



**Stakeholder Comment and Rationale Form**

**AESO AUTHORITATIVE DOCUMENT PROCESS**

**Stakeholder Consultation Draft  
2010-06-11**

**Alberta Reliability Standard – VAR-002-AB-1.1b Generator Operation for Maintaining Network Voltages**

*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>2010-06-11</u> Period of Consultation [yyyy/mm/dd]: <u>2010-06-11</u> through <u>2010-07-09</u> Comments From: _____ Date [yyyy/mm/dd]: _____	Contact: <u>Jerry Mossing</u> Phone: <u>403-539-2496</u> E-mail: <u><a href="mailto:ars_comments@ieso.ca">ars_comments@ieso.ca</a></u>
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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 underneath (if any).*

1. Definitions	Comments	Rationale and/or Alternate Proposal
<b>(a) New</b> <b>"aggregated generating facilities"</b> means an aggregation of generating units, including any reactive power resources, which are: (i) designated by the ISO; and (ii) situated in the same proximate location at one or more point of connections.	<input type="checkbox"/> Support <input type="checkbox"/> Support with language suggestions <input type="checkbox"/> Oppose  <i>Insert Comments / Reason for Position (if any)</i>	



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<p>“<b>voltage regulating system</b>” means the equipment that automatically controls the reactive power resources to regulate the voltage level at any collector bus.</p>	<p> <input type="checkbox"/> Support  <input type="checkbox"/> Support with language suggestions  <input checked="" type="checkbox"/> Oppose         </p> <p><i>Insert Comments / Reason for Position (if any)</i></p>	<p>The text in the draft standard does not show defined terms in bold and this makes it somewhat difficult to fully interpret the intention of the AESO in using particular language, specifically, “directive” should be bolded in the document.</p>
<p><b>(b) Removals</b></p>	<p> <input type="checkbox"/> Support  <input type="checkbox"/> Support with language suggestions  <input checked="" type="checkbox"/> Oppose         </p> <p><i>Insert Comments / Reason for Position (if any)</i></p>	<p>In reviewing VAR-001-AB-1a, VAR-002-AB-1.1b it appears that a number of changes have been made to the standards since the last time they were reviewed and approved by the working group and the ARC. It appears that a number of the changes are a result of the AESO's proposed removal of OPP 702 and the incorporation of portions of that OPP into these two standards. As a general observation, it appears that the result of this additional OPP language has resulted in standard that is much more specific and far reaching than the NERC version of the standard.</p> <p>TransAlta's position is that these standards should not be approved until such a time as the AESO can provide a complete package that would show how OPP 702 is to be mapped into any of the VAR Standards and the ISO rules, which portions of the OPP are to be retired, and the draft of the Information</p>



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		<p>Document dealing with Voltage Control. This is especially critical when the AESO proposes to eliminate an entire document, such as OPP 702.</p> <p>TransAlta needs to better understand where and how some of the key elements of OPP 702 (17 Feb 2010) will be treated going forward when implementing standard VAR-002-AB-1,</p> <p>Some excerpts from OPP-702 Section 3.2 are below:</p> <p style="padding-left: 40px;">Generators must be capable of operating continuously in automatic voltage regulation mode between the generating unit's lagging and leading reactive power obligations. Generator automatic voltage regulators must be capable of maintaining voltage at the generator interface as prescribed in the AESO Generation and Load Interconnection Standards.(the "interface" is the generator terminals for synchronous generators and low voltage side of the system step-up transformer for wind power facilities) To adjust</p>

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		<p>system voltages the SC will direct GFOs to raise or lower their voltage by a specific amount using either the generator transformer OLTC (On-Load Tap Changer) or adjusting the generator interface voltage. This action will result in a change in VAr output from the generator. The SC will ensure the desired voltage level is attained. Under normal operating conditions and subject to any operating agreements with the AESO, the SC will direct voltage such that reactive power is within the unit obligation or within 0.9 power factor lagging and 0.95 power factor leading based on gross MW output of generating units. The SC will issue directives for generator voltage adjustments directly to the generator operator. It is preferred that the SC directs generators to adjust their voltage level rather than their VAr output so that confusion about the generator control modes is avoided.</p>

