



**Stakeholder Comparison Comment Rationale Matrix**

**2010-07-15**

**AESO AUTHORITATIVE DOCUMENT PROCESS**

**Alberta Reliability Standard – PRC-023-AB-1 Transmission Relay Loadability**

*NOTE: The AESO is asking market participants to give an initial indication of their support for, or opposition to, the specific Alberta Reliability Standard variances to the NERC requirements referenced below. Such an initial indication assists in the AESO's practical understanding of the receptivity of the industry to the proposed changes, and in that regard the AESO thanks, in advance, all market participants who choose to respond. With regard to the specific standard changes and their implications, such responses are without prejudice to the rights of market participants under the Act, any regulations, or related decisions of the Commission.*

Date of Request for Comment [yyyy/mm/dd]: 2010/07/15  
Period of Consultation [yyyy/mm/dd]: 2010/07/15 through 2010/08/15  
Comments From: Nexen Inc.  
Date [yyyy/mm/dd]: August 16, 2010

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*Listed below is the summary of changes for the proposed new, removed or amended sections of the standard. Please refer back to the Letter of Notice under the "Attachments to Letter of Notice" section to view the proposed content changes to the standard. Please double-click on the check box for either "Support" or "Oppose" and/or place your comments, reasons for position, and alternate proposals underneath (if any).*

**COMPARISON BETWEEN NERC PRC-023-1 AND ALBERTA PRC-023-AB-1  
TRANSMISSION RELAY LOADABILITY**

NERC PRC-023-1	Alberta PRC-023-AB-1	AESO Reason for Difference	Stakeholder Comments	AESO Replies
<p><b>Purpose</b> Protective relay settings shall not limit transmission loadability; not interfere with system operators' ability to take remedial action to protect system reliability and; be set to reliably detect all fault conditions and protect the electrical network from these faults.</p>	<p><b>Purpose</b> The purpose of this reliability standard is to ensure the protective relay settings do not limit transmission loadability, do not interfere with system operators ability to take remedial action to protect system reliability and, are set to reliably detect all fault conditions and protect the electrical network from these faults.</p>	<p>Clarified the purpose to align with the content of the reliability standard.</p>		
<p><b>Applicability</b> 4.1. Transmission Owners with load-responsive phase protection systems as described in Attachment A, applied to facilities defined below: 4.1.1 Transmission lines operated at 200 kV and above. 4.1.2 Transmission lines operated at 100 kV to 200 kV as designated by the Planning Coordinator as critical to the reliability of the Bulk Electric System. 4.1.3 Transformers with low voltage terminals connected at 200 kV and above. 4.1.4 Transformers with low voltage terminals connected at 100 kV to 200 kV as designated by the Planning Coordinator as critical to the reliability</p>	<p><b>Applicability</b> This reliability standard applies to:</p> <ul style="list-style-type: none"> <li>• TFOs with load-responsive phase protection systems, as described in Attachment A, and with any of the facilities defined below: <ul style="list-style-type: none"> <li>○ transmission lines operated at 200 kV and above.</li> <li>○ transmission lines operated at 100 kV to 200 kV as identified by the ISO as critical to the reliability of the BES as required in requirement</li> </ul> </li> </ul>	<p><input type="checkbox"/> New <input checked="" type="checkbox"/> Amended <input type="checkbox"/> Deleted</p> <p>Amended to identify the responsible entities in Alberta.</p> <p>GFO removed as all transmission facilities in Alberta are managed by a registered TFO.</p>	<p><input type="checkbox"/> Support <input type="checkbox"/> Support with language suggestions <input checked="" type="checkbox"/> Oppose</p> <p>Nexen has concerns regarding “transmission lines operated at 100 kV to 200 kV as identified by the ISO as critical to the reliability of the BES as required in requirement R3” and “transformers with low voltage terminals connected at 100 kV to 200 kV as designated by the ISO as critical to the reliability of the BES”. As noted in comments provided in PRC-007, if the AESO intends to reference a document /</p>	

