

September 21, 2012

Don Popowich
Director, Facilities
Alberta Utilities Commission
Fifth Avenue Place
4th Floor, 425 – 1st Street SW
Calgary, Alberta T2P 3L8

Dear Mr. Popowich:

Re: Windy Flats Amendment to the Alberta Utilities Commission Southern Alberta Transmission System Reinforcement (SATR) Approval No. U2011-115 (SATR NID Approval)

1. Pursuant to the relevant provisions of the *Electric Utilities Act*, S.A. 2003, c. E-5.1 (EUA) and the *Alberta Utilities Commission Act*, S.A. 2007, c. A-37.2 (AUCA), the Alberta Electric System Operator (AESO) is applying to the Alberta Utilities Commission (Commission) for approval of certain amendments to the SATR NID Approval to replace upgrades at the Peigan substation with construction of the new Windy Flats substation, as more particularly described below (Application).

Background

2. On December 30, 2008, the AESO applied to the Commission for approval of a needs identification document for transmission reinforcement in southern Alberta (SATR NID). The Commission approved the SATR NID in *Decision 2009-126* and Approval No. U2009-340.
3. On December 7, 2009, the AESO filed the finalized SATR milestones and monitoring process with the Commission. The Commission approved the finalized milestones and monitoring process in *Decision 2010-343* and Approval No. U2010-264. On October 5, 2010, the AESO reported that each of the SATR milestones had been met and that it had issued directions to the legal owner of transmission facilities to prepare facility applications for SATR Stage 1 and Stage 2 components.¹
4. On September 1, 2010, by Application No. 1606526, the AESO filed amendments to Approval No. U2010-264 and Approval No. U2010-435² in respect of the proposed Cassils 324S

¹ Southern Alberta Transmission Reinforcement (SATR) Milestones and Monitoring Process (MMP) – Status Report for Q3 2010; http://www.aeso.ca/downloads/SATR_Milestones_Quarterly_Update_Q3_2010-R1.pdf

² Amendment to Hanna Region Transmission System Needs Identification Document, Application No. 1606434, Decision 2010-592.

substation. On September 13, 2010, by Application No. 1606564, the AESO filed an amendment to Approval No. U2010-264 in respect of shunt reactors at the proposed 240 kV Sub D. The Commission approved Application Nos. 1606526 and 1606564 in *Decision 2011-102* and the SATR NID Approval.

5. On May 11, 2012, by Application No. 1608442, the AESO filed its application to amend the SATR NID Approval to delete certain Medicine Hat area upgrades for 600L and 880L transmission lines; the associated Proceeding ID No. 1879 is currently in progress.

Existing SATR NID Approval Developments

6. The SATR NID Approval includes the following three specific developments (Original Developments):

SATR NID Approval, Stage I - Paragraphs 1 and 2

1. *“A new double-circuit 240-kilovolt (kV) transmission line with 50 per cent series compensation from Peigan 59S substation to a future Foothills substation to be located at Calgary south.”*
2. *“Static Var Compensator (SVC) addition at Peigan 59S substation.”*

SATR NID Approval, Stage II – Paragraph 8

8. *“Two new 200-megavolt ampere (MVA) transformers at Peigan 59S substation to replace the existing 179-MVA transformer.”*

7. The SATR NID Approval, Appendix A, also includes the following Milestone:

Project and Area, Stage 1 - SW

“Peigan – South Calgary 240 kV Line”

Proposed Amendments

8. For the reasons provided below, the AESO proposes to amend the SATR NID Approval with the following specific amendments (Amended Developments)³:

(a) Delete paragraphs 1 and 2 under **Stage I** and replace with:

1. *“A new double-circuit 240-kilovolt (kV) transmission line with a **maximum** 50 per cent series compensation from **Windy Flats 138S** substation to the proposed Foothills 237S substation; and*

³ For ease of reference, the proposed amendments to existing language are shown in bold.

2. ***“A new 240/138 kV Windy Flats 138S substation with one 400-megavolt ampere (MVA) transformer.”***

(b) Add the following paragraph 9 under **Stage I**:

9. ***“Decommission the 138 kV line sections and equipment at Peigan 59S as appropriate and add transmission line connections to Windy Flats 138S substation consisting of:***

(a) a new double circuit 240 kV line to and from Windy Flats 138S substation in order to arrange a line in and out scheme of the existing 967L/968L line

(b) a new single circuit 138 kV line to Windy Flats 138S substation from the existing 603L line

(c) a new single circuit 138 kV line to Windy Flats 138S substation from the existing 608L line.”

(c) Delete paragraph 8 under **Stage II**, in its entirety.