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		<p>The addition of portions of an OPP into Reliability Standards has a number of ramifications that need to be carefully considered. The move from an OPP into a reliability standard means that those sections of the OPP would then be subject to audit. This must be carefully considered from three points of view: 1) Is the OPP worded such that it can be audited against and what are the appropriate measures 2) The additional workload that will result from the need to create an audit trail where one was not previously required. 3) The implications of creating a standard more specific and broader reaching than the NERC standards.</p> <p>At all the applicable places in this standard we recommend that a NERC requirement not be split into a number of AESO sub-requirements. We recommend that bullets be used instead to prevent an increase of any penalty coverage, as compared to what was envisaged by NERC.</p> <p>We understand one of the principles of the TOAD process is to eliminate duplication among authoritative</p>



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		<p>documents, however there are additional ramifications when moving into reliability standards that must be considered and we believe it is very important that they are fully vetted at the working group level within the standards development process. For these reasons we believe it is necessary to send both of these standard back to the working group and ARC as part of a complete review of the VAR standards and the associated issues surrounding OPP 702.</p>
<p><b>(c) Amendments</b></p>	<p> <input type="checkbox"/> Support  <input type="checkbox"/> Support with language suggestions  <input checked="" type="checkbox"/> Oppose         </p> <p><i>Insert Comments / Reason for Position (if any)</i></p>	<p>TransAlta has review the proposed VAR reliability standards proposed for adoption and seeks some clarification. Some requirements in this standard include specification to “wind aggregated generating facilities” to identify that it applies to voltage regulating systems at wind aggregated generating facilities. However some requirements such as R8, R9, R10, do not make reference to any wind aggregated facility so does that mean the requirement would not apply to “wind aggregated generating facilities”</p>
2. Alberta Reliability Standards	Comments	Rationale and/or Alternate Proposal



2. Alberta Reliability Standards	Comments	Rationale and/or Alternate Proposal
<p><b>(a) New Alberta Variances</b></p> <p>The provisions within the proposed Alberta Reliability Standard VAR-002-AB-1.1b Generator Operation for Maintaining Network Voltages, are derived from NERC VAR-002-1.1b with suitable revisions for the responsible entities within Alberta. An Alberta variance is a change from the NERC Reliability Standard that the AESO has determined is material. Specifically, the following provisions have are deemed as Alberta variances and have been added, replacing existing NERC VAR-002-1.1b requirements.</p>		
<p><b>R1.</b> Each operator of a generating unit, subject to requirement R3 and the ISO's consent to operate otherwise, must operate such generating unit with the automatic voltage regulator in service and in voltage control mode and must not operate in any other mode including without limitation,</p> <ul style="list-style-type: none"> <li>• power factor control mode</li> <li>• VAR control mode</li> </ul>	<input type="checkbox"/> Support <input type="checkbox"/> Support with language suggestions <input type="checkbox"/> Oppose  <i>Insert Comments / Reason for Position (if any)</i>	
<p><b>R2.</b> Each operator of a wind aggregated generating facility, subject to requirement R3 and the ISO's consent to operate otherwise, must operate such wind aggregated generating facility with the voltage regulating system in service and in voltage control mode and must not operate in any other mode including without limitation,</p> <ul style="list-style-type: none"> <li>• power factor control mode</li> <li>• VAR control mode</li> </ul>	<input type="checkbox"/> Support <input type="checkbox"/> Support with language suggestions <input type="checkbox"/> Oppose  <i>Insert Comments / Reason for Position (if any)</i>	
<p><b>R3.</b> Each operator of a generating unit or wind aggregated generating facility must notify the ISO as soon as practical when the automatic voltage regulator or voltage regulating system is out of service.</p>	<input type="checkbox"/> Support <input type="checkbox"/> Support with language suggestions <input type="checkbox"/> Oppose  <i>Insert Comments / Reason for Position (if any)</i>	
<p><b>R4.</b> The operator of a generating unit or wind aggregated generating facility unless exempted by the ISO must comply with directives from the ISO that specify the following:</p> <p>a) voltage level on the high voltage side of the transformer(s) at the point of connection between each generating unit or wind</p>	<input type="checkbox"/> Support <input type="checkbox"/> Support with language suggestions <input checked="" type="checkbox"/> Oppose  We are supportive of Capital Power's comments as	R4.2. the wording of R4.2 is difficult to follow. We believe the intent is to ensure that after the adjustment of the set point



