



July 3, 2020

To: Alberta Utilities Commission (“AUC” or “Commission”)

Re: Forwarding Notice – New and Amended Alberta Reliability Standard Definitions:

- 1) Proposed new “radial circuit”;
- 2) Proposed new “system access service” and
- 3) Proposed amended “bulk electric system”

(collectively referred to as “new and amended ARS-related definitions”)

The Alberta Electric System Operator (“AESO”) recommends that the Commission approve the proposed new and amended ARS-related definitions, pursuant to Section 19 of the *Transmission Regulation*.

Consistent with the AESO’s drafting principles for authoritative documents, the AESO has determined that it is appropriate for defined terms used in the reliability standards to go through the same consultation and forwarding process as the reliability standards themselves.

Background

The existing “bulk electric system” definition in the AESO [Consolidated Authoritative Document Glossary](#) (“CADG”) is quite general, and lacks clarity and specificity. To address this, the AESO’s current practice is to add details to the applicability sections of reliability standards to compensate for the general wording in the existing “bulk electric system” definition. For example, the current definition does not include the minimum sizes of generating units and aggregated generating facilities that are part of the bulk electric system. Consequently, the minimum sizes of the generating units and aggregated generating facilities are added to the applicability section of reliability standards. The proposed amended definition provides clarity and specificity such that the applicability section of reliability standards that apply at the bulk electric system level can be simplified. More importantly, however, is that the proposed amended definition more clearly identifies the bulk electric system facilities that are important for maintaining reliable operation of the electricity system within Alberta.

The term “radial circuit” is a new definition that is being proposed for use in the proposed amended definition of “bulk electric system”. The definition of “radial circuit” is consistent with how the AESO currently classifies affected circuits in applicable reliability standards and includes two clarifications that are in the NERC “bulk electric system” definition as these clarifications have been assessed to be appropriate for use in the broader application of the definition “radial circuit”. These clarifications identify how circuits are treated that are energized at 50 kV or higher and have a normally open point between them; and how circuits are treated that create a contiguous loop, where part of the loop includes a connection energized at less than 50 kV.

The term “system access service” is an existing defined term in the CADG for use in the ISO tariff, and is now being proposed for use in the reliability standards. This term is used in the proposed amended definition of “bulk electric system” to identify the substation that a generating unit or aggregated generating facility connects through to the transmission system. The identification of this substation is then used to determine if the generating unit or aggregated generating facility connects at a bulk electric system voltage level of 100 kV or higher.

The following new defined terms, along with their related definitions are proposed for incorporation into the AESO’s CADG for use in the reliability standards:

- a) radial circuit; and
- b) system access service.



The following existing reliability standards defined term along with its related definition is proposed to be amended in the AESO's CADG for use in the reliability standards:

- a) bulk electric system.

AESO Consultation

On July 23, 2019, the AESO posted a [Consultation Letter](#) on its website requesting written comments from market participants and other interested parties ("Stakeholders") with respect to the proposed new and amended ARS-related definitions, and notified market participants in the AESO Stakeholder Newsletter.

On August 8, 2019, the AESO posted written comments received from Stakeholders and other interested parties, in response to the Consultation Letter, on its website and notified market participants in the AESO Stakeholder Newsletter. Please see the [Stakeholder Comments](#) on Consultation Letter for a summary of written comments received.

Stakeholder comments generated further review and consideration of the proposed new and amended ARS-related definitions and on June 17, 2020, the AESO posted its replies to Stakeholder comments, including the final proposed new and amended ARS-related definitions on its website, and notified Stakeholders in the AESO Stakeholder Newsletter. Please see the [AESO Reply to Stakeholders Comments Letter](#) for a summary of replies to written comments received, as well as the rationale or basis for the position of the AESO that explains why certain positions were accepted or rejected.

Based on a comment received from ATCO Electric Ltd., section (viii) in the bulk electric system definition was revised to include all system elements from the terminal of a bulk electric system reactive power resource to transmission facilities energized at 100 kV or higher. This revision helps to ensure the reliable operation of the system elements that provide the connection between a reactive power resource that is part of the bulk electric system and the transmission facilities that are part of the bulk electric system.

Proposed Effective Date

The AESO recommends that the Commission approve the final proposed new and amended ARS-related definitions to become effective upon approval by the Commission.

The AESO submits that the final proposed new and amended ARS-related definitions comply with the requirements of the *Transmission Regulation*, are not technically deficient, and are in the public interest.

Attachments to Forwarding Notice

The following documents are attached to this Forwarding Notice:

1. [Blackline](#) and [clean](#) copies of the final proposed new and amended ARS-related definitions;
2. [July 23, 2020 Consultation Letter](#);
3. [August 8, 2019, Stakeholder Comments on Consultation Letter](#); and
4. [June 17, 2020, AESO Reply to Stakeholders Comments Letter](#).



If you have any questions, please contact the undersigned.

Sincerely,

"Melissa Mitchell-Moisson"

Melissa Mitchell-Moisson
Regulatory Administrator
Email: ars_comments@aeso.ca

Attachments

Proposed amended “bulk electric system”, and new “radial circuit” and “system access service” definitions for application in Alberta reliability standards

July 3, 2020 – Blackline for Forwarding



Proposed Amended “Bulk electric System” Definition

“bulk electric system” ~~as defined by the Regional Reliability Organization,~~ means **all system elements** that are included in the following:

- (i) all system elements that have all terminals energized at 100 kV or higher that are not part of a radial circuit;
- (ii) a radial circuit comprised of system elements that have all terminals energized at 100 kV or higher where the electrical generation radial circuit connects to:
 - (a) any facility included in items (iv) through (vii) below; or
 - (b) 2 or more generating resources, being generating units and aggregated generating facilities, that have a combined maximum authorized real power higher than 67.5 MW;
- (iii) a transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher;
- (iv) a generating unit that has a maximum authorized real power higher than 18 MW where system access service is provided through a switchyard that is directly connected to transmission lines, interconnections, with neighbouring systems, and associated equipment, generally operated at voltages of one hundred (100) kV or higher; radial facilities energized at 100 kV or higher, including all system elements from the terminal of the generating unit to the transmission facilities serving only load with one (1) energized at 100 kV or higher;
- (v) an aggregated generating facility that has a maximum authorized real power higher than 67.5 MW where system access service is provided through a switchyard that is directly connected to transmission source are generally not included in this definition. facilities energized at 100 kV or higher, including all system elements from the collector bus to the transmission facilities energized at 100 kV or higher, and excluding the generating units and the collector system feeders;
- (vi) all generating units and aggregated generating facilities where system access service is provided through a common switchyard that is directly connected to transmission facilities energized at 100 kV or higher and the generating units and aggregated generating facilities have a combined maximum authorized real power higher than 67.5 MW, including all system elements from the terminal of each generating unit and from the collector bus of each aggregated generating facility to transmission facilities energized at 100 kV or higher, and excluding the generating units and collector system feeders of each aggregated generating facility;
- (vii) a blackstart resource, including all system elements from the terminal of the blackstart resource to transmission facilities that are energized at 100 kV or higher; and

Proposed amended “bulk electric system”, and new “radial circuit” and “system access service” definitions for application in Alberta reliability standards

July 3, 2020 – Blackline for Forwarding



- (viii) a static or dynamic **reactive power** resource that is dedicated to supplying or absorbing **reactive power** to or from the **transmission system** and is connected:
- (a) to **transmission facilities** energized at 100 kV or higher;
 - (b) through a dedicated transformer that is directly connected to **transmission facilities** energized at 100 kV or higher; or
 - (c) through a non-dedicated transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher;
- including all **system elements** from the terminal of the **reactive power** resource to the **transmission facilities** energized at 100 kV or higher.

Proposed new “radial circuit” Definition

“**radial circuit**” means an arrangement of contiguous **system elements** energized at 50 kV or higher that:

- (a) extend from a **system element** on the networked **transmission system** in a linear or branching configuration;
- (b) connect to one or more of a load facility, a **generating unit**, or an **aggregated generating facility**; and
- (c) comprise the only circuit by which power can flow between the networked **transmission system** and the facilities identified in item (b) under normal operating conditions,

and includes an arrangement where the circuit energized at 50 kV or higher is connected to another circuit energized at 50 kV or higher, either through a switching device that is operated normally open or through facilities energized at less than 50 kV where the circuit would be a **radial circuit** if the connection did not exist.

Proposed new “system access service” Definition

“**system access service**” as defined in the Act means the service obtained by **market participants** through a connection to the **transmission system**, and includes access to exchange electric energy and **ancillary services**.

Proposed amended “bulk electric system”, and new “radial circuit” and “system access service” definitions for application in Alberta reliability standards



July 3, 2020 – Clean for Forwarding

Proposed Amended “Bulk electric System” Definition

“**bulk electric system**” means all **system elements** that are included in the following:

- (i) all **system elements** that have all terminals energized at 100 kV or higher that are not part of a **radial circuit**;
- (ii) a **radial circuit** comprised of **system elements** that have all terminals energized at 100 kV or higher where the **radial circuit** connects to:
 - (a) any facility included in items (iv) through (vii) below; or
 - (b) 2 or more generating resources, being **generating units** and **aggregated generating facilities**, that have a combined **maximum authorized real power** higher than 67.5 MW;
- (iii) a transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher;
- (iv) a **generating unit** that has a **maximum authorized real power** higher than 18 MW where **system access service** is provided through a switchyard that is directly connected to **transmission facilities** energized at 100 kV or higher, including all **system elements** from the terminal of the **generating unit** to the **transmission facilities** energized at 100 kV or higher;
- (v) an **aggregated generating facility** that has a **maximum authorized real power** higher than 67.5 MW where **system access service** is provided through a switchyard that is directly connected to **transmission facilities** energized at 100 kV or higher, including all **system elements** from the collector bus to the **transmission facilities** energized at 100 kV or higher, and excluding the **generating units** and the collector system feeders;
- (vi) all **generating units** and **aggregated generating facilities** where **system access service** is provided through a common switchyard that is directly connected to **transmission facilities** energized at 100 kV or higher and the **generating units** and **aggregated generating facilities** have a combined **maximum authorized real power** higher than 67.5 MW, including all **system elements** from the terminal of each **generating unit** and from the collector bus of each **aggregated generating facility** to **transmission facilities** energized at 100 kV or higher, and excluding the **generating units** and collector system feeders of each **aggregated generating facility**;
- (vii) a **blackstart resource**, including all **system elements** from the terminal of the **blackstart resource** to **transmission facilities** that are energized at 100 kV or higher; and
- (viii) a static or dynamic **reactive power** resource that is dedicated to supplying or absorbing **reactive power** to or from the **transmission system** and is connected:
 - (a) to **transmission facilities** energized at 100 kV or higher;
 - (b) through a dedicated transformer that is directly connected to **transmission facilities** energized at 100 kV or higher; or

Proposed amended “bulk electric system”, and new “radial circuit” and “system access service” definitions for application in Alberta reliability standards



July 3, 2020 – Clean for Forwarding

- (c) through a non-dedicated transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher;

including all **system elements** from the terminal of the **reactive power** resource to the **transmission facilities** energized at 100 kV or higher.

Proposed new “radial circuit” Definition

“**radial circuit**” means an arrangement of contiguous **system elements** energized at 50 kV or higher that:

- (a) extend from a **system element** on the networked **transmission system** in a linear or branching configuration;
- (b) connect to one or more of a load facility, a **generating unit**, or an **aggregated generating facility**; and
- (c) comprise the only circuit by which power can flow between the networked **transmission system** and the facilities identified in item (b) under normal operating conditions,

and includes an arrangement where the circuit energized at 50 kV or higher is connected to another circuit energized at 50 kV or higher, either through a switching device that is operated normally open or through facilities energized at less than 50 kV where the circuit would be a **radial circuit** if the connection did not exist.

Proposed new “system access service” Definition

“**system access service**” as defined in the Act means the service obtained by **market participants** through a connection to the **transmission system**, and includes access to exchange electric energy and **ancillary services**.



July 23, 2019

To: Market Participants and Other Interested Parties (“Stakeholders”)

Re: **Consultation Letter for Proposed New and Amended Alberta Reliability Standard Definitions:**

- 1) **Proposed new “radial circuit”;** and
- 2) **Proposed new “system access service” and**
- 3) **Proposed amended “bulk electric system”**

(collectively referred to as “new and amended ARS-related definitions”)

Section 19 of the *Transmission Regulation* requires the Alberta Electric System Operator (“AESO”) to consult with stakeholders likely to be directly affected by the AESO’s adoption or making of Alberta reliability standards, and also requires the AESO to forward the proposed Alberta reliability standards to the Alberta Utilities Commission (“Commission”) for review along with the AESO’s recommendation that the Commission approve or reject them.

Consistent with the AESO’s drafting principles for authoritative documents, the AESO has determined that it is appropriate for defined terms used in the Alberta reliability standards to go through the same consultation process as the Alberta reliability standards themselves. Accordingly, the AESO is providing notice and seeking comments from stakeholders on the attached proposed new and amended ARS-related definitions.

Background

The existing “bulk electric system” definition in the AESO [Consolidated Authoritative Document Glossary](#) (“CADG”) is quite general, and lacks clarity and specificity. Additional details are currently being added to the applicability sections of reliability standards to compensate for the general wording in the existing “bulk electric system” definition. For example, the current definition does not include the sizes of generating units and aggregated generating facilities that are part of the bulk electric system. Consequently the sizes of the generating units and aggregated generating facilities are added to the applicability section of Alberta reliability standards. The proposed amended definition provides clarity and specificity such that the applicability section of reliability standards that apply at the bulk electric system level can be simplified. More importantly, however, is that the proposed amended definition more clearly identifies the bulk electric system facilities that are important for maintaining reliable operations within Alberta.

The term “radial circuit” is a new definition that is being proposed for use in the proposed amended definition of “bulk electric system”. The definition of “radial circuit” includes two clarifications that are in the NERC “bulk electric system” definition as these clarifications have been assessed to be appropriate for use in the broader application of the definition “radial circuit”. These clarifications identify how circuits are treated that are energized at 50 kV or higher and have a normally open point between them; and how circuits are treated that create a contiguous loop, where there is a connection through facilities energized at less than 50 kV.

The term “system access service” is an existing defined term in the CADG for use in the ISO tariff, and is now being proposed for use in the reliability standards. This term is used in the proposed amended definition of “bulk electric system” to identify the substation that a generating unit or aggregated generating facility connects through to the transmission system. The identification of this substation is then used to determine if the generating unit or aggregated generating facility connects at a bulk electric system voltage level of 100 kV or higher.

Summary of the Proposed Definitions

The AESO proposes to incorporate the following new defined terms along with their related definition into the AESO’s CADG for use in the Alberta reliability standards:

- a) “radial circuit”; and
- b) “system access service”.

