Alberta Utilities Commission

In the Matter of the Need for the Carmon Creek Co-generation 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 Carmon Creek Co-generation 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 further provisions set out in legislation,[1] the Alberta Electric System Operator (AESO) applies to the Alberta Utilities Commission (Commission) for approval of the *Carmon Creek Co-generation Connection Needs Identification Document* (Application).

1.2 Application Overview – This Application describes the need for transmission development arising from a Shell Canada Ltd. (Market Participant) request for transmission system access service for its gas-fired Carmon Creek Co-generation Facility (Facility), located in the Peace River area.[2] The Market Participant has requested system access for new load and generation, as provided below (cumulative):

- Phase 1 (Q3, 2015) - 5 MW load and 230 MW generation;
- Phase 2 (Q2, 2016) - 40 MW load and 460 MW generation; and
- Phase 3 (Q4, 2016) - 90 MW load and 690 MW generation.

The Market Participant's request can be met by adding two 240 kV circuits connecting the Facility to the existing Wesley Creek 834S substation and modifying Wesley Creek 834S (Proposed Transmission Development, as further described in Section 2.2). The anticipated in-service date for the Proposed Transmission Development is Q3, 2015.

[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] The Shell Carmon Creek Co-generation Facility obtained an industrial system designation in Decision 2014-068 and Utilities Order No. U2014-97, which includes an approved 690 MW co-generation power plant and the approved 240 kV Brock 232S substation.

Having followed the AESO Connection Process, the AESO has determined that the Proposed Transmission Development provides a reasonable opportunity for the Market Participant to exchange electricity and is aligned with the AESO's long-term plans for the area.[3] The AESO, in accordance with its responsibility to plan the transmission system, 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 Electric Ltd. as the legal owner of transmission facilities (TFO), including direction to assist the AESO in preparing this Application.[6]

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

[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 note vi of Part C.

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 assess the impacts of connecting the Facility to the transmission system. The AESO has issued directions to the TFO to prepare a Facility Proposal to meet the Market Participant's identified need. [7]

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

1. Add two new 240 kV transmission circuits between the existing Wesley Creek 834S substation and the approved Brock 232S substation;

2. Add two new 240 kV breakers at Wesley Creek 834S substation; and

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.[8]

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

[8] 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. The two new 240 kV circuits are currently estimated to have lengths of approximately 25 km

2.3 Transmission Development Alternatives – In addition to the Proposed Transmission Development, the AESO considered the following development to connect the Facility to the transmission system:

- Add a new 240 kV switching station on the 9L15 transmission line between the Wesley Creek 834S and Brintnell 876S substations connected to the Facility via two new 240 kV circuits, each approximately 10 km in length.

Relative to the Proposed Transmission Development, this alternative would require a greater number of transmission facilities, including a new switching substation, with similar mitigations required. In addition, the thermal capacity of 9L15 is not sufficient to accommodate the Facility's capacity and therefore, additional mitigations would be required. Accordingly, the Proposed Transmission Development was selected as the preferred alternative and forms the basis of the cost estimates and the Connection Assessment described herein.

2.4 Connection Assessment – Power flow and short circuit analyses were conducted to assess transmission system performance prior to and following connection of the Proposed Transmission Development and associated generation. In addition, Transient stability analysis was conducted following connection of the Proposed Transmission Development. The load and generation assumptions used in these analyses align with the AESO *2014 Long-term Outlook* (2014 LTO).[9]

The analyses assume the 200 MW Whitetail Peaking Station[10] to be in service. Since both the Facility and the Whitetail Peaking Station are proposing to connect in the Peace River area in 2015-2016, the AESO has reviewed and assessed the two

each. 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.

[9] The 2014 LTO is used by the AESO to assess adequacy of the regional transmission system and to identify future transmission system expansion and enhancement plans.

[10] The Whitetail Peaking Station Connection Needs Identification Document will be filed as a separate application

connection studies together. Both connection studies are included in Appendix A, prefaced by the *AESO Assessment and Acceptance of the Carmon Creek and Whitetail Connection Engineering Studies*.

The Facility power flow analysis indicates that connection of both the Facility and the Whitetail Peaking Station may result in new thermal constraints on 7L27 under the studied 2016 summer peak and summer light normal conditions (N-0), depending on the availability of two critical generators in the area: (i) Daishowa 1A; and (ii) HR Milner. In addition, the analyses identified new thermal constraints on various transmission lines under the studied 2015 and 2016 contingency conditions (N-1).

The power flow analysis confirms that these new overloads can be resolved by the planned development of the 240 kV transmission line from 834S Wesley Creek substation to the new Little Smoky South substation identified in the AESO 2013 Long-term Transmission Plan, specifically, in the supporting Northwest Region Plan (NWRP).[11] This new 240 kV transmission line is planned specifically to mitigate thermal constraints following connection of both the Facility and the Whitetail Peaking Station.

Until such time as these specified NWRP developments are in place, the AESO will analyze and implement operating procedures, including remedial action schemes, and apply ISO Rules Section 302.1, Real Time Transmission Constraint Management, as system conditions require.[12] As outlined in further detail below, the AESO is also submitting contemporaneously with this application, a request for Commission approval of a specific and limited exception to the matters described in Subsections 15(1)(e) and (f) of the *Transmission Regulation* pursuant to Subsection 15(2) of the *Transmission Regulation* (Exception Application).

[11] The Northwest Region Plan is available at: http://www.aeso.ca/downloads/NW_LRP_Report_Final.pdf

[12] The AESO develops appropriate ISO Rules and practices (including remedial action schemes) to address transmission constraints that may materialize from time to time. The creation and management of such ISO rules are beyond the scope of this NID.