(d) Delete Project & Area, Stage 1 - SW in Appendix A and replace with:

“Windy Flats – Foothills 240 kV line”

Rationale for Proposed Amendments

Windy Flats 138S Substation

9. The Amended Developments include replacing Peigan 59S with the proposed Windy Flats 138S substation as the southern termination point for the 911L line replacement approved as part of SATR.⁴ In the SATR NID, the AESO described the limitations imposed by the existing 240 kV 911L transmission line to transfer wind generation from the Pincher Creek area. As a replacement for 911L, the AESO recommended the new double-circuit 240 kV transmission line (now designated 1037L/1038L) to provide a high capacity corridor between Calgary and Peigan 59S and result in lower line losses.⁵ As a result of the Amended Developments, Windy Flats 138S substation will serve as the southern point of connection for the 1037L/1038L high capacity corridor to Calgary.

10. The northern termination point of 1037L/1038L will be the proposed Foothills 237S substation. While specific 1037L/1038L line terminations at Foothills 237S substation were included in the SATR NID⁶, the need for the Foothills 237S substation forms part of the AESO's 240 kV and 138 kV Transmission System Expansion in the Vicinities of Southeast Calgary, Okotoks and High

⁴ SATR NID Approval, Stage I, paragraph 1.

⁵ SATR NID section 7.1.1.

⁶ SATR NID, page 63, Table 7-1, Item I-2.

River Foothills Area Transmission Development Plan needs identification document (FATD-East NID).⁷

11. The SATR and Foothills Area Transmission Development (FATD) interdependency is described in the AESO's *Long-term Transmission Plan* which states, in part, that "In addition to the 240 kV looped system in the south [SATR], the FATD project is an integral part of the system required to move wind energy to the load centres of the Foothills and greater Calgary area."⁸ Accordingly, the AESO's planned in-service date for the Amended Developments and interconnection to the AIES is Q3 2015 which is required to complete planned area transmission enhancements, including FATD, in a timely and progressive manner.
12. From 2008-2011, the AESO issued various directions to AltaLink Management Ltd. (AltaLink), as the legal owner of transmission facilities (TFO) in the area, including directions to prepare a transmission facility proposal to meet the need identified in the SATR NID.
13. As a result of detailed engineering and scheduling conducted in preparation of its forthcoming South Foothills Transmission Project (SFTP) facility proposal, AltaLink identified an in-service date risk for the Original Developments arising from work on federal lands and proposed the development of a new 240/138 kV substation east of Peigan 59S substation to serve as the southern termination point for the proposed 1037L/1038L. By letter dated July 25, 2012 appended hereto as Attachment 1, AltaLink has provided an explanation of the scheduling and cost factors it considered regarding development of a new 240/138 kV substation (now designated Windy Flats 138S in the Amended Developments).
14. Having considered the need for and potential effects of delaying the proposed 1037L/1038L transmission line⁹ and the Windy Flats 138S substation order of magnitude costs, the AESO is now proposing the Amended Developments to include a new 240/138 kV Windy Flats 138S substation connected to the existing transmission system via 240 kV and 138kV line connections to serve as the southern termination point for the proposed 1037L/1038L.¹⁰

Other Specific Technical Amendments

15. In place of the approved two 200 MVA transformers at Peigan 59S substation¹¹, the Amended Developments also include one 400 MVA transformer at the Windy Flats 138S substation. A description of the required transformation capacity at Windy Flats 138S is provided in Attachment 2, section 5.

⁷ Application No. 1608620, Proceeding ID No. 2001, filed with the Commission July 5, 2012

⁸ Section 4.4.3.5 of the AESO *Long-term Transmission Plan*.

⁹ Refer to paragraphs 9-11 of this Application.

¹⁰ Details and configuration of equipment required for the proposed transmission development, including substation single-line diagrams, are more specifically described in the AESO Functional Specification which will be included in each of AltaLink's SFTP and Windy Flats 138S Substation 138 kV facility applications. Also, further details will be determined as detailed engineering progresses. Routing and/or siting of transmission facilities do not form part of this Application and will be addressed in AltaLink's facilities applications.

¹¹ SATR NID Approval, Stage II, paragraph 8.

16. In the SATR NID, the AESO recommended static and dynamic reactive power support at various locations in southern Alberta. In order to optimize system reactive power in the area, the AESO performed the South Region Reactive Power Requirement Study, attached hereto as Attachment 3.¹² The study results indicate that only static power is needed at the southern terminus of 1037/1038L (formerly, Peigan 59S substation, now designated Windy Flats 138S substation in the Amended Developments). Therefore, the Amended Developments include two 75 MVar shunt reactors at the Windy Flats 138S substation in place of the approved SVC at Peigan 59S.¹³

Related Information

The Need for Transmission Reinforcement Remains the Same as Identified in the SATR NID

17. In the SATR NID, the AESO explained that the need for transmission reinforcement in southern Alberta is driven predominantly by the forecast development of wind generation and the limited capability of the transmission system to deliver additional generation on a firm basis to the AIES.¹⁴ The AESO recommended, and the Commission approved, the construction of a 240 kV looped system in southern Alberta that would enable connection of the forecast wind power.¹⁵ Part of this loop was the replacement of the existing 911L which limits the transfer of wind generation from the Pincher Creek area.¹⁶
18. This Application seeks to amend specific components of the SATR NID Approval and does not change the need for the expansion or enhancement of the capability of the transmission system described in the SATR NID.

