



Stakeholder Comparison Comment Rationale Matrix

2010-09-02

AESO AUTHORITATIVE DOCUMENT PROCESS

Alberta Reliability Standard – MOD-029-AB-1 Rated System Path Methodology

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]: <u>2010/09/02</u>	Contact: _____
Period of Consultation [yyyy/mm/dd]: <u>2010/09/02</u> through <u>2010/10/01</u>	Phone: _____
Comments From: <u>TransAlta</u>	E-mail: _____
Date [yyyy/mm/dd]: <u>2010/09/28</u>	

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 MOD-029-1 AND ALBERTA MOD-029-AB-1

Rated System Path Methodology

NERC MOD-029-1	Alberta MOD-029-AB-1	AESO Reason for Difference	Stakeholder Comments	AESO Replies
<p>Purpose To increase consistency and reliability in the development and documentation of transfer capability calculations for short-term use performed by entities using the Rated System Path Methodology to support analysis and system operations.</p>	<p>Purpose The purpose of this reliability standard is to increase consistency and reliability in the development and documentation of transfer capability calculations for short-term use performed by the ISO using the rated system path methodology to support analysis and system operations.</p>	<p>Clarified the purpose to align with the content of the reliability standard.</p>	<p>TransAlta requests AESO to complete a comparison of this new standard vs. the existing AESO document that is used currently to determine 'transfer capability calculations for short term use' and identify any impacts so that we can understand what they are. TransAlta requests AESO to share this and identify the current document used.</p>	
<p>Applicability 4.1. Each Transmission Operator that uses the Rated System Path Methodology to calculate Total Transfer Capabilities (TTCs) for ATC Paths. 4.2. Each Transmission Service Provider that uses the Rated System Path Methodology to calculate Available Transfer Capabilities (ATCs) for ATC Paths.</p>	<p>Applicability This reliability standard applies to:</p> <ul style="list-style-type: none"> the ISO. 	<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><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>Effective Date First day of the first calendar quarter that is twelve months beyond the date that all four standards (MOD-001-1, MOD-028-1, MOD-029-1, and MOD-030-1) are approved by all applicable regulatory authorities.</p>	<p>Effective Date Ninety (90) days after the date the Commission approves it.</p>	<p>To allow a reasonable amount of time for Alberta entities to implement this Alberta Reliability Standard.</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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<p>R1. When calculating TTCs for ATC Paths, the Transmission Operator shall use a Transmission model which satisfies the following requirements: [Violation Risk Factor: Lower] [Time Horizon: Operations Planning]</p> <p>R1.1. The model utilizes data and assumptions consistent with the time period being studied and that meets the following criteria:</p> <p>R1.1.1. Includes at least:</p> <p>R1.1.1.1. The Transmission Operator area. Equivalent representation of radial lines and facilities 161kV or below is allowed.</p> <p>R1.1.1.2. All Transmission Operator areas contiguous with its own Transmission Operator area. (Equivalent representation is allowed.)</p> <p>R1.1.1.3. Any other Transmission Operator area linked to the Transmission Operator's area by joint operating agreement. (Equivalent representation is allowed.)</p> <p>R1.1.2. Models all system Elements as in-service for the assumed initial conditions.</p>	<p>R1 The ISO must, when calculating total transfer capability for available transfer capability paths, use a transmission model which meets the following requirements:</p> <p>R1.1 uses data and assumptions consistent with the time period being studied and, at a minimum, meets the following criteria:</p> <p>R1.1.1. includes at least the balancing authority area of the ISO, and with respect to radial lines and facilities 161kV or below, an equivalent representation;</p> <p>R1.1.2 includes at least all interconnected transmission operator areas interconnected with the balancing authority area of the ISO, or an equivalent representation;</p> <p>R1.1.3 includes at least any other interconnected transmission operator area linked to the balancing authority area of the ISO by an operating agreement, or an equivalent representation;</p> <p>R1.1.4 uses all system elements, bulk transmission lines and transformers that are normally in-service as in-service for the assumed</p>	<p><input type="checkbox"/> New <input checked="" type="checkbox"/> Amended <input type="checkbox"/> Deleted</p> <p>Amended for clarity and consistency.</p> <p>Alberta requirement R1.1.4 reflects actual transmission system configuration and does not include elements that are normally out of service.</p> <p>Alberta requirements R1.1.6, R1.1.11 and R1.1.12: the Alberta Reliability Standards section of the AESO website, and in particular the section that contains this reliability standard, will contain reference to reliability standard MOD-001-AB <i>Available Transmission System Capability</i> as a related authoritative document.</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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<p>R1.1.3. Models all generation (may be either a single generator or multiple generators) that is greater than 20 MVA at the point of interconnection in the studied area.</p> <p>R1.1.4. Models phase shifters in non-regulating mode, unless otherwise specified in the Available Transfer Capability Implementation Document (ATCID).</p> <p>R1.1.5. Uses Load forecast by Balancing Authority.</p> <p>R1.1.6. Uses Transmission Facility additions and retirements.</p> <p>R1.1.7. Uses Generation Facility additions and retirements.</p> <p>R1.1.8. Uses Special Protection System (SPS) models where currently existing or projected for implementation within the studied time horizon.</p> <p>R1.1.9. Models series compensation for each line at the expected operating level unless specified otherwise in the ATCID.</p> <p>R1.1.10. Includes any other modeling requirements or criteria specified in the ATCID.</p> <p>R1.2. Uses Facility Ratings as provided by the Transmission Owner and Generator Owner</p>	<p>initial conditions;</p> <p>R1.1.5 uses all generation greater than 20 MVA at the point of interconnection in the studied area, including a single generating unit or multiple generating units;</p> <p>R1.1.6 uses phase shifters in non-regulating mode, unless otherwise specified in the available transfer capability implementation document;</p> <p>R1.1.7 uses the load forecast for the balancing authority area of the ISO;</p> <p>R1.1.8 uses transmission facility additions and retirements;</p> <p>R1.1.9 uses generating unit additions and retirements;</p> <p>R1.1.10 uses remedial action schemes or considers the effects of remedial action schemes, whether currently existing or projected, in the transmission model, for implementation within the time period being studied;</p> <p>R1.1.11 uses series compensation for each bulk transmission line that has series compensation at the expected operating level unless specified otherwise in the available transfer capability implementation document; and</p>			

