

Information Document

South Area Transmission Constraint Management

ID #2013-009R



Information Documents are not authoritative. Information Documents are provided 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, *Real Time Transmission Constraint Management*. The purpose of this Information Document is to provide additional information regarding the unique operating characteristics and resulting constraint conditions and limits in the South area of the Alberta 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 Alberta interconnected electric system. These steps are referenced in Table 1 of this Information Document as they are applied to the South area.

2 General

The transmission and generation facilities in the South area are shown in a geographical map in Appendix 2. For a schematic single line diagram of the South area, see Appendix 3.

Several remedial action schemes are in place in the South area to ensure system reliability. The remedial action schemes for the South area are listed in Appendix 4, with their locations labeled on the single line diagram located in Appendix 3.

3 Constraint Conditions and Limits

When managing a transmission constraint in the South area, the AESO ensures that transmission line flows out of the area are managed in accordance with 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 Alberta interconnected electric system. The existing remedial action schemes are designed to ensure line flows are managed to safely maintain emergency transmission line ratings.

The AESO monitors the remedial action schemes in the South to ensure that they are available when required. If a remedial action scheme is not available or partially inoperable, the AESO proactively curtails generation in anticipation of contingencies in order to ensure safe, reliable operation of the system. The remedial action schemes are outlined in Appendix 4.

The AESO uses wind power management tools to curtail during constraints. Wind power management does not apply to any wind aggregated facilities that have been constrained down for a local area constraint. Once the transmission constraint management directive is cancelled, wind power management is again applied to the asset.

3.1 Non-Studied Constraints and Limits

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. Authoritative Documents include: the ISO rules, the Alberta reliability standards, and the ISO tariff.

For system conditions that have not been pre-studied, the AESO uses energy management system tools and dynamic stability tools to assess unstudied system operating limits in real time.

3.2 Studied Constraints and Limits

System studies have identified several specific transmission constraints in the South which have required the installation of appropriate remedial action schemes to take automatic action to manage the constraint. The identified constraints and the pool assets that are included in the specific remedial action schemes are shown in Appendix 4. The constraints can arise under abnormal operating conditions; however, constraints can also occur under normal operating conditions when there are high levels of wind production in addition to high British Columbia intertie flows. The constraints on transmission lines 786L, and on transmission line 225L at Spring Coulee can occur under normal operating conditions.

Loss of a 138 kV path (164L, 863L or 820L) could also result in a possibility of voltage collapse on the 69 kV system (N-1-1 contingency). When such a contingency occurs the AESO may be required to prepare the 69 kV system for the next contingency by proactively curtailing generation as required.

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 of the ISO rules. However, not all of those provisions are effective in the South 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 South area, and provides additional clarifying steps as required to effectively manage transmission constraints in that area before and after the activation of a remedial action scheme. The protocol steps which are effective in managing transmission constraints are outlined in Table 1 below.

Table 1
Transmission Constraint Management
Sequential Procedures for South Area

Section 302.1 of the ISO rules, subsection 2(1) protocol steps	Is the procedure applicable to the South area?
(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	Yes
(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, which are effective in managing constraints. A list of those effective generating pool are identified in Appendix 1. As per subsection 2(4) of section 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 South area transmission constraints. The effective pool assets that the AESO may curtail are listed in Appendix 1.

Step (c) in Table 1

There may be situations where curtailment of import flows is effective in managing a transmission constraint in the South area.

Step (d) in Table 1

Curtailing effective demand opportunity service on the downstream constraint side is not effective in managing South 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 South 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 South 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 Alberta interconnected electrical system, curtailing load on the upstream side is not effective in managing South area constraints.

5 Project Updates

As necessary, the AESO intends to provide information in this section about projects underway in the South area that are known to have an impact on the information contained in this Information Document.

6 Appendices to this Information Document

Appendix 1 – *Effective Pool Assets*

Appendix 2 – *Geographical Map of the South Area*

Appendix 3 – *South Area Single Line Diagram*

Appendix 4 - *Remedial Action Schemes In Effect in South Alberta*

Revision History

Version	Posting Date	Description of Changes
1.0	2014-02-27	Initial Release
2.0	2014-04-08	Appendix 1 through 3 amended to include pool asset BSR1
3.0	2014-05-29	Appendix 1 through 3 amended to include Old Man River Wind 112S (OWF1).
4.0	2014-06-26	Appendix 3 amended to include Fidler Substation with associated line amendments and Appendix 4 amended to renumber and add note concerning Remedial Action Scheme at 103S Goose Lake 893L .
5.0	2015-08-20	With energization of components of Southern Area Transmission Reinforcement (SATR) and Foothills Area Transmission Development (FATD), changes to the description of constraints and removal of four Remedial Action schemes.