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<p>aggregated generating facility and the TFO's facilities; or</p> <p>b) the reactive power to be achieved by the generating unit or wind aggregated generating facility.</p> <p><b>R4.1</b> Each operator of a generating unit or wind aggregated generating facility pursuant to requirement R4 must comply by adjusting the:</p> <p>a) set point of the automatic voltage regulator or voltage regulation system; or</p> <p>b) on-load tap changer.</p> <p><b>R4.2</b> The operator of a generating unit or wind aggregated generating facility, subsequent to complying pursuant to requirement R4, must not adjust either of the following:</p> <p>a) set point of the automatic voltage regulator or voltage regulating system; or</p> <p>b) on-load tap changer.</p>	<p>per below:</p> <p>Capital Power does not support the AESO's proposal to add two sub-requirements (R4.1 and R4.2) to the Alberta version of this standard when the NERC version has only a single requirement. Alberta Reliability Standards will be enforced at the sub-requirement level and therefore market participants are at risk of facing multiple penalties for an infraction that would only result in one violation in NERC jurisdictions.</p> <p>The AUC recently acknowledged the PPAs as an enactment for the purposes of Subsection 3(2)(e) of the FEOC Regulation. Therefore, it may be inferred that the PPA would be considered an enactment in other situations as well. The AESO should recognize that the PPAs state the MVAR limits of the respective generating units and that these limits are not necessarily those shown on the Generator "D" curve. The AESO should respect these limits and avoid issuing directives that would cause unnecessary strain on the unit, should these limits be breached.</p>	<p>of the AVR or voltage regulator, or adjustment of on-load tap changer, are made upon receiving a directive as specified in R4.1 , that R4.2 is intended to disallow any further changes of the set point of the AVR or voltage regulating system, or the change of on-load tap changer. Please confirm this or provide any clarifications.</p> <p>In R4. a)in our opinion "the high voltage side of the transformer at the point of connection" is not appropriate based on the following considerations: It should be the generator terminals for synchronous generators or the LV side of system step-up transformer for the wind power facilities. Our rationale is as follows:</p> <p>1. The wording suggested in R4.a) does not match the wording in the section 3.2 of OPP 702. The section 3.2 of OPP 702 states that "....(the "interface" is the generator terminals for synchronous generators and low voltage side of the system step-up transformer for wind power facilities." To adjust system voltages the SC will direct GFOs to raise or lower their voltage by a specific amount using either the generator transformer OLTC (On-Load Tap Changer) or adjusting the generator interface voltage."</p>



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<p><b>R5</b> Each operator of a generating unit or wind aggregated generating facility must use an alternative method to control voltage and reactive power output to meet the voltage level directive, or reactive power level directive issued by the ISO when the automatic voltage regulator or voltage regulating system is out of service.</p>	<input type="checkbox"/> Support <input type="checkbox"/> Support with language suggestions <input checked="" type="checkbox"/> Oppose  <i>Insert Comments / Reason for Position (if any)</i>	<p>With a wind farm when certain of the devices forming part of the voltage control system are "out of service" it may not be possible to meet a voltage directive. The voltage control system contains reactive devices separate from the generators themselves and if such devices are out of service then this requirement could not be met.</p>
<p><b>R6.</b> Each operator of a generating unit or wind aggregated generating facilities who cannot comply with a directive pursuant to requirement R5 must notify the ISO with its explanation for not complying with a voltage level directive within 30 minutes.</p>	<input type="checkbox"/> Support <input type="checkbox"/> Support with language suggestions <input type="checkbox"/> Oppose  <i>Insert Comments / Reason for Position (if any)</i>	
<p><b>R7.</b> Each operator of a generating unit or wind aggregated generating facility must notify the ISO as soon as practical, but within 30 minutes of any of the following:</p> <p><b>R7.1.</b> A status or capability change on any generating unit or wind aggregated generating facility reactive power resource in excess of 2.5 MVar or 1% (which ever is greater) of its reactive power obligation, including the status of each automatic voltage regulator, voltage regulating system and power system stabilizer, and the expected duration of the change in status or capability.</p> <p><b>R7.2</b> A status or capability change on any other reactive power resource in excess of 2.5 MVar or 1% (which ever is greater) of the reactive power obligation under the control of each operator of a generating unit or operator of a wind aggregated generating facility , and the expected duration of the change in status or capability.</p> <p><b>R7.3</b> A status or capability change of the reactive power resource of an</p>	<input type="checkbox"/> Support <input type="checkbox"/> Support with language suggestions <input checked="" type="checkbox"/> Oppose  <i>Insert Comments / Reason for Position (if any)</i>	<p>According to this requirement, if the generator VAR capability changes, it is required for GFO to report it in 30 minutes. This is NOT consistent with the R5 requirements of TOP-005-AB-1 (approved standard). According to the R5 in TOP-005-AB-1, the pool participant is required to provide the generation MVAR capability to AESO. So for the units with PPA agreement, the PPA buyers are supposed to communicate the unit VAR capability change to AESO, it is not the operator of the unit.</p>



