Information Document
Central East Area Transmission Constraint Management
ID #2012-018R

Information Documents are not authoritative. Information Documents are for information purposes only and are intended to provide guidance. In the event of any discrepancy between an Information Document and any Authoritative Document(s) in effect, the Authoritative Document(s) governs.

1 Purpose

This Information Document relates to the following Authoritative Document[1]:

- Section 302.1 of the ISO rules, *Real Time Transmission Constraint Management* ("Section 302.1").

The purpose of this Information Document is to provide additional information regarding the unique operating characteristics and resulting constraint conditions and limits in the Central East area of the interconnected electric system.

Section 302.1 sets out the general transmission constraint management protocol steps the AESO uses to manage transmission constraints in real time on the interconnected electric system. These steps are referenced in Table 1 of this information document as they are applied to the Central East area.

2 General

The transmission and generation facilities in the Central East area are shown in a geographical map in Appendix 2. Several generation facilities, including Ghost Pine, Wintering Hills, Battle River 3, 4, and 5, Sheerness 1 and 2, and Halkirk, are located in the area. The associated generation pool IDs for these Central East assets are; NEP1, SCR4, BR3, BR4, BR5, SH1, SH2 and HAL1, respectively.

Operational studies show that transmission congestion occurs on 7L50, 174L, 757s Battle River 240/138kV transformer or the 766s Nevis 240/138kV transformer. For a schematic single line diagram of the Central East area, see Appendix 3 in this information document.

3 Constraint Conditions and Limits

When managing a transmission constraint in the Central East area, the AESO ensures that bulk transmission line flows out of the area are managed in accordance with bulk transmission line ratings. These ratings are established by the legal owner of the transmission facility to protect transmission facilities, ensuring the continued reliable operation of the interconnected electric system. .

3.1 Non-Studied Constraints and Limits

For system conditions that have not been pre-studied, the AESO uses the resultant limits from the Energy Management System Voltage Stability Analysis and the Contingency Analysis tools to determine real-time system operating limits when limits are related to voltage or thermal concerns. For system conditions that have not been pre-studied, the AESO uses dynamic analysis software to determine the real-time system operating limits when limits are related to dynamic stability concerns.

3.2 Studied Constraints and Limits

With respect to the Central East area, a remedial action scheme is required and in place on each of 7L50, 174L and the 766s Nevis 240/138kV transformer to ensure system reliability. In accordance with subsection 2(1) of Section 302.1, the AESO follows the transmission constraint management

[1] "Authoritative Documents" is the general name given by the AESO to categories of documents made by the AESO under the authority of the *Electric Utilities Act* and regulations, and that contain binding legal requirements for either market participants or the AESO, or both. AESO Authoritative Documents include: the ISO rules, the Alberta reliability standards, and the ISO tariff.

procedures and applies the procedures to the Central East area as outlined in section 5 of this information document in the following circumstances:

(a) prior to remedial action scheme activation, if required; and

(b) to manage a constraint after the remedial action scheme has been activated.

Battle River N-1-1 Stability Concerns

If the 757s Battle River 240/144 kV transformer is out of service, there are transient stability concerns on Battle River 3 and 4 for the loss of either 7L50 or 7L701. Refer to Appendix 4.

4 Application of Transmission Constraint Management Procedures

The AESO manages transmission constraints in all areas of Alberta in accordance with the provisions of Section 302.1. However, not all of those provisions are effective in the Central East area due to certain operating conditions that exist in that area. This information document represents the application of the general provisions of Section 302.1 to the Central East area and provides additional clarifying steps as required to effectively manage transmission constraints in that area.

The protocol steps which are effective in managing transmission constraints are outlined in Table 1 below.

Table 1

Transmission Constraint Management

Sequential Procedures for Central East Area

Section 302.1 of the ISO rules, subsection 2(1) protocol steps	Applicable to a Central East Area transmission constraint?
(a) Determine effective pool assets	Yes
(b) Ensure maximum capability not exceeded	Yes
(c) Curtail effective downstream constraint side export service and upstream constraint side import service	No
(d) Curtail effective demand opportunity service on the downstream constraint side	No
(e)(i) Issue a dispatch for effective contracted transmission must-run	No
(e)(ii) Issue a directive for effective non-contracted transmission must-run	No
(f) Curtail effective pool assets in reverse energy market merit order followed by pro-rata curtailment	Yes
(g) Curtail effective loads with bids in reverse energy market merit order followed by pro-rata load curtailment	No

Applicable Protocol Steps

The first step in managing constraints is to identify those pool assets, both generating units and loads, effective in managing constraints. A list of the generating pool assets that are effective in managing constraints are identified in Appendix 1. As per section 2(4) of 302.1, when a transmission constraint has been or is expected by the AESO to activate a remedial action scheme, the AESO recommences the procedural sequence in Table 1 (above) once the AESO has ensured that the system is operating in a safe and reliable mode.

Step (a) in Table 1

The effective pool assets are as shown in Appendix 1.

