

Needs identification document checklist application

Date: July 16, 2021

Applicant reference: P2179 - Horizon Mining 838S Substation Modification

<p>Identification</p> <p>Company name: Alberta Electric System Operator</p> <p>Name, position and contact information of applicant contact:</p> <p>Brenda Hill Regulatory Administrator 403-539-2850 Brenda.Hill@aeso.ca</p>
<p>Project details</p> <p>This application is for:</p> <p>Generation connection <input type="checkbox"/> Non-distribution facility owner load <input checked="" type="checkbox"/></p>
<p>Project written description, including the need, nature and extent of the project and the Alberta Electric System Operator's (AESO) preferred option:</p> <p>Canadian Natural Resources Limited (market participant), has requested system access service to relocate the existing 240 kV transmission lines 9L32 and 9L66 located north of the Fort MacKay area (AESO Planning Area 25, Fort McMurray, which is part of the AESO Northeast Planning Region). The market participant's request can be met by modifying the existing Horizon 838S substation. The scheduled in-service date for the Proposed Transmission Development is March 31, 2023.</p> <p>The market participant's request does not include any changes to its existing Rate STS, <i>Supply Transmission Service</i> or Rate DTS, <i>Demand Transmission Service</i> contract capacities.</p> <p>The Proposed Transmission Development consists of the following elements:</p> <p><u>AESO Proposed Transmission Development</u></p> <ol style="list-style-type: none"> 1. Modify the existing Horizon Mining 838S substation, including adding six 240 kV circuit breakers; 2. 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. <p><u>ATCO Electric Ltd. (ATCO) Transmission Capital Maintenance Project</u></p> <p>In addition to the AESO's Proposed Transmission Development, ATCO intends to undertake the following scope of work as an ATCO Transmission Capital Maintenance Project (per AUC Decision 24964-D02-2021, <i>ATCO Electric Ltd. 2020 – 2022 Transmission General Tariff Application</i>, March 19, 2021).</p> <ol style="list-style-type: none"> 1. Add two 240 kV circuits, approximately 10 kilometres each in length, with a minimum line rating of 753 MVA, to connect the Horizon Mining 838S substation and the existing 240 kV transmission lines 9L32 and 9L66; 2. Salvage approximately 12 kilometres of existing 240 kV double-circuit line 9L66 and 9L32, between the existing Joslyn 849S substation and the connection point with the new segments of 9L32 and 9L66; 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.
<p>Applicable ratings/capability of any proposed major elements:</p>

The 240 kV transmission circuit proposed as part of the ATCO Capital Maintenance Project shall have a minimum line rating of 753 MVA.

Proposed in-service date: March 31, 2023

Cost estimate for the preferred option for the project is attached.

Yes No

Technical considerations

Single line diagram(s) of the proposed development and study area is attached.

Yes No

The AESO has conducted appropriate studies and considers that the project will not result in adverse impacts to the Alberta Interconnected Electric System.

Yes No

List any new or exacerbated Category B system impacts that occur as a result of the project and provide a description of how they will be addressed (e.g. description of remedial action schemes that will be used):

Power flow, transient stability, and short-circuit studies were conducted to assess the impact that the Proposed Transmission Development and the ATCO Transmission Capital Maintenance Project would have on the transmission system. No system performance issues were identified following the connection of the Proposed Transmission Development and the ATCO Transmission Capital Maintenance Project. Based on the study results, the Proposed Transmission Development and the ATCO Transmission Capital Maintenance Project will not adversely affect the performance of the transmission system.

Briefly describe any alternatives to the AESO's preferred option that the AESO considered and why they were ruled out:

In addition to the Proposed Transmission Development and the ATCO Transmission Capital Maintenance Project, the AESO, in consultation with the market participant and ATCO, examined four other transmission development alternatives to respond to the market participant's request for system access service:

- 1. Add a switching station south of Joslyn 849S substation** – This alternative involves adding a switching station, including six 240 kV circuit breakers, south of the existing Joslyn 849S substation. This alternative also requires the addition of two 240 kV circuits, approximately 27 kilometres in length each to connect the new switching station and the existing 240 kV transmission lines 9L32 and 9L66 and salvaging approximately 12 kilometres of the existing 240 kV double-circuit line 9L66 and 9L32 between the Joslyn 849S substation and the connection point with the new segments of 9L32 and 9L66.

This alternative was ruled out due to increased transmission development, and hence increased overall cost, compared to the Proposed Transmission Development.

- 2. Connect Joslyn 849S substation to the 240 kV transmission lines 9L32 and 9L66** – This alternative involves adding two 240 kV circuits, approximately 18 to 40 kilometres each in length to connect the existing Joslyn 849S substation and the existing 240 kV transmission lines 9L32 and 9L66, and salvaging approximately 12 kilometres of the existing 240 kV double-circuit line 9L66 and 9L32 between the Joslyn 849S substation and the connection point with the new segments of 9L32 and 9L66.

This alternative was ruled out due to increased transmission development, and hence increased overall cost, compared to the Proposed Transmission Development.

- 3. Add a switching station adjacent to Horizon Upgrading 842S substation** – This alternative involves adding a switching station, including six 240 kV circuit breakers, adjacent to the existing Horizon Upgrading 842S substation. This alternative also requires the addition of two 240 kV circuits, approximately 8 kilometres each in length, to connect the switching station and the existing 240 kV transmission lines 9L32 and 9L66 and salvaging approximately 12 kilometres of the existing 240 kV double-circuit line 9L66 and 9L32 between the existing Joslyn 849S substation and the connection point with the new segments of 9L32 and 9L66.

This alternative was ruled out as the market participant indicated it would not meet the operating requirements of its Industrial System Designation (ISD) and identified siting constraints associated with lands adjacent to the Horizon

Upgrading 842S substation.

4. **Modify the Horizon Upgrading 842S substation** – This alternative involves modifying the existing Horizon Upgrading 842S substation, including adding two 240 kV circuit breakers. This alternative also requires the addition of two 240 kV circuits, approximately 8 kilometres each in length, to connect the Horizon Upgrading 842S substation and the existing 240 kV transmission lines 9L32 and 9L66 and salvaging approximately 12 kilometres of the existing 240 kV double-circuit line 9L66 and 9L32 between the existing Joslyn 849S substation and the connection point with the new segments of 9L32 and 9L66.

This alternative was ruled out after the market participant indicated it would not meet the operating requirements of its ISD and identified siting constraints associated with any modification to the Horizon Upgrading 842S substation.

Participant involvement requirements

Notification requirements have been met and there are no unresolved objections.

Yes No

Environmental requirements

The AESO does not anticipate significant environmental effects as a result of the project.

Yes No

Other considerations

If you answered no to any of the questions above, please explain:

n/a

The project raises issues not addressed by the preceding questions.

Yes No

If yes, please explain:

In accordance with the ISO tariff, the AESO has determined that all costs associated with the AESO Proposed Transmission Development will be classified as participant-related. The AESO understands that ATCO considers all costs associated with the AESO Proposed Transmission Development to be system costs, per Decision 24964-D02-2021, *ATCO Electric Ltd. 2020 – 2022 Transmission General Tariff Application*, March 19, 2021.