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	<p>R1.1.12 includes any other modeling requirements or criteria specified in the available transfer capability implementation document.</p> <p>R1.2 uses facility ratings as provided by interconnected transmission operators and by the legal owner of: a transmission facility, a generating unit, or an aggregated generating facility.</p>			
<p>R2. The Transmission Operator shall use the following process to determine TTC: [Violation Risk Factor: Lower] [Time Horizon: Operations Planning]</p> <p>R2.1. Except where otherwise specified within MOD-029-1, adjust base case generation and Load levels within the updated power flow model to determine the TTC (maximum flow or reliability limit) that can be simulated on the ATC Path while at the same time satisfying all planning criteria contingencies as follows:</p> <p>R2.1.1. When modeling normal conditions, all Transmission Elements will be modeled at or below 100% of their continuous rating.</p>	<p>R2. The ISO must calculate total transfer capability in accordance with the following process:</p> <p>R2.1 except where otherwise specified within this reliability standard, the ISO must adjust generation and load levels within the updated power flow model to determine the total transfer capability maximum flow or reliability limit that can be simulated on the available transfer capability path while at the same time satisfying all planning criteria contingencies as follows:</p> <p>R2.1.1 when modeling normal conditions, the ISO must model all transmission elements at or below 100% of their continuous rating;</p>	<p><input type="checkbox"/> New <input checked="" type="checkbox"/> Amended <input type="checkbox"/> Deleted</p> <p>Amended for clarity and consistency.</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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<p>R2.1.2. When modeling contingencies the system shall demonstrate transient, dynamic and voltage stability, with no Transmission Element modeled above its Emergency Rating.</p> <p>R2.1.3. Uncontrolled separation shall not occur.</p> <p>R2.2. Where it is impossible to actually simulate a reliability-limited flow in a direction counter to prevailing flows (on an alternating current Transmission line), set the TTC for the non-prevailing direction equal to the TTC in the prevailing direction. If the TTC in the prevailing flow direction is dependant on a Special Protection System (SPS), set the TTC for the non-prevailing flow direction equal to the greater of the maximum flow that can be simulated in the non-prevailing flow direction or the maximum TTC that can be achieved in the prevailing flow direction without use of a SPS.</p> <p>R2.3. For an ATC Path whose capacity is limited by contract, set TTC on the ATC Path at the lesser of the maximum allowable contract capacity or the reliability limit as</p>	<p>R2.1.2 when applying contingencies to the transmission model, the ISO must demonstrate transient, dynamic and voltage stability, with no transmission element loaded above its emergency rating;</p> <p>R2.1.3 the ISO must demonstrate that uncontrolled separation does not occur.</p> <p>R2.2 Where it is impossible to simulate a reliability-limited flow in a direction counter to prevailing flows on an alternating current bulk transmission line, the ISO must model the total transfer capability for the non-prevailing direction equal to the total transfer capability in the prevailing direction. If the total transfer capability in the prevailing flow direction is dependant on a remedial action scheme, the ISO must model the total transfer capability for the non-prevailing flow direction equal to the greater of the maximum flow that can be simulated in the non-prevailing flow direction or the maximum total transfer capability that can be achieved in the prevailing flow direction without use of a remedial action scheme.</p>			