Appendix 1 – Effective Pool Assets

The effective pool assets for the South cutplane, listed alphabetically by their pool IDs, are:

AKE1	IEW2
ARD1	KHW1
BSR1	OMRH
BTR1	OWF1
CHIN	RYMD
CR1	TAB1
CRR1	TAY1
CRWD	SCR2
DRW1	SCR3
GWW1	STMY
ICP1	WTRN
IEW1	

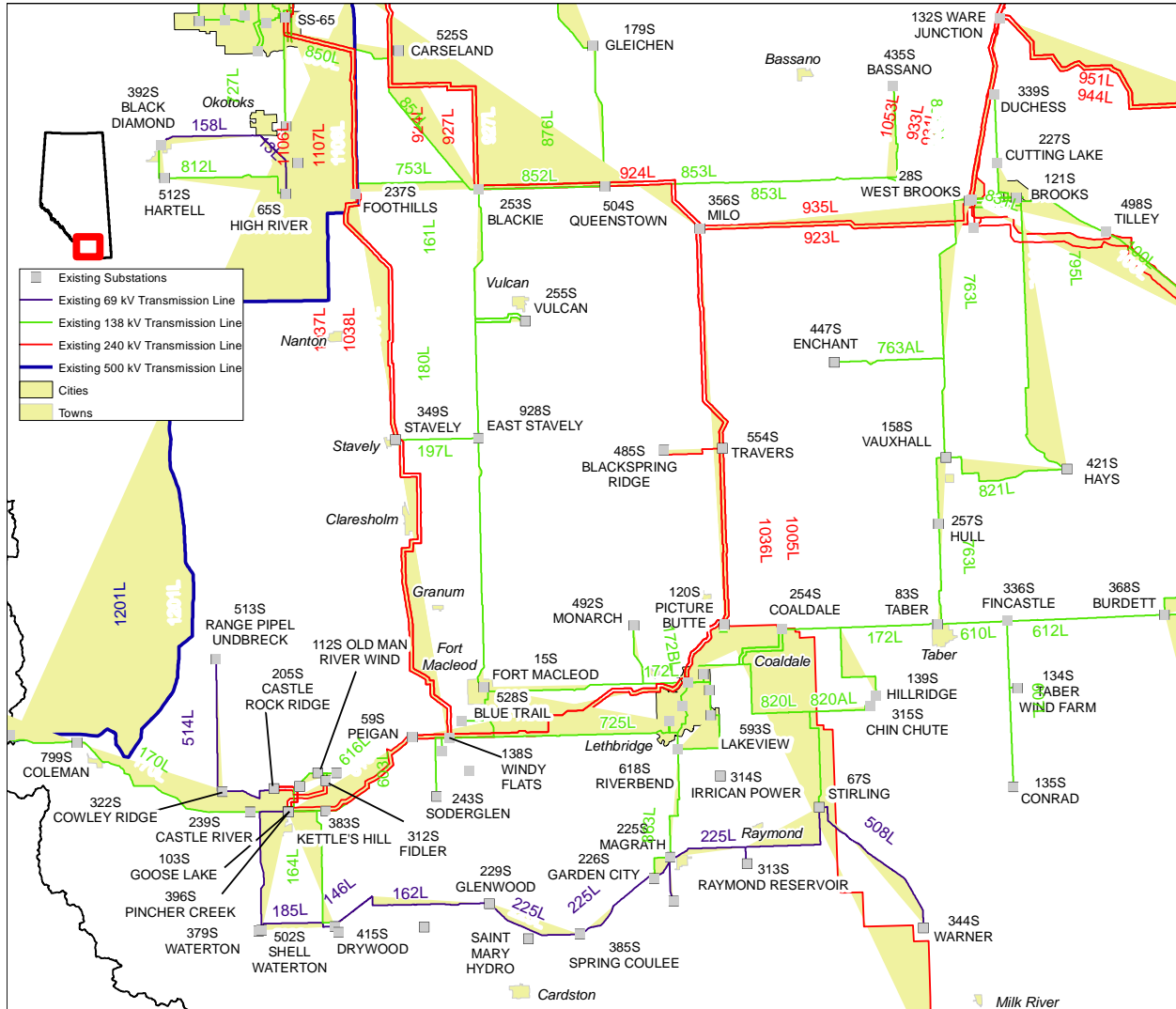
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Appendix 2 – Geographical Map of the South Area



