

This document is intended to provide guidance to legal owners of electric distribution systems (also referred to as “Distribution Facility Owners” or “DFOs”) for the reports that they prepare for the AESO to detail distribution planning decisions in support of a System Access Service Request (SASR).

Terminology

Depending on the DFO, the report noted above may be called a Distribution Deficiency Report (DDR), Need for Development report (sometimes abbreviated as NFD), or Statement of Need report (sometimes abbreviated as SON). This document will use the term DDR.

Purpose of the DDR

As outlined in the SASR form, the DFO is required to submit a DDR with a SASR. The DDR must detail the distribution planning decisions that led the DFO to submit a SASR to the AESO.

The AESO expects a DDR to cover the existing or expected deficiencies on the distribution system, which the DFO has identified, and to describe why the DFO requires additional system access service from the AESO (e.g., capacity-related (N-0) issues, reliability-related (N-1) issues, etc).

The AESO will review and assess the DFO's DDR, and will then determine whether an expansion or enhancement of the transmission system is required to respond to the request for system access service. As the project progresses, the AESO will also collaborate with the DFO and the applicable legal owner of transmission facilities (also referred to as a “Transmission Facility Owner” or “TFO”) to determine the AESO's preferred option to respond to the request for system access service. Information from the TFO is not required in the DDR, but if included to support the DDR, should be provided under a separate cover of the TFO.

The DDR is essential because it assists the AESO, when responding to a request for system access service, to do one or more of the following:

- plan the transmission system as a whole,
- determine if and when an expansion or enhancement of the transmission system is required and, if so, the AESO's preferred transmission development,
- prepare a Needs Identification Document (NID) for filing with the Alberta Utilities Commission, if required,
- provide a key piece of evidence that demonstrates the need for an expansion or enhancement of the transmission system, and/or
- demonstrate that the AESO's preferred transmission development is technically sufficient, in the public interest, and provides the market participant with a reasonable opportunity to exchange electricity.

AESO Review of DDR

When the AESO reviews the DDR provided by the DFO, the following checklist will be used. The DFO is encouraged to use this checklist when preparing the DDR to ensure all items are addressed.

Criteria to be Assessed
Existing distribution system description is complete
<input type="checkbox"/> Configuration of the distribution system is presented, including all substations applicable to the development area. ¹
<input type="checkbox"/> Applicable load centres are identified and the load types at these centres are characterized. ²
<input type="checkbox"/> Distributed generation of any type is identified with type, size and availability. ³
Applicable distribution issues are identified
<input type="checkbox"/> Distribution issues, such as the following, are identified and supported by the DFO's criteria/guidelines/standards: <ul style="list-style-type: none"> - Distribution feeder overloads - Transformer overloads under N-0 - Unsupplied load under N-1 due to a distribution feeder contingency - Unsupplied load under N-1 due to a transformer contingency - Other distribution issues
<input type="checkbox"/> Distribution issues are identified as either existing or expected to occur in the future. ⁴
<input type="checkbox"/> DFO's supporting distribution system planning criteria/guidelines/standards are stated and explained.
DFO's historical and forecast load information is complete and supports the issues explained above
<input type="checkbox"/> Actual summer and winter peak load values for the past 5 years, and 10 year forecast values are provided. ⁵
<input type="checkbox"/> Load tables, including N-1 supply tables under transformer and feeder contingencies, for all substations applicable to the development area as per AUC Rule 007 NID12, as applicable.
<input type="checkbox"/> Sources and types of load growth and planned distributed generation in the study area are explained. ⁶
<input type="checkbox"/> Rationale provided for the historic and forecast load increase/decrease is appropriate. ⁷
<input type="checkbox"/> N-1 tables indicate: (1) How the load in the area will be served in N-1 transformer and feeder situations (2) How much unsupplied load remains
<input type="checkbox"/> Existing Rate Demand Transmission Service (DTS)/Rate Supply Transmission Service (STS) and requested Rate DTS/Rate STS are provided.
<input type="checkbox"/> Requested in-service date (ISD) is included with rationale provided. ⁸
Distribution-only (D-only) alternative(s) are not considered adequate to address the issues above
<input type="checkbox"/> D-only alternatives, such as the following, are described and include the total length of new feeders that would be required and a +20% to +50% and -15% to -30% cost estimate ⁹ : <ul style="list-style-type: none"> - Load shifting - Distribution upgrades¹⁰ - Other D-only solutions
<input type="checkbox"/> Technical reasons for ruling out the D-only alternative(s) are stated and explained, and are based on DFO's criteria/guidelines/standards. ¹¹
<input type="checkbox"/> Where appropriate, non-technical reasons for ruling out the D-only alternative(s) are stated and explained. ¹²
<input type="checkbox"/> Supporting detail (diagrams or tables) explain why the distribution deficiency cannot be solved by the D-only alternatives.
Transmission alternative(s) are appropriately considered
<input type="checkbox"/> Transmission-only or transmission + distribution (T+D) alternative(s), if any, are identified and include the total length of new feeders that would be required and a +20% to +50% and -15% to -30% cost estimate (for the distribution portion).
<input type="checkbox"/> Technical <i>distribution</i> reasons for ruling out the alternative(s) are stated and explained, and are based on DFO's criteria/guidelines/standards. ¹¹
<input type="checkbox"/> Where appropriate, non-technical <i>distribution</i> reasons for ruling out the alternative(s) are stated and explained. ¹²
<input type="checkbox"/> 10 year distribution load forecast table for <i>each alternative</i> is included as rationale for considering or ruling out the alternative.
Report is clear, complete, and consistent
<input type="checkbox"/> Includes content for all the major sections ¹³
<input type="checkbox"/> All cross references are accurate (tables, other sections, links to publications)
<input type="checkbox"/> All tables and figures are legible in print
<input type="checkbox"/> Written in accordance with the DDR Author's Guide