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<p>determined by R2.1.</p> <p>R2.4. For an ATC Path whose TTC varies due to simultaneous interaction with one or more other paths, develop a nomogram describing the interaction of the paths and the resulting TTC under specified conditions.</p> <p>R2.5. The Transmission Operator shall identify when the TTC for the ATC Path being studied has an adverse impact on the TTC value of any existing path. Do this by modeling the flow on the path being studied at its proposed new TTC level simultaneous with the flow on the existing path at its TTC level while at the same time honoring the reliability criteria outlined in R2.1. The Transmission Operator shall include the resolution of this adverse impact in its study report for the ATC Path.</p> <p>R2.6. Where multiple ownership of Transmission rights exists on an ATC Path, allocate TTC of that ATC Path in accordance with the contractual agreement made by the multiple owners of that ATC Path.</p>	<p>R2.3 for an available transfer capability limited by contract capacity, the ISO must model total transfer capability on the available transfer capability path at the lesser of the maximum allowable contract capacity or the reliability limit as determined by requirement R2.1.</p> <p>R2.4 for an available transfer capability path, whose total transfer capability varies due to simultaneous interaction with one or more other paths, the ISO must develop a nomogram describing the interaction of the paths and the resulting total transfer capability under specified conditions.</p> <p>R2.5 the ISO must identify when the total transfer capability for the available transfer capability path being studied has an adverse impact on the total transfer capability of any existing path. This must be done by modeling the flow on the path being studied at its proposed new total transfer capability level, simultaneous with the flow on the existing path at its total transfer capability level, while complying</p>			

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<p>R2.7. For ATC Paths whose path rating, adjusted for seasonal variance, was established, known and used in operation since January 1, 1994, and no action has been taken to have the path rated using a different method, set the TTC at that previously established amount.</p>	<p>with the reliability criteria outlined in requirement R2.1. The ISO must include the result in its study report for the available transfer capability path required in requirement R 2.8.</p> <p>R2.6 where multiple ownership of transmission rights exist on an available transfer capability path, total transfer capability of that path must be allocated in accordance with the contracts made by the multiple legal owners.</p> <p>R2.7 for available transfer capability paths whose path rating, adjusted for seasonal variance, was established, known and used in operation since January 1, 1994, and no action has been taken to have the path rated using a different method, the ISO must set the total transfer capability at the established amount.</p>			
<p>R2.8. Create a study report that describes the steps above that were undertaken (R2.1 – R2.7), including the contingencies and assumptions used, when determining the TTC and the results of the study. Where three</p>	<p>R2.8 the ISO must create a report that describes the steps that were undertaken to meet requirements R2.1 through R2.7 including the results of the study, the contingencies and assumptions</p>	<p><input type="checkbox"/> New <input checked="" type="checkbox"/> Amended <input type="checkbox"/> Deleted</p> <p>Alberta Variance:</p>		

