

Decision-Making Framework

DFO Connection Projects

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1. Introduction

1.1 Purpose

The purpose of this document is to outline the Alberta Electric System Operator's (AESO) decision-making framework for responding to a distribution facility owner (DFO) system success service request (SASR) as a result of deficiencies identified on its distribution system by the DFO.

1.2 Limitations of use

This document is not an Authoritative Document or Information Document.

Interested parties may rely on this document as a reference, understanding that it is to be read in conjunction with the AESO Connection Process.

1.3 Objective

The objective of the AESO decision-making framework is to provide:

- A consistent, efficient and thorough decision-making process
- A transparent decision-making process for stakeholders
- A fair, balanced and well-reasoned approach to making decisions on whether DFO SASRs require an expansion or enhancement of the capability of the transmission system.

2. Duties

The AESO, Alberta Utilities Commission (AUC), DFOs and Transmission Facility Owners (TFOs) have numerous duties and obligations as described in the legislation, regulations and rules that govern the electricity industry in Alberta. The following subsections are intended to highlight some of the duties that the AESO has identified as being relevant to decision making framework.

2.1 AESO

- Assesses the current and future needs of the electricity market participants and plans the capability of the transmission system
- Makes arrangements for the expansion and enhancement of the transmission system
- Provides an efficient process to make decisions about requests for system access service
- Provides system access service to the transmission system in a manner that gives market participants a reasonable opportunity to exchange electric energy and ancillary services (reasonable opportunity)
- Determines whether an expansion or enhancement to the capability of the transmission system is required in response to a SASR
- Seeks needs approval if it is determined that an expansion or enhancement of the transmission system is required and is in the public interest
- Directs the safe, reliable and economic operation of the interconnected electric system and promotes a fair, efficient and openly competitive (FEOC) electricity market.

2.2 AUC

- In considering whether to approve a NID, the AUC must take into account:

- Public interest considerations
- Benefits to the transmission system and electricity market filed transmission system plans
- AESO responsibilities under the legislative framework.
- Considers the AESO's assessment of the need to be correct unless an interested party satisfies the AUC that:
 - The AESO's assessment is technically deficient, or
 - Approval would not be in the public interest.

2.3 DFOs

- Makes decisions about building, upgrading and improving the electric distribution system for the purpose of providing safe, reliable and economic delivery of electric energy
- Provides electric distribution service to customers within their service area that is not unduly discriminatory
- Determines whether a SASR should be submitted to the AESO
- Responsible for the accuracy of the information in the SASR and Distribution Deficiency Report (DDR)
- Operates and maintains the electric distribution system.

2.4 TFOs

- Operates and maintains the transmission system
- Assists the AESO with identifying and assessing alternatives, providing cost estimates and preparing transmission facility applications
- Applies to the AUC for permit to construct and license to operate transmission facilities, as directed by the AESO
- Determines siting and routing of transmission facilities.

2.5 Coordination between TFOs, DFOs and the AESO

- Coordinate with each other to develop a solution that is economically efficient and in the public interest
- Provide the AESO with information for its assessment of the DFO deficiency and alternatives considering the near and long-term development of the transmission and distribution systems.

3. Decision Making Elements

3.1 Frame

The decision-making process should differentiate between reliability-driven and load-growth driven capacity projects, given that DFO's have an obligation to serve customers.

The decisions the AESO will make include:

- Confirming the distribution deficiency exists as described by the DFO in its SASR, and in coordination with the DFO

- Determining if the DFO has a reasonable opportunity to exchange electric energy and ancillary services.
- Following the assessment of the distribution deficiency, reasonable opportunity, and benefit / cost considerations, the AESO may identify a preferred alternative to provide the DFO with access to transmission and seeks needs approval.