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<p>of the Bulk Electric System.  <b>4.2.</b> Generator Owners with load-responsive phase protection systems as described in Attachment A, applied to facilities defined in 4.1.1 through 4.1.4.  <b>4.3.</b> Distribution Providers with load-responsive phase protection systems as described in Attachment A, applied according to facilities defined in 4.1.1 through 4.1.4., provided that those facilities have bi-directional flow capabilities.  <b>4.4.</b> Planning Coordinators.</p>	<p>R3.</p> <ul style="list-style-type: none"> <li>○ transformers with low voltage terminals connected at 200 kV and above.</li> <li>○ transformers with low voltage terminals connected at 100 kV to 200 kV as designated by the ISO as critical to the reliability of the BES.</li> </ul> <ul style="list-style-type: none"> <li>● ISO</li> </ul>		<p>lists not outlined in the standard or utilize terms which are crucial to the standard (i.e. “which affects the reliability of the AIES electric system or the bulk electric system”) that information must be included in the stakeholder consultation process for that standard. Without all the important information available market participants cannot adequately evaluate the impact that standard has on their operations, nor does it lend itself to a full robust consultation which would be beneficial to the AESO and the industry.</p> <p>Nexen also submits the AESO’s rationale for a variance from the NERC standard (i.e. “GFO removed as all transmission facilities in Alberta are managed by a registered TFO.”) reaffirms the need to review the definitions associated with the functional entity registration model. If the AESO has encountered circumstances where the current functional entity definitions creates concerns, Nexen submits the AESO should undertake a</p>	

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			comprehensive review of the current functional entity definitions to ensure consistency and efficiency of the process and in turn does not broaden a market participants compliance obligations beyond what is reasonable.	
<p><b>Effective Date</b>  <b>5.1.</b> Requirement 1, Requirement 2:  <b>5.1.1</b> For circuits described in 4.1.1 and 4.1.3 above (except for switch-on-to-fault schemes) —the beginning of the first calendar quarter following applicable regulatory approvals.  <b>5.1.2</b> For circuits described in 4.1.2 and 4.1.4 above (including switch-on-to-fault schemes) — at the beginning of the first calendar quarter 39 months following applicable regulatory approvals.  <b>5.1.3</b> Each Transmission Owner, Generator Owner, and Distribution Provider shall have 24 months after being notified by its Planning Coordinator pursuant to R3.3 to comply with R1 (including all sub-requirements) for each facility that is added to the Planning Coordinator’s critical facilities list determined</p>	<p><b>Effective Date</b>  For requirements R1 and R2 for transmission lines operated at 200kV and above and transformers with low voltage terminals connected at 200kV and above, except for switch-on-to-fault schemes, the beginning of the first calendar quarter following ninety (90) days after the date of approval by the Commission.   For requirements R1 and R2 for transmission lines operated at 100 kV to 200 kV as identified by the ISO as critical to the reliability of the BES and transformers with low voltage terminals connected at 100 kV to 200 kV as designated by the ISO as critical to the reliability of</p>	Amended to allow a reasonable amount of time for Alberta entities to implement this Alberta Reliability Standard.	<input type="checkbox"/> Support <input type="checkbox"/> Support with language suggestions <input type="checkbox"/> Oppose  <i>Insert comments, reason for position, and alternate proposal (if any).</i>	