Amendments to the following existing definition are proposed for incorporation into the AESO’s CADG:

- a) “bulk electric system”.

The proposed amended “bulk electric system” definition was derived from the NERC “bulk electric system” definition but includes the following Alberta variances:

1. does not include the NERC exemption E2 for generating units on the customer’s side of the retail meter where the net capacity provided to the BES does not exceed 75 MVA;
2. does not include the NERC exemption E3 for “local networks”;
3. does not include the individual generating units of an aggregated generating facility; and
4. does not include an exemption for generating units that connect to off-site load through facilities that are non-“bulk electric system” where the generating unit also connects through to “bulk electric system” transmission facilities at the same site. (Note: This exemption is not stated in the NERC definition but is illustrated in the NERC “bulk electric system” guidance document.)

The proposed amended “bulk electric system” definition generally includes a narrower set of facilities than the existing “bulk electric system” definition. However, it has been broadened to apply to the following new facilities:

1. intermediary system elements between the terminals of a bulk electric system generating unit or blackstart resource and transmission facilities energized at 100 kV or higher; and
2. reactive power resources energized at less than 100 kV that are connected through a dedicated transformer that has a high-side voltage of 100 kV or higher or through a non-dedicated transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher.

The AESO conducted a review of all existing reliability standards and identified that the new facilities being proposed for inclusion in the proposed amended definition of “bulk electric system” may be subject to additional requirements under the following reliability standards:

- CIP *Critical Infrastructure Protection Standards* – to the extent that the new facilities meet the criteria of a high, medium or low impact rating.
- FAC-008 *Facility Ratings* – to the extent that the new facilities are transmission facilities;



- IRO-002, 003 and 005 *Interconnection Reliability Operations and Coordination* - the monitoring of system elements that are part of the “bulk electric system”. Subsequent to identifying this, the AESO conducted an initial assessment and determined that there will be little to no impact to existing practices or documented processes;
- PRC-001 *Protection System Coordination* – applies to protection systems on the new facilities;
- PRC-004 *Analysis and Mitigation of Transmission and Generation Protection System Misoperation* – applies to the new facilities.

While the AESO has conducted a reasonable review of the impacts of the proposed amended “bulk electric system” definition, stakeholders are ultimately responsible for completing their own review and making their own determination as to any consequences in relation to the applicability of requirements under the reliability standards.

Please see the attached blacklined version of the proposed amended “bulk electric system” definition for all changes made to the existing Alberta reliability standard definition. When reviewing the attached proposed new and amended ARS-related definitions, stakeholders should note that all defined terms appear **bolded**. Stakeholders and other interested parties are encouraged to refer to the AESO’s CADG when reviewing definitions to ensure they have an accurate understanding of those defined terms.

Request for Comment

Please use the attached *Stakeholder Comment Matrix* when submitting comments to the AESO. Only written comments will be considered in finalizing the proposed new and amended ARS-related definitions. Stakeholders should ensure that comments provided represent all interests within their organization. The scope of comments is limited to the proposed new and amended ARS-related definitions. The AESO will not consider any comments received outside of this scope.

Stakeholders are asked to provide comments no later than **August 6, 2019** to ars_comments@aeso.ca. Adherence to deadlines is essential to the integrity of Alberta reliability standard comment process. As such, the AESO may not publish, reply to, or otherwise consider any stakeholder comments received after August 1, 2019.

In August, the AESO will publish all comments received. The AESO also expects to publish replies to the comments with the proposed new and amended ARS-related definitions in August 2019.

If the AESO does not receive comments regarding the proposed new and amended ARS-related definitions, the AESO expects to forward the proposed new and amended ARS-related definitions to the Commission in August 2019.

Proposed Effective Date for new and amended ARS related definitions

The AESO is proposing the following effective dates for the proposed amended “bulk electric system” definition

- October 1, 2019, for facilities that are currently considered part of the bulk electric system under the existing definition and will continue to be part of the bulk electric system under the proposed amended definition; and
- October 1, 2021, for facilities that are not currently considered part of the bulk electric system under the existing definition but will be part of the bulk electric system under the proposed amended definition.

The AESO is also proposing an October 1, 2019 effective date for the proposed new defined terms “radial circuit” and “system access service”.



Attachments to Consultation Letter

The following documents are attached:

1. [Stakeholder Comment Matrix – new and amended ARS related definitions.](#)

Sincerely,

“Melissa Mitchell-Moisson”

Melissa Mitchell-Moisson
Regulatory Administrator
Phone: 403-539.2948
Email: ars_comments@aeso.ca

Attachments

Stakeholder Comment Matrix – July 23, 2019

Consultation on Proposed new and amended ARS related definitions



Date of Request for Comment: <u>July 23, 2019</u> Period of Consultation: <u>July 23, 2019</u> through <u>August 6, 2019</u> Comments From: <u>Company Name</u> Date [yyyy/mm/dd]: _____	Contact: <u>Company Contact</u> Phone: <u>Contact Phone Number</u> Email: _____
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Listed below is the summary description of changes for the proposed new and amended ARS related definitions. Please refer back to the Consultation Letter under the “Attachments” section to view materials related to the proposed new and amended ARS related definitions. Please place your comments/reasons for position underneath (if any).

Definitions – New		
Existing	Proposed	Stakeholder Comments and/or Alternate Proposal
No definition currently exists for use in the Alberta reliability standards	<p>“radial circuit” means an arrangement of contiguous system elements energized at 50 kV or higher that:</p> <ul style="list-style-type: none"> (a) extend from a system element on the networked transmission system in a linear or branching configuration; (b) connect to one or more of a load facility, a generating unit, or an aggregated generating facility; and (c) comprise the only circuit by which power can flow between the networked transmission system and the facilities 	<i>Comment # 1: Insert Comments / Reason for Position (if any)</i>

	<p>identified in item (b) under normal operating conditions, and includes an arrangement where the circuit energized at 50 kV or higher is connected to another circuit energized at 50 kV or higher, either through a switching device that is operated normally open or through facilities energized at less than 50 kV where the circuit would be a radial circuit if the connection did not exist.</p>		
<p>No definition currently exists for use in the Alberta reliability standards</p>	<p>“system access service” as defined in the Act means the service obtained by market participants through a connection to the transmission system, and includes access to exchange electric energy and ancillary services.</p>		
Definitions – Amended			
Existing	Proposed	Blackline of Existing and Proposed	Stakeholder Comments and/or Alternate Proposal
<p>“bulk electric system” as defined by the Regional Reliability Organization, means the electrical generation resources, transmission lines, interconnections, with neighbouring systems, and associated equipment, generally operated at voltages of one hundred (100) kV or higher; radial transmission facilities serving only load with one</p>	<p>“bulk electric system” means all system elements that are included in the following:</p> <ul style="list-style-type: none"> (i) all system elements that have all terminals energized at 100 kV or higher that are not part of a radial circuit; (ii) a radial circuit comprised of system elements that have all terminals energized at 100 kV or higher where the radial circuit connects to: <ul style="list-style-type: none"> (a) any facility included in items (iv) through (vii) 	<p>“bulk electric system” as defined by the Regional Reliability Organization, means <u>all system elements that are included in the following:</u></p> <ul style="list-style-type: none"> <u>(i) all system elements that have all terminals energized at 100 kV or higher that are not part of a radial circuit;</u> <u>(ii) a radial circuit comprised of system elements that have all terminals energized at 100 kV or higher where the electrical generationradial circuit connects to:</u> <ul style="list-style-type: none"> <u>(a) any facility included in items (iv) through (vii) below; or</u> <u>(b) 2 or more generating resources, being generating units and aggregated generating</u> 	<p><i>Comment # 1: Insert Comments / Reason for Position (if any)</i></p>

<p>(1) transmission source are generally not included in this definition.</p>	<p>below; or</p> <p>(b) 2 or more generating resources, being generating units and aggregated generating facilities, that have a combined maximum authorized real power higher than 67.5 MW;</p> <p>(iii) a transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher;</p> <p>(iv) a generating unit that has a maximum authorized real power higher than 18 MW where system access service is provided through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the terminal of the generating unit to the transmission facilities energized at 100 kV or higher;</p> <p>(v) an aggregated generating facility that has a maximum authorized real power higher than 67.5 MW where system access service is provided through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the collector bus to the transmission facilities</p>	<p>facilities, that have a combined maximum authorized real power higher than 67.5 MW;</p> <p>(iii) <u>a transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher;</u></p> <p>(iv) <u>a generating unit that has a maximum authorized real power higher than 18 MW where system access service is provided through a switchyard that is directly connected to transmission facilities, lines, interconnections, with neighbouring systems, and associated equipment, generally operated at voltages of one hundred (100) kV or higher; radial facilities energized at 100 kV or higher, including all system elements from the terminal of the generating unit to the transmission facilities serving only load with one (1) energized at 100 kV or higher;</u></p> <p>(v) <u>an aggregated generating facility that has a maximum authorized real power higher than 67.5 MW where system access service is provided through a switchyard that is directly connected to transmission facilities source are generally not included in this definition. facilities energized at 100 kV or higher, including all system elements from the collector bus to the transmission facilities energized at 100 kV or higher, and excluding the generating units and the collector system feeders;</u></p> <p>(vi) <u>all generating units and aggregated generating facilities where system access service is provided through a common switchyard that is directly connected to transmission facilities energized at 100 kV or higher and the generating units and aggregated generating facilities have a combined maximum authorized real power higher than 67.5 MW, including all system elements from the terminal of each generating unit and from the collector bus of each aggregated generating facility to transmission facilities energized at 100 kV or higher, and excluding the generating units and collector system feeders of each aggregated generating facility;</u></p>	
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	<p>energized at 100 kV or higher, and excluding the generating units and the collector system feeders;</p> <p>(vi) all generating units and aggregated generating facilities where system access service is provided through a common switchyard that is directly connected to transmission facilities energized at 100 kV or higher and the generating units and aggregated generating facilities have a combined maximum authorized real power higher than 67.5 MW, including all system elements from the terminal of each generating unit and from the collector bus of each aggregated generating facility to transmission facilities energized at 100 kV or higher, and excluding the generating units and collector system feeders of each aggregated generating facility;</p> <p>(vii) a blackstart resource, including all system elements from the terminal of the blackstart resource to transmission facilities that are energized at 100 kV or higher; and</p> <p>(viii) a static or dynamic reactive power resource that is dedicated to supplying or</p>	<p>(vii) <u>a blackstart resource, including all system elements from the terminal of the blackstart resource to transmission facilities that are energized at 100 kV or higher; and</u></p> <p>(viii) <u>a static or dynamic reactive power resource that is dedicated to supplying or absorbing reactive power to or from the transmission system and is connected:</u></p> <p><u>(a) to transmission facilities energized at 100 kV or higher;</u></p> <p><u>(b) through a dedicated transformer that is directly connected to transmission facilities energized at 100 kV or higher; or</u></p> <p><u>(c) through a non-dedicated transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher.</u></p>	
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	<p>absorbing reactive power to or from the transmission system and is connected:</p> <ul style="list-style-type: none"> (a) to transmission facilities energized at 100 kV or higher; (b) through a dedicated transformer that is directly connected to transmission facilities energized at 100 kV or higher; or (c) through a non-dedicated transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher. 		
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August 8, 2019

To: Market Participants and Other Interested Parties (“Stakeholders”)

Re: **Stakeholder Comments on Consultation Letter –Proposed New and Amended Alberta Reliability Standard Definitions:**

- 1) Proposed new “radial circuit”; and
- 2) Proposed new “system access service” and
- 3) Proposed amended “bulk electric system”

(collectively referred to as “new and amended ARS-related definitions”)

Written comments received from Stakeholders in response to the Alberta Electric System Operator’s (“AESO”) July 23, 2019 [Consultation Letter](#) have been posted on the AESO website.

The following grid is hyperlinked to provide assistance in directing you to these written comments:

new and amended ARS-related definitions
AltaLink Management Inc.
ATCO Electric Ltd.
Canadian Natural Resources Limited
Capital Power
EPCOR Distribution & Transmission Inc.
Fort Hills Energy Corporation

Thank you to all Stakeholders who participated in this consultation. All written comments received will be considered in the AESO’s finalization of the proposed new and amended ARS-related definitions.

Sincerely,

“Melissa Mitchell-Moisson”

Melissa Mitchell-Moisson
Regulatory Administrator
Phone: 403-539-2948
Email: ars_comments@aesoc.ca

Stakeholder Comment Matrix – July 23, 2019

Consultation on Proposed new and amended ARS related definitions



Date of Request for Comment: <u>July 23, 2019</u> Period of Consultation: <u>July 23, 2019</u> through <u>August 6, 2019</u> Comments From: <u>AltaLink</u> Date [yyyy/mm/dd]: <u>2019/08/06</u>	Contact: <u>Jenette Yearsley</u> Phone: <u>403-387-8275</u> Email: <u>Jenette.Yearsley@AltaLink.ca</u>
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Listed below is the summary description of changes for the proposed new and amended ARS related definitions. Please refer back to the Consultation Letter under the “Attachments” section to view materials related to the proposed new and amended ARS related definitions. Please place your comments/reasons for position underneath (if any).