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<p>unknown value. Once the value is known then operator of generating unit must report the value to the ISO as soon as practical, but within 30 minutes.</p>		<p>R7.1 and R7.2. The phrase "reactive power obligation" is used. It is not clear what "obligation" means in this context related to wind facilities. We understand this to mean that if the aggregate lost contributions of wind turbines, capacitor banks, reactors, or dynamic Var devices used in wind farms exceeds 2.5 MVar that the AESO must be informed. The threshold level of 2.5 MVar is very low. In a typical 10 MVAR dynamic var device the common failure mode would take out 2.5 MVar. We would suggest that if 25% or more of the MVar capability is unavailable then the AESO should be notified.</p>
<p><b>R8.</b> Each GFO with generating unit step-up and auxiliary transformers with primary voltages equal to or greater than the generating unit terminal voltage must provide the ISO any one or more of the following within 30 days of a request:  <b>R8.1</b> Tap settings.  <b>R8.2</b> Available fixed tap ranges.  <b>R8.3</b> Impedance data.  <b>R8.4</b> The +/- voltage range with step-change in % for on-load tap changing transformers.</p>	<p> <input type="checkbox"/> Support  <input type="checkbox"/> Support with language suggestions  <input checked="" type="checkbox"/> Oppose   <i>Insert Comments / Reason for Position (if any)</i> </p>	<p>Do not make reference to any wind aggregated facility so does that mean the requirement would not apply to "wind aggregated generating facilities"</p>
<p><b>R9.</b> Each GFO with step-up transformer off-load taps, after reviewing with the ISO, must ensure that transformer tap positions are changed according to the specifications provided by the ISO.</p>	<p> <input type="checkbox"/> Support  <input type="checkbox"/> Support with language suggestions  <input checked="" type="checkbox"/> Oppose         </p>	<p><b>R9.</b> Each GFO with step-up transformer off-load taps, after reviewing with the ISO, must ensure that transformer tap positions are changed according to the technical specifications provided by the ISO, unless such action would violate safety, an</p>



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		<p>equipment rating, a regulatory requirement, or a statutory requirement.</p> <p>Does not make reference to any wind aggregated facility. So does that mean the requirement would not apply to “wind aggregated generating facilities”?</p>
<p><b>R10.</b> Each GFO must notify the ISO within 30 days of the ISO providing the specifications pursuant to requirement R9 if the GFO cannot comply and must include the technical justification in such notice.</p>	<p> <input type="checkbox"/> Support  <input type="checkbox"/> Support with language suggestions  <input checked="" type="checkbox"/> Oppose         </p> <p><i>Insert Comments / Reason for Position (if any)</i></p>	<p>Does not make reference to any wind aggregated facility. So does that mean the requirement would not apply to “wind aggregated generating facilities”?</p>
<p><b>(b) Removals (Alberta Variances)</b></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 (if any)</i></p>	



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<p><b>(c) Amendments (Alberta Variances)</b></p> <p>The following revisions have been made throughout this proposed reliability standard:</p> <ul style="list-style-type: none"> <li>- Identified the responsible entities in Alberta.</li> <li>- Applied a consistent writing style and added clarity.</li> <li>- Changed passive terms such as “shall” to “must”.</li> <li>- Developed measures specific to the requirements.</li> </ul>	<p> <input type="checkbox"/> Support  <input type="checkbox"/> Support with language suggestions  <input type="checkbox"/> Oppose         </p> <p><i>Insert Comments / Reason for Position (if any)</i></p>	
<p><b>(d) Other</b> (<i>Stakeholders wishing to comment on specific provisions are requested to copy the provision into this area and provide comments</i>)</p>		