Engineering Studies

19. The AESO performed steady state analyses to assess transmission system performance for each of the studied Peigan 59S and Windy Flats 138S substation configurations. The analyses indicate that the two options have the same functionality and each would meet transmission system requirements. Based on the study assumptions, the Windy Flats 138S option would also mitigate constraints on 608L under normal system conditions (N-0). A copy of the AESO South Termination of SATR 911L Replacement Project Assessment, dated March 22, 2012 is provided as Attachment 2.

¹² The South Region Reactive Power Requirement Study also proposes changes in reactive power requirements at Journault, Cypress and Chapel Rock substations. The AESO will be filing amendment applications with the Commission for these substations at a later date.

¹³ SATR NID Approval, Stage I, paragraph 2.

¹⁴ SATR NID Executive Summary, page i.

¹⁵ SATR NID Executive Summary, page ii.

¹⁶ SATR NID, section 7.1.1.

Information Regarding Rule 007, Section 6.1 - NID12

20. The AESO has been advised that AltaLink's SFTP and Windy Flats 138S Substation and Line Reconfiguration facility proposals will address the major aspects listed in Commission Rule 007, Section 6.1 – NID12 (Attachment 4). In consideration of that fact, and as the filing of this Application is combined with AltaLink's facility proposals, the AESO has not undertaken a separate assessment of the sort contemplated in Commission Rule 007, Section 6.1 – NID12.

Cost Estimates

21. AltaLink estimated the cost of the Amended Developments to be in the order of \$441 million (+30/-15%, 2015\$) and the cost of the Original Developments to be in the order of \$493 million (+30/-15%, 2012\$). A copy of the AltaLink estimates is included in Attachment 1.
22. AltaLink has further refined the cost of the Amended Developments to be in the order of \$441 million (+20/-10%, 2015\$). A copy of the AltaLink cost estimates for the SFTP project and the Windy Flats 138S Substation and Line Reconfigurations projects are provided in Attachment 5.

Participant Involvement Program (PIP)

23. In October 2011, the AESO provided information regarding the Amended Developments to potentially affected stakeholders in the Peigan 59S substation and Windy Flats 138S substation proposed development area. A description of the information provided to stakeholders, and the means by which information was provided, is included as Attachment 6.
24. The AESO received questions from one stakeholder regarding the need for the Amended Developments and requesting an explanation of the proposed Windy Flats 138S transmission line connections. The AESO met with the stakeholder on December 2, 2011 and responded to subsequent queries through April 10, 2012; the stakeholder has not requested any further information or clarification. The AESO also updated the stakeholder on August 24, 2012 to advise that this Application would be filed shortly.

Request to Combine this Amendment Application with the Facility Proposals for Consideration in a Single Process

25. Pursuant to subsection 35(1) of the EUA, the AESO has directed AltaLink to prepare transmission facility proposal(s) to meet the need identified in the SATR NID. The AESO understands that AltaLink's SFTP and Windy Flats 138S Substation and Line Reconfigurations facility proposals will be filed shortly. The AESO requests, and expects AltaLink will also request, that this Application be combined with the facility proposals for consideration by the Commission in a single process.¹⁷

¹⁷ In addition, the AESO notes that such a request is consistent with the principles contemplated by section 15.4 of the *Hydro and Electric Energy Act*, R.S.A. 2000, c. H-16 and section 6 of Commission Rule 007.

26. While it is believed that this Application and the facility proposals 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 Commission approval to amend the SATR NID Approval as described herein. In contrast, the facility proposals will contain more detailed engineering and designs for the proposed transmission development and seek approval for the construction and operation of specific facilities.¹⁸

Request for Approval

27. Having regard to: the relevant provisions of the EUA and the AUCA; the transmission responsibilities of the AESO as set out in the EUA and the *Transmission Regulation*; information obtained from the AESO's PIP; estimated costs; system studies undertaken by the AESO; and the AESO's long-term transmission system plans, it is the conclusion of the AESO that its assessment of the Amendment Developments is technically complete and that the Amended Developments are in the public interest. In consideration of these factors, the AESO requests that the Commission approve the amendments to the SATR NID Approval as described herein.

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Yours very truly,



Doyle Sullivan, P. Eng.
Director, Regulatory Services

¹⁸ The AESO understands that AltaLink intends to file two facility proposals relating to this Application to be titled *South Foothills Transmission Project* and *Windy Flats 138S Substation and Line Reconfigurations Project*.