

Needs identification document checklist application

Date: December 3, 2021 **Applicant reference:** P1567 Sharp Hills Wind Farm Connection NID Approval Amendment

<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>The AESO is applying to amend Needs Identification Document Approval No. 23066-D02-2018¹ (NID Approval) by changing the connection configuration from in-and-out to T-tap, as follows:</p> <p>Remove the entirety of parts a) and c):</p> <p>a) Addition of a new switching station, to be designated as New Brigden 2088S Substation, including three 240 kilovolt (kV) circuit breakers.</p> <p>e) Connection of the Sharp Hills Wind Project to the New Brigden 2088S Substation.</p> <p>Amend part b) as follows:</p> <p>b) Addition of <u>one</u> two 240-kV transmission lines to connect the <u>New Brigden 2088S Substation</u> New Brigden 2088S Substation Sharp Hills Wind Project to the existing 240-kV transmission line 9L46 using a <u>T-tap</u> an in-and-out configuration.</p> <p>The above transmission development is required to respond to the request for system access service submitted by EDP Renewables SH Project Limited Partnership (EDPR) to connect its approved Sharp Hills Wind Project (Facility) in the Sedalia area (AESO Planning Area 42, Hanna, which is part of the AESO Central Planning Region). The Facility includes EDPR's approved Sedalia 363S collector substation. EDPR expects the Facility to be commercially operational by December 2023.</p> <p>EDPR's request includes a new Rate STS, <i>Supply Transmission Service</i>, contract capacity of 297.1 MW and a new Rate DTS, <i>Demand Transmission Service</i>, contract capacity of 2.8 MW.</p>

¹ Appendix 1 to Decision 23066-D01-2018, *Sharp Hills Wind Project Connection* (October 4, 2018).

Applicable ratings/capability of any proposed major elements:

The proposed 240 kV transmission line shall have a minimum summer/winter capacity no less than that of the existing line rating of 240 kV transmission line 9L46.

Proposed in-service date:

October 31, 2022

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 associated generation would have on the transmission system. Power flow, short-circuit, and transient stability studies were performed.

Thermal criteria violations were observed on the following facilities in the post-connection assessment:

- 138 kV 174L (North Holden 395S to Bardo 197S)
- 138 kV 701L (Heisler Tap to Strome 223S)
- 138 kV 701L (Strome 223S to North Holden 395S)
- 138 kV 749L (Killarney Tap to Edgerton 899S)
- 240 kV/144 kV Nevis 766S substation transformer 901T
- 144 kV 7L127 (Pemukan 932S to Monitor 774S)
- 144 kV 7L129 (Bauer Tap to Vermilion 710S)
- 144 kV 7L129 (Buffalo Creek 526S to Bauer Tap)
- 144 kV 7L159 (Ghost Pine Tap to Heatburg 948S)
- 144 kV 7L16 (Heatburg 948S to Nevis 766S)
- 144 kV transmission line 7L171 (Michichi Creek 802S - Wintering Hills 804S)
- 144 kV 7L224 (Hansman Lake 650S - Monitor 774S)
- 144 kV 7L50 (Jarrow Tap to Buffalo Creek 526S)
- 144 kV 7L701 (Battle River 757S to Heisler Tap)
- 240 kV 912L\9L912 (Nevis 766S to Red Deer 63S)

The following mitigation measures can be used, alone or in combination as appropriate, to mitigate the observed thermal criteria violations:

- Real-time operational practices;
- modifications to the existing remedial action scheme (RAS) 134;
- modifications to the existing RAS 138;
- modifications to the existing RAS 139; and
- a new RAS to mitigate overloads on 144 kV transmission line 7L224.

Modification of RAS 134, 138 and 139 could result in generation curtailment in excess of the Most Severe Single

Contingency (MSSC) limit of 466 MW. While the post-connect assessment did not identify Reliability Criteria violations under the Category A condition; pre-contingency generation curtailment under the Category A condition may be required in real-time to prevent generation curtailment above the MSSC limit during Category B conditions.

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

The AESO examined one other transmission development alternative, in consultation with ATCO Electric Ltd.:

1. In-and-out connection to the 240 kV transmission line 9L46 – this alternative would require adding one switching station, including three 240 kV circuit breakers, two 240 kV circuits to connect the switching station to the existing transmission line 9L46, and connecting the Facility to the switching station.

This alternative was ruled out due to increased transmission development, and hence increased overall cost, compared to the NID Approval option.

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:

n/a