Definitions – New		
Existing	Proposed	Stakeholder Comments and/or Alternate Proposal
No definition currently exists for use in the Alberta reliability standards	<p>“radial circuit” means an arrangement of contiguous system elements energized at 50 kV or higher that:</p> <ul style="list-style-type: none"> (a) extend from a system element on the networked transmission system in a linear or branching configuration; (b) connect to one or more of a load facility, a generating unit, or an aggregated generating facility; and (c) comprise the only circuit by which power can flow between the networked transmission system and the facilities 	<p><i>Comment #1:</i> AltaLink notes that the use of 50kV, while in alignment with NERC, does not align with the definition of transmission facilities in the Electric Utilities Act. While practically this may not cause any confusion, it does create a potential gap.</p>

	identified in item (b) under normal operating conditions, and includes an arrangement where the circuit energized at 50 kV or higher is connected to another circuit energized at 50 kV or higher, either through a switching device that is operated normally open or through facilities energized at less than 50 kV where the circuit would be a radial circuit if the connection did not exist.		
No definition currently exists for use in the Alberta reliability standards	“system access service” as defined in the Act means the service obtained by market participants through a connection to the transmission system , and includes access to exchange electric energy and ancillary services .	<i>Altalink: No comments</i>	
Definitions – Amended			
Existing	Proposed	Blackline of Existing and Proposed	Stakeholder Comments and/or Alternate Proposal
“ bulk electric system ” as defined by the Regional Reliability Organization, means the electrical generation resources, transmission lines, interconnections , with neighbouring systems , and associated equipment, generally operated at voltages of one hundred (100) kV or higher; radial transmission facilities serving only load with one	“ bulk electric system ” means all system elements that are included in the following: (i) all system elements that have all terminals energized at 100 kV or higher that are not part of a radial circuit ; (ii) a radial circuit comprised of system elements that have all terminals energized at 100 kV or higher where the radial circuit connects to: (a) any facility included in items (iv) through (vii)	“ bulk electric system ” means all system elements that are included in the following: (i) all system elements that have all terminals energized at 100 kV or higher that are not part of a radial circuit ; (ii) a radial circuit comprised of system elements that have all terminals energized at 100 kV or higher where the radial circuit connects to: (a) any facility included in items (iv) through (vii) below; or (b) 2 or more generating resources, being generating units and aggregated generating facilities , that have a combined maximum authorized real power higher than 67.5 MW;	<i>Comment # 1: Regarding definition (vi), please clarify whether generators interconnected to transmission yard through a distributed feeder are in scope.</i> <i>Comment # 2: AltaLink requests that AESO develop an ID similar to the NERC Bulk Electric System Definition Reference Document that shows the amended definition with diagrams explaining how to apply the BES definition for the specific configurations for (iv) through (vii).</i>

<p>(1) transmission source are generally not included in this definition.</p>	<p>below; or</p> <p>(b) 2 or more generating resources, being generating units and aggregated generating facilities, that have a combined maximum authorized real power higher than 67.5 MW;</p> <p>(iii) a transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher;</p> <p>(iv) a generating unit that has a maximum authorized real power higher than 18 MW where system access service is provided through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the terminal of the generating unit to the transmission facilities energized at 100 kV or higher;</p> <p>(v) an aggregated generating facility that has a maximum authorized real power higher than 67.5 MW where system access service is provided through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the collector bus to the transmission facilities</p>	<p>(iii) a transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher;</p> <p>(iv) a generating unit that has a maximum authorized real power higher than 18 MW where system access service is provided through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the terminal of the generating unit to the transmission facilities energized at 100 kV or higher;</p> <p>(v) an aggregated generating facility that has a maximum authorized real power higher than 67.5 MW where system access service is provided through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the collector bus to the transmission facilities energized at 100 kV or higher, and excluding the generating units and the collector system feeders;</p> <p>(vi) all generating units and aggregated generating facilities where system access service is provided through a common switchyard that is directly connected to transmission facilities energized at 100 kV or higher and the generating units and aggregated generating facilities have a combined maximum authorized real power higher than 67.5 MW, including all system elements from the terminal of each generating unit and from the collector bus of each aggregated generating facility to transmission facilities energized at 100 kV or higher, and excluding the generating units and collector system feeders of each aggregated generating facility;</p> <p>(vii) a blackstart resource, including all system elements from the terminal of the blackstart resource to transmission facilities that are energized at 100 kV or higher; and</p> <p>(viii) a static or dynamic reactive power resource that is dedicated to supplying or absorbing reactive power to or from the transmission system and is</p>	<p><i>Comment # 3:</i> <i>AltaLink understand that the AESO conducted a review of all existing reliability standards using the amended Bulk Electric System definition. AltaLink requests that AESO conduct a similar review on the existing ISO rules using the amended Bulk Electric System definition.</i></p>
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	<p>energized at 100 kV or higher, and excluding the generating units and the collector system feeders;</p> <p>(vi) all generating units and aggregated generating facilities where system access service is provided through a common switchyard that is directly connected to transmission facilities energized at 100 kV or higher and the generating units and aggregated generating facilities have a combined maximum authorized real power higher than 67.5 MW, including all system elements from the terminal of each generating unit and from the collector bus of each aggregated generating facility to transmission facilities energized at 100 kV or higher, and excluding the generating units and collector system feeders of each aggregated generating facility;</p> <p>(vii) a blackstart resource, including all system elements from the terminal of the blackstart resource to transmission facilities that are energized at 100 kV or higher; and</p> <p>(viii) a static or dynamic reactive power resource that is dedicated to supplying or</p>	<p>connected:</p> <p>(a) to transmission facilities energized at 100 kV or higher;</p> <p>(b) through a dedicated transformer that is directly connected to transmission facilities energized at 100 kV or higher; or</p> <p>(c) through a non-dedicated transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher.</p>	
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	<p>absorbing reactive power to or from the transmission system and is connected:</p> <ul style="list-style-type: none"> (a) to transmission facilities energized at 100 kV or higher; (b) through a dedicated transformer that is directly connected to transmission facilities energized at 100 kV or higher; or (c) through a non-dedicated transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher. 		
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Stakeholder Comment Matrix – July 23, 2019

Consultation on Proposed new and amended ARS related definitions



Date of Request for Comment: <u>July 23, 2019</u> Period of Consultation: <u>July 23, 2019</u> through <u>August 6, 2019</u> Comments From: <u>ATCO Electric</u> Date [yyyy/mm/dd]: <u>2019/08/01</u>	Contact: <u>Alain Duguay</u> Phone: <u>587-372-1595</u> Email: <u>Alain.duguay@atco.com</u>
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Listed below is the summary description of changes for the proposed new and amended ARS related definitions. Please refer back to the Consultation Letter under the “Attachments” section to view materials related to the proposed new and amended ARS related definitions. Please place your comments/reasons for position underneath (if any).

Definitions – New		
Existing	Proposed	Stakeholder Comments and/or Alternate Proposal
No definition currently exists for use in the Alberta reliability standards	<p>“radial circuit” means an arrangement of contiguous system elements energized at 50 kV or higher that:</p> <ul style="list-style-type: none"> (a) extend from a system element on the networked transmission system in a linear or branching configuration; (b) connect to one or more of a load facility, a generating unit, or an aggregated generating facility; and (c) comprise the only circuit by which power can flow between the networked transmission system and the facilities 	

	<p>identified in item (b) under normal operating conditions, and includes an arrangement where the circuit energized at 50 kV or higher is connected to another circuit energized at 50 kV or higher, either through a switching device that is operated normally open or through facilities energized at less than 50 kV where the circuit would be a radial circuit if the connection did not exist.</p>		
No definition currently exists for use in the Alberta reliability standards	<p>“system access service” as defined in the Act means the service obtained by market participants through a connection to the transmission system, and includes access to exchange electric energy and ancillary services.</p>		
Definitions – Amended			
Existing	Proposed	Blackline of Existing and Proposed	Stakeholder Comments and/or Alternate Proposal
<p>“bulk electric system” as defined by the Regional Reliability Organization, means the electrical generation resources, transmission lines, interconnections, with neighbouring systems, and associated equipment, generally operated at voltages of one hundred (100) kV or higher; radial transmission facilities serving only load with one</p>	<p>“bulk electric system” means all system elements that are included in the following:</p> <ul style="list-style-type: none"> (i) all system elements that have all terminals energized at 100 kV or higher that are not part of a radial circuit; (ii) a radial circuit comprised of system elements that have all terminals energized at 100 kV or higher where the radial circuit connects to: <ul style="list-style-type: none"> (a) any facility included in items (iv) through (vii) 	<p>“bulk electric system” means all system elements that are included in the following:</p> <ul style="list-style-type: none"> (i) all system elements that have all terminals energized at 100 kV or higher that are not part of a radial circuit; (ii) a radial circuit comprised of system elements that have all terminals energized at 100 kV or higher where the radial circuit connects to: <ul style="list-style-type: none"> (a) any facility included in items (iv) through (vii) below; or (b) 2 or more generating resources, being generating units and aggregated generating facilities, that have a combined maximum authorized real power higher than 67.5 MW; 	<p><i>Comment #1:</i></p> <p><i>For section (ii) (a) where “any facility included in items (iv) through (vii) below, ATCO Electric would like to suggest that it be extended to include (viii). We propose a reactive power resource at the end of the radial line provides benefits not only to the load but also to the BES at which it is connected. Please consider including (viii) by looking at 754S Ksituan substation as an example in ATCO Electric’s system where this would be applicable.</i></p>

<p>(1) transmission source are generally not included in this definition.</p>	<p>below; or</p> <p>(b) 2 or more generating resources, being generating units and aggregated generating facilities, that have a combined maximum authorized real power higher than 67.5 MW;</p> <p>(iii) a transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher;</p> <p>(iv) a generating unit that has a maximum authorized real power higher than 18 MW where system access service is provided through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the terminal of the generating unit to the transmission facilities energized at 100 kV or higher;</p> <p>(v) an aggregated generating facility that has a maximum authorized real power higher than 67.5 MW where system access service is provided through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the collector bus to the transmission facilities</p>	<p>(iii) a transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher;</p> <p>(iv) a generating unit that has a maximum authorized real power higher than 18 MW where system access service is provided through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the terminal of the generating unit to the transmission facilities energized at 100 kV or higher;</p> <p>(v) an aggregated generating facility that has a maximum authorized real power higher than 67.5 MW where system access service is provided through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the collector bus to the transmission facilities energized at 100 kV or higher, and excluding the generating units and the collector system feeders;</p> <p>(vi) all generating units and aggregated generating facilities where system access service is provided through a common switchyard that is directly connected to transmission facilities energized at 100 kV or higher and the generating units and aggregated generating facilities have a combined maximum authorized real power higher than 67.5 MW, including all system elements from the terminal of each generating unit and from the collector bus of each aggregated generating facility to transmission facilities energized at 100 kV or higher, and excluding the generating units and collector system feeders of each aggregated generating facility;</p> <p>(vii) a blackstart resource, including all system elements from the terminal of the blackstart resource to transmission facilities that are energized at 100 kV or higher; and</p> <p>(viii) a static or dynamic reactive power resource that is dedicated to supplying or absorbing reactive power to or from the transmission system and is</p>	
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	<p>energized at 100 kV or higher, and excluding the generating units and the collector system feeders;</p> <p>(vi) all generating units and aggregated generating facilities where system access service is provided through a common switchyard that is directly connected to transmission facilities energized at 100 kV or higher and the generating units and aggregated generating facilities have a combined maximum authorized real power higher than 67.5 MW, including all system elements from the terminal of each generating unit and from the collector bus of each aggregated generating facility to transmission facilities energized at 100 kV or higher, and excluding the generating units and collector system feeders of each aggregated generating facility;</p> <p>(vii) a blackstart resource, including all system elements from the terminal of the blackstart resource to transmission facilities that are energized at 100 kV or higher; and</p> <p>(viii) a static or dynamic reactive power resource that is dedicated to supplying or</p>	<p>connected:</p> <p>(a) to transmission facilities energized at 100 kV or higher;</p> <p>(b) through a dedicated transformer that is directly connected to transmission facilities energized at 100 kV or higher; or</p> <p>(c) through a non-dedicated transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher.</p>	
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	<p>absorbing reactive power to or from the transmission system and is connected:</p> <ul style="list-style-type: none"> (a) to transmission facilities energized at 100 kV or higher; (b) through a dedicated transformer that is directly connected to transmission facilities energized at 100 kV or higher; or (c) through a non-dedicated transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher. 		<p><i>Comment #2:</i></p> <p><i>In reference to section (viii), the definition speaks to the reactive resource and its configuration used to connect to the BES, but it does not mention the dedicated or non-dedicated transformers themselves. This is related to a RFI sent on 2019-07-19 by ATCO Electric . Although the transformer may not have both windings >100 kV, we believe it should be part of BES definition as the transformer is an integral intermediary device between the BES and the reactive power resource itself. If the transformer is compromised for any reason, it will impact reactive power flow to and from the BES and cause system issues. We understand it is above and beyond NERC and AESO's definition, but ask the AESO to consider adding the transformer element. This directly affects PRC-005-AB1-6 as well as the protection system maintenance is performed for the purpose of protecting BES elements.</i></p>
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Stakeholder Comment Matrix – July 23, 2019

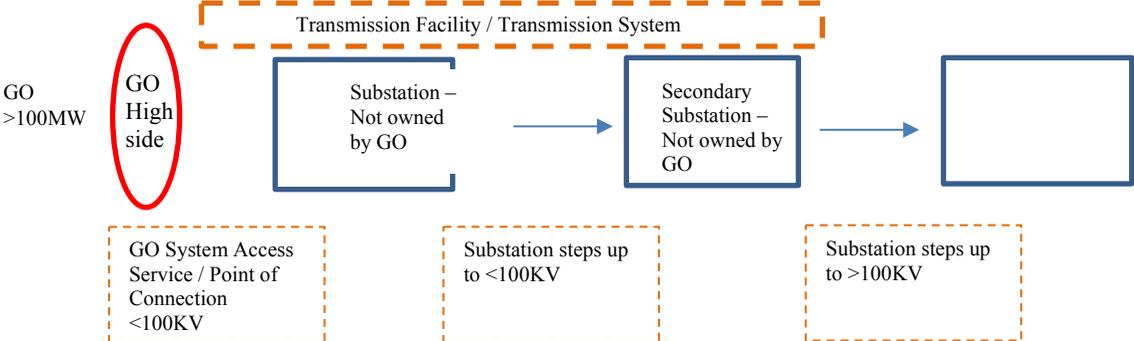
Consultation on Proposed new and amended ARS related definitions



Date of Request for Comment: <u>July 23, 2019</u> Period of Consultation: <u>July 23, 2019</u> through <u>August 6, 2019</u> Comments From: <u>Capital Power GP Holdings Inc. ("Capital Power")</u> Date [yyyy/mm/dd]: <u>2019/08/06</u>	Contact: <u>Shannon Ferdinand</u> Phone: <u>780-392-5442</u> Email: <u>SFerdinand@capitalpower.com</u>
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Listed below is the summary description of changes for the proposed new and amended ARS related definitions. Please refer back to the Consultation Letter under the "Attachments" section to view materials related to the proposed new and amended ARS related definitions. Please place your comments/reasons for position underneath (if any).

Definitions – New		
Existing	Proposed	Stakeholder Comments and/or Alternate Proposal
No definition currently exists for use in the Alberta reliability standards	<p>"radial circuit" means an arrangement of contiguous system elements energized at 50 kV or higher that:</p> <ul style="list-style-type: none"> (a) extend from a system element on the networked transmission system in a linear or branching configuration; (b) connect to one or more of a load facility, a generating unit, or an aggregated generating facility; and (c) comprise the only circuit by which power can flow between the networked transmission system and the facilities 	Capital Power has no comments.

