

Proposed New Alberta Reliability Standard PRC-025-AB-2, *Generator Load Reliability* (“PRC-025-AB-2”)

Date of Request for Comment: January 10, 2019  
 Period of Consultation: January 10, 2019 through January 31, 2019

Alberta Reliability Standard	Stakeholder Comments and/or Alternative Proposal	AESO Replies
<p><b>New</b></p> <p>The AESO is seeking comments from market participants with regard to the following matters:</p> <ol style="list-style-type: none"> <li>Are there any requirements contained in proposed new PRC-025-AB-2 that are not clearly articulated? If yes, please indicate the specific section of proposed new PRC-025-AB-2, describe the concern and suggest alternative language.</li> <li>Please provide any additional comments regarding proposed new PRC-025-AB-2.</li> </ol>	<p><b>AltaLink Management Ltd. (“AML”)</b></p> <ol style="list-style-type: none"> <li>Applicability:                     <p>In section 2 – Applicability, the “Inclusions” part applies to legal owners, however, the “Exclusions” part applies to protection systems. The two lists are not comparable. AltaLink suggests the “Applicability” section include “Functional Entities” and “Facilities” as in NERC PRC-025, since it is more clear on the applicability of this standard to TFOs; and the “Exclusions” part be moved from “Applicability” section to an Appendix, as Appendix 1 in PRC-023-AB-4.</p> </li> <li>2.1 Inclusions                     <p>(c) the <b>legal owner</b> of a <b>transmission facility</b> that is:                             <ol style="list-style-type: none"> <li>part of the <b>bulk electric system</b>;</li> </ol> <p>It is AltaLink’s understanding that BES definition is under review to exclude the radial circuits that are only used to export energy directly from a generating unit or aggregated generating facility to a single system element on the networked transmission system. Using the proposed BES definition to define the scope of PRC-025-AB-2 will exclude the above mentioned radial circuits, which AltaLink does not believe is the intent of this standard.</p> <p>For section 2.1 (c) (i), AltaLink suggests using language such as: “system elements that are part of a radial circuit, including transmission step-up transformers and lines, that are only used to export</p> </p></li> </ol>	<ol style="list-style-type: none"> <li>The AESO has moved the exclusions into a new appendix.</li> <li>The bulk electric system definition that is currently under review does not exclude the radial circuits that are only used to export energy directly from a bulk electric system generating unit or aggregated generating facility to a single element on the networked transmission system and, as such, it is not necessary to revise Applicability section 2.1(c)(i) as suggested.</li> </ol>

	<p>energy directly from a generating unit or aggregated generating facility to a single system element on the networked transmission system.”</p> <p>3. 2.1 Inclusions  (c) the <b>legal owner</b> of a <b>transmission facility</b> that is:  (ii) which the <b>ISO</b> determines is necessary for the reliable operation of either the <b>interconnected electric system</b> or the City of Medicine Hat electric system and publishes on the AESO website and may amend from time to time on notice to <b>market participants</b> in accordance with the process set out in Appendix 1.</p> <p>For section 2.1 (c) (ii), AltaLink suggests AESO to provide, in an appendix, a list of all <b>transmission facilities</b> that are in the scope of PRC-025. This would help to clarify which transmission facilities are in the scope of PRC-025.</p>	<p>3. Section 2.1 (c)(i) in PRC-025-AB-2 clearly states that this reliability standards applies to the legal owner of a transmission facility that is part of bulk electric system. In addition, the AESO may determine that it is necessary to apply this reliability standard to other transmission facilities. If so, the AESO will follow the process required by Section 2.1 (c)(ii) in PRC-025-AB-2 and publish a list of such additional facilities on its website.</p>
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Table 1. Relay Loadability Evaluation Criteria				
Application	Relay Type	Option	Bus Voltage <sup>1</sup>	Pickup Setting Criteria
Relays installed on the high side of the transmission step-up transformer <sup>2</sup> including relays installed on the remote end of the line for system elements that connect any transmission step-up transformers to the transmission system that are used to export energy from a generating unit, aggregated generating facility, or generating plant – connected to synchronous generators.	Phase distance relay (e.g. 21) – directional toward the transmission system	14a	0.85 per unit of the line nominal voltage at the relay location.	The impedance element must be set less than the calculated impedance derived from 115% of: (1) Real power output – 100% of the aggregate authorized real power, and (2) Reactive power output – 120% of the aggregate real power value, derived from the generator nameplate apparent power rating at rated power factor.
		14b	Simulated line voltage at the relay location coincident with the highest reactive power output achieved during field-forcing in response to a 0.85 per unit of the line nominal voltage at the remote end of the line prior to field-forcing.	OR The impedance element must be set less than the calculated impedance derived from 115% of: (1) Real power output – 100% of the aggregate authorized real power, and (2) Reactive power output – 100% of the aggregate maximum gross reactive power output during field-forcing as determined by simulation.
		The same application continues on the next page with a different relay type		