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<p>pursuant to R3.1. <b>5.2.</b> Requirement 3: 18 months following applicable regulatory approvals.</p>	<p>the BES, including switch-on-to-fault schemes, on the first day of the month after the 39<sup>th</sup> full month following the date of approval by the Commission.</p> <p>Requirement R3, the first day of the month after the 18<sup>th</sup> full month following the date of approval by the Commission.</p>			
<p><b>R1.</b> Each Transmission Owner, Generator Owner, and Distribution Provider shall use any one of the following criteria (R1.1 through R1.13) for any specific circuit terminal to prevent its phase protective relay settings from limiting transmission system loadability while maintaining reliable protection of the Bulk Electric System for all fault conditions. Each Transmission Owner, Generator Owner, and Distribution Provider shall evaluate relay loadability at 0.85 per unit voltage and a power factor angle of 30 degrees: [Violation Risk Factor: High] [Mitigation Time Horizon: Long Term Planning].</p> <p><b>R1.1.</b> Set transmission line relays so they do not operate at or below 150% of the highest seasonal Facility Rating of a circuit, for the available defined</p>	<p><b>R1</b> Each TFO must use one of the criteria set out in requirements R1.1 through R1.13, inclusive, for each of its specific circuit terminals to prevent its phase protective relay settings from limiting transmission system loadability while maintaining reliable protection of the BES for all fault conditions; and evaluate relay loadability at 0.85 per unit voltage and a power factor angle of 30 degrees.</p> <p><b>R1.1.</b> Set transmission line relays so they do not operate at or below 150% of the highest seasonal facility rating of a circuit for the available defined loading duration nearest to four hours, expressed in amperes;</p>	<p><input type="checkbox"/> New <input checked="" type="checkbox"/> Amended <input type="checkbox"/> Deleted</p> <p>Amended for clarity and consistency and to identify the responsible entities in Alberta.</p> <p>Sub-requirements R1.3.1 and R1.3.2 amended to show their inter-relationship.</p>	<p><input type="checkbox"/> Support <input type="checkbox"/> Support with language suggestions <input checked="" type="checkbox"/> Oppose</p> <p>R1.4: It is Nexen's understanding that NERC R1.10 states 150% of the applicable maximum transformer nameplate rating while the AESO states 115%. Can the AESO please outline its rationale for the variance between the NERC requirement and AESO's proposal?</p>	

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<p>loading duration nearest 4 hours (expressed in amperes).</p> <p><b>R1.2.</b> Set transmission line relays so they do not operate at or below 115% of the highest seasonal 15-minute Facility Rating<sup>2</sup> of a circuit (expressed in amperes).</p> <p><sup>2</sup> When a 15-minute rating has been calculated and published for use in real-time operations, the 15-minute rating can be used to establish the loadability requirement for the protective relays.</p> <p><b>R1.3.</b> Set transmission line relays so they do not operate at or below 115% of the maximum theoretical power transfer capability (using a 90-degree angle between the sending-end and receiving-end voltages and either reactance or complex impedance) of the circuit (expressed in amperes) using one of the following to perform the power transfer calculation:</p> <p><b>R1.3.1.</b> An infinite source (zero source impedance) with a 1.00 per unit bus voltage at each end of the line.</p> <p><b>R1.3.2.</b> An impedance at each end of the line, which reflects the actual system source impedance with a 1.05 per unit voltage behind each source impedance.</p>	<p><b>R1.2.</b> Set transmission line relays so they do not operate at or below 115% of the highest seasonal 15-minute facility rating of a transmission line expressed in amperes;</p> <p><b>R1.3.</b> Set transmission line relays so they do not operate at or below 115% of the maximum theoretical power transfer capability (using a 90-degree angle between the sending-end and receiving-end voltages and either reactance or complex impedance) of the transmission line expressed in amperes, using one of the following to perform the power transfer calculation:</p> <p><b>R1.3.1.</b> an infinite source (zero source impedance) with a 1.00 per unit bus voltage at each end of the transmission line; or</p> <p><b>R1.3.2.</b> an impedance at each end of the transmission line, which reflects the actual system source impedance with a 1.05 per unit voltage behind each source impedance.</p>			

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<p><b>R1.4.</b> Set transmission line relays on series compensated transmission lines so they do not operate at or below the maximum power transfer capability of the line, determined as the greater of:</p> <ul style="list-style-type: none"> <li>- 115% of the highest emergency rating of the series capacitor.</li> <li>- 115% of the maximum power transfer capability of the circuit (expressed in amperes), calculated in accordance with R1.3, using the full line inductive reactance.</li> </ul> <p><b>R1.5.</b> Set transmission line relays on weak source systems so they do not operate at or below 170% of the maximum end-of-line three-phase fault magnitude (expressed in amperes).</p> <p><b>R1.6.</b> Set transmission line relays applied on transmission lines connected to generation stations remote to load so they do not operate at or below 230% of the aggregated generation nameplate capability.</p> <p><b>R1.7.</b> Set transmission line relays applied at the load center terminal, remote from generation stations, so they do not operate at or below 115%</p>	<p><b>R1.4.</b> Set transmission line relays on series compensated transmission lines so they do not operate at or below the maximum power transfer capability of the transmission line, determined as the greater of:</p> <ul style="list-style-type: none"> <li>■ 115% of the highest emergency rating of the series capacitor, or</li> <li>■ 115% of the maximum power transfer capability of the transmission line (expressed in amperes), calculated in accordance with requirement R1.3, using the full transmission line inductive reactance;</li> </ul> <p><b>R1.5.</b> Set transmission line relays on weak source systems so they do not operate at or below 170% of the maximum end-of-line three-phase fault magnitude, expressed in amperes;</p> <p><b>R1.6.</b> Set transmission line relays applied on transmission lines connected to generating facilities remote to load so they do not operate at or below</p>			