	<p>identified in item (b) under normal operating conditions, and includes an arrangement where the circuit energized at 50 kV or higher is connected to another circuit energized at 50 kV or higher, either through a switching device that is operated normally open or through facilities energized at less than 50 kV where the circuit would be a radial circuit if the connection did not exist.</p>		
<p>No definition currently exists for use in the Alberta reliability standards</p>	<p>“system access service” as defined in the Act means the service obtained by market participants through a connection to the transmission system, and includes access to exchange electric energy and ancillary services.</p>	<p>The current AESO “point of connection” definition part (i) states: <i>a point at which electric energy is transferred between a transmission facility that is not an industrial system, and (i) the high voltage side of any aggregated generating facilities or generating unit</i></p> <p>For GO/GOPs - Capital Power’s interpretation of the proposed “system access service” definition is same as the existing “point of connection” definition part (i) for a generating unit. Please confirm if this is acceptable.</p> 	
Definitions – Amended			
Existing	Proposed	Blackline of Existing and Proposed	Stakeholder Comments and/or Alternate Proposal
<p>“bulk electric system” as defined by the Regional Reliability Organization, means the electrical</p>	<p>“bulk electric system” means all system elements that are included in the following: (i) all system elements that have all terminals energized</p>	<p>“bulk electric system” means all system elements that are included in the following: (i) all system elements that have all terminals energized at 100 kV or higher that are not part of a radial circuit;</p>	<p>In connection to part (iv) of the proposed “bulk electric system” definition, Capital Power’s interpretation is outlined below. Please confirm if this is acceptable.</p>

<p>generation resources, transmission lines, interconnections, with neighbouring systems, and associated equipment, generally operated at voltages of one hundred (100) kV or higher; radial transmission facilities serving only load with one (1) transmission source are generally not included in this definition.</p>	<p>(ii) at 100 kV or higher that are not part of a radial circuit; a radial circuit comprised of system elements that have all terminals energized at 100 kV or higher where the radial circuit connects to:</p> <p>(a) any facility included in items (iv) through (vii) below; or</p> <p>(b) 2 or more generating resources, being generating units and aggregated generating facilities, that have a combined maximum authorized real power higher than 67.5 MW;</p> <p>(iii) a transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher;</p> <p>(iv) a generating unit that has a maximum authorized real power higher than 18 MW where system access service is provided through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the terminal of the generating unit to the transmission facilities energized at 100 kV or higher;</p> <p>(v) an aggregated generating facility that has a maximum authorized real power higher than 67.5 MW where</p>	<p>(ii) a radial circuit comprised of system elements that have all terminals energized at 100 kV or higher where the radial circuit connects to:</p> <p>(a) any facility included in items (iv) through (vii) below; or</p> <p>(b) 2 or more generating resources, being generating units and aggregated generating facilities, that have a combined maximum authorized real power higher than 67.5 MW;</p> <p>(iii) a transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher;</p> <p>(iv) a generating unit that has a maximum authorized real power higher than 18 MW where system access service is provided through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the terminal of the generating unit to the transmission facilities energized at 100 kV or higher;</p> <p>(v) an aggregated generating facility that has a maximum authorized real power higher than 67.5 MW where system access service is provided through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the collector bus to the transmission facilities energized at 100 kV or higher, and excluding the generating units and the collector system feeders;</p> <p>(vi) all generating units and aggregated generating facilities where system access service is provided through a common switchyard that is directly connected to transmission facilities energized at 100 kV or higher and the generating units and aggregated generating facilities have a combined maximum authorized real power higher than 67.5 MW, including all system elements from the terminal of each generating unit and from the collector bus of each aggregated generating facility to transmission facilities energized at 100 kV or higher, and excluding the generating units</p>	<ul style="list-style-type: none"> Under the part (iv) of the proposed “bulk electric system” definition, a generating unit is <u>not</u> part of the proposed “bulk electric system” if its “system access service” is at the voltage level below 100 kV and is connected to the “transmission system” energized at the voltage level below 100 kV.
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	<p>(vi) system access service is provided through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the collector bus to the transmission facilities energized at 100 kV or higher, and excluding the generating units and the collector system feeders;</p> <p>(vii) all generating units and aggregated generating facilities where system access service is provided through a common switchyard that is directly connected to transmission facilities energized at 100 kV or higher and the generating units and aggregated generating facilities have a combined maximum authorized real power higher than 67.5 MW, including all system elements from the terminal of each generating unit and from the collector bus of each aggregated generating facility to transmission facilities energized at 100 kV or higher, and excluding the generating units and collector system feeders of each aggregated generating facility;</p> <p>(viii) a blackstart resource,</p>	<p>and collector system feeders of each aggregated generating facility;</p> <p>(vii) a blackstart resource, including all system elements from the terminal of the blackstart resource to transmission facilities that are energized at 100 kV or higher; and</p> <p>(viii) a static or dynamic reactive power resource that is dedicated to supplying or absorbing reactive power to or from the transmission system and is connected:</p> <p>(a) to transmission facilities energized at 100 kV or higher;</p> <p>(b) through a dedicated transformer that is directly connected to transmission facilities energized at 100 kV or higher; or</p> <p>(c) through a non-dedicated transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher.</p>	
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	<p>including all system elements from the terminal of the blackstart resource to transmission facilities that are energized at 100 kV or higher; and</p> <p>(viii) a static or dynamic reactive power resource that is dedicated to supplying or absorbing reactive power to or from the transmission system and is connected:</p> <ul style="list-style-type: none"> (a) to transmission facilities energized at 100 kV or higher; (b) through a dedicated transformer that is directly connected to transmission facilities energized at 100 kV or higher; or (c) through a non-dedicated transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher. 		
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Stakeholder Comment Matrix – July 23, 2019

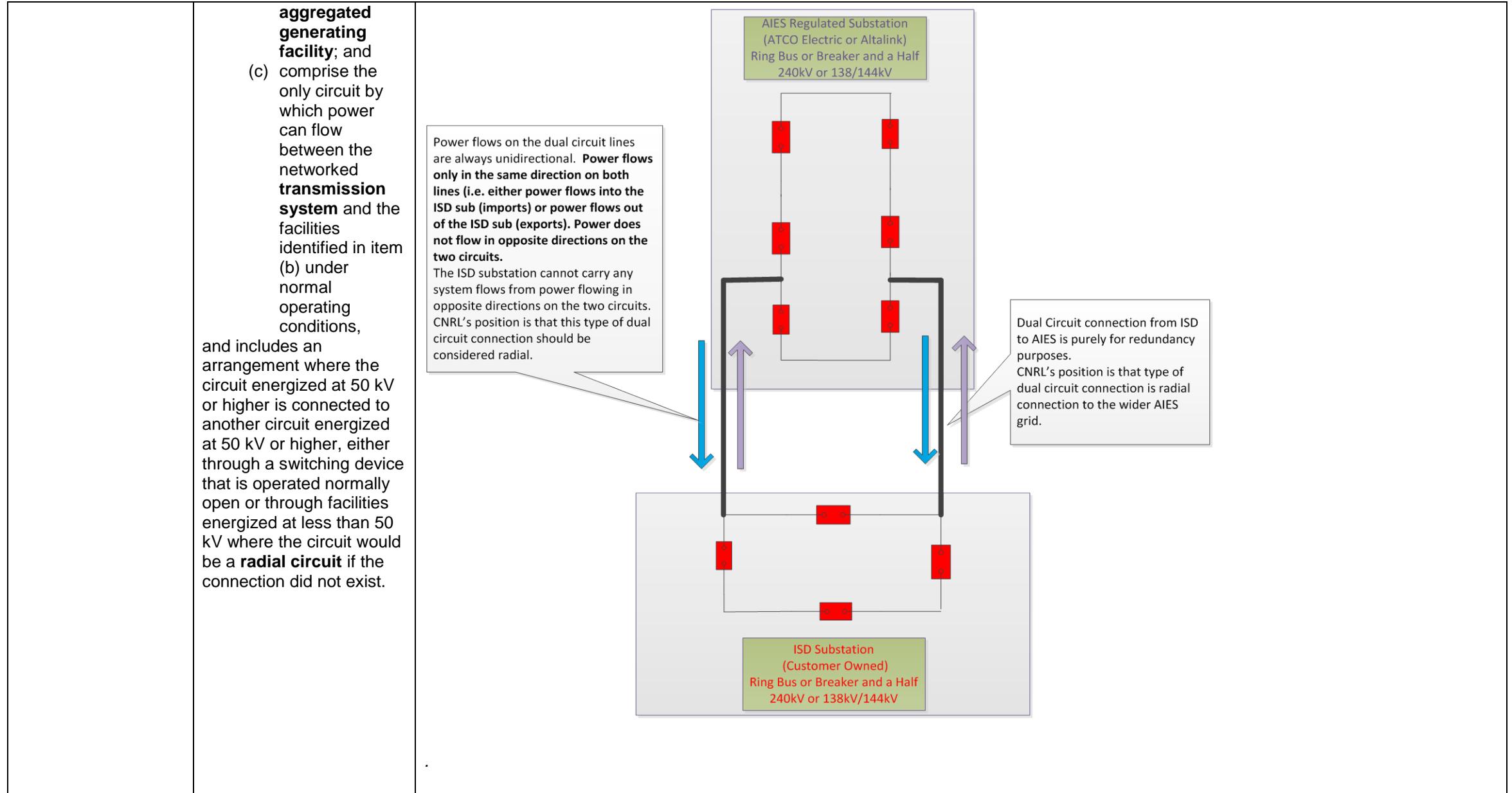
Consultation on Proposed new and amended ARS related definitions



Date of Request for Comment: <u>July 23, 2019</u>	Contact: <u>Jamie Walker</u>
Period of Consultation: <u>July 23, 2019</u> through <u>August 6, 2019</u>	Phone: <u>403-869-2537</u>
Comments From: <u>Canadian Natural Resources Ltd (CNRL)</u>	Email: <u>Jamie.walker@cnrl.com</u>
Date [yyyy/mm/dd]: <u>2019/08/06</u>	

Listed below is the summary description of changes for the proposed new and amended ARS related definitions. Please refer back to the Consultation Letter under the “Attachments” section to view materials related to the proposed new and amended ARS related definitions. Please place your comments/reasons for position underneath (if any).

Definitions – New		
Existing	Proposed	Stakeholder Comments and/or Alternate Proposal
No definition currently exists for use in the Alberta reliability standards	<p>“radial circuit” means an arrangement of contiguous system elements energized at 50 kV or higher that:</p> <p>(a) extend from a system element on the networked transmission system in a linear or branching configuration;</p> <p>(b) connect to one or more of a load facility, a generating unit, or an</p>	<p><i>Comment # 1: CNRL understands that the proposed definition sufficiently represent different radial connection arrangement between typical distribution facility interconnection with transmission but it does not take in to account some following specific arrangements many industrial facilities have to improve reliability:</i></p> <ul style="list-style-type: none"> - <i>(c) Industrial facilities are connected to the transmission via a dual circuit, a second parallel line is added for the purpose of improving system reliability while any single line is capable of handling full load and fault current. These facilities should also be considered radial.</i> - <i>(c) Industrial facilities are connected to the transmission via dual circuit where the second circuit is purely for redundancy purposes. The flow of power is always unidirectional on the two circuits (i.e. power always flows in the same direction on the dual circuits). CNRL believe that this type of dual circuit connection should be considered radial since the power flow is always in the same direction on the two circuits and the 2nd circuit is purely for redundancy purposes.</i>



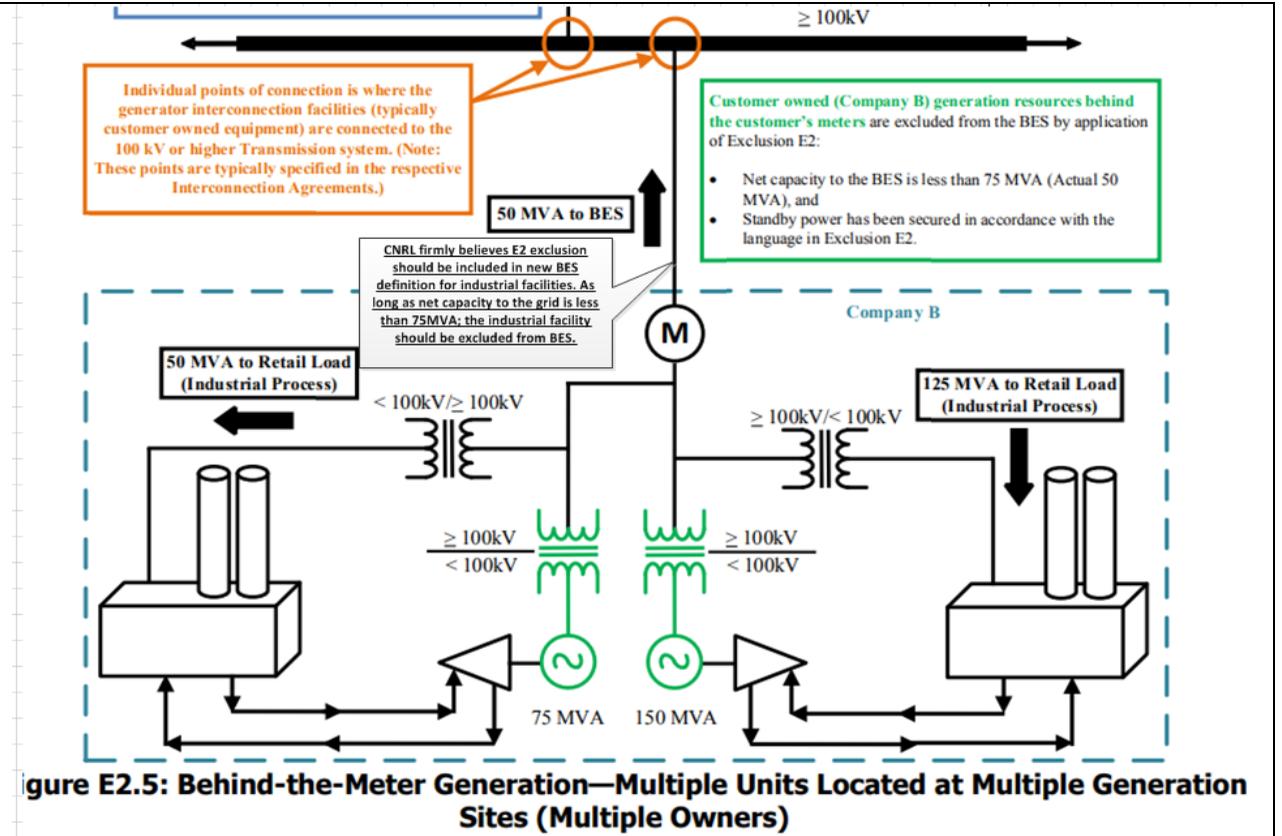
		<p>CNRL Requests:</p> <ol style="list-style-type: none"> Point (b) should be modified to include “dual parallel circuits provided any single line is capable of handling 100% of load and that power cannot flow in opposite directions on the two circuits simulataneously”. Point (b) should be modified to include “connect to one or more of a load facility, one or more generating units with net capacity to the BES of less than a (suitable MVA limit), or an aggregated generating facility”; and
<p>No definition currently exists for use in the Alberta reliability standards</p>	<p>“system access service” as defined in the Act means the service obtained by market participants through a connection to the transmission system, and includes access to exchange electric energy and ancillary services.</p>	