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<p>phase fault damping is used to determine stability limits, that report shall also identify the percent used and include justification for use unless specified otherwise in the ATCID.</p>	<p>used.</p>	<p>NERC requirement R2.8 includes reference to three phase fault dampening which has been removed from Alberta requirement R2.8. Three phase fault dampening will be referenced in the AESO's available transfer capability implementation document as appropriate.</p>		
<p>R3. Each Transmission Operator shall establish the TTC at the lesser of the value calculated in R2 or any System Operating Limit (SOL) for that ATC Path. [Violation Risk Factor: Lower] [Time Horizon: Operations Planning]</p>	<p>R3 The ISO must establish the total transfer capability at the lesser of the total transfer capability calculated in requirement R2 or any system operating limit for the studied available transfer capability path.</p>	<p><input type="checkbox"/> New <input checked="" type="checkbox"/> Amended <input type="checkbox"/> Deleted</p> <p>The Alberta Reliability Standards section of the AESO website, and in particular the section that contains this reliability standard, will contain reference to OPP304 <i>Alberta-BC Interconnection Transfer Limits</i> as a related authoritative document, which lists the total transfer capability.</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>R4. Within seven calendar days of the finalization of the study report, the Transmission Operator shall make available to the Transmission Service Provider of the ATC Path, the most current value for TTC and the TTC study report documenting the assumptions used and steps taken in</p>		<p><input type="checkbox"/> New <input type="checkbox"/> Amended <input checked="" type="checkbox"/> Deleted</p> <p>Alberta Variance: NERC requirement R4 has been deleted as it has been assessed as</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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<p>determining the current value for TTC for that ATC Path. [Violation Risk Factor: Lower] [Time Horizon: Operations Planning]</p>		<p>not applicable in Alberta, as, in Alberta, the AESO is both the Transmission Operator and the Transmission Service Provider.</p>		
<p>R5. When calculating ETC for firm Existing Transmission Commitments (ETC_F) for a specified period for an ATC Path, the Transmission Service Provider shall use the algorithm below: [Violation Risk Factor: Lower] [Time Horizon: Operations Planning]</p> $TC_F = NL_F + NITS_F + GF_F + PTP_F + ROR_F + OS_F$ <p>Where: NL_F is the firm capacity set aside to serve peak Native Load forecast commitments for the time period being calculated, to include losses, and Native Load growth, not otherwise included in Transmission Reliability Margin or Capacity Benefit Margin. NITS_F is the firm capacity reserved for Network Integration Transmission Service serving Load, to include losses, and Load growth, not otherwise included in Transmission Reliability Margin or Capacity Benefit</p>		<p><input type="checkbox"/> New <input type="checkbox"/> Amended <input checked="" type="checkbox"/> Deleted</p> <p>Alberta Variance: NERC requirement R5 has been deleted as it has been assessed as not applicable in Alberta. The ISO tariff does not currently recognize transmission system “rights” or “Commitments”.</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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<p>Margin. GF_F is the firm capacity set aside for grandfathered Transmission Service and contracts for energy and/or Transmission Service, where executed prior to the effective date of a Transmission Service Provider's Open Access Transmission Tariff or "safe harbor tariff." PTP_F is the firm capacity reserved for confirmed Point-to-Point Transmission Service. ROR_F is the firm capacity reserved for Roll-over rights for contracts granting Transmission Customers the right of first refusal to take or continue to take Transmission Service when the Transmission Customer's Transmission Service contract expires or is eligible for renewal. OS_F is the firm capacity reserved for any other service(s), contract(s), or agreement(s) not specified above using Firm Transmission Service as specified in the ATCID.</p>				
<p>R6. When calculating ETC for non-firm Existing Transmission Commitments (ETC_{NF}) for all time horizons for an ATC Path the Transmission Service Provider shall</p>		<p><input type="checkbox"/> New <input type="checkbox"/> Amended <input checked="" type="checkbox"/> Deleted</p> <p>Alberta Variance:</p>	<p><input type="checkbox"/> Support <input type="checkbox"/> Support with language suggestions <input type="checkbox"/> Oppose</p>	