The transient stability analysis indicates that connection of the Facility prior to the completion of the NWRP developments will not affect the response of the system under transient conditions. The short circuit analyses indicates that connection of the Facility will not materially change the short-circuit levels at other substations studied in the connection assessment.

2.5 Proposed Transmission Development Cost – 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 $50 million ($2015).[13] In accordance with the ISO Tariff, the AESO has classified these costs as participant-related.

Allocation of costs associated with the NWRP development described in Section 2.4 will be determined in accordance with the ISO Tariff. This aspect of the tariff is under review as part of the AESO's 2014 ISO Tariff Compliance Filing and is yet to be approved.[14] However, as a preliminary assessment of the proposed tariff, the AESO anticipates that a portion or all of these costs may be classified as participant-related.

2.6 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 A of Commission Rule 007. Between November 2013 and December 2014 the AESO and the TFO 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. One landowner raised a concern related to the AESO's long-term plans for transmission development in the area, including development in the vicinity of the Wesley Creek 834S substation. The AESO held a public meeting to address these concerns on May 27th, 2014. The AESO understands that the stakeholder has no outstanding concerns related to the need for the Proposed Transmission Development.

[13] Further details of this cost estimate can be found in Appendix B.

Having identified that overloads in the area may occur under normal operating conditions after connection of the Facility and until the NWRP developments described in Section 2.4 are in place, the AESO notified all potentially affected market participants of its intention to manage such constraints using the ISO Rules Section 302.1, Real Time Transmission Constraint Management. After receiving requests from several market participants for additional information, the AESO also provided all potential effective generators with a technical summary of the Carmon Creek connection assessment. The AESO has responded to several enquiries regarding its notification to generators. One market participant indicated that it may have further questions and the AESO has made itself available to respond when approached.[15]

2.7 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. In consideration of that 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 Commission Rule 007, Section 6.1 – NID13.[16]

2.8 Integral Applications – As the AESO has determined that thermal constraints may occur in the Peace River area under N-0 conditions, contemporaneously with this application the AESO will be submitting the Exception Application. The Exception Application will include, *inter alia*, information regarding the AESO's participant involvement program in respect of the N-0 constraints.

The AESO will also be submitting the *Whitetail Peaking Station Connection Needs Identification Document* (Whitetail NID) for Commission approval. In the present unique circumstances, where two market participants have requested system access service to

[14] Application No. 1610935, Proceeding ID No. 3473.

[15] Further information regarding the AESO's PIP for this Application is included as Appendix C including copies of the AESO's letters to effective generators.

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

connect significant new generating units in the same area (i.e., Peace River area), and for which the AESO has reviewed and assessed the connection studies for each transmission development together, the AESO submits that it would be administratively efficient to consider such applications in common proceedings. Accordingly, the AESO respectfully requests that the Commission combine the Application, the Exception Application and the Whitetail NID in a common proceeding along with the respective Facility Proposals, as discussed further below.

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

- the transmission planning duties of the AESO as described in Sections 17, 29, 33 and 34 of the Act;
- the System Access Service Request;
- the Connection Assessment;
- information obtained from AESO PIP Activities;
- the AESO's Exception Application; 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 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's Facility Proposal was recently filed with the Commission.[17] The AESO requests, and understands the TFO has requested, that this Application be combined with the Facility Proposal for consideration by the Commission in a single process (along with Exception Application and Whitetail NID and associated Facility Proposal). 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 Proposed Transmission Development 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.

[17] The AESO understands that the TFO's Facility Proposal relating to this Application is titled *Wesley Creek to Brock Transmission Project*.

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 of the need for the Proposed Transmission Development 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, including issuing an approval of the need to connect the Market Participant and of the following elements:

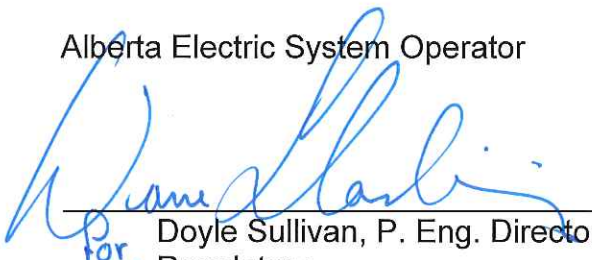
A. Add two new 240 kV transmission circuits between the existing Wesley Creek 834S substation and the approved Brock 232S substation;

B. Add two new 240 kV breakers at Wesley Creek 834S substation; 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 17th day of December 2014.

Alberta Electric System Operator



For, Doyle Sullivan, P. Eng. Director, Regulatory

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, Shell Carmon Creek Cogeneration Interconnection* (Study) The Study assesses the transmission system performance prior to and following the connection of the Proposed Transmission Development. The Study is prefaced by the *AESO Assessment and Acceptance of the Carmon Creek and Whitetail Connection Engineering Studies* in which the AESO provides its assessment and acceptance of the referenced connection engineering studies. Since both the Carmon Creek and Whitetail generators are proposing to connect in the Peace River area in 2015-2016, the AESO has reviewed the two connection engineering studies together. The Whitetail Peaking Station connection engineering study is also attached for completeness.

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 are 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 a letter provided by the TFO confirming that the seven major aspects of Commission Rule 007, NID 13 will be addressed within the TFO's Facility Proposal.

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 Standards (TPL Standards).[18] Appendix E 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).

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

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.[19] 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, 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 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[20] 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.[21]

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

[19] 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.

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

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

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 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 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 territory 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. Additionally, 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.