Notes:

¹ If the development area is near another DFO's service territory, the DFO should consider substations in both their service territory and the other DFO's service territory.

² Load type characterizations (e.g., residential, commercial, industrial, farm, or oilsands).

³ Has the DFO considered distributed generation (DG) as a means to solve the distribution deficiency?

⁴ If the issues are existing, include an explanation of how the existing issues are being addressed.

⁵ The last year of actuals must coincide with the year the SASR was submitted. Data requirements are 5-year historical actual (summer and winter peak) and 10-year forecast. The values should be presented as MW. (If presented as MVA the applicable power factor(s) must be provided and include an explanation of how it can be applied to the MVA values to produce values in MW.) This information can be used to demonstrate the capacity available for load transfers to adjacent substations. Prior to filing a NID application, actuals and forecasted values may need to be updated, and the DFO's analysis and conclusions in the DDR will have to be reconfirmed.

⁶ Load growth should be identified as resulting from (1) organic load growth attributed to existing customers, (2) load additions attributed to existing customers, and/or (3) load additions attributed to new customers. If new customers are responsible for the load increase, then sufficient detail about the new customers is required, including customer load type, contract date and contract capacity.

⁷ The rationale should include explanations for large load increases or decreases and an indication of whether coincidence factors were applied and why.

⁸ Further details about the reasons underlying the DFO's requested ISD should be included, such as how the requested ISD relates to the DFO's planning decisions for the distribution system. The details should be based on information provided throughout the DDR, including identified deficiencies on the distribution system and/or the timing of customer load additions, as applicable. When proposing a T+D alternative, the requested ISD should account for the entire proposed development. The DFO should consult with the TFO to determine an appropriate requested ISD.

⁹ This cost estimate accuracy range aligns with the Association for the Advancement of Cost Engineering (AACE) Class Level Estimate Class 4. A cost estimate is not required for D-only alternatives that are not technically feasible.

¹⁰ Distribution upgrades that necessitate transmission development—such as the addition of a circuit breaker at a substation to accommodate a new distribution feeder—are considered transmission solutions and are therefore not considered D-only solutions.

¹¹ Technical reasons might include: unacceptable voltage drop, lack of transformation capacity, feeder overloads, feeder length, coincidence with distributed generation availability, etc. For any of the above reasons, the DFO must explain the supporting data analysis (e.g., when ruling out load shifting, explain why no surrounding substations can support the load).

¹² Non-technical reasons might include: cost, land use, environmental concerns, feeder routing/egress constraints, etc. Please be specific and avoid the use of generalities (e.g., extensive distribution development, marginal advantages, construction challenges).

¹³ Major report sections should be organized in the following manner:

- Executive Summary/Overview
- Introduction
- Existing Distribution System Description
- Distribution System Planning Criteria and/or Standards
- Distribution Concerns/Issues
- Identified Alternatives
- Alternative Evaluation and Comparison
- Conclusions

Updates to the DDR

The AESO reviews the DDR for clarity, accuracy and completeness in preparation for filing with the AESO's NID application. Typically, more than a year has passed since the DDR was received with the SASR and therefore some information in the DDR will likely require updating prior to the filing of a NID application.

DDR Supplement

The load-related information (contract additions, actuals and forecast) in the DDR must be up-to-date and accurate at the time of filing a NID application. This includes providing the record of the last five-year summer and winter peak substation loads applicable to the development area, in accordance with the requirements of AUC Rule 007: *Applications for Power Plants, Substations, Transmission Lines, Industrial System Designations and Hydro Developments* (Rule 007).

