



July 20, 2010

To: Market Participants and Interested Persons

Re: Information Document # 2010-006R Connection Remedial Action Schemes

This document describes how Remedial Action Schemes (RAS) may be employed by the AESO to connect customers prior to system reinforcements. The document is intended to provide staff and consultants with a set of guidelines to ensure consistent application of RAS and support discussions with customers.

Sincerely

Kelly Gunsch
Vice President
Market Services

Comments/Questions

If you have any comments or questions about the information in this document please contact:

Gordon Nadeau

Market Design Specialist, Market Services

Phone (403) 539 - 2568

e-mail: gordon.nadeau@aeso.ca



Market participants are advised that the contents of this information document are for information purposes only and are intended to provide guidance. Information document content is therefore subject to change from time to time. For an understanding of the governing legal and binding requirements and obligations on any referenced subject matter, please consult the actual authoritative document language within the relevant ISO rules, tariff and reliability standards.

1. Purpose

This document provides further information regarding the application of ISO Rule 302.2 Connection Remedial Action Scheme (RAS). This document discusses the use of Connection RAS by the AESO to connect customers prior to system reinforcements and is intended to provide staff and consultants with a set of guidelines to ensure consistent application of RAS and support discussions with customers.

2. Background

The AESO has an obligation to provide connection customers system access while recognizing the congestion that may occur from time to time. The AESO's role is to ensure that there are adequate transmission facilities available so that the system can operate in a safe, reliable and efficient manner and to promote a fair, efficient and openly competitive market for electricity.

To provide system access, the AESO plans transmission expansions and enhancements so that 100% of a generator's in merit energy can be accommodated under normal system conditions. That is, transmission development plans must accommodate all anticipated in-merit generation and must ensure reliable operation including acceptable system performance during credible contingency events as defined in established reliability criteria and standards.

When the transmission system is not capable of handling the full output from a generator until system enhancements are completed and when this congestion cannot be handled through real time operator action, RAS may be employed to facilitate market participation while maintaining system reliability and protecting system facilities. Market participants seeking to interconnect to the system may be assigned a RAS on a temporary basis prior to system reinforcements. RAS requirements may be identified in the planning stage of system development or when system studies are undertaken.

It is not feasible or practical to plan the transmission system to accommodate all operating conditions or contingency events on the system. The planning of the Alberta transmission system is in accordance with the Alberta Reliability Standards TPL-001-AB, TPL-002-AB, TPL-003-AB and TPL-004-AB. Within the Standards, the acceptable performance of the transmission system under various contingency conditions is identified. In particular TPL-003-AB and TPL-004-AB identify that controlled interruption of demand to demand customers, the planned removal of generating units, or the curtailment of firm (non-recallable reserved) power transfers may required to meet the required acceptable performance of the system. For the



contingency events identified, RAS may be incorporated to satisfy the Reliability Standards performance requirements that arise through planning assessments on a regional or system wide basis.

Governing ISO Rules and Regulation

The following rules and regulations are particularly relevant to Connection RAS:

ISO Rule 302.2 Connection RAS

ISO Rule 9.4 Transmission Constraints Management

EUA section 17 Duties of ISO subsections (a), (g), (h), (i)

TR Part 2 Transmission System Planning sections 8 and 11,

TR Part 3 Transmission System Criteria and Reliability Standards sections 15,19

Alberta Reliability Standards TPL-001-AB, TPL-002-AB, TPL-003-AB and TPL-004-AB

3. Connection RAS Assessment

3.1 Connection RAS Overview

RAS is used primarily on a temporary basis when new market participants are being added to the system in advance of the transmission system's capability to manage such loads or supplies. In considering the use of a RAS, the AESO will consider its duty to ensure reliable system operation while at the same time allowing customers market access in a fair, efficient and openly competitive manner. The primary purpose of a RAS in Alberta is to immediately detect abnormal or predetermined system conditions and take instantaneous corrective actions to maintain system performance where operator action cannot be relied upon.