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<p>of the maximum current flow from the load to the generation source under any system configuration.</p> <p><b>R1.8.</b> Set transmission line relays applied on the bulk system-end of transmission lines that serve load remote to the system so they do not operate at or below 115% of the maximum current flow from the system to the load under any system configuration.</p> <p><b>R1.9.</b> Set transmission line relays applied on the load-end of transmission lines that serve load remote to the bulk system so they do not operate at or below 115% of the maximum current flow from the load to the system under any system configuration.</p> <p><b>R1.10.</b> Set transformer fault protection relays and transmission line relays on transmission lines terminated only with a transformer so that they do not operate at or below the greater of: - 150% of the applicable maximum transformer nameplate rating (expressed in amperes), including the forced cooled ratings corresponding to all installed supplemental cooling</p>	<p>230% of the aggregated generating unit(s) nameplate capability;</p> <p><b>R1.7.</b> Set transmission line relays applied at the load center terminal, remote from generating facilities, so they do not operate at or below 115% of the maximum current flow from the load to the generation source under any system configuration;</p> <p><b>R1.8.</b> Set transmission line relays applied on the bulk system-end of transmission lines that serve load remote to the system so they do not operate at or below 115% of the maximum current flow from the system to the load under any system configuration;</p> <p><b>R1.9.</b> Set transmission line relays applied on the load-end of transmission lines that serve load remote to the BES so they do not operate at or below 115% of the maximum current flow from the load to the system under any system configuration;</p>			

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<p>equipment. - 115% of the highest operator established emergency transformer rating.</p> <p><b>R1.11.</b> For transformer overload protection relays that do not comply with R1.10 set the relays according to one of the following: Set the relays to allow the transformer to be operated at an overload level of at least 150% of the maximum applicable nameplate rating, or 115% of the highest operator established emergency transformer rating, whichever is greater. The protection must allow this overload for at least 15 minutes to allow for the operator to take controlled action to relieve the overload. Install supervision for the relays using either a top oil or simulated winding hot spot temperature element. The setting should be no less than 100° C for the top oil or 140° C for the winding hot spot temperature<sup>3</sup>.</p> <p><sup>3</sup> IEEE standard C57.115, Table 3, specifies that transformers are to be designed to withstand a winding hot spot temperature of 180 degrees C, and cautions that bubble formation may occur above 140 degrees C.</p>	<p><b>R1.10.</b> Set transformer fault protection relays and transmission line relays on transmission lines terminated only with a transformer so that they do not operate at or below the greater of:</p> <ul style="list-style-type: none"> <li>■ 115% of the applicable maximum transformer nameplate rating expressed in amperes, including the forced cooled ratings corresponding to all installed supplemental cooling equipment; or</li> <li>■ 115% of the highest operator established emergency transformer rating;</li> </ul> <p><b>R1.11.</b> For transformer overload protection relays that do not comply with requirement R1.10 set the relays according to the following: Set the relays to allow the transformer to be operated at an overload level of at least 150% of the maximum applicable nameplate rating, or 115% of the highest emergency transformer rating, whichever is greater. The protection must</p>			