Updated information that was not available at the time the DDR was prepared can be provided by way of a "supplement". A supplement to the DDR is acceptable for the following types of information:

- updated historic load tables
- updated forecasted load tables
- updated customer requests and contract capacities
- verification that the distribution deficiency still exists and that the DFO's analysis and conclusions in the DDR remains unchanged, in light of the above updates
- DFO analysis of alternatives developed by the AESO

A supplement is not acceptable for purposes of correcting errors or omissions associated with the DDR.

DDR Revision

In some instances, the DDR document itself will require revision. Situations that require revisions to a DDR include:

- The updated historic and forecasted load tables show the timing or nature of the distribution deficiency has changed (e.g., changes to the requested ISD, or the requested Rate DTS or Rate STS contract capacity);
- The distribution deficiency is characterized incorrectly or has changed over time before filing (e.g., if the DDR states capacity, but the real distribution deficiency is related to both capacity and reliability); or
- The rationale for ruling out alternatives is incorrect after new information is learned or becomes available as the project moves forward (e.g., if the DDR states an alternative is not technically viable, but later conversations demonstrate that it is viable).

If the DDR requires a revision to address any of the points above, it is expected that the up-to-date load-related information (e.g., updates to forecast and historic loads, updates to customer load requests) will be incorporated into the revised DDR itself and not under separate cover.

The AESO reserves the right to determine when a revised DDR is required for the filing of a NID application.

Technical Writing Tips

General

	Topic	Original	Change	Rationale ¹	Priority ²	
1.	Any point of delivery (POD) or substation totals		POD or substation totals must be included and should be represented in MW, rather than in MVA. If represented in MVA, the applicable power factor(s) must be provided and include a clear explanation of how it can be applied to the MVA values to produce values in MW.	C	R	
2.	Any references to units or ratings	<p>Examples:</p> <ol style="list-style-type: none"> “11MVA”; “138/25kV”; “138:25 kV”; “138/25-kV” “10MW”; “7km”; “10/15/25 MVA 138/25 kV transformer” vs. “138/25 kV 10/15/25 MVA transformer” 	<p>Recommended:</p> <ol style="list-style-type: none"> “11 MVA” [inserted a space]; “138/25 kV” [inserted a space]; “138/25 kV” [replaced colon with slash]; “138/25 kV” [replaced dash with space]; “10 MW” [inserted a space]; “7 km” [inserted a space]; Choose one rating description and use consistently throughout the document. 	C	Style, clarity and consistency of the content.	S
3.	Whenever a short form or acronym is used in connection with a name or term	<p>Example:</p> <ul style="list-style-type: none"> System Access Service Request; Alberta Electric System Operator; Demand Transmission Service 	<p>Recommended:</p> <p><u>First usage:</u> e.g., “[DFO name] submitted a System Access Service Request (SASR) to the Alberta Electric System Operator (AESO), and has requested a Rate Demand Transmission Service (DTS) increase...”</p> <p><u>Subsequent usage:</u> Instead of repeating the full term/name each time throughout the document, subsequent references will only be</p> <ul style="list-style-type: none"> SASR; AESO; and Rate DTS 	C	A term or name should be stated in full when it is <i>first</i> introduced, followed by its acronym/short form. <i>Then</i> use the acronym/short form for subsequent references to the term or name.	S
4.	Table and Figure labels	<p>Example:</p> <p>Row labeled “N-1 Supply” which only refers to “N-1 supply” at one substation</p>	<p>Recommended:</p> <p>Row labeled “N-1 supply at the John Smith 111S substation”</p>	C	Provide comprehensive labels for tables and figures to provide clear information.	A

Terminology and Phrasing

Topic	Original	Change	Rationale ¹	Priority ²
Distribution Deficiencies				
1.	<p>When discussing concerns that gave rise to the need for development</p>	<p>Example:</p> <p>There have been DDRs which use a combination (or all) of the following terms to describe <i>capacity</i>-related or <i>reliability</i>-related concerns, or both:</p> <ul style="list-style-type: none"> • “distribution system concerns”; • “distribution system issues”; • “distribution service concerns”; • “distribution service issues”; • “system concerns”; • “technical concerns” 	<p>Recommended:</p> <p>1. Be <i>clear</i> and <i>precise</i> about the concerns (that is, distribution deficiencies) that give rise to the need for development: AESO needs to know whether the need for development stems from</p> <ul style="list-style-type: none"> • <i>capacity</i>-related concerns (e.g., transformer capacity limits exceeded; feeder overloading, if applicable; etc.); • <i>reliability</i> concerns (e.g., insufficient backup ability, resulting in unsupplied load under N-1 contingency; feeder overloading, if applicable; etc.); or • both <i>capacity</i> and <i>reliability</i> concerns, with details about the nature of those concerns. <p>2. Avoid using broad, general terms such as</p> <ul style="list-style-type: none"> • “distribution system concerns”; • “distribution service concerns”; • “distribution system issues” and • “technical concerns” <p>if more specific terms—such as “reliability concerns” or “capacity concerns”—would be more accurate and informative.</p> <p>When referring to both capacity concerns <i>and</i> reliability concerns, then the clearest term to use is “capacity and reliability concerns”.</p>	<p>R</p> <p>Use consistent terminology throughout the document when referring to the same thing. Consistent use of terms enhances the document’s clarity and provides the AESO with information required to assess transmission development alternatives.</p> <p>R</p>