3.2 **Confirming the DFO distribution deficiency**

- Refer to the AESO Connection Process¹ for information on submitting a DFO SASR and supporting documentation, including the methods to be used to ensure completeness of information.
 - Under the AESO Connection Process, the DFO submits a SASR to the AESO, which includes a supporting DDR.
 - The AESO will review the DFO SASR and supporting DDR to confirm the distribution deficiency.
 - The AESO may coordinate with the DFO for clarifications and request additional information as required during this review process, particularly for projects with unique characteristics.
- The AESO considers the following factors when confirming that the distribution deficiency exists as described in the DDR:
 - DFOs planning criteria, applicable to the request
 - Current system configuration
 - Load data and forecast
 - Other unique project-specific factors, as required.

3.3 **Confirming Reasonable Opportunity**

The AESO has a duty to provide system access service in a manner that gives all market participants wishing to exchange electric energy and ancillary services a reasonable opportunity to do so.

In the context of a DFO requesting system access service to meet its own planning criteria, the AESO will assess whether the DFO's existing system access service is sufficient to grant the DFO a reasonable opportunity, or if an expansion or enhancement to the capability of the transmission system is required to provide a reasonable opportunity.

In assessing whether a DFO has a reasonable opportunity, the AESO may consider the following factors, as applicable:

- Are there deficiencies that exist today or forecast to exist in the future over the medium to long term?
- Are the deficiencies related to meeting increased capacity or improving reliability performance?

¹ [AESO Connection Process](#)

- How does the current transmission system performance *System Average Interruption Duration Index (SAIDI)* and *System Average Interruption Frequency Index (SAIFI)* at relevant points-of-delivery (PODs) compare to expected or average system performance?
- What is the number of contingencies that could result in deficiencies?
- What source, certainty, rate and timing of load growth and/or load additions are anticipated?
- Are the deficiencies forecast to deteriorate over time?
- Does a cost-effective distribution-only solution exist?
- What is the frequency, magnitude, and consequence of forecast unsupplied load?
- What frequency, magnitude and consequence of unsupplied load has occurred in the past?
- Could unsupplied load occur during peak or non-peak conditions?
- What is the risk of failure of existing transmission infrastructure?
- Are there any limitations on maintenance or planned outages as a result of the identified deficiencies?
- What other unique project-specific factors does the AESO need to be aware of?

3.4 Identification and analysis of transmission alternatives

- The AESO, in working with the DFOs and TFOs, determines a list of alternatives that are reasonable and feasible for solving any deficiencies confirmed in section 3.2.
- Alternatives are determined by the nature of the identified distribution deficiency and may include, but are not limited to:
 - Distribution-only (including Non-Wire Alternatives)
 - Transmission-only (including Non-Wire Alternatives), or
 - Distribution/Transmission Hybrids.
- A summary matrix will be prepared by the AESO to document the alternatives considered and provide a rationale for the selection the preferred alternative and reasons for ruling out each of the other's alternatives. The matrix summary will be included in the application for needs approval.

3.5 Benefit considerations

The AESO takes into account benefits when deciding whether there is a need to enhance or expand the capability of the transmission system when selecting the preferred transmission development, and when determining if the development is in the public interest. The AESO will assess benefits for each alternative based on the quantitative or qualitative information provided by the DFO in the DDR (as per the summary benefit table 4.1 in the Appendix at the end of this document).

- Not all benefit factors apply to all DFO SASR applications.
- The assessment involves a comparison of alternatives, to both justify the need for new or enhanced transmission and to determine the highest benefit / lowest cost solution. The assessment will also consider a “do-nothing” alternative.
- The most common benefit factors the AESO considers are:
 - Magnitude of potential unsupplied load (MVA and MWh)
 - Magnitude of potential unsupplied number of DFO customer sites
 - Estimated duration of potential unsupplied load (restoration time via means of switching or use of mobile substation, etc.)
 - Potential unsupplied critical loads including details of on-site back-up and limitations

- Customer reliability benefits
- Operational flexibility
- Supporting forecast future growth
- Environment and land use impacts (comparison between alternatives)
- Residual violations of DFO planning criteria.