Definitions – Amended

Existing	Proposed	Blackline of Existing and Proposed	Stakeholder Comments and/or Alternate Proposal
<p>“bulk electric system” as defined by the Regional Reliability Organization, means the electrical generation resources, transmission lines, interconnections, with neighbouring systems, and associated equipment, generally operated at voltages of one hundred (100) kV or higher; radial</p>	<p>“bulk electric system” means all system elements that are included in the following:</p> <ol style="list-style-type: none"> all system elements that have all terminals energized at 100 kV or higher that are not part of a radial circuit; a radial circuit comprised of system elements that have all terminals energized 	<p>“bulk electric system” as defined by the Regional Reliability Organization, means <u>all system elements that are included in the following:</u></p> <ol style="list-style-type: none"> <u>all system elements that have all terminals energized at 100 kV or higher that are not part of a radial circuit;</u> <u>a radial circuit comprised of system elements that have all terminals energized at 100 kV or higher where the electrical generation radial circuit</u> 	<p><i>Comment # 1: Insert Comments / Reason for Position (if any)</i> NERC E2 Exclusion from BES: “E2: A generating unit or multiple generating units on the customer’s side of the retail meter that serve all or part of the retail customer Load with electric energy on the customer’s side of the retail meter if: (i) the net capacity provided to the BES does not exceed 75 MVA, and (ii) standby, back-up, and maintenance power services are provided to the generating unit or multiple generating units, or to the retail Load by a Balancing Authority, or provided pursuant to a binding obligation with a Generator Owner or Generator Operator, or under terms approved by the applicable regulatory authority.”</p> <p>CNRL understands that large industrial facilities that have distribution embedded generation primarily to support internal load, these industrial facilities should be excluded from BES as per E2 exemption specified in the NERC definition. These facilities have no impact on transmission reliability due to their limited net exports/imports to the grid and bringing them under the ARS umbrella complicates routine industrial process operation and does not improve reliability.</p> <p>Essentially with commercial and technical arrangements that the industrial facilities have with the AESO,</p>

<p>transmission facilities serving only load with one (1) transmission source are generally not included in this definition.</p>	<p>at 100 kV or higher where the radial circuit connects to:</p> <ul style="list-style-type: none"> (a) any facility included in items (iv) through (vii) below; or (b) 2 or more generating resources, being generating units and aggregated generating facilities, that have a combined maximum authorized real power higher than 67.5 MW; (iii) a transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher; (iv) a generating unit that has a maximum authorized real power higher than 18 MW where system access service is provided through a switchyard that is directly connected to transmission 	<p><u>connects to:</u></p> <ul style="list-style-type: none"> <u>(a) any facility included in items (iv) through (vii) below; or</u> <u>(b) 2 or more generating resources, being generating units and aggregated generating facilities, that have a combined maximum authorized real power higher than 67.5 MW;</u> <u>(iii) a transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher;</u> <u>(iv) a generating unit that has a maximum authorized real power higher than 18 MW where system access service is provided through a switchyard that is directly connected to transmission lines, interconnections, with neighbouring systems, and associated equipment, generally operated at voltages of one hundred (100) kV or higher; radial facilities energized at 100 kV or higher, including all system elements from the terminal of the generating unit to the transmission facilities serving only load with one (1) energized at 100 kV or higher;</u> 	<p>the reliability impact to the wider AIES of a typical industrial facility with onsite heat integrated generation is less severe than any typical distribution load. This aspect is not taken into consideration when E2 exception is removed which essentially brings many industrial facilities under unnecessary ARS obligations and complicates the applicability assessment process of most standards.</p> <p>CNRL requests that NERC E2 exemption be retained in the BES definition and industrial facilities with distribution embedded generation with net capacity to grid of 75 MVA be considered exempt from BES. CNRL firmly believes that BES NERC E2 exclusion should be retained in the new BES definition from the AESO. CNRL states that adopting new NERC BES definition incl. applicable exclusions will improve process safety within complex industrial facilities and reduce compliance costs for industrial facilities. Industrial facilities with behind the fence heat integrated generation are designed to produce electricity to primarily supply internal loads.</p>
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	<p>facilities energized at 100 kV or higher, including all system elements from the terminal of the generating unit to the transmission facilities energized at 100 kV or higher; an aggregated generating facility that has a maximum authorized real power higher than 67.5 MW where system access service is provided through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the collector bus to the transmission facilities energized at 100 kV or higher, and excluding the generating units and the collector system feeders;</p> <p>(vi) all generating units and aggregated generating facilities where system access service is provided through a common</p>	<p>(v) <u>an aggregated generating facility that has a maximum authorized real power higher than 67.5 MW where system access service is provided through a switchyard that is directly connected to transmission source are generally not included in this definition. facilities energized at 100 kV or higher, including all system elements from the collector bus to the transmission facilities energized at 100 kV or higher, and excluding the generating units and the collector system feeders;</u></p> <p>(vi) <u>all generating units and aggregated generating facilities where system access service is provided through a common switchyard that is directly connected to transmission facilities energized at 100 kV or higher and the generating units and aggregated generating facilities have a combined maximum authorized real power higher than 67.5 MW, including all system elements from the terminal of each generating unit and from the collector bus of each</u></p>
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	<p>switchyard that is directly connected to transmission facilities energized at 100 kV or higher and the generating units and aggregated generating facilities have a combined maximum authorized real power higher than 67.5 MW, including all system elements from the terminal of each generating unit and from the collector bus of each aggregated generating facility to transmission facilities energized at 100 kV or higher, and excluding the generating units and collector system feeders of each aggregated generating facility;</p> <p>(vii) a blackstart resource, including all system elements from the terminal of the blackstart resource to transmission facilities that are</p>	<p>aggregated generating facility to transmission facilities energized at 100 kV or higher, and excluding the generating units and collector system feeders of each aggregated generating facility;</p> <p>(vii) a blackstart resource, including all system elements from the terminal of the blackstart resource to transmission facilities that are energized at 100 kV or higher; and</p> <p>(viii) a static or dynamic reactive power resource that is dedicated to supplying or absorbing reactive power to or from the transmission system and is connected:</p> <p>(a) to transmission facilities energized at 100 kV or higher;</p> <p>(b) through a dedicated transformer that is directly connected to transmission facilities energized at 100 kV or higher; or</p> <p>(c) through a non-dedicated transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher.</p>	
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	<p>energized at 100 kV or higher; and (viii) a static or dynamic reactive power resource that is dedicated to supplying or absorbing reactive power to or from the transmission system and is connected: (a) to transmission facilities energized at 100 kV or higher; (b) through a dedicated transformer that is directly connected to transmission facilities energized at 100 kV or higher; or (c) through a non-dedicated transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher.</p>		
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Stakeholder Comment Matrix – July 23, 2019

Consultation on Proposed new and amended ARS related definitions



Date of Request for Comment: <u>July 23, 2019</u>	Contact: <u>Rajveen Gill</u>
Period of Consultation: <u>July 23, 2019</u> through <u>August 6, 2019</u>	Phone: <u>780-412-3435</u>
Comments From: <u>EPCOR Distribution & Transmission Inc.</u>	Email: <u>rgill@epcor.com</u>
Date [yyyy/mm/dd]: <u>2019-08-06</u>	

Listed below is the summary description of changes for the proposed new and amended ARS related definitions. Please refer back to the Consultation Letter under the “Attachments” section to view materials related to the proposed new and amended ARS related definitions. Please place your comments/reasons for position underneath (if any).

Definitions – New		
Existing	Proposed	Stakeholder Comments and/or Alternate Proposal
No definition currently exists for use in the Alberta reliability standards	<p>“radial circuit” means an arrangement of contiguous system elements energized at 50 kV or higher that:</p> <ul style="list-style-type: none"> (a) extend from a system element on the networked transmission system in a linear or branching configuration; (b) connect to one or more of a load facility, a generating unit, or an aggregated generating facility; and (c) comprise the only circuit by which power can flow between the networked transmission system and the facilities 	<ol style="list-style-type: none"> 1. Given the significance of these changes, EDTI believes that changes to definitions such as BES and radial are better addressed in AESO tariff proceedings rather than ad hoc consultations. 2. Does the AESO anticipate any changes to transmission project cost classifications with this proposed definition? 3. Why is this definition of radial circuit for ARS different from what has been proposed in the AESO’s 2018 tariff (section 4.2)? 4. Can the AESO provide the rationale behind the inclusion of “...an arrangement where the circuit energized at 50 kV or higher is connected to another circuit energized at 50 kV or higher, either through a switching device that is operated normally open or through facilities energized at less than 50 kV where the circuit would be a radial circuit if the connection did not exist.” in part (c)?

	<p>identified in item (b) under normal operating conditions, and includes an arrangement where the circuit energized at 50 kV or higher is connected to another circuit energized at 50 kV or higher, either through a switching device that is operated normally open or through facilities energized at less than 50 kV where the circuit would be a radial circuit if the connection did not exist.</p>		
No definition currently exists for use in the Alberta reliability standards	<p>“system access service” as defined in the Act means the service obtained by market participants through a connection to the transmission system, and includes access to exchange electric energy and ancillary services.</p>		
Definitions – Amended			
Existing	Proposed	Blackline of Existing and Proposed	Stakeholder Comments and/or Alternate Proposal
<p>“bulk electric system” as defined by the Regional Reliability Organization, means the electrical generation resources, transmission lines, interconnections, with neighbouring systems, and associated equipment, generally operated at voltages of one hundred (100) kV or higher; radial transmission facilities serving only load with one</p>	<p>“bulk electric system” means all system elements that are included in the following:</p> <ul style="list-style-type: none"> (i) all system elements that have all terminals energized at 100 kV or higher that are not part of a radial circuit; (ii) a radial circuit comprised of system elements that have all terminals energized at 100 kV or higher where the radial circuit connects to: <ul style="list-style-type: none"> (a) any facility included in items (iv) through (vii) 	<p>“bulk electric system” means all system elements that are included in the following:</p> <ul style="list-style-type: none"> (i) all system elements that have all terminals energized at 100 kV or higher that are not part of a radial circuit; (ii) a radial circuit comprised of system elements that have all terminals energized at 100 kV or higher where the radial circuit connects to: <ul style="list-style-type: none"> (a) any facility included in items (iv) through (vii) below; or (b) 2 or more generating resources, being generating units and aggregated generating facilities, that have a combined maximum authorized real power higher than 67.5 MW; 	<ol style="list-style-type: none"> 1. Given the significance of these changes, EDTI believes that changes to definitions such as BES and radial are better addressed in AESO tariff proceedings rather than ad hoc consultations. 2. Does the AESO anticipate any changes to transmission project cost classifications with this proposed definition? 3. Please clarify “direct connection” and “common switchyard” in parts (iv), (v), and (vi). 4. It is not clear how the presence of a third winding (whose voltage is ≥100kV) on a non-dedicated

<p>(1) transmission source are generally not included in this definition.</p>	<p>below; or</p> <p>(b) 2 or more generating resources, being generating units and aggregated generating facilities, that have a combined maximum authorized real power higher than 67.5 MW;</p> <p>(iii) a transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher;</p> <p>(iv) a generating unit that has a maximum authorized real power higher than 18 MW where system access service is provided through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the terminal of the generating unit to the transmission facilities energized at 100 kV or higher;</p> <p>(v) an aggregated generating facility that has a maximum authorized real power higher than 67.5 MW where system access service is provided through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the collector bus to the transmission facilities</p>	<p>(iii) a transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher;</p> <p>(iv) a generating unit that has a maximum authorized real power higher than 18 MW where system access service is provided through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the terminal of the generating unit to the transmission facilities energized at 100 kV or higher;</p> <p>(v) an aggregated generating facility that has a maximum authorized real power higher than 67.5 MW where system access service is provided through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the collector bus to the transmission facilities energized at 100 kV or higher, and excluding the generating units and the collector system feeders;</p> <p>(vi) all generating units and aggregated generating facilities where system access service is provided through a common switchyard that is directly connected to transmission facilities energized at 100 kV or higher and the generating units and aggregated generating facilities have a combined maximum authorized real power higher than 67.5 MW, including all system elements from the terminal of each generating unit and from the collector bus of each aggregated generating facility to transmission facilities energized at 100 kV or higher, and excluding the generating units and collector system feeders of each aggregated generating facility;</p> <p>(vii) a blackstart resource, including all system elements from the terminal of the blackstart resource to transmission facilities that are energized at 100 kV or higher; and</p> <p>(viii) a static or dynamic reactive power resource that is dedicated to supplying or absorbing reactive power to or from the transmission system and is</p>	<p>transformer (with a high-side voltage that is $\geq 100\text{kV}$ and a low-side winding $< 100\text{kV}$ which is connected to a capacitor bank) changes whether the capacitor bank is part of the BES or not.</p> <p>5. EDTI finds the proposed format of BES hard to interpret and apply. EDTI suggests a re-write or alternate presentation of the BES definition (i.e. a matrix or decision workflow) to better clarify the requirements.</p> <p>6. Is the AESO able to provide a map of what is to be included in the BES?</p> <p>7. ARS TPL-002 System Performance Following Loss of a Single BES Element applies to transmission facilities rated 69 kV and above. The proposed BES definition appears to apply only transmission facilities rated 100 kV and above. Does the AESO see an inconsistency between TPL-002 and the proposed BES definition?</p> <p>8. Please explain why the proposed BES definition ratings are not aligned with NERC?</p> <p>9. Can the AESO clarify the reasoning behind excluding the exemption of the NERC Local Area Network definition?</p> <p>10. Is the AESO able to provide a comparison of the application of LAN in Edmonton and Calgary's service territories with the proposed BES definition?</p>
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	<p>energized at 100 kV or higher, and excluding the generating units and the collector system feeders;</p> <p>(vi) all generating units and aggregated generating facilities where system access service is provided through a common switchyard that is directly connected to transmission facilities energized at 100 kV or higher and the generating units and aggregated generating facilities have a combined maximum authorized real power higher than 67.5 MW, including all system elements from the terminal of each generating unit and from the collector bus of each aggregated generating facility to transmission facilities energized at 100 kV or higher, and excluding the generating units and collector system feeders of each aggregated generating facility;</p> <p>(vii) a blackstart resource, including all system elements from the terminal of the blackstart resource to transmission facilities that are energized at 100 kV or higher; and</p> <p>(viii) a static or dynamic reactive power resource that is dedicated to supplying or</p>	<p>connected:</p> <p>(a) to transmission facilities energized at 100 kV or higher;</p> <p>(b) through a dedicated transformer that is directly connected to transmission facilities energized at 100 kV or higher; or</p> <p>(c) through a non-dedicated transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher.</p>	
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	<p>absorbing reactive power to or from the transmission system and is connected:</p> <ul style="list-style-type: none"> (a) to transmission facilities energized at 100 kV or higher; (b) through a dedicated transformer that is directly connected to transmission facilities energized at 100 kV or higher; or (c) through a non-dedicated transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher. 		
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Stakeholder Comment Matrix – July 23, 2019

Consultation on Proposed new and amended ARS related definitions



Date of Request for Comment: <u>July 23, 2019</u>	Contact: <u>Bharat Vyas</u>
Period of Consultation: <u>July 23, 2019</u> through <u>August 6, 2019</u>	Phone: <u>780-715-2628, 587-646-4537</u>
Comments From: <u>Fort Hills Energy Corporation</u>	Email: <u>bvyas@suncor.com</u>
Date [yyyy/mm/dd]: <u>2019/08/01</u>	

Listed below is the summary description of changes for the proposed new and amended ARS related definitions. Please refer back to the Consultation Letter under the “Attachments” section to view materials related to the proposed new and amended ARS related definitions. Please place your comments/reasons for position underneath (if any).