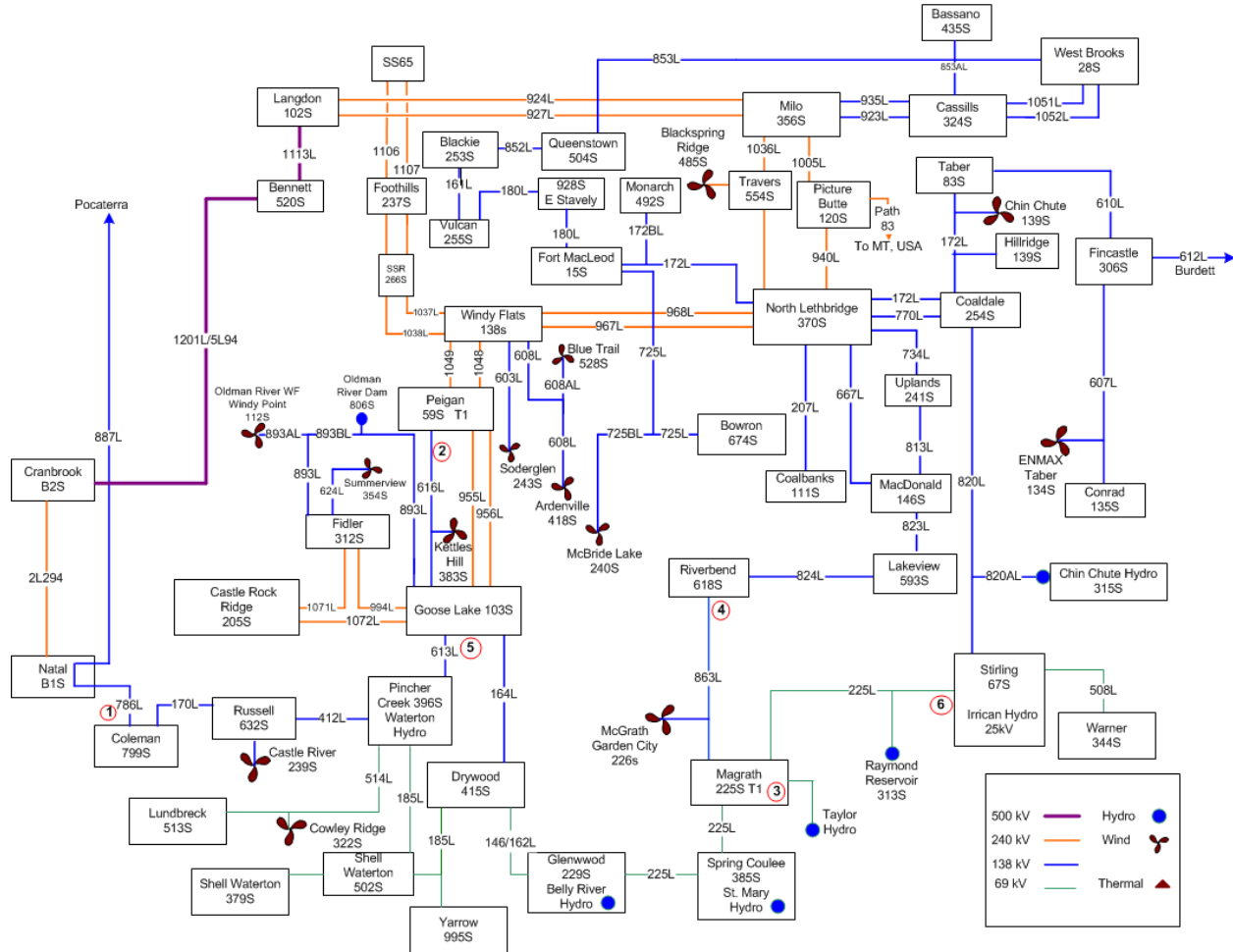
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Appendix 3 – South Area Single Line Diagram



Note: 893L Goose Lake (103s) to Oldman River Dam (806s) is decommissioned but can be temporarily re-energized.

Appendix 4 – Remedial Action Schemes in South Alberta

#	Remedial Action Scheme Monitoring Point
1	At 799S Coleman 786L (799S Coleman – BC Hydro Natal)
2	At 59S Peigan 616L Terminal
3	Loss of the 225S Magrath transformer T1
4	At 225S Magrath or 618S Riverbend 863L
5	At 103S Goose Lake 613L Terminal
6	At 67S Sterling 225L Terminal
7	At 28S West Brooks 853L Terminal (not represented in the map)