3.6 **Cost considerations**

The cost factors the AESO considers in weighing its decision are the total project net present value of the capital costs for both transmission and distribution, as per the summary cost table 4.2 in the Appendix at the end of this document. Where projects have operating and maintenance costs with the potential to be material, relative to the total installed capital costs, these will be considered in the comparative analysis of alternatives.

3.7 **Recommended alternative**

The AESO proposes a recommended alternative to the DFO based on a comparative analysis of the above-described benefit and cost considerations. If the AESO and DFO project teams cannot reach an agreement on the AESO's recommended alternative, then the AESO will schedule an escalation meeting with the DFO, accountable Vice President and CEO. The purpose of this meeting will be to:

- Review the DFOs identified deficiency, alternatives considered, including the benefit and cost considerations
- Discuss the relative rankings of all alternatives
- Confirm the alternative the DFO will support, including the rationale for why the DFO alternative is the best alternative to provide a reliable and economic delivery of electric energy to the DFO customers.

3.8 **AESO decision**

The Vice President of Grid Reliability or a delegate, considers all project information and makes the AESO's decision on the need for any transmission development. The AESO decision will be based on the lowest cost alternative with the highest benefit to the public and Alberta interconnected electric system, as demonstrated in the comparative analysis. The rationale for the AESO decision will be provided to the DFO, including an explanation on the AESO's assessment of reasonable opportunity and public interest.

3.9 **DFO responses**

The DFO provides a written response in a cover letter addressed to the Vice President of Grid Reliability.

The DFO's written response should include a statement indicating whether the DFO supports or opposes the AESO's decision on the need for transmission development. If the DFO's preferred alternative is different from the AESO's preferred alternative, the DFO should describe why the DFO's preferred alternative is the best option to provide reliable and economic delivery of electric energy to the DFO's customers.

3.10 **Commit to action**

If the AESO's decision requires an expansion or enhancement to the transmission system, with full DFO support, then the AESO seeks needs approval (or issue ANAP approval as appropriate) requesting for the approval of the AESO proposed transmission development.

If the AESO's decision requires an expansion or enhancement to the transmission system and the DFO disagrees with the AESO scope of the proposed transmission development (PTD), then the AESO seeks needs approval and includes the DFOs written response together with a description of benefits, costs and rationale to support the AESO's PTD.

If the AESO's decision results in no expansion or enhancements to the transmission system and the DFO disagrees with the AESO decision, then the AESO files an application which represents the DFOs preferred alternative. The AESO will describe the benefits, costs and rationale for why the AESO does not support expansion or enhancements to the transmission system. The AESO will request the AUC to either approve or reject the DFO's preferred alternative or turn the application back to the AESO with guidance.

4. Appendix

4.1 Benefits matrix example

Benefit Description	Base Case: Do Nothing	Alternative 1:	Alternative 2:
Unsupplied Load (MVA)	2021 – 20; 2031 – 25	2021 – 4; 2031 – 9	2021 – 1; 2031 – 1
Unsupplied Load (MWh)	2021 - 1,752	2021 - 350	0
Unsupplied Customer Sites	10,000	2,000	0
Unsupplied Critical Loads	Hospital	None	None
Expected Restoration Time	< 24Hrs	< 24Hrs	0Hrs
Land Impacts	none	10 km of Dx and 5 km of Tx	10 km of Dx and 20 km of Tx
10 yr SAIDI System (mins)	50	-	-
10 yr SAIFI System (#/yr)	1.5	-	-
Estimated N-1 Transmission Unavailability (Hrs/yr)	5.50	2.25	1
Dx Deficiency Resolved	N	N	Y

4.2 Cost matrix example

Cost Description	Base Case: Do Nothing	Alternative 1:	Alternative 2:	Alternative n:
Distribution Solution (M)	\$0	\$2M	\$5M	\$
Transmission Solution (M)	\$0	\$5M	\$30M	\$
Total Cost (M)	\$0	\$7M	\$35M	\$