Definitions – New		
Existing	Proposed	Stakeholder Comments and/or Alternate Proposal
No definition currently exists for use in the Alberta reliability standards	<p>“radial circuit” means an arrangement of contiguous system elements energized at 50 kV or higher that:</p> <ul style="list-style-type: none"> (a) extend from a system element on the networked transmission system in a linear or branching configuration; (b) connect to one or more of a load facility, a generating unit, or an aggregated generating facility; and (c) comprise the only circuit by which power can flow between the networked transmission system and the facilities 	<p><i>Comment # 1: Insert Comments / Reason for Position (if any)</i></p> <p>Fort Hills Energy Corporation (FHEC) supports the AESO’s proposal to define the term “radial circuit” in order to provide clarity regarding facilities that are radially connected to a networked transmission system. However, FHEC is opposed to the AESO’s proposed definition of this term on the grounds that it is technically deficient and not in the public interest.</p> <p>The AESO’s proposed definition of “radial circuit” may limit its application to only those facilities that are connected to the networked transmission system via a single (only one) transmission circuit, but exclude those that are connected through a single transmission line with multiple circuits, or multiple transmission lines with multiple circuits that terminate at the same electrical node at both ends which provide the only path for power flow between the two nodes.</p> <p>As an example, a load initially connected radially to the networked transmission system through a single circuit may later add a parallel circuit to the transmission line (tower) or another transmission line for redundancy to improve reliability of supply. In this case, the load is still radially connected to the networked transmission system and hence will remain a “radial load”. The number of circuits or lines that connect the load to the networked transmission system does not make any difference to the classification of the load being “radially” fed from the network.</p> <p>This connection scenario can be extended to the connections between the networked transmission system and groups of</p>

	<p>identified in item (b) under normal operating conditions, and includes an arrangement where the circuit energized at 50 kV or higher is connected to another circuit energized at 50 kV or higher, either through a switching device that is operated normally open or through facilities energized at less than 50 kV where the circuit would be a radial circuit if the connection did not exist.</p>	<p>facilities or industrial complex, such as FHEC which employs a redundant connection to its ISD to improve reliability. This redundant connection does not provide alternative paths for power flow in and out of the FHEC complex.</p> <p>Accordingly, FHEC requests that the AESO explain whether the proposed definition of “radial circuit” would elevate FHEC from a “low” to “medium” criticality under relevant CIP rules because of this redundant circuit. FHEC further requests that the AESO update its relevant ID (#2016-006RS) to provide examples of what connection configurations are considered radial versus non-radial.</p> <p>FHEC submits that its current configuration is generally regarded as a single system element connection despite its redundant connection configuration, since both circuits terminate at the same nodes at both ends. This interpretation is consistent with the intent of the defined term “radial circuit” in AESO ID #2016-006RS, specifically the phrase “which is the only circuit for power to flow between the networked transmission system and the facilities of one or more market participants under normal operating conditions...”. This interpretation is also consistent with the common understanding of the term “radial circuit” including the consistent use of this term by Electric Reliability Organizations such as NERC and WECC.</p> <p>FHEC submits that deviating from the commonly understood and commonly used meaning of “radially connected” (i.e. to restrict the meaning to single circuit connections) irrespective of the overall connection scheme may impose significant direct and indirect costs for affected market participants, both in regards to the initial implementation of requirements as well as ongoing personnel and compliance costs.</p> <p>FHEC also notes that the AESO has provided no basis to date (beyond a desire to provide clarity and simplicity) for this potential departure from the general technical and engineering understanding of this term used by other regional reliability councils and power system planners.</p> <p>FHEC further notes that the AESO has not demonstrated that a redundant connection in an otherwise radial configuration poses any unique or specific reliability risk to the BES. Further, the AESO has not demonstrated that the potential adoption of this particular interpretation alleviates any specific reliability risk to the BES, either in FHEC’s case or in respect of any other market participant. A conclusion that a redundant connection is inherently non-radial may appear arbitrary in light of the fact that such interpretation is inconsistent with common usage, in light of the fact that such interpretation could impose significant costs on affected market participants, and in light of the fact that relevant risks have neither been identified nor alleviated by such interpretation.</p> <p>Accordingly, FHEC proposes the following in order to accommodate the above radial connection scenarios. FHEC proposes that the term “radial circuit” be revised to “radial connection”, a term that is frequently referenced in Alberta’s Reliability Standards such as CIP-002-AB05.1. FHEC also proposes that the definition be revised to make all references to “circuit” potentially plural (circuit(s)). In other words, FHEC proposes that “(s)” be added to all references to circuit, in the following manner:</p> <p>“radial connection” [or “radial circuit(s)”] means an arrangement of contiguous system elements energized at 50 kV or higher that:</p> <p>(a) extend from a system element on the networked transmission system in a linear or branching configuration;</p>
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		(b) connect to one or more of a load facility, a generating unit , or an aggregated generating facility ; and (c) comprise the only circuit(s) by which power can flow between the networked transmission system and the facilities identified in item (b) under normal operating conditions, and includes an arrangement where the circuit energized at 50 kV or higher is connected to another circuit(s) energized at 50 kV or higher, either through a switching device that is operated normally open or through facilities energized at less than 50 kV where the circuit(s) would be a radial connection [or radial circuit(s)] if the connection did not exist.	
No definition currently exists for use in the Alberta reliability standards	“system access service” as defined in the Act means the service obtained by market participants through a connection to the transmission system , and includes access to exchange electric energy and ancillary services .		
Definitions – Amended			
Existing	Proposed	Blackline of Existing and Proposed	Stakeholder Comments and/or Alternate Proposal
“bulk electric system” as defined by the Regional Reliability Organization, means the electrical generation resources, transmission lines, interconnections , with neighbouring systems , and associated equipment, generally operated at voltages of one hundred (100) kV or higher; radial transmission facilities serving only load with one (1) transmission source are generally not included in this definition.	“bulk electric system” means all system elements that are included in the following: (i) all system elements that have all terminals energized at 100 kV or higher that are not part of a radial circuit ; (ii) a radial circuit comprised of system elements that have all terminals energized at 100 kV or higher where the radial circuit connects to: (a) any facility included in items (iv) through (vii) below; or (b) 2 or more generating resources, being generating units and aggregated generating facilities , that have a combined maximum	“bulk electric system” means all system elements that are included in the following: (i) all system elements that have all terminals energized at 100 kV or higher that are not part of a radial circuit ; (ii) a radial circuit comprised of system elements that have all terminals energized at 100 kV or higher where the radial circuit connects to: (a) any facility included in items (iv) through (vii) below; or (b) 2 or more generating resources, being generating units and aggregated generating facilities , that have a combined maximum authorized real power higher than 67.5 MW; (iii) a transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher; (iv) a generating unit that has a maximum authorized real power higher than 18 MW where system access service is provided through a switchyard that is directly connected to transmission facilities	<i>Comment # 1: Insert Comments / Reason for Position (if any)</i> Comments from above sections are applicable to eventual definition of “bulk electric system”.

	<p>authorized real power higher than 67.5 MW;</p> <p>(iii) a transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher;</p> <p>(iv) a generating unit that has a maximum authorized real power higher than 18 MW where system access service is provided through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the terminal of the generating unit to the transmission facilities energized at 100 kV or higher;</p> <p>(v) an aggregated generating facility that has a maximum authorized real power higher than 67.5 MW where system access service is provided through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the collector bus to the transmission facilities energized at 100 kV or higher, and excluding the generating units and the collector system feeders;</p> <p>(vi) all generating units and aggregated generating facilities where system access service is provided through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the terminal of the generating unit to the transmission facilities energized at 100 kV or higher, and excluding the generating units and the collector system feeders;</p>	<p>energized at 100 kV or higher, including all system elements from the terminal of the generating unit to the transmission facilities energized at 100 kV or higher;</p> <p>(v) an aggregated generating facility that has a maximum authorized real power higher than 67.5 MW where system access service is provided through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the collector bus to the transmission facilities energized at 100 kV or higher, and excluding the generating units and the collector system feeders;</p> <p>(vi) all generating units and aggregated generating facilities where system access service is provided through a common switchyard that is directly connected to transmission facilities energized at 100 kV or higher and the generating units and aggregated generating facilities have a combined maximum authorized real power higher than 67.5 MW, including all system elements from the terminal of each generating unit and from the collector bus of each aggregated generating facility to transmission facilities energized at 100 kV or higher, and excluding the generating units and collector system feeders of each aggregated generating facility;</p> <p>(vii) a blackstart resource, including all system elements from the terminal of the blackstart resource to transmission facilities that are energized at 100 kV or higher; and</p> <p>(viii) a static or dynamic reactive power resource that is dedicated to supplying or absorbing reactive power to or from the transmission system and is connected:</p> <p>(a) to transmission facilities energized at 100 kV or higher;</p> <p>(b) through a dedicated transformer that is directly connected to transmission facilities energized at 100 kV or higher; or</p> <p>(c) through a non-dedicated transformer that has its</p>	
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	<p>access service is provided through a common switchyard that is directly connected to transmission facilities energized at 100 kV or higher and the generating units and aggregated generating facilities have a combined maximum authorized real power higher than 67.5 MW, including all system elements from the terminal of each generating unit and from the collector bus of each aggregated generating facility to transmission facilities energized at 100 kV or higher, and excluding the generating units and collector system feeders of each aggregated generating facility;</p> <p>(vii) a blackstart resource, including all system elements from the terminal of the blackstart resource to transmission facilities that are energized at 100 kV or higher; and</p> <p>(viii) a static or dynamic reactive power resource that is dedicated to supplying or absorbing reactive power to or from the transmission system and is connected:</p> <p>(a) to transmission facilities energized at 100 kV or higher;</p> <p>(b) through a dedicated</p>	<p>primary terminal and at least one secondary terminal energized at 100 kV or higher.</p>	
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	<p>transformer that is directly connected to transmission facilities energized at 100 kV or higher; or</p> <p>(c) through a non-dedicated transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher.</p>		
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June 17, 2020

To: Market Participants and Other Interested Parties (“Stakeholders”)

Re: **Alberta Electric System Operator (“AESO”) Reply to Stakeholder Comments on**

- 1) **Proposed new “radial circuit”;**
- 2) **Proposed new “system access service”;** and
- 3) **Proposed amended “bulk electric system”**

(collectively referred to as “new and amended ARS-related definitions”)

On July 23, 2019, the AESO issued the [Consultation Letter for Proposed New and Amended Alberta Reliability Standard Definitions](#) regarding proposed new and amended ARS-related definitions and requested Stakeholders comments on the same.

AESO Reply to Stakeholder Comments

On August 8, 2019, the AESO posted written comments received regarding proposed new and amended ARS-related definitions. The AESO’s replies to those comments, including the rationale or basis for the AESO’s position, are set out in the attached *Stakeholder Comment and AESO Replies Matrix*.

The AESO has made amendments to the proposed amended “bulk electric system” definition in response to comments received, which are reflected in the attached blackline.

In addition, in response to concerns raised by Stakeholders, the AESO is now contemplating a revision to CIP-002-AB-5.1, *Cyber Security – BES Cyber System Categorization* (“CIP-002-AB-5.1”), which may include adopting the proposed NERC CIP-002-5.1a should it be approved by FERC.

Forwarding of the Final Proposed new and amended ARS-related definitions

Pursuant to Section 19 of the *Transmission Regulation*, the AESO expects to forward the proposed new and amended ARS-related definitions to the Alberta Utilities Commission (“Commission”) by July 6, 2020, with the AESO’s recommendation that the Commission approve proposed new and amended ARS-related definitions.

The new and amended ARS-related definitions are proposed to become effective upon approval by the Commission.

Attachments to AESO Reply Letter

The following documents are attached:

1. [Stakeholder Comment and AESO Replies Matrix](#) on proposed new and amended ARS-related definitions; and
2. [Blackline](#) and [clean](#) copies of proposed new and amended ARS-related definitions.



If you have any questions, please contact the undersigned.

