

Needs identification document checklist application

Date: April 1, 2022

Applicant reference: P2232 – Buffalo Trail North Wind Project Connection

<p>Identification</p> <p>Company name: Alberta Electric System Operator</p> <p>Name, position and contact information of applicant contact:</p> <p>Michelle Jackson Regulatory Administrator 403-539-2850 Michelle.Jackson@aeso.ca</p>
<p>Project details</p> <p>This application is for:</p> <p>Generation connection <input checked="" type="checkbox"/> Non-distribution facility owner load <input 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>ENGIE Development Canada LP (ENGIE) has requested system access service to connect its proposed Buffalo Trail North Wind Project (the Facility) to the transmission system in the Dunmore area (AESO Planning Area 4, Medicine Hat, which is part of the AESO South Planning Region). The Facility includes ENGIE's proposed Buffalo Trail North 453S substation. ENGIE expects the Facility to be commercially operational by December 1, 2024.</p> <p>ENGIE's request includes a new Rate STS, <i>Supply Transmission Service</i>, contract capacity of 200 MW and a new Rate DTS, <i>Demand Transmission Service</i>, contract capacity of 2 MW.</p> <p>The Proposed Transmission Development consists of the following:</p> <ol style="list-style-type: none"> 1. Add one 240 kilovolt (kV) circuit, approximately 200 meters in length, with a minimum capacity of 223 MVA, to connect the Facility to the existing 240 kV transmission line 983L in a T-tap configuration; and 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>Applicable ratings/capability of any proposed major elements:</p> <p>The 240 kV transmission circuit shall have a minimum capacity of 223 MVA.</p>
<p>Proposed in-service date: August 1, 2024</p>
<p>Cost estimate for the preferred option for the project is attached.</p> <p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
<p>Technical considerations</p> <p>Single line diagram(s) of the proposed development and study area is attached.</p> <p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>

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 associated generation would have on the transmission system. Power flow and short-circuit studies were conducted prior to and following the connection of the Proposed Transmission Development and transient stability studies were performed following the connection of the Proposed Transmission Development.

The post-connection assessment main study scenarios identified thermal and voltage criteria violations under certain Category B conditions.

Thermal criteria violations:

- 240 kV transmission line 1087L (Cassils 324S – Newell 2075S)
- 138 kV transmission line 879L (Bowmanton 244S – 879L Tap)
- 138 kV transmission line 610L (Fincastle 336S – Taber 83S)
- 240 kV transmission line 924L (Milo 356S - Langdon 102S)

Voltage criteria violations:

- Voltage collapse was observed following the loss of either 240 kV transmission lines 1034L (Bowmanton 244S to Cassils 324S) or 1035L (Bowmanton 244S to Newell 2075S).

The following mitigation measures can be used, alone or in combination as appropriate, to mitigate the post-connection system thermal and voltage criteria violations:

- modified existing remedial action scheme (RAS) 164, to include the Buffalo Trail North Wind Project Connection;
- planned RAS 879L, to be implemented with the Rattlesnake Ridge Wind Power Project Connection, approved in AUC Decision 25018-D01-2020; and
- real-time operational practices.

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, the AESO examined five other transmission development alternatives, in consultation with ENGIE and AltaLink:

1. **In-and-Out Connection to the 240 kV Transmission Line 983L** – This alternative would require the addition of a switching station, including three 240 kV circuit breakers, and the addition of two 240 kV circuits, approximately 300 meters each in length, to connect the switching station to the 240 kV transmission line 983L.
2. **In-and-Out Connection to the 240 kV Transmission Line 964L** – This alternative would require the addition of a switching station, including three 240 kV circuit breakers, and the addition of two 240 kV circuits, approximately 300 meters each in length, to connect the switching station to the 240 kV transmission line 964L. This alternative would also require crossing the 240 kV transmission line 983L.
3. **Radial Connection to the Proposed Elkwater 264S Substation** – This alternative would require the addition of one 240 kV circuit, approximately 17 kilometers in length, and modification of the proposed Elkwater 264S substation, including the addition of one 240 kV circuit breaker.
4. **T-tap Connection to the 240 kV Transmission Line 964L** - This alternative would require the addition of a 240 kV circuit, approximately 300 meters in length, and crossing the 240 kV transmission line 983L.
5. **T-tap Connection to the 138 kV Transmission Line 676L** - This alternative would require the addition of a 138 kV circuit, approximately 7 kilometers in length, and crossing the 240 kV transmission lines 964L and 983L.

Alternatives 1, 2, 3, 4, and 5 were ruled out due to increased transmission development, and hence overall increased cost, compared to the Proposed Transmission Development.

Participant involvement requirements
Notification requirements have been met and there are no unresolved objections. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Environmental requirements
The AESO does not anticipate significant environmental effects as a result of the project. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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 <input type="checkbox"/> No <input checked="" type="checkbox"/>
If yes, please explain: n/a