3.2 RAS Definition

System protection schemes are used throughout the WECC region though different definitions exist for such schemes. The ISO rules contain a RAS [definition](#) that has been adopted for Alberta. In general terms, RAS, also known as special protection schemes, are control systems that make automatic adjustments to electrical system elements (i.e. generation, load and transmission lines) in order to meet system performance criteria without operator intervention. RAS are designed for specific foreseen events and may include shedding load or generation triggered automatically in response to system limits designed to preserve system integrity.

3.3 Transmission System Criteria

In planning for a proposed connection and assessing the potential for a RAS under subsection 2 and 3 of the ISO rule 302.2, the AUC has approved the Alberta Reliability Standards TPL-001-AB, TPL-002-AB, TPL-003-AB and TPL-004-AB which provide a framework for planning a reliable system. The transmission planning standards include categories of system events and define acceptable response to these events. These categories named Category A,B,C and D are included in the [Alberta Reliability Standards](#) and represent increasing levels of system contingencies.

These criteria apply to the critical system conditions as determined necessary by the ISO. These include, but are not limited to, the system or path at its maximum load or loading condition based on the average MW flow over the highest load or path loading hour. Planned or controlled interruption of electric supply to radial customers or some local network customers connected to or supplied by the faulted element or by the affected area, may occur in certain areas without impacting the overall security of the interconnected transmission system.

3.4 Connection RAS Considerations

The AESO, in making its initial determination under subsection 3 of the ISO rule 302.2, will examine the following technical considerations, in order for a RAS to be considered a viable option:

- (1) The RAS must provide the same level of reliability as other protection systems.
- (2) A RAS will not compromise the reliability or restrict the operation of the electric system. RAS must meet applicable NERC/WECC and AESO reliability criteria and Alberta reliability standards.
- (3) The use of RAS will not impose safety hazards to customers, the public, or operating personnel.

The following additional operational factors are considered by the AESO in assessing whether a RAS is feasible under subsection 3 of the ISO rule 302.2.

- (1) The probability of more than one operating procedure being applied at the same time (e.g. coincident use of transmission constraint procedures and supply shortfall procedures).
- (2) The complexity of the operating procedure (e.g. number of steps in a procedure)
- (3) The operating tools that can be designed and prudently implemented to handle the number of inputs required to determine a recommended action including consideration of comprehensive programming logic. The design will consider failure of the operating tool itself and the ability of the system controller to apply manual procedures.

If a RAS is out-of-service for maintenance work or unavailable or fails to operate, system controller actions to manage the situation will be outlined in the appropriate OPP. System controller actions may occur in real time in response to an event or the actions may occur prior to a potential event in a manner which ensures that system reliability is maintained

4. Notification of Connection RAS

4.1 RAS and the Connection Assessment

As per subsection 4 of the ISO rule 302.2, if a constraint is identified at the time a system access customer request is being assessed and the AESO determines that it can achieve the requested connection date by offering a RAS, the AESO policy is to allow the customer to choose to accept the RAS, or decline service until the system is reinforced.

4.2 RAS and the Connection In-service Date

When the AESO receives a preliminary assessment application from a customer to connect to the transmission system or receive additional system access, the AESO makes an assessment identifying the required facilities for and timing of the requested connection.

The AESO is responsible for preparing and submitting needs identification documents to the Commission which include the information requirements set out in subsection 4(1). One such requirement is the provision of an estimate of the timing for completion of the required facilities which will allow full system access under normal operating conditions. The AESO notes that there are many factors which are beyond the AESO's control which may alter the timing for completion of the requested facilities. Any customer interconnection project timeline may impact or be impacted by other customer interconnection projects and system projects, and their respective timelines. As a result, RAS requirements may change as noted in subsection 5. The AESO regards interconnection RAS to be a temporary measure but can only provide an estimate of when the RAS will no longer be required. The Customer can choose to accept the conditions of the RAS before interconnecting or can choose to wait until the facilities are in fact in place.