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<p>use the following algorithm: [Violation Risk Factor: Lower] [Time Horizon: Operations Planning]</p> $ETC_{NF} = NITS_{NF} + GF_{NF} + PTP_{NF} + OS_{NF}$ <p>Where: NITS_{NF} is the non-firm capacity set aside for Network Integration Transmission Service serving Load (i.e., secondary service), to include losses, and load growth not otherwise included in Transmission Reliability Margin or Capacity Benefit Margin. GF_{NF} is the non-firm capacity set aside for grandfathered Transmission Service and contracts for energy and/or Transmission Service, where executed prior to the effective date of a Transmission Service Provider's Open Access Transmission Tariff or "safe harbor tariff." PTP_{NF} is non-firm capacity reserved for confirmed Point-to-Point Transmission Service. OS_{NF} is the non-firm capacity reserved for any other service(s), contract(s), or agreement(s) not specified above using non-firm</p>		<p>NERC requirement R6 has been deleted as it has been assessed as not applicable in Alberta. The ISO tariff does not currently recognize transmission system "rights" or "commitments".</p>	<p><i>Insert comments, reason for position, and alternate proposal (if any).</i></p>	

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transmission service as specified in the ATCID.				
<p>R7. When calculating firm ATC for an ATC Path for a specified period, the Transmission Service Provider shall use the following algorithm: [Violation Risk Factor: Lower] [Time Horizon: Operations Planning]</p> $ATC_F = TTC - ETC_F - CBM - TRM + Postbacks_F + counterflows_F$ <p>Where ATC_F is the firm Available Transfer Capability for the ATC Path for that period. TTC is the Total Transfer Capability of the ATC Path for that period. ETC_F is the sum of existing firm commitments for the ATC Path during that period. CBM is the Capacity Benefit Margin for the ATC Path during that period. TRM is the Transmission Reliability Margin for the ATC Path during that period. Postbacks_F are changes to firm Available Transfer Capability due to a change in the use of Transmission Service for that period, as defined in Business Practices.</p>	<p>R4 When calculating available transfer capability for an available transfer capability path for a specified period, the ISO must use the algorithm in Appendix 1.</p>	<p><input type="checkbox"/> New <input checked="" type="checkbox"/> Amended <input type="checkbox"/> Deleted</p> <p>Alberta Variance: NERC requirement R7 identifies the calculation for firm available transfer capability; however, the AESO does not provide rights to the transmission system under the ISO tariff. Therefore, the calculation provided in R4 of the Proposed Reliability Standard is for the calculation of available transfer capability. There are no firm commitments for an available transfer capability path; consequently, ETC_F, counterflows_F and Postbacks_F are not included in the available transfer capability calculation. Further, Capacity Benefit Margin (“CBM”) is not included in the available transfer capability calculation as CBM is not used in Alberta.</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>TransAlta requests AESO to explain why they did not include counterflow in the ATC calculation.</p>	