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<p><b>R1.12.</b> When the desired transmission line capability is limited by the requirement to adequately protect the transmission line, set the transmission line distance relays to a maximum of 125% of the apparent impedance (at the impedance angle of the transmission line) subject to the following constraints:</p> <p><b>R1.12.1.</b> Set the maximum torque angle (MTA) to 90 degrees or the highest supported by the manufacturer.</p> <p><b>R1.12.2.</b> Evaluate the relay loadability in amperes at the relay trip point at 0.85 per unit voltage and a power factor angle of 30 degrees.</p> <p><b>R1.12.3.</b> Include a relay setting component of 87% of the current calculated in R1.12.2 in the Facility Rating determination for the circuit.</p> <p><b>R1.13.</b> Where other situations present practical limitations on circuit capability, set the phase protection relays so they do not operate at or below 115% of such limitations.</p>	<p>allow this overload for at least 15 minutes to allow for the system operator to take controlled action to relieve the overload. Install supervision for the relays using either a top oil or simulated winding hot spot temperature element. The setting should be no less than 100°C for the top oil or 140°C for the winding hot spot temperature;</p> <p><b>R1.12.</b> When the desired transmission line capability is limited by the requirement to adequately protect the transmission line, set the transmission line distance relays to a maximum of 125% of the apparent impedance (at the impedance angle of the transmission line) subject to the following constraints:</p> <p><b>R1.12.1.</b> Set the maximum torque angle (MTA) to 90 degrees or the highest setting supported by the manufacturer.</p> <p><b>R1.12.2.</b> Evaluate the relay loadability in amperes at the relay trip point at 0.85 per unit voltage and a power factor</p>			

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	<p>angle of 30 degrees; and <b>R1.12.3.</b> Include a relay setting component of 87% of the current calculated in requirement <b>R1.12.2.</b> in the facility rating determination for the circuit.</p> <p><b>R1.13.</b> Where other situations present practical limitations on circuit capability, set the phase protection relays so they do not operate at or below 115% of such limitations.</p>			
<p><b>R2.</b> The Transmission Owner, Generator Owner, or Distribution Provider that uses a circuit capability with the practical limitations described in R1.6, R1.7, R1.8, R1.9, R1.12, or R1.13 shall use the calculated circuit capability as the Facility Rating of the circuit and shall obtain the agreement of the Planning Coordinator, Transmission Operator, and Reliability Coordinator with the calculated circuit capability. [Violation Risk Factor: Medium] [Time Horizon: Long Term Planning]</p>	<p><b>R2.</b> A TFO that uses a circuit capability with the practical limitations described in requirements R1.6, R1.7, R1.8, R1.9, R1.12, or R1.13 must use the calculated circuit capability as the facility rating of the circuit and must obtain the agreement of the ISO to use the calculated circuit capability.</p>	<p><input type="checkbox"/> New <input checked="" type="checkbox"/> Amended <input type="checkbox"/> Deleted</p> <p>Amended to identify requirements of the responsible entities in Alberta and for clarity and consistency.</p> <p><b>Alberta Variance:</b> Reliability Coordinator is not included in Alberta requirement R2. NERC requirement R2 states that agreement shall be obtained from the Planning Coordinator, Transmission Operator, and Reliability Coordinator. The ISO is the authority from which TFOs and GFOs will obtain agreement for the calculated circuit capability and the ISO</p>	<p><input type="checkbox"/> Support <input type="checkbox"/> Support with language suggestions <input type="checkbox"/> Oppose</p> <p><i>Insert comments, reason for position, and alternate proposal (if any).</i></p>	

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		will consult with the WECC Reliability Coordinator at its discretion.		
<p><b>R3.</b> The Planning Coordinator shall determine which of the facilities (transmission lines operated at 100 kV to 200 kV and transformers with low voltage terminals connected at 100 kV to 200 kV) in its Planning Coordinator Area are critical to the reliability of the Bulk Electric System to identify the facilities from 100 kV to 200 kV that must meet Requirement 1 to prevent potential cascade tripping that may occur when protective relay settings limit transmission loadability. [Violation Risk Factor: Medium] [Time Horizon: Long Term Planning]</p> <p><b>R3.1.</b> The Planning Coordinator shall have a process to determine the facilities that are critical to the reliability of the Bulk Electric System.</p> <p><b>R3.2.</b> The Planning Coordinator shall maintain a current list of facilities determined according to the process described in R3.1.</p> <p><b>R3.3.</b> The Planning Coordinator shall provide a list of facilities to its</p>	<p><b>R3.</b> The ISO must identify which transmission lines operated at 100 kV to 200 kV and transformers with low voltage terminals connected at 100 kV to 200 kV are critical to the reliability of the BES in order to prevent potential cascade tripping that may occur when protective relay settings limit transmission loadability. In order to carry out this requirement, the ISO must do the following:</p> <p><b>R3.1</b> The ISO must have a process to determine the facilities that are critical to the reliability of the BES and must consider input from adjoining planning coordinators and affected reliability coordinators.</p> <p><b>R3.2</b> The ISO must maintain a current list of facilities determined according to the process specified in requirement R3.1.</p>	<p><input type="checkbox"/> New  <input checked="" type="checkbox"/> Amended  <input type="checkbox"/> Deleted</p> <p>Amended to identify requirements of the responsible entities in Alberta and for clarity and consistency.</p> <p>Deleted redundant requirement from requirement R3 that states, "These identified facilities must meet requirement R1".</p>	<p><input type="checkbox"/> Support  <input type="checkbox"/> Support with language suggestions  <input type="checkbox"/> Oppose</p> <p><i>Insert comments, reason for position, and alternate proposal (if any).</i></p>	