When a RAS is a reasonable alternative to otherwise denying system access, the AESO will apply subsection 7(1) of the ISO rule 302.2 and require the last load or generator connecting to the system in a congested area to use a RAS on a temporary basis. This is a practical solution to a temporary issue, and would allow the market participant some access to compete. The order of connection is determined by the AESO's connection queue management process in effect at the time.

4.3 RAS and the Connection Process Documentation



If the customer chooses to proceed with the application, the AESO follows the customer connection procedure and includes documents specific relevant RAS information for the market participant.

As an example, to the extent feasible, the AESO will identify the necessary transmission reinforcements (and an estimate of the timing) that will remove the need for a RAS. The period of time under which a RAS may be used is temporary and may span a few months or several years.

To the extent possible, the AESO will also identify to the customer all conditions under which the RAS may operate and all existing operating procedures in a constrained area together with the need for any changes to operating procedures.

Notification to market participants of impending transmission congestion involving application of the RAS will be handled through the development and filing for approval of Needs Identification Documents ("NID"). Any RAS would also be subsequently incorporated and consulted upon in a new or revised Rule (OPP) for the area.

Market participants will not be provided notice prior to the NID filing for RAS directly related to a particular connection primarily because the customer may or may not choose to move forward with the connection proposal. Furthermore earlier notice may be in conflict with the customer's right to confidentiality¹ while the connection agreement is at the earlier stages of development.

5. Multiple Market Participant Connections in Constrained Area

In the AESO's view, the pro rata assignment of RAS to multiple generators who are effective in relieving the constraint increases is not practical and will not be used. The AESO policy is to assign the RAS to the new generator who has the option to either accept the limited system access conditions or wait until the required facilities are in place.

RAS assignment and the order of RAS activation in a constrained area will be determined by the market participant project status in the connection queue that is maintained as part of the AESO connection process. RAS will be assigned and utilized on a last on first off basis using the project's relative position in the connection queue in the constrained area.

¹ The AESO respects customer requests for confidentiality including customer information and development of interconnection proposal detail, until it is necessary to engage in public consultation prior to filing a Needs Identification Document for approval.



6. Other Connection RAS Considerations

6.1 Connection RAS and TCM

A RAS would not be used to manage congestion when a real time operational approach could be used consistent with the intent of the DOE policy. The AESO will apply subsection 9.4.1 c) of the ISO rules to manage a constraint after a RAS has activated.

RAS is an automatic action designed to protect system facilities. If a potential issue is anticipated, a RAS can be installed to insure timely response. If a RAS is known to be unavailable due to maintenance the SC has time to take pre-emptive actions before a constraint occurs to provide protection of system facilities. Pre-emptive SC actions result in a lower degree of transmission optimization compared to the use of RAS. If a RAS fails to operate, the transmission system operators and the SC will act to mitigate the issue but there is no guarantee that such action will prevent damage to system facilities. Alberta AESO reliability standards require the AESO to investigate and report on such RAS failures as they are considered to have serious consequences.

RAS design may provide for a signal to runback generation to a safe, reliable operating level if the runback can occur in a timely manner thereby avoiding the need to trip the unit. The time limits for the generation runback required by an overload condition are usually determined by the wires owner and are specified in the wires owner's facility ratings. The AESO is of the view that the wires owners are in the best position to establish the time limits within a RAS that would serve to protect their own facilities.

6.2 Connection RAS as a non-wires solution

The AESO notes that a connection RAS is an acceptable, temporary non-wires solution contemplated under regulation. Further the AESO notes that on occasion RAS may be a permanent non-wires solution to specific system issues.

Revision History

Version	Effective Date	Description of Changes
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Comments/Questions

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Market Design Specialist, Market Services

Phone # (403) 539 - 2568

e-mail: gordon.nadeau@aeso.ca