting a participant involvement program (PIP) in accordance with requirement NID13 and Appendix A of Commission Rule 007. Between December 2013 and September 2014, the TFO and the AESO used various methods to notify occupants, residents and landowners of the need for the Proposed Transmission Development in the area where transmission facilities could be installed to address the identified need. The AESO has received no indication of concern from any party regarding the need for the Proposed Transmission Development.¹¹

2.8 Information In Regards to Rule 007, Section 6.1 - NID13 – The AESO has been advised that the TFO's Facility Proposal will address the major aspects listed in Commission Rule 007, Section 6.1 – NID13.¹² In consideration of that fact, and as the filing of the Application is combined with the TFO Facility Proposal, the AESO has not undertaken a separate assessment of the sort contemplated in Commission Rule 007, Section 6.1 – NID13.

2.9 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 System Access Service Request;
- information obtained from AESO PIP Activities;
- the Connection Assessment; 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.

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

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

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In consideration of these factors, the AESO submits that approval of the Application is in the public interest.

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 Facility Proposal will be filed shortly.¹³ The AESO requests, and understands that the TFO will also 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 for the identified transmission system developments 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.

¹³ The AESO understands that AltaLink intends to file a Facility Proposal relating to this Application to be titled, *Maxim Deerland Peaking Station*.

4 Relief Requested

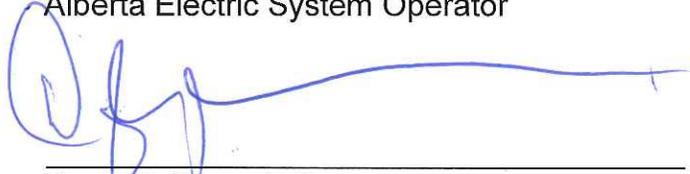
4.1 Having regard to the factors set out in Section 38 of the *Transmission Regulation*, and in particular, Subsections 38(d) and (e), the AESO submits that its assessment of the need to meet the market participant's request for transmission system access service is technically complete and that approval of the need for the Proposed Transmission Development, as described in Section 2.2, is in the public interest.

4.2 For the reasons set out herein, and pursuant to Section 34 of the Act, the AESO requests that the Commission approve this Application as follows:

- A. add a new 138 kV circuit from the market participant's proposed Skaro 109S substation to the existing Deerland 13S substation;
- B. add a new 138 kV breaker to Deerland 13S substation;
- C. re-terminate the existing transmission line 815L at Deerland 13S substation; and
- D. modify, alter, add or remove equipment, including switchgear, and any operational, protections, 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 18th day of September 2014.

Alberta Electric System Operator



Doyle Sullivan, P.Eng.
Director, Regulatory Services

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 Maxim Power Corp. Deerland Peaking Station*, which contains an assessment of transmission system performance prior to and following the connection of the Proposed Transmission Development. As part of the AESO Connection Process, a consultant was engaged 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. These estimates have been prepared 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 for the Proposed Transmission Development. 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 the letter provided by the TFO confirming that the seven major aspects of Commission Rule 007, NID13 will be addressed within the TFO Facility Application.

APPENDIX E **AESO Transmission Planning Criteria – Basis and Assumptions** – Recently the AESO has revised the *Transmission Reliability Criteria, Part II System Planning*, Version 0, dated March 11, 2005 to mainly remove all criteria that are now included in the Transmission Planning (TPL) Standards¹⁴. Appendix F

¹⁴ TPL Standards are included in the current Alberta Reliability Standards.

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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, TPL-002-AB-0 and specified contingencies associated with TPL-003-AB-0).

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.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 transmission system access service, 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, and 11, 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 market participant 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>¹⁶ In addition, the AESO’s *Transmission Planning Criteria – Basis and Assumptions* is included in Appendix E.
- 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/8602.html>¹⁷
- v. **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

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.

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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.

Furthermore, this Application is directed solely to the question of the need for expansion or enhancement of the capability of the transmission system. 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 constitute an application for approval of such facilities. The responsibility for seeking such regulatory or other approval remains the responsibility of such 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. **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.