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<p>counterflows_F are adjustments to firm Available Transfer Capability as determined by the Transmission Service Provider and specified in their ATCID.</p>				
<p>R8. When calculating non-firm ATC for an ATC Path for a specified period, the Transmission Service Provider shall use the following algorithm: [Violation Risk Factor: Lower] [Time Horizon: Operations Planning]</p> $ATC_{NF} = TTC - ETC_F - ETC_{NF} - CBM_s - TRM_U + Postbacks_{NF} + counterflows_{NF}$ <p>Where: ATC_{NF} is the non-firm Available Transfer Capability for the ATC Path for that period. TTC is the Total Transfer Capability of the ATC Path for that period. ETC_F is the sum of existing firm commitments for the ATC Path during that period. ETC_{NF} is the sum of existing non-firm commitments for the ATC Path during that period. CBM_s is the Capacity Benefit Margin for the ATC Path that has been</p>		<p><input type="checkbox"/> New <input type="checkbox"/> Amended <input checked="" type="checkbox"/> Deleted</p> <p>Alberta Variance:</p> <p>NERC requirement R8 has been deleted as it identifies the calculation for non-firm available transfer capability, however, the AESO does not provide rights to the transmission system under the ISO tariff. The calculation provided in R4 of the Proposed Reliability Standard is the only calculation used for an available transfer capability path in Alberta.</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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<p>scheduled during that period. TRM_U is the Transmission Reliability Margin for the ATC Path that has not been released for sale (unreleased) as non-firm capacity by the Transmission Service Provider during that period. Postbacks_{NF} are changes to non-firm Available Transfer Capability due to a change in the use of Transmission Service for that period, as defined in Business Practices. counterflows_{NF} are adjustments to non-firm Available Transfer Capability as determined by the Transmission Service Provider and specified in its ATCID.</p>				
<p>M1. Each Transmission Operator that uses the Rated System Path Methodology shall produce any Transmission model it used to calculate TTC for purposes of calculating ATC for each ATC Path, as required in R1, for the time horizon(s) to be examined. (R1) M1.1. Production shall be in the same form and format used by the Transmission Operator to calculate the TTC, as required in R1. (R1)</p>	<p>MR1 Evidence exists, such as an engineering report, and shows that the transmission model as specified in requirement R1 has been used to calculate available transfer capability. MR1.1 Evidence exists, such as an engineering report, that data and assumptions are used as specified in requirement R1.1. MR1.1.1 Evidence exists, such as statements in an engineering report, that the model includes at least the</p>	<p><input type="checkbox"/> New <input checked="" type="checkbox"/> Amended <input type="checkbox"/> Deleted</p> <p>Amended to align with requirements R1 and its sub-requirements.</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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<p>M1.2. The Transmission model produced must include the areas listed in R1.1.1 (or an equivalent representation, as described in the requirement) (R1.1)</p> <p>M1.3. The Transmission model produced must show the use of the modeling parameters stated in R1.1.2 through R1.1.10; except that, no evidence shall be required to prove: 1) utilization of a Special Protection System where none was included in the model or 2) that no additions or retirements to the generation or Transmission system occurred. (R1.1.2 through R1.1.10)</p> <p>M2. Each Transmission Operator that uses the Rated System Path Methodology shall produce the ATCID it uses to show where it has described and used additional modeling criteria in its ACTID that are not otherwise included in MOD-29 (R1.1.4, R.1.1.9, and R1.1.10).</p> <p>M1.4. The Transmission Operator must provide evidence that the models used to determine TTC included Facility Ratings as provided by the Transmission Owner and Generator Owner. (R1.2)</p>	<p>balancing authority area of the ISO, and is modeled as specified in requirement R1.1.1.</p> <p>MR1.1.2 Evidence exists, such as statements in an engineering report, that areas are included in the model as specified in requirement R1.1.2.</p> <p>MR1.1.3 Evidence exists, such as statements in an engineering report, that areas are included in the model as specified in requirement R1.1.3.</p> <p>MR1.1.4 Evidence exists, such as statements in an engineering report, that the model includes those elements as specified in requirement R1.1.4.</p> <p>MR1.1.5 Evidence exists, such as statements in an engineering report, that the model includes those elements as specified in requirement R1.1.5.</p> <p>MR1.1.6 Evidence exists, such as statements in an engineering report, that the model includes those elements as specified in requirement R1.1.6.</p> <p>MR1.1.7 Evidence exists, such as statements in an engineering report, that the model includes those elements as specified in requirement R1.1.7.</p> <p>MR1.1.8 Evidence exists, such as</p>			