Sincerely,

"Melissa Mitchell-Moisson"

Melissa Mitchell-Moisson
Regulatory Administrator
Phone: 403-539-2948
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Attachments

Stakeholder Comment and AESO Replies Matrix – July 23, 2019



Proposed new and amended ARS-related definitions

Date of Request for Comment:	<u>July 23, 2019</u>
Period of Consultation:	<u>July 23, 2019</u> through <u>August 6, 2019</u>

Definitions – New			
Existing	Proposed	Stakeholder Comments and/or Alternate Proposal	AESO Replies
No definition currently exists for use in the Alberta reliability standards	<p>“radial circuit” means an arrangement of contiguous system elements energized at 50 kV or higher that:</p> <p>(a) extend from a system element on the networked transmission system in a linear or branching configuration;</p> <p>(b) connect to one or more of a load facility, a generating unit, or an aggregated generating facility; and</p> <p>(c) comprise the only</p>	<p>AltaLink Management Ltd. (“AltaLink”)</p> <p>1. AltaLink notes that the use of 50kV, while in alignment with NERC, does not align with the definition of transmission facilities in the Electric Utilities Act. While practically this may not cause any confusion, it does create a potential gap.</p>	<p>1. The AESO acknowledges that the use of 50 kV for the definition of radial circuit is not the same as the 25 kV set for transmission facilities in the <i>Electric Utilities Act</i>. However, the AESO is of the opinion that it is appropriate to maintain alignment with NERC in this instance.</p>
		<p>Canadian Natural Resources Limited (“CNRL”)</p> <p>2. CNRL understands that the proposed definition sufficiently represent different radial connection arrangement between typical distribution facility interconnection with transmission but it does not take in to account some following specific arrangements many industrial facilities have to improve reliability:</p> <p>- (c) <i>Industrial facilities are connected to the transmission via a dual circuit, a second parallel line is added for the purpose of improving system reliability while any single line is capable of handling full load and fault current. These facilities should also be considered radial.</i></p> <p>- (c) <i>Industrial facilities are connected to the transmission via dual circuit where the second circuit is purely for redundancy purposes. The flow of power is always unidirectional on the two circuits (i.e. power always flows in the same direction on the dual circuits). CNRL believe that this type of dual circuit connection should be considered radial since the power flow is always in the same direction on the two circuits and the 2nd circuit is purely for redundancy purposes.</i></p>	<p>2. The AESO has assessed the NERC guidance information on the application of radial circuits in the NERC BES definition and the AESO is of the opinion that maintaining consistency with the NERC guidance information is appropriate.</p> <p>The AESO generally considers the size of the generating unit or aggregated generating facility to be the primary consideration for bulk electric system inclusion rather than the net supply to the transmission system. A large generating unit or aggregated generating facility may significantly impact the reliable operation of the bulk electric system by causing a large instantaneous change in power flow on the system, regardless of the size of its on-site load.</p> <p>Even though the AESO does not consider the circuit configuration described as being a radial circuit, it does recognize that these types of configurations should be considered when</p>

	<p>circuit by which power can flow between the networked transmission system and the facilities identified in item (b) under normal operating conditions, and includes an arrangement where the circuit energized at 50 kV or higher is connected to another circuit energized at 50 kV or higher, either through a switching device that is operated normally open or through facilities energized at less than 50 kV where the circuit would be a radial circuit if the connection did not exist.</p>	<p>Power flows on the dual circuit lines are always unidirectional. Power flows only in the same direction on both lines (i.e. either power flows into the ISD sub (imports) or power flows out of the ISD sub (exports). Power does not flow in opposite directions on the two circuits. The ISD substation cannot carry any system flows from power flowing in opposite directions on the two circuits. CNRL's position is that this type of dual circuit connection should be considered radial.</p> <p>Dual Circuit connection from ISD to AIES is purely for redundancy purposes. CNRL's position is that type of dual circuit connection is radial connection to the wider AIES grid.</p> <p>AIES Regulated Substation (ATCO Electric or Altalink) Ring Bus or Breaker and a Half 240kV or 138/144kV</p> <p>ISD Substation (Customer Owned) Ring Bus or Breaker and a Half 240kV or 138kV/144kV</p> <p>CNRL Requests: 3. Point (b) should be modified to include “dual parallel circuits provided any single line is capable of handling 100% of load and that power cannot flow in opposite directions on the two circuits simulataneously”.</p> <p>4. Point (b) should be modified to include “connect to one or more of a load facility, one or more generating units with net capacity to the BES of less than a (suitable MVA limit), or an aggregated generating facility”;</p>	<p>developing the applicability section of reliability standards. Where appropriate, the AESO adjusts the original NERC applicability to meet the needs of the Alberta system.</p> <p>If a market participant has reason to think that it should not be subject to a proposed new or amended reliability standard, then the AESO encourages market participants to comment on the applicability section of the proposed reliability standards during consultation.</p> <p>3. The AESO does not agree to include the proposed language in point (b) of the definition of “radial circuit”. Please refer to AESO reply #2.</p> <p>4. The AESO does not agree to include the proposed language in point (b) of the definition of “radial circuit”. Please refer to AESO reply #2.</p>
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		<p><u>Capital Power Corporation (“Capital Power”)</u></p> <p>5. Capital Power has no comments.</p>	<p>5. The AESO acknowledges Capital Power’s comment.</p>
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		<p><u>EPCOR Distribution & Transmission Inc. (“EDTI”)</u></p> <p>6. Given the significance of these changes, EDTI believes that changes to definitions such as BES and radial are better addressed in AESO tariff proceedings rather than ad hoc consultations.</p> <p>7. Does the AESO anticipate any changes to transmission project cost classifications with this proposed definition?</p> <p>8. Why is this definition of radial circuit for ARS different from what has been proposed in the AESO’s 2018 tariff (section 4.2)?</p> <p>9. Can the AESO provide the rationale behind the inclusion of “...an arrangement where the circuit energized at 50 kV or higher is connected to another circuit energized at 50 kV or higher, either through a switching device that is operated normally open or through facilities energized at less than 50 kV where the circuit would be a radial circuit if the connection did not exist.” in part (c)?</p>	<p>6. The definitions being consulted on are for application in the reliability standards and are not being proposed for application in the ISO tariff at this time. However, it is the AESO’s view that the proposed new radial circuit definition is consistent with the approved ISO tariff radial circuit definition.¹ The proposed definition of radial circuit for application in the reliability standards is a refined version of the approved ISO tariff radial circuit definition.</p> <p>7. No. Please see AESO reply to #6.</p> <p>8. Please see the AESO reply to #6.</p> <p>9. Inclusion of these conditions is consistent with NERC. The AESO prefers to maintain alignment with NERC in this instance. Two circuits that are connected through a normally open point are operating as two separate radial circuits under normal operating conditions and as such it is reasonable to treat those circuits as being radial circuits.</p> <p>Two circuits that are connected through facilities energized at less than 50 kV will not normally have any appreciable looped power flow through them for the purposes of transferring power across the networked transmission system. These circuits are therefore treated as radial circuits.</p>
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¹ Approved by the Alberta Utilities Commission through Decision 22942-D02-2019, *AESO 2018 ISO Tariff Decision* on September 22, 2019.



		<p><u>Fort Hills Energy Corporation (“FHEC”)</u></p> <p>10. Fort Hills Energy Corporation (FHEC) supports the AESO’s proposal to define the term “radial circuit” in order to provide clarity regarding facilities that are radially connected to a networked transmission system. However, FHEC is opposed to the AESO’s proposed definition of this term on the grounds that it is technically deficient and not in the public interest.</p> <p>11. The AESO’s proposed definition of “radial circuit” may limit its application to only those facilities that are connected to the networked transmission system via a single (only one) transmission circuit, but exclude those that are connected through a single transmission line with multiple circuits, or multiple transmission lines with multiple circuits that terminate at the same electrical node at both ends which provide the only path for power flow between the two nodes.</p> <p>12. As an example, a load initially connected radially to the networked transmission system through a single circuit may later add a parallel circuit to the transmission line (tower) or another transmission line for redundancy to improve reliability of supply. In this case, the load is still radially connected to the networked transmission system and hence will remain a “radial load”. The number of circuits or lines that connect the load to the networked transmission system does not make any difference to the classification of the load being “radially” fed from the network.</p> <p>13. This connection scenario can be extended to the connections between the networked transmission system and groups of facilities or industrial complex, such as FHEC which employs a redundant connection to its ISD to improve reliability.</p>	<p>10. The AESO acknowledges FHEC’s comment. The AESO disagrees that the proposed definition is technically deficient and not in the public interest.</p> <p>11. The AESO agrees with FHEC’s conclusions regarding the impact of AESO’s proposed definition of “radial circuit”. It is the opinion of the AESO that it is appropriate to define a radial circuit as a single transmission circuit, unless two circuits are connected through facilities energized at less than 50 kV where each of the circuits would be a radial circuit if the connection did not exist. This is consistent with the NERC guidance on radial circuit as included in the <i>Bulk Electric System Definition Reference Document</i>.</p> <p>For clarification, a single node does not constitute a single system element and as such does not meet the requirements of the definition of radial circuit. The configuration described in the comment constitutes two circuits, either of which provides a separate path for power to flow between the networked transmission system and the facilities of the market participant. Please also refer to AESO reply #2.</p> <p>12. Please see AESO replies #2 and #11.</p> <p>13. Please see AESO replies to #2 and #11.</p>
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	<p>This redundant connection does not provide alternative paths for power flow in and out of the FHEC complex.</p> <p>14. Accordingly, FHEC requests that the AESO explain whether the proposed definition of “radial circuit” would elevate FHEC from a “low” to “medium” criticality under relevant CIP rules because of this redundant circuit. FHEC further requests that the AESO update its relevant ID (#2016-006RS) to provide examples of what connection configurations are considered radial versus non-radial.</p> <p>15. FHEC submits that its current configuration is generally regarded as a single system element connection despite its redundant connection configuration, since both circuits terminate at the same nodes at both ends. This interpretation is consistent with the intent of the defined term “radial circuit” in AESO ID #2016-006RS, specifically the phrase “which is the only circuit for power to flow between the networked transmission system and the facilities of one or more market participants under normal operating conditions...”. This interpretation is also consistent with the common understanding of the term “radial circuit” including the consistent use of this term by Electric Reliability Organizations such as NERC and WECC.</p> <p>16. FHEC submits that deviating from the commonly understood and commonly used meaning of “radially connected” (i.e. to restrict the meaning to single circuit connections) irrespective of the overall connection scheme may impose significant direct and indirect costs for affected market participants, both in regards to the initial implementation of requirements as well as ongoing personnel and compliance</p>	<p>14. Currently, if a market participant has transmission facilities that are connected to the transmission system through a non-radial connection and their control centre controls transmission facilities at 2 or more locations, then their control centre would have a medium impact rating in accordance with Section 2.12 of Attachment 1 in CIP-002-AB-5.1, <u>Cyber Security – BES Cyber System Categorization</u> (“CIP-002-AB-5.1”). Based on comments received, the AESO is contemplating a revision to the existing CIP-002, which may include adopting the proposed NERC CIP-002-5.1a should it be approved by FERC.</p> <p>The AESO is considering whether to further revise AESO Information Document ID #2016-006, <i>Radial Circuit</i> (“ID #2016-006”). Should ID #2016-006 be amended, the AESO will consider adding example figures to assist market participants in understanding the definition and make the amended information document available if, and when, the definitions are approved by the Alberta Utilities Commission.</p> <p>15. The proposed definition of “radial circuit” and the defined term in ID#2016-006 both exclude “redundant connection configurations”. Changes were made to the “radial circuit” definition to improve clarity for market participants and to better align with NERC. Please also refer to the AESO reply #2.</p> <p>16. Please refer to AESO replies #2 and #15.</p>
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	<p>costs.</p> <p>17. FHEC also notes that the AESO has provided no basis to date (beyond a desire to provide clarity and simplicity) for this potential departure from the general technical and engineering understanding of this term used by other regional reliability councils and power system planners.</p> <p>18. FHEC further notes that the AESO has not demonstrated that a redundant connection in an otherwise radial configuration poses any unique or specific reliability risk to the BES. Further, the AESO has not demonstrated that the potential adoption of this particular interpretation alleviates any specific reliability risk to the BES, either in FHEC’s case or in respect of any other market participant. A conclusion that a redundant connection is inherently non-radial may appear arbitrary in light of the fact that such interpretation is inconsistent with common usage, in light of the fact that such interpretation could impose significant costs on affected market participants, and in light of the fact that relevant risks have neither been identified nor alleviated by such interpretation.</p> <p>19. Accordingly, FHEC proposes the following in order to accommodate the above radial connection scenarios. FHEC proposes that the term “radial circuit” be revised to “radial connection”, a term that is frequently referenced in Alberta’s Reliability Standards such as CIP-002-AB05.1. FHEC also proposes that the definition be revised to make all references to “circuit” potentially plural (circuit(s)). In other words, FHEC proposes that “(s)” be added to all references to circuit, in the following manner:</p> <p>“radial connection” [or “radial circuit(s)”] means an arrangement of contiguous system elements energized at 50 kV or higher that:</p> <ul style="list-style-type: none"> (a) extend from a system element on the networked transmission system in a linear or branching configuration; (b) connect to one or more of a load facility, a generating unit, or an aggregated generating facility; and (c) comprise the only circuit(s) by which power can flow between the networked transmission system and the facilities identified in item (b) under normal operating conditions, and includes an arrangement where the circuit energized at 50 kV or higher is connected to another circuit(s) 	<p>17. Please see the AESO replies #2 and #15. Further, the AESO is providing clarity by defining “radial circuit” in order to assist market participants in complying with relevant reliability standards. The AESO is of the opinion that stakeholder responses provided pursuant to this consultation demonstrate the need for such clarification.</p> <p>18. Please see the AESO reply #2.</p> <p>19. Please see the AESO reply #2.</p>
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		<p>energized at 50 kV or higher, either through a switching device that is operated normally open or through facilities energized at less than 50 kV where the circuit(s) would be a radial connection [or radial circuit(s)] if the connection did not exist.</p>	
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<p>No definition currently exists for use in the Alberta reliability standards</p>	<p>“system access service” as defined in the Act means the service obtained by market participants through a connection to the transmission system, and includes access to exchange electric energy and ancillary services.</p>	<p><u>AltaLink</u> 20. No comments.</p>	<p>20. The AESO acknowledges AltaLink’s comment.</p>
		<p><u>Capital Power</u> 21. The current AESO “point of connection” definition part (i) states: <i>a point at which electric energy is transferred between a transmission facility that is not an industrial system, and (i) the high voltage side of any aggregated generating facilities or generating unit</i></p> <p>For GO/GOPs - Capital Power’s interpretation of the proposed “system access service” definition is same as the existing “point of connection” definition part (i) for a generating unit. Please confirm if this is acceptable.</p> <pre> graph LR GO[GO >100MW] --> HS((GO High side)) subgraph TFS [Transmission Facility / Transmission System] HS --> S1[Substation - Not owned by GO] S1 --> S2[Secondary Substation - Not owned by GO] end S2 --> CP[] subgraph SA [GO System Access Service / Point of Connection <100KV] S1 end subgraph S1L [Substation steps up to <100KV] S1 end subgraph S2L [Substation steps up to >100KV] S2 end </pre>	<p>21. System access service is the service provided through a connection to the transmission system. The point of connection identifies where a market participant’s facilities connect to the transmission system. Quantities related to system access service are usually, but not always, identified at the point of connection.</p>