Topic	Original	Change	Rationale ¹	Priority ²	
Capital Costs and Project Developments					
2.	When discussing costs, including cost breakdowns or cost comparisons	<p>Examples:</p> <ol style="list-style-type: none"> “is the most <i>economical</i>”; “is the least <i>expensive</i>”; “this is the most <i>expensive</i> alternative” (emphasis added) 	<p>Recommended:</p> <ol style="list-style-type: none"> “is the most cost effective”; “has the lowest estimated capital cost”; “this alternative has the highest estimated capital cost” 	<p>C</p> <p>When discussing costs relating to a project, avoid references to economic considerations or words that imply economic considerations (e.g., “economic impacts”; “most economical”; “the most expensive”). Instead, refer to the <i>estimated capital cost</i>.</p>	<p>S</p>
3.	When discussing the extent of distribution system development for a given alternative	<p>Example:</p> <ol style="list-style-type: none"> “[Alternative X] has less distribution <i>scope</i> compared to [Alternative Y]” (emphasis added) 	<p>Recommended:</p> <ol style="list-style-type: none"> “[Alternative X] has less distribution system development compared to [Alternative Y]” 	<p>C</p> <p>The change from distribution <i>scope</i> to distribution <i>system development</i> clarifies the terminology and enhances clarity.</p>	<p>A</p>
4.	When discussing solutions to address the distribution deficiencies identified in the DDR	<p>Example:</p> <ol style="list-style-type: none"> “Alternative [X] is the [DFO’s] <i>proposed</i> development to address the [distribution deficiencies identified in the DDR]”; “[the DFO] <i>proposes</i> transmission system upgrades to address the distribution deficiencies” (emphasis added) 	<p>Recommended:</p> <ol style="list-style-type: none"> “Alternative [X] is [the DFO’s] preferred development to address the [distribution deficiencies identified in the DDR]”; “[the DFO] requests transmission system upgrades to address the distribution deficiencies” 	<p>R</p> <p>The DFO can <i>request</i> transmission system developments and may identify its <i>preferred</i> alternative, but the AESO ultimately <i>proposes</i> and <i>recommends</i> transmission system developments to respond to the DFO’s request for system access service.</p>	<p>R</p>
5.	When discussing facility limitations	<p>Example:</p> <ol style="list-style-type: none"> “[POD name] will <i>run out of its capacity</i>” (emphasis added) 	<p>Recommended:</p> <ol style="list-style-type: none"> “[POD name] will exceed its limits” 	<p>C</p> <p>This wording more clearly explains the issue with the POD. Please be specific and avoid the use of generalities when ruling out alternatives. (e.g., extensive</p>	<p>S</p>

	Topic	Original	Change	Rationale ¹	Priority ²
				distribution development, marginal advantages, construction challenges).	
6.	When discussing the fate of transmission facilities that will no longer be needed	Example: 1. “This alternative involves <i>salvaging</i> the existing [POD name]substation and building a new substation...” (emphasis added)	Recommended: 1. “This alternative <i>would result in the discontinued use of</i> the existing [POD name] substation for transmission purposes, and involves building a new substation...”	R Avoid the use of “salvage” when referring to transmission facilities. The correct phrasing is “discontinue use for transmission purposes”. If approval were obtained from the Alberta Utilities Commission to specifically salvage facilities that are no longer used for transmission purposes, then the TFO would be obligated to salvage those facilities. Such an outcome precludes any other use for the facilities, unless the approval is amended. AESO prefers not to use the term “salvage” because it does not decide what happens to transmission facilities that are no longer in use. From the AESO’s perspective, what matters is that the transmission facilities are discontinued once the need for them no longer exists.	A

Notes:

1. Rationale: R- Regulatory, C-Clarity
2. Priority: S-Suggest, A-Advise, R-Required