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	<p>statements in an engineering report, that the model includes those elements as specified in requirement R1.1.8.</p> <p>MR1.1.9 Evidence exists, such as statements in an engineering report, that the model includes those elements as specified in requirement R1.1.9.</p> <p>MR1.1.10 Evidence exists, such as statements in an engineering report, that the model includes those elements as specified in requirement R1.1.10.</p> <p>MR1.1.11 Evidence exists, such as statements in an engineering report, that the model includes those elements as specified in requirement R1.1.11.</p> <p>MR1.1.12 Evidence exists, such as statements in an engineering report, that the model includes those elements as specified in requirement R1.1.12.</p> <p>MR1.2 Evidence exists, such as statements in an engineering report, that the model includes those elements as specified in requirement R1.2, where applicable.</p>			

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<p>M4. Each Transmission Operator that uses the Rated System Path Methodology shall produce as evidence the study reports, as required in R.2.8, for each path for which it determined TTC for the period examined. (R2)</p>	<p>MR2 Evidence exists, such as statements in an engineering report, that total transfer capability was calculated as specified in requirement R2, where applicable.</p> <p>MR2.1 Evidence exists, such as statements in an engineering report, that the model includes those elements as specified in requirement R 2.1, where applicable.</p> <p>MR2.1.1 Evidence exists, such as statements in an engineering report, that the model includes those elements as specified in requirement R 2.1.1, where applicable.</p> <p>MR2.1.2 Evidence exists, such as statements in an engineering report, that the model includes those elements as specified in requirement R 2.1.2, where applicable.</p> <p>MR2.1.3 Evidence exists, such as statements in an engineering report, that the model includes those elements as specified in requirement R 2.1.3, where applicable.</p> <p>MR2.2 Evidence exists, such as statements in an engineering report, that the model includes those conditions as specified in requirement R 2.2, where applicable.</p>	<p><input type="checkbox"/> New <input checked="" type="checkbox"/> Amended <input type="checkbox"/> Deleted</p> <p>Amended to align with requirement R2 and its sub-requirements.</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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	<p>MR2.3 Evidence exists, such as statements in an engineering report, that the model includes those conditions as specified in requirement R 2.3, where applicable.</p> <p>MR2.4 Evidence exists, such as statements in an engineering report, that the model includes those conditions as specified in requirement R 2.4, where applicable.</p> <p>MR2.5 Evidence exists, such as statements in an engineering report, that the model includes those conditions as specified in requirement R 2.5, where applicable.</p> <p>MR2.6 Evidence exists, such as statements in an engineering report, that the model includes those conditions as specified in requirement R 2.6, where applicable.</p> <p>MR2.7 Evidence exists, such as statements in an engineering report, that the model includes those conditions as specified in requirement R 2.7, where applicable.</p> <p>MR2.8 Study report exists and</p>			

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	documents the steps that were undertaken to meet requirements R2.1 through to R2.7.			
<p>M5. Each Transmission Operator shall provide evidence that it used the lesser of the calculated TTC or the SOL as the TTC, by producing: 1) all values calculated pursuant to R2 for each ATC Path, 2) Any corresponding SOLs for those ATC Paths, and 3) the TTC set by the Transmission Operator and given to the Transmission Service Provider for use in R7 and R8 for each ATC Path. (R3)</p>	<p>MR3 Evidence exists, such as an engineering study report, that the total transfer capability value established meets the requirements as specified in requirement R3.</p>	<p> <input type="checkbox"/> New <input checked="" type="checkbox"/> Amended <input type="checkbox"/> Deleted Amended to align with requirement R3. </p>	<p> <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> </p>	
<p>M6. Each Transmission Operator shall provide evidence (such as logs or data) that it provided the TTC and its study report to the Transmission Service Provider within seven calendar days of the finalization of the study report. (R4)</p>		<p> <input type="checkbox"/> New <input type="checkbox"/> Amended <input checked="" type="checkbox"/> Deleted </p>	<p> <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> </p>	
<p>M7. The Transmission Service Provider shall demonstrate compliance with R5 by recalculating firm ETC for any specific time period as described in (MOD-001 R2), using the algorithm defined in R5 and with data used to calculate the specified value for the designated time period.</p>		<p> <input type="checkbox"/> New <input type="checkbox"/> Amended <input checked="" type="checkbox"/> Deleted </p>	<p> <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> </p>	

