

Needs identification document checklist application

Date: December 3, 2021

Applicant reference: P2337 – Dunmore Solar Power 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>Dunmore Solar Inc. (Dunmore) has requested system access service to connect its approved Dunmore Solar Power Plant¹ (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 Dunmore's approved Dunmore 1011S substation. Dunmore expects the Facility to be commercially operational by May 1, 2023.</p> <p>Dunmore's request includes a new Rate STS, <i>Supply Transmission Service</i>, contract capacity of 216 MW and a new Rate DTS, <i>Demand Transmission Service</i>, contract capacity of 0.5 MW.</p> <p>The Proposed Transmission Development consists of:</p> <ol style="list-style-type: none"> 1. Add one 138 kilovolt (kV) circuit, approximately 100 meters in length, to connect the Facility to the existing 138 kV transmission line 676L between the Bowmanton 244S and Bullshead 523S substations 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 138 kV transmission circuit shall have a normal rating no less than the existing 138 kV transmission line 676L.</p>
<p>Proposed in-service date: April 1, 2023</p>

¹ The AUC approved Dunmore's application in Decision 26485-D01-2021 on September 9, 2021.

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 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 identified thermal and voltage criteria violations under certain Category B conditions. Reliability Criteria violations were observed on the following facilities in the post-connection assessment:

Thermal criteria violations

- 138 kV transmission line 879L (Bowmanton 244S - 879L Tap)
- 138 kV transmission line 668L (Empress 394S - Cypress 562S)
- 240 kV transmission line 1005L (Milo 356S - 1005L Tap)
- 138 kV transmission line 507L (Taber 83S - Hull 257S)
- 240 kV transmission line 1087L (Cassils 324S - Newell 2075S)
- 240 kV transmission line 924L (Milo 356S -Langdon 102S)
- 240 kV transmission line 927L (Milo 356S -Langdon 102S)
- 138 kV transmission line 507L (Taber 83S – Hull 257S)
- 240 kV transmission line 1036L (Milo 356S – Travers 554S)
- Bowmanton 244S 240/138 kV Transformer T1
- Bowmanton 244S 240/138 kV Transformer T2

Voltage criteria violations

- Voltage collapse was observed following the loss of 240 kV transmission line 1034L or 1035L.

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

- modification of existing RAS 164;
- new RAS 176; 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 six other transmission development alternatives:

1. **T-tap Connection to 240 kV Transmission Line 983L** –This would require the addition of a 240 kV circuit, approximately 200 meters in length and crossing both the 138 kV transmission lines 676L and 879L.
2. **T-tap Connection to 240 kV Transmission Line 964L** –This alternative would require the addition of a 240 kV circuit, approximately 200 meters in length and crossing the 240 kV transmission line 983L as well as both the 138 kV transmission lines 676L and 879L.

3. **In-and-Out Connection to the 240 kV transmission line 983L** –This alternative would require adding a new substation including two 240 kV circuit breakers; modifying the Bowmanton 244S substation, including adding three 240 kV circuit breakers; and adding two 240 kV circuits, approximately 200 meters in length.
4. **In-and-Out Connection to the 240 kV transmission line 964L** - This alternative would require adding a new substation including two 240 kV circuit breakers; modifying the Bowmanton 244S substation, including adding three 240 kV circuit breakers; and adding two 240 kV circuits, approximately 200 meters in length.
5. **In-and-Out Connection to the 138 kV transmission line 676L** - This alternative would require adding a new substation, including two 138 kV circuit breakers; modifying the Bowmanton 244S substation, including adding three 138 kV circuit breakers; and adding two 138 kV circuits, approximately 100 meters in length.
6. **Radial 138 kV Connection to the Bowmanton 244S Substation** - This alternative would require adding one 138 kV circuit, approximately 17 kilometers in length, and modifying the Bowmanton 244S substation, including adding one 138 kV circuit breaker.

All the alternatives above 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 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