For Table 1 option 14a (shown above) - 16b, how can market participants acquire the following data in order to determine the Pickup Settings: the aggregate maximum authorized real power; the generator nameplate MVA rating at rated power factor; maximum gross Mvar output during field-forcing as determined by simulation.

4. A market participant can obtain the required information, such as the aggregate maximum authorized real power and the generator nameplate MVA rating at rated power factor, directly through coordination between the legal owner of transmission facility and the legal owner of generation facility or aggregated generation facility. Also, it would be the responsibility of the market participant to perform simulations (based on available models such as PSS/E) to determine the maximum gross MVA output during field-forcing.

5.

**Table 1. Relay Loadability Evaluation Criteria**

Application	Relay Type	Option	Bus Voltage <sup>1</sup>	Pickup Setting Criteria
Relays installed on the high-side of the transmission step up transformer <sup>11</sup> including relays installed at the remote end of the line for system elements that connect the transmission step-up transformers to the transmission system that are used to export energy from a power plant, asynchronous generating units or aggregated generating facility comprised of asynchronous generating units including inverter-based installations.	Phase distance relay (e.g. 21) – directional toward the transmission system	17	1.0 per unit of the line nominal voltage at the relay location	The impedance element must be set less than calculated impedance derived from 130% of aggregate nameplate apparent power output power factor (including the reactive power static or dynamic reactive power devices).
		The same application continues on the next page with a different relay type		

For Table 1 option 17 (shown above) - 19, how can market participants acquire the maximum aggregate nameplate MVA output at rated power factor (including the Mvar output of any static or dynamic reactive power devices) that is necessary to determine the Pickup Settings?

6. Please provide the implementation plan of this standard.

**ENMAX Energy Corporation (“EEC”)**

7. EEC suggests that market participants provide to the AESO appropriate information on setpoints and protection settings, and that the AESO use this information to perform electrical system stability studies to determine whether the objectives of PRC-025 have been met. If not, the AESO should engage participants to determine whether setpoints should be adjusted or additional action is required.

5. Please see the AESO’s response #4.

6. The AESO proposes PRC-025-AB-2 to be in effect the first day of the calendar quarter that follows 20 full calendar quarters after approval by the Commission. There is no further implementation plan.

7. The AESO disagrees with the proposed approach by ENMAX Energy Corporation. Reviewing the protection settings is the responsibility of the legal owner. PRC-025-AB-2 only addresses steady state loadability.

	<p>This approach takes into consideration existing protection and control settings currently in place for transmission, distribution and generation facilities, and mitigates against the risk of damaging facilities. EEC encourages collaboration between the AESO and market participants to reach efficiencies in the best interest of system reliability.</p>	
	<p><b><u>ENMAX Power Corporation (“EPC”)</u></b>              8. Would it be possible to get single line diagrams for Table 1 Relay Loadability Evaluation Criteria Options 14a to 19?</p>	<p>8. The AESO is preparing an information document for PRC-025-AB-2 and will include single line diagrams.</p>