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<p>The data used must meet the requirements specified in MOD-029-1 and the ATCID. To account for differences that may occur when recalculating the value (due to mixing automated and manual processes), any recalculated value that is within +/- 15% or 15 MW, whichever is greater, of the originally calculated value, is evidence that the Transmission Service Provider used the algorithm in R5 to calculate its firm ETC. (R5)</p>				
<p>M8. The Transmission Service Provider shall demonstrate compliance with R5 by recalculating non-firm ETC for any specific time period as described in (MOD-001 R2), using the algorithm defined in R6 and with data used to calculate this specified value for the designated time period. The data used must meet the requirements specified in the MOD-029 and the ATCID. To account for differences that may occur when recalculating the value (due to mixing automated and manual processes), any recalculated value that is within +/- 15% or 15 MW, whichever is greater, of the originally calculated value, is evidence that the Transmission</p>		<p> <input type="checkbox"/> New <input type="checkbox"/> Amended <input checked="" type="checkbox"/> Deleted </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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Service Provider used the algorithm in R6 to calculate its non-firm ETC. (R6)				
<p>M9. Each Transmission Service Provider shall produce the supporting documentation for the processes used to implement the algorithm that calculates firm ATCs, as required in R7. Such documentation must show that only the variables allowed in R7 were used to calculate firm ATCs, and that the processes use the current values for the variables as determined in the requirements or definitions. Note that any variable may legitimately be zero if the value is not applicable or calculated to be zero (such as counterflows, TRM, CBM, etc...). The supporting documentation may be provided in the same form and format as stored by the Transmission Service Provider. (R7)</p>	<p>MR4 Evidence exists that when calculating available transfer capability the algorithm specified in requirement Appendix 1 was used.</p>	<p> <input type="checkbox"/> New <input checked="" type="checkbox"/> Amended <input type="checkbox"/> Deleted </p> <p>Amended 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>	
<p>M10. Each Transmission Service Provider shall produce the supporting documentation for the processes used to implement the algorithm that calculates non-firm ATCs, as required in R8. Such documentation must show that only the variables allowed in R8 were used to calculate non-firm ATCs, and that the</p>		<p> <input type="checkbox"/> New <input type="checkbox"/> Amended <input checked="" type="checkbox"/> Deleted </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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processes use the current values for the variables as determined in the requirements or definitions. Note that any variable may legitimately be zero if the value is not applicable or calculated to be zero (such as counterflows, TRM, CBM, etc...). The supporting documentation may be provided in the same form and format as stored by the Transmission Service Provider. (R8)				
Compliance To view the compliance section D of the NERC reliability standard follow this link: http://www.nerc.com/files/MOD-029-1.pdf		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: http://www.aeso.ca/loadsettlement/17189.html .		
Regional Differences None identified.	None identified.	Not applicable in Alberta		

Definitions	Comments	Rationale and/or Alternate Proposal
(a) New N/A		
(b) Removals N/A		

Definitions	Comments	Rationale and/or Alternate Proposal
<p>(c) Amendments</p> <p>N/A</p>		

Appendix 1 –Available Transfer Capability Algorithm

ATC =	$= \text{TTC} - \text{TRM}$ <p>(ATC is the available transfer capability for the available transfer capability path for that period.)</p>
TTC=	the total transfer capability of the available transfer capability path for that period.
TRM=	the transmission reliability margin for the available transfer capability path during that period.