Definitions – Amended				
Existing	Proposed	Blackline	Stakeholder Comments and/or Alternate Proposal	AESO Replies
<p>“bulk electric system” as defined by the Regional Reliability Organization, means the electrical generation resources, transmission lines, interconnections, with neighbouring systems, and associated equipment, generally operated at voltages of one hundred (100) kV or higher; radial transmission facilities serving only load with one (1) transmission source are generally not included in this definition.</p>	<p>“bulk electric system” means all system elements that are included in the following:</p> <p>(i) all system elements that have all terminals energized at 100 kV or higher that are not part of a radial circuit;</p> <p>(ii) a radial circuit comprised of system elements that have all terminals energized at 100 kV or higher where the radial circuit connects to:</p> <p>(a) any facility included in items (iv) through (vii) below; or</p> <p>(b) 2 or more generating resources, being generating units and aggregated generating facilities, that have a combined maximum authorized real power higher</p>	<p>“bulk electric system” means all system elements that are included in the following:</p> <p>(i) all system elements that have all terminals energized at 100 kV or higher that are not part of a radial circuit;</p> <p>(ii) a radial circuit comprised of system elements that have all terminals energized at 100 kV or higher where the radial circuit connects to:</p> <p>(a) any facility included in items (iv) through (vii) below; or</p> <p>(b) 2 or more generating resources, being generating units and aggregated generating facilities, that have a combined maximum authorized real power higher than 67.5 MW;</p> <p>(iii) a transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher;</p> <p>(iv) a generating unit that has a maximum authorized real power higher than 18 MW where system access service is provided through</p>	<p>AltaLink</p> <p>22. Regarding definition (vi), please clarify whether generators interconnected to transmission yard through a distributed feeder are in scope.</p> <p>23. AltaLink requests that AESO develop an ID similar to the NERC Bulk Electric System Definition Reference Document that shows the amended definition with diagrams explaining how to apply the BES definition for the specific configurations for (iv) through (vii).</p> <p>24. AltaLink understand that the AESO conducted a review of all existing reliability standards using the amended Bulk Electric System definition. AltaLink requests that AESO conduct a similar review on the existing ISO rules using the amended Bulk Electric System definition.</p>	<p>22. A generating unit connected to an electric distribution system, where system access service is not provided by the AESO, is not part of the bulk electric system.</p> <p>23. The AESO is considering developing an information document in relation to the proposed bulk electric system definition to assist market participants in understanding the definition. This information document could include diagrams that illustrate what system elements are part of the bulk electric system for different system connection configurations.</p> <p>24. The definition of bulk electric system is currently only being proposed for use in the reliability standards and not the ISO rules.</p> <p>Nevertheless, the AESO has reviewed the currently effective ISO rules and has found only one instance of the use of “bulk electric system” in Section 304.7 of the ISO rules, <i>Event Reporting</i>.</p> <p>If the AESO considers adopting the revised bulk electric system definition in the ISO rules, the AESO will consult with stakeholders on its proposal to do so at that time.</p>



Definitions – Amended				
Existing	Proposed	Blackline	Stakeholder Comments and/or Alternate Proposal	AESO Replies
	<p>than 67.5 MW;</p> <p>(iii) a transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher;</p> <p>(iv) a generating unit that has a maximum authorized real power higher than 18 MW where system access service is provided through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the terminal of the generating unit to the transmission facilities energized at 100 kV or higher;</p> <p>(v) an aggregated generating facility that has a maximum authorized real power higher than 67.5 MW where system access service is provided</p>	<p>a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the terminal of the generating unit to the transmission facilities energized at 100 kV or higher;</p> <p>(v) an aggregated generating facility that has a maximum authorized real power higher than 67.5 MW where system access service is provided through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the collector bus to the transmission facilities energized at 100 kV or higher, and excluding the generating units and the collector system feeders;</p> <p>(vi) all generating units and aggregated generating facilities where system access service is provided through a common switchyard that is directly connected to transmission facilities energized at 100</p>	<p>ATCO Electric Limited (“ATCO Electric”)</p> <p>25. For section (ii) (a) where “any facility included in items (iv) through (vii) below, ATCO Electric would like to suggest that it be extended to include (viii). We propose a reactive power resource at the end of the radial line provides benefits not only to the load but also to the BES at which it is connected. Please consider including (viii) by looking at 754S Ksituan substation as an example in ATCO Electric’s system where this would be applicable.</p> <p>26. In reference to section (viii), the definition speaks to the reactive resource and its configuration used to connect to the BES, but it does not mention the dedicated or non-dedicated transformers themselves. This is related to a RFI sent on 2019-07-19 by ATCO Electric . Although the transformer may not have both windings >100 kV, we believe it should be part of BES definition as the transformer is an integral intermediary device between the BES and the reactive power resource itself. If the transformer is compromised for any reason, it will impact reactive power flow to and from the BES and cause system issues. We understand it is above and beyond NERC and AESO’s definition, but ask the AESO to consider adding the transformer element. This directly affects PRC-</p>	<p>25. The AESO is of the view that reactive power resources connected to radial circuits that serve only load generally supports voltage on the circuit itself. As such, the AESO intends to maintain its current reference to (iv) through (vii) in section (ii)(a), which is in alignment with NERC.</p> <p>26. The AESO agrees with ATCO Electric’s recommendation and will amend proposed section (viii) to include all system elements from the terminal of a reactive power resource to transmission facilities energized at 100 kV or higher.</p>

Definitions – Amended				
Existing	Proposed	Blackline	Stakeholder Comments and/or Alternate Proposal	AESO Replies
	through a switchyard that is directly connected to transmission facilities energized at 100 kV or higher, including all system elements from the collector bus to the transmission facilities energized at 100 kV or higher, and excluding the generating units and the collector system feeders;	kV or higher and the generating units and aggregated generating facilities have a combined maximum authorized real power higher than 67.5 MW, including all system elements from the terminal of each generating unit and from the collector bus of each aggregated generating facility to transmission facilities energized at 100 kV or higher, and excluding the generating units and collector system feeders of each aggregated generating facility ;	005-AB1-6 as well as the protection system maintenance is performed for the purpose of protecting BES elements.	
	(vi) all generating units and aggregated generating facilities where system access service is provided through a common switchyard that is directly connected to transmission facilities energized at 100 kV or higher and the generating units and aggregated generating facilities have a combined maximum authorized real	(vii) a blackstart resource , including all system elements from the terminal of the blackstart resource to transmission facilities that are energized at 100 kV or higher; and (viii) a static or dynamic reactive power resource that is dedicated to supplying or absorbing reactive power to or from the transmission system and is connected: (a) to transmission facilities energized at 100 kV or higher;	CNRL 27. NERC E2 Exclusion from BES: “E2: A generating unit or multiple generating units on the customer’s side of the retail meter that serve all or part of the retail customer Load with electric energy on the customer’s side of the retail meter if: (i) the net capacity provided to the BES does not exceed 75 MVA, and (ii) standby, back-up, and maintenance power services are provided to the generating unit or multiple generating units, or to the retail Load by a Balancing Authority, or provided pursuant to a binding obligation with a Generator Owner or Generator Operator, or under terms approved by the applicable regulatory authority.” CNRL understands that large industrial facilities that have distribution embedded generation primarily to support internal load,	27. The AESO generally considers the size of the generating unit or aggregated generating facility to be the primary consideration for BES inclusion rather than the net supply to the transmission system. Please see AESO reply #2. BES requirements also apply to generating units for dynamic response to ensure reliable operation when the generating unit is on-line, irrespective of the nature of its integration with load. The AESO is not aware of any safety concerns arising from the application of the bulk electric system definition that cannot be mitigated through appropriate practices. The implementation of appropriate safety practices is the responsibility of the market participant. As was mentioned in the AESO reply #2, if a market participant has reason to think that it should not be subject to a proposed new or amended reliability standard, then the AESO encourages market participants to comment on the applicability section of the proposed reliability standards during consultation.

Definitions – Amended				
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	<p>power higher than 67.5 MW, including all system elements from the terminal of each generating unit and from the collector bus of each aggregated generating facility to transmission facilities energized at 100 kV or higher, and excluding the generating units and collector system feeders of each aggregated generating facility;</p> <p>(vii) a blackstart resource, including all system elements from the terminal of the blackstart resource to transmission facilities that are energized at 100 kV or higher; and</p> <p>(viii) a static or dynamic reactive power resource that is dedicated to supplying or absorbing reactive power to or from the</p>	<p>(b) through a dedicated transformer that is directly connected to transmission facilities energized at 100 kV or higher; or</p> <p>(c) through a non-dedicated transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher.</p>	<p><u>these industrial facilities should be excluded from BES as per E2 exemption specified in the NERC definition.</u> These facilities have no impact on transmission reliability due to their limited net exports/imports to the grid and bringing them under the ARS umbrella complicates routine industrial process operation and does not improve reliability.</p> <p>Essentially with commercial and technical arrangements that the industrial facilities have with the AESO, the reliability impact to the wider AIES of a typical industrial facility with onsite heat integrated generation is less severe than any typical distribution load. This aspect is not taken into consideration when E2 exception is removed which essentially brings many industrial facilities under unnecessary ARS obligations and complicates the applicability assessment process of most standards.</p> <p>CNRL requests that NERC E2 exemption be retained in the BES definition and industrial facilities with distribution embedded generation with net capacity to grid of 75 MVA be considered exempt</p>	

Definitions – Amended				
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	<p>transmission system and is connected:</p> <p>(a) to transmission facilities energized at 100 kV or higher;</p> <p>(b) through a dedicated transformer that is directly connected to transmission facilities energized at 100 kV or higher; or</p> <p>(c) through a non-dedicated transformer that has its primary terminal and at least one secondary terminal energized at 100 kV or higher.</p>		<p>from BES. CNRL firmly believes that BES NERC E2 exclusion should be retained in the new BES definition from the AESO. CNRL states that adopting new NERC BES definition incl. applicable exclusions will improve process safety within complex industrial facilities and reduce compliance costs for industrial facilities. Industrial facilities with behind the fence heat integrated generation are designed to produce electricity to primarily supply internal loads.</p> <p>Figure E2.5: Behind-the-Meter Generation—Multiple Units Located at Multiple Generation Sites (Multiple Owners)</p>	

Definitions – Amended				
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			<p><u>Capital Power</u></p> <p>28. In connection to part (iv) of the proposed “bulk electric system” definition, Capital Power’s interpretation is outlined below. Please confirm if this is acceptable.</p> <ul style="list-style-type: none"> Under the part (iv) of the proposed “bulk electric system” definition, a generating unit is <u>not</u> part of the proposed “bulk electric system” if its “system access service” is at the voltage level below 100 kV and is connected to the “transmission system” energized at the voltage level below 100 kV. 	<p>28. The AESO agrees with Capital Power’s assessment provided that all system elements are energized at less than 100 kV within the switchyard where system access service is provided.</p>
			<p><u>EPCOR Distribution & Transmission Inc.</u></p> <p>29. Given the significance of these changes, EDTI believes that changes to definitions such as BES and radial are better addressed in AESO tariff proceedings rather than ad hoc consultations.</p> <p>30. Does the AESO anticipate any changes to transmission project</p>	<p>29. Please see the AESO reply #6.</p> <p>30. Please see the AESO reply #6.</p>



Definitions – Amended				
Existing	Proposed	Blackline	Stakeholder Comments and/or Alternate Proposal	AESO Replies
			<p>cost classifications with this proposed definition?</p> <p>31. Please clarify “direct connection” and “common switchyard” in parts (iv), (v), and (vi).</p> <p>32. It is not clear how the presence of a third winding (whose voltage is $\geq 100\text{kV}$) on a non-dedicated transformer (with a high-side voltage that is $\geq 100\text{kV}$ and a low-side winding $< 100\text{kV}$ which is connected to a capacitor bank) changes whether the capacitor bank is part of the BES or not.</p> <p>33. EDTI finds the proposed format of BES hard to interpret and apply. EDTI suggests a re-write or alternate presentation of the BES definition (i.e. a matrix or decision workflow) to better clarify the requirements.</p>	<p>31. These terms reflect the common meaning of the words used. The phrase “switchyard that is directly connected to transmission facilities energized at 100 kV or higher” refers to the highest voltage level of the transmission facilities that are located within the switchyard. In the context of the “bulk electric system” definition, common switchyard is referring to a switchyard that connects to more than one generating unit or aggregated generating facility. The AESO is considering developing an information document in relation to the proposed “bulk electric system” definition to assist market participants in understanding the definition. This information document may include an explanation of these terms for added clarity.</p> <p>32. A reactive power resource that is connected to a non-dedicated transformer with two terminals energized at voltage levels above 100 kV is generally connected in this way to support the bulk electric system. Therefore, it is reasonable, and in alignment with NERC to include these reactive power resources as part of the bulk electric system.</p> <p>33. The AESO acknowledges that the definition of bulk electric system is inherently complex but does not agree that it is necessarily difficult to interpret and apply. The AESO has tested several different ways of presenting the information and has determined that the proposed definition provides the best clarity. As mentioned in the AESO reply #23, the AESO is considering providing an information document with diagrams.</p>

Definitions – Amended				
Existing	Proposed	Blackline	Stakeholder Comments and/or Alternate Proposal	AESO Replies
			<p>34. Is the AESO able to provide a map of what is to be included in the BES?</p> <p>35. ARS TPL-002 System Performance Following Loss of a Single BES Element applies to transmission facilities rated 69 kV and above. The proposed BES definition appears to apply only transmission facilities rated 100 kV and above. Does the AESO see an inconsistency between TPL-002 and the proposed BES definition?</p> <p>36. Please explain why the proposed BES definition ratings are not aligned with NERC?</p> <p>37. Can the AESO clarify the reasoning behind excluding the exemption of the NERC Local Area</p>	<p>34. The AESO has considered EDTI's request and has determined that it cannot create a map that indicates all system elements in Alberta that are part of the bulk electric system. If the AESO were to create a map that indicates all system elements in Alberta that are part of the bulk electric system, it would result in the AESO interpreting, on market participants' behalf, how to apply the bulk electric system definition to their facilities. The AESO does not interpret applicability for market participants.</p> <p>35. The AESO recognizes that there is an apparent inconsistency between the title of TPL-002-AB1-0, <i>System Performance Following Loss of a Single BES Element</i> ("TPL-002") and the application of the standard to transmission facilities rated at 69 kV. The title of the authoritative document is used for descriptive convenience and does not affect the obligations within the authoritative document. In the case of TPL-002, the AESO has maintained the title of the comparative NERC standard. However, TPL-002 applies to transmission facilities rated at 69 kV or above consistent with the AESO's mandate to provide for the reliable operation of the interconnected electric system.</p> <p>36. The AESO has considered EDTI's request and has determined that it would be inappropriate for the AESO to use the ratings that are used by NERC. The AESO has proposed using maximum authorized real power (MW) ratings for generating units and aggregated generating facilities because, in Alberta, maximum authorized real power is a quantity that is defined and used for reliability standards rather than gross nameplate (MVA) ratings. The MVA values are converted to a maximum authorized real power (MW) values by multiplying by a power factor of 0.9.</p> <p>37. The AESO uses the reliability standards to assist it in meeting its mandate to safely and reliably operate the interconnected</p>

Definitions – Amended				
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			<p>Network definition?</p> <p>38. Is the AESO able to provide a comparison of the application of LAN in Edmonton and Calgary’s service territories with the proposed BES definition?</p>	<p>electric system. It is the opinion of the AESO that many of the facilities that would be captured in a local area network exemption are important elements of the interconnected electric system. Accordingly, the AESO has decided that it would not be appropriate to include a local area network exemption in its proposed bulk electric system definition.</p> <p>38. As the proposed bulk electric system definition does not identify local area networks, the AESO has not assessed whether specific facilities would be considered part of a local area network.</p>
			<p><u>Fort Hills Energy Corporation (“FHEC”)</u></p> <p>39. Comments from above sections are applicable to eventual definition of “bulk electric system”.</p>	<p>39. Please see the AESO replies #10 to #19.</p>