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Reliability Coordinators, Transmission Owners, Generator Owners, and Distribution Providers within 30 days of the establishment of the initial list and within 30 days of any changes to the list.	<b>R3.3</b> The ISO must provide a list of facilities maintained pursuant to requirement R3.2 to each TFO within 30 days of the establishment of the initial list and within 30 days of any changes to the list.			
	<b>R4</b> TFOs must comply with requirement R1 for all new facilities added to the ISO's list of facilities within 2 years of receipt from the ISO as contemplated in requirement R3.3.	<input checked="" type="checkbox"/> New <input type="checkbox"/> Amended <input type="checkbox"/> Deleted  Added to address timelines for TFOs to meet requirement R1 for new facilities added to the ISO list. This is consistent with the timelines in the effective date section of the NERC reliability standard.	<input type="checkbox"/> Support <input type="checkbox"/> Support with language suggestions <input type="checkbox"/> Oppose  <i>Insert comments, reason for position, and alternate proposal (if any).</i>	
<b>M1.</b> The Transmission Owner, Generator Owner, and Distribution Provider shall each have evidence to show that each of its transmission relays are set according to one of the criteria in R1.1 through R1.13. (R1)	<b>MR1.</b> The TFO must have evidence to show that each of its transmission relays is set according to one of the criteria in requirements R1.1 through R1.13.  Records of actual settings are within acceptable tolerances of the applicable criteria in requirements R1.1 through R1.13.	<input type="checkbox"/> New <input checked="" type="checkbox"/> Amended <input type="checkbox"/> Deleted  Amended to align with requirement R1.	<input type="checkbox"/> Support <input type="checkbox"/> Support with language suggestions <input type="checkbox"/> Oppose  <i>Insert comments, reason for position, and alternate proposal (if any).</i>	
<b>M2.</b> The Transmission Owner,	<b>MR2</b> The TFO with	<input type="checkbox"/> New	<input type="checkbox"/> Support	

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NERC PRC-023-1	Alberta PRC-023-AB-1	AESO Reason for Difference	Stakeholder Comments	AESO Replies
<p>Generator Owner, and Distribution Provider with transmission relays set according to the criteria in R1.6, R1.7, R1.8, R1.9, R1.12, or R.13 shall have evidence that the resulting Facility Rating was agreed to by its associated Planning Coordinator, Transmission Operator, and Reliability Coordinator. (R2)</p>	<p>transmission relays set according to the criteria in requirements R1.6, R1.7, R1.8, R1.9, R1.12, or R.13 must have evidence that the ISO agreed to the resulting facility rating.</p>	<p><input checked="" type="checkbox"/> Amended <input type="checkbox"/> Deleted</p> <p>Amended to align with requirement R2.</p>	<p><input type="checkbox"/> Support with language suggestions <input type="checkbox"/> Oppose</p> <p><i>Insert comments, reason for position, and alternate proposal (if any).</i></p>	
<p><b>M3.</b> The Planning Coordinator shall have a documented process for the determination of facilities as described in R3. The Planning Coordinator shall have a current list of such facilities and shall have evidence that it provided the list to the appropriate Reliability Coordinators, Transmission Operators, Generator Operators, and Distribution Providers. (R3)</p>	<p><b>MR3.1</b> Written process exists which includes input from adjoining planning coordinators and affected reliability coordinators and is of sufficient detail to meet requirements specified in requirement R3.1. <b>MR3.2</b> List is complete and up to date as specified in requirement R3.2. <b>MR3.3</b> Confirmation that the ISO provided the list as specified in requirement R3.3.</p>	<p><input type="checkbox"/> New <input checked="" type="checkbox"/> Amended <input type="checkbox"/> Deleted</p> <p>Amended to align with requirement R3.</p>	<p><input type="checkbox"/> Support <input type="checkbox"/> Support with language suggestions <input type="checkbox"/> Oppose</p> <p><i>Insert comments, reason for position, and alternate proposal (if any).</i></p>	
	<p><b>MR4</b> Evidence exists that TFOs complied with requirement R1 for new facilities added to the ISO's list of facilities as specified in requirement R4.</p>	<p><input checked="" type="checkbox"/> New <input type="checkbox"/> Amended <input type="checkbox"/> Deleted</p> <p>Added to align with requirement R4.</p>	<p><input type="checkbox"/> Support <input type="checkbox"/> Support with language suggestions <input type="checkbox"/> Oppose</p> <p><i>Insert comments, reason for position, and alternate proposal (if any).</i></p>	
<b>Compliance</b>				