Step (b) in Table 1

Ensuring maximum capability levels are not exceeded is effective in managing Central East area transmission constraints. The effective pool assets that the AESO may curtail are listed in Appendix 1.

Step (c) in Table 1

There are no interties in the Central East area and curtailing import and export flows elsewhere on the system is not effective in managing a transmission constraint.

Step (d) in Table 1

Curtailing effective demand opportunity service on the downstream constraint side is not effective in managing Central East area constraints because there is no demand opportunity service in the area.

Step (e) in Table 1

With respect to steps (e)(i) and (ii), there are no transmission must-run contracts in the Central East area and using transmission must-run is not effective in managing a transmission constraint.

Step (f) in Table 1

Curtailing effective generating units in reverse energy market merit order followed by pro-rata curtailment is effective in managing Central East area transmission constraints. The effective pool assets that the AESO may curtail are listed in Appendix 1.

Step (g) in Table 1

Because of the configuration of the interconnected electrical system, curtailing load on the upstream side is not effective in managing Central East area constraints.

5 Project Updates

As necessary, the AESO intends to provide information in this section about projects underway in the Central East area that are known to have an impact on the information contained in this information document. Presently, there are no known projects underway that are known to have an impact.

6 Appendices

Appendix 1 – *Effective Pool Assets*

Appendix 2 – *Geographical Map of the Central East Area*

Appendix 3 – *Central East Area Single Line Diagram*

Revision History

Posting Date	Description of Changes
2019-03-19	Amendments to Section 2 to include 757s Battle River 240/138kV transformer and 766s Nevis 240/138kV transformer
	Addition of Appendix 4 Battle River Transient Stability Limits
2016-09-28	Administrative amendments
2014-10-21	Amendment to remedial action schemes
2012-10-11	Initial Release

Appendix 1 – Effective Pool Assets

The effective pool assets for transmission constraints in the Central East area, listed alphabetically by their pool IDs, are:

BR3

BR4

BR5

HAL1

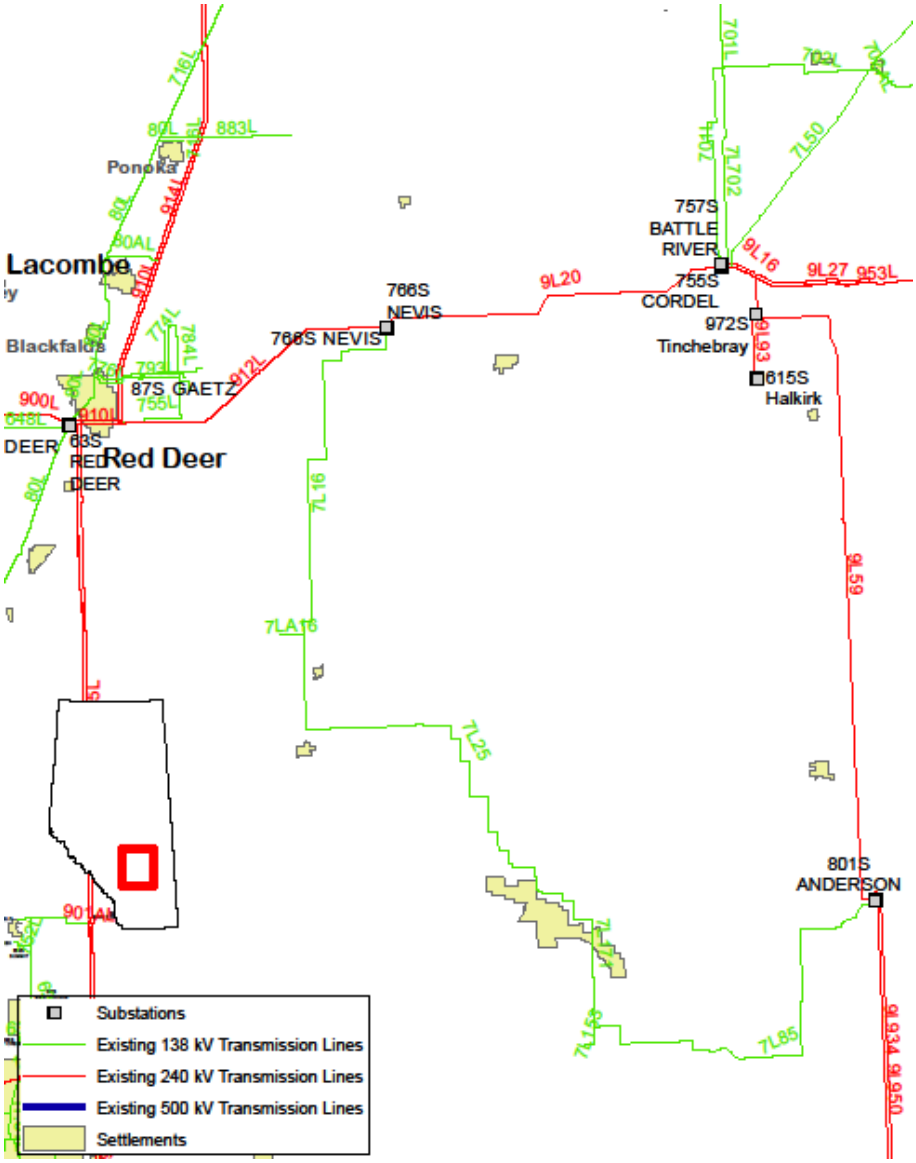
NEP1

SCR4

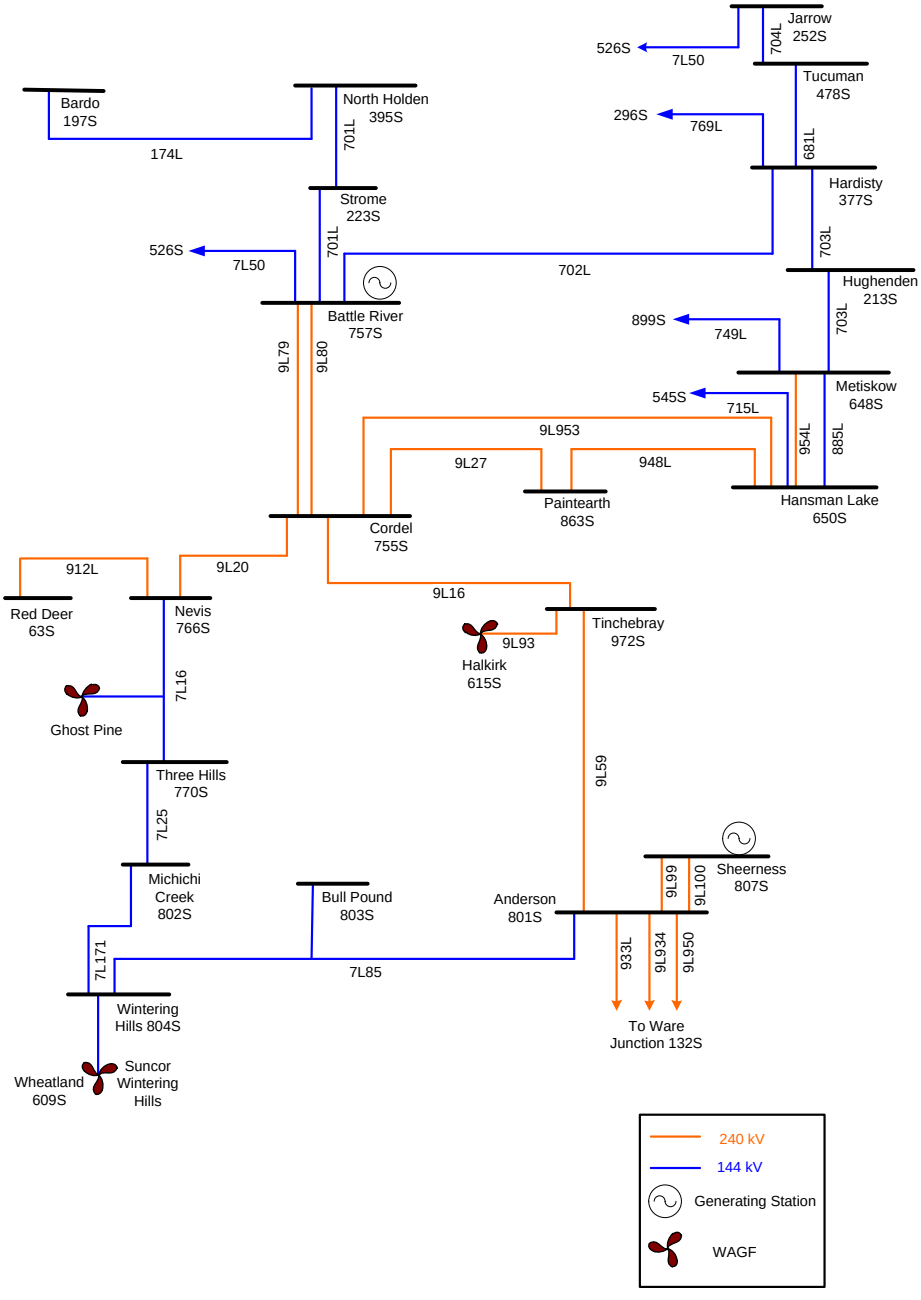
SH1

SH2

Appendix 2 – Geographical Map of the Central East Area



Appendix 3 – Central East Area Single Line Diagram



Appendix 4: Battle River Transient Stability Limits

Transmission Outage	Next Contingency	BR3/BR4 Status	Output limit of BR3 and/or BR4 net-to-grid (MW)
Battle River 757s 240/144 kV Transformer	7L50 or 7L701	BR3 in-service BR4 in-service	240
		BR3 on-line BR4 off-line	115
		BR3 off-line BR4 on-line	135