**COMPARISON BETWEEN NERC PRC-023-1 AND ALBERTA PRC-023-AB-1  
TRANSMISSION RELAY LOADABILITY**

<b>NERC PRC-023-1</b>	<b>Alberta PRC-023-AB-1</b>	<b>AESO Reason for Difference</b>	<b>Stakeholder Comments</b>	<b>AESO Replies</b>
To view the compliance section D of the NERC reliability standard follow this link: <a href="http://www.nerc.com/files/PRC-023-1.pdf">http://www.nerc.com/files/PRC-023-1.pdf</a>		The Alberta reliability standards do not contain a compliance section. Compliance with all Alberta reliability standards is completed in accordance with the Alberta Reliability Standards Compliance Monitoring Program, available on the AESO website at: <a href="http://www.aeso.ca/loadsettlement/17189.html">http://www.aeso.ca/loadsettlement/17189.html</a> .		
<b>Regional Differences</b> None identified.	None identified.	Not applicable in Alberta		

<b>Attachment A</b>	<b>Attachment A</b>	<b>AESO Reason for Difference</b>	<b>Comments</b>	<b>Rationale and/or Alternate Proposal</b>
<p><b>1.</b> This reliability standard includes any protective functions which could trip with or without time delay, on load current, including but not limited to:</p> <ul style="list-style-type: none"> <li><b>1.1.</b> Phase distance.</li> <li><b>1.2.</b> Out-of-step tripping.</li> <li><b>1.3.</b> Switch-on-to-fault.</li> <li><b>1.4.</b> Overcurrent relays.</li> <li><b>1.5.</b> Communications aided protection schemes including but not limited to: <ul style="list-style-type: none"> <li><b>1.5.1</b> Permissive overreach transfer trip (POTT).</li> <li><b>1.5.2</b> Permissive under-reach transfer trip (PUTT).</li> <li><b>1.5.3</b> Directional comparison blocking (DCB).</li> </ul> </li> </ul>	<p><b>1.</b> This reliability standard includes any protective functions which could trip with or without time delay, on load current, including but not limited to:</p> <ul style="list-style-type: none"> <li><b>1.1.</b> Phase distance.</li> <li><b>1.2.</b> Out-of-step tripping.</li> <li><b>1.3.</b> Switch-on-to-fault.</li> <li><b>1.4.</b> Overcurrent relays.</li> <li><b>1.5.</b> Communications aided protection schemes including but not limited to: <ul style="list-style-type: none"> <li><b>1.5.1</b> Permissive overreach transfer trip (POTT).</li> <li><b>1.5.2</b> Permissive under-</li> </ul> </li> </ul>	Amended 3.5 to align with Alberta Reliability Standards.	<input type="checkbox"/> Support <input type="checkbox"/> Support with language suggestions <input checked="" type="checkbox"/> Oppose  <p>In Section 3.5 below, it references standards PRC-015-AB-0, PRC-016-AB-0 and PRC-017-AB-0. It is Nexen's understanding that these standards have not been approved or in effect. Nexen submits until the three referenced standards have been approved and are effective, this standard cannot be implemented. Only when the three standards have been approved can this standard</p>	

Attachment A	Attachment A	AESO Reason for Difference	Comments	Rationale and/or Alternate Proposal
<p><b>1.5.4</b> Directional comparison unblocking (DCUB).</p> <p><b>2.</b> This reliability standard includes out-of-step blocking schemes which must be evaluated to ensure that they do not block trip for faults during the loading conditions defined within this reliability standard's requirements.</p> <p><b>3.</b> The following protection systems are excluded from the requirements of this reliability standard:</p> <p><b>3.1.</b> Relay elements that are only enabled when other relays or associated systems fail. For example:</p> <ul style="list-style-type: none"> <li>• Overcurrent elements that are only enabled during loss of potential conditions; or</li> <li>• Elements that are only enabled during a loss of communications.</li> </ul> <p><b>3.2.</b> Protection systems intended for the detection of ground fault conditions.</p> <p><b>3.3.</b> Protection systems intended for protection during stable power swings.</p> <p><b>3.4.</b> Generating unit protection relays that are susceptible to load.</p> <p><b>3.5.</b> Relay elements used only for Special Protection Systems applied and approved in accordance with</p>	<p>reach transfer trip (PUTT).</p> <p><b>1.5.3</b> Directional comparison blocking (DCB).</p> <p><b>1.5.4</b> Directional comparison unblocking (DCUB).</p> <p><b>2.</b> This reliability standard includes out-of-step blocking schemes which must be evaluated to ensure that they do not block trip for faults during the loading conditions defined within this reliability standard's requirements.</p> <p><b>3.</b> The following protection systems are excluded from the requirements of this reliability standard:</p> <p><b>3.1.</b> Relay elements that are only enabled when other relays or associated systems fail. For example:</p> <ul style="list-style-type: none"> <li>• Overcurrent elements that are only enabled during loss of potential conditions; or</li> <li>• Elements that are only enabled during a loss of communications.</li> </ul> <p><b>3.2.</b> Protection systems</p>		<p>come into force.</p>	

Attachment A	Attachment A	AESO Reason for Difference	Comments	Rationale and/or Alternate Proposal
<p>NERC Reliability Standards PRC-012 through PRC-017.</p> <p><b>3.6.</b> Protection systems that are designed only to respond in time periods which allow operators 15 minutes or greater to respond to overload conditions.</p> <p><b>3.7.</b> Thermal emulation relays which are used in conjunction with dynamic Facility Ratings.</p> <p><b>3.8.</b> Relay elements associated with DC lines.</p> <p><b>3.9.</b> Relay elements associated with DC converter transformers.</p>	<p>intended for the detection of ground fault conditions.</p> <p><b>3.3.</b> Protection systems intended for protection during stable power swings.</p> <p><b>3.4.</b> Generating unit protection relays that are susceptible to load.</p> <p><b>3.5.</b> Relay elements used only for RASs applied and approved in accordance with reliability standards PRC-015-AB-0, PRC-016-AB-0 and PRC-017-AB-0.</p> <p><b>3.6.</b> Protection systems that are designed only to respond in time periods which allow operators 15 minutes or greater to respond to overload conditions.</p> <p><b>3.7.</b> Thermal emulation relays which are used in conjunction with dynamic Facility Ratings.</p> <p><b>3.8.</b> Relay elements associated with DC lines.</p> <p><b>3.9.</b> Relay elements associated with DC converter transformers.</p>			

Definitions	Comments	Rationale and/or Alternate Proposal
<p><b>(a) New</b></p> <p>“planning coordinator” means the responsible entity that coordinates and integrates transmission facility and service plans, resource plans, and protection systems.</p>	<p> <input type="checkbox"/> Support  <input type="checkbox"/> Support with language suggestions  <input type="checkbox"/> Oppose         </p> <p><i>Insert comments, reason for position, and alternate proposal (if any).</i></p>	
<p><b>(b) Removals</b></p> <p>N/A</p>		
<p><b>(c) Amendments</b></p> <p>N/A</p>		