Information Document
Calgary Area Transmission Constraint Management
ID #2015-001R

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 in effect, the authoritative document 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 Calgary 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 Calgary area.

2 General

The AESO has provided a single line diagram of the Calgary area, indicating bulk transmission lines and area generators, in Appendix 2.

2.1 Shepard Remedial Action Scheme

The Shepard remedial action scheme is designed to protect the ENMAX 138 KV system at SS-65. The remedial action scheme sheds Shepard pool asset generation on the loss of both 985L and 1003L.

Under high south area generation and high Shepard generation, there can be N-1 concerns for the loss of 985L overloading 1003L or the loss of 1003L overloading 985L. This scenario may cause Constrain Down Generation being applied to both Shepard and south area generation.

3 Constraint Conditions and Limits

3.1 Non-Studied Constraints and Limits

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

3.2 Studied Constraints and Limits

Generating Units

AESO engineering studies have determined that in order to mitigate identified transient stablity concerns, certain Calgary area generators have a maximum allowable output under identified system conditions. Refer to Appendix 3, Appendix 4 and Appendix 5.

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 on the Shepard cutplane due to certain unique operating conditions that exist in that area. This information document represents the application

[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.

of the general provisions of Section 302.1 to the Shepard cutplane, 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 Calgary Area

Section 302.1 of the ISO rules, subsection 2(1) protocol steps	Applicable to a Calgary 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	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	Yes

Applicable Protocol Steps

The first step in managing a transmission constraint is to identify the pool assets e.g., generating units, energy storage resources, and loads that are effective in mitigating the transmission constraint. A list of the generating pool assets that are effective in managing constraints are identified in Appendix 1.

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 Calgary area transmission constraints.

Step (c) in Table 1

There may be situations where curtailment of import or export flows are effective in managing a transmission constraint in the Calgary area.

Step (d) in Table 1

Curtailing effective demand opportunity service on the downstream constraint side is not effective in managing Calgary 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 Calgary area and using transmission must-run is not effective in managing a transmission constraint in this area.

Step (f) in Table 1

Curtailing effective pool assets using reverse energy market merit order, followed by pro-rata curtailment, is effective in managing Calgary area transmission constraints.

Step (g) in Table 1

Depending on the congestion, if all the other steps are exhausted, load curtailment could potentially be considered effective.

5 Project Updates

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

Appendices

Appendix 1 – *Effective Pool Assets*
Appendix 2 – *Calgary Area Single Line Drawing*
Appendix 3 – *Cavalier Transient Stability Limits*
Appendix 4 – *Crossfield Energy Centre Transient Stability Limits*
Appendix 5 – *Cavalier, Carseland and area Distributed Energy Resources Thermal Constraints*

Revision History

Posting Date	Description of Changes
2024-04-25	Included the term energy storage resources in section 4 Amended Table 1 Transmission Constraint Management Sequential Procedures for Calgary area, Step C and Step G. Updated Appendix 2-Calgary Area SLD Removed Limiting Contingency column in Appendix 3-Cavalier Transient Stability Limits. Updated Appendix 4 Crossfield Energy Centre Transient Stability Limits and removed Limiting Contingency Column. Updated Appendix 5 **Cavalier, Carseland and area Distributed Energy Rescources Thermal Constraints** Removed Appendix 6 Shepard Cutplane Operating Limits
2021-01-20	Updated Appendix 2-Calgary Area SLD Removed Appendix 3-Carsland Transient Stability Limits Added Appendix 5–Cavalier(EC01) and Carseland (TC01) Thermal Constraints Amended Appendix 6-Shepard Cutplane Operating Limits
2020-10-21	Updated Appendix 2. Added Appendix 3, Appendix 4, and Appendix 5. Amended Section 3.2

2015-08-20	With energization of components of Foothills Area Transmission Development (FATD), maps updated to include new lines. Sections 2 and 3.2 revised to account for the possibility of RAS being unavailable and real-time contingency analysis being performed to determine limits.
2015-04-16	Revised note 3 in appendix 4 to clarify that the limits have been established based on a split 138 kV bus at SS-65.
2015-01-13	Initial release

Appendix 1 – Effective Pool Assets

The effective pool assets for Calgary Area Constraints, listed alphabetically by their pool IDs, are:

CRS1

CRS2

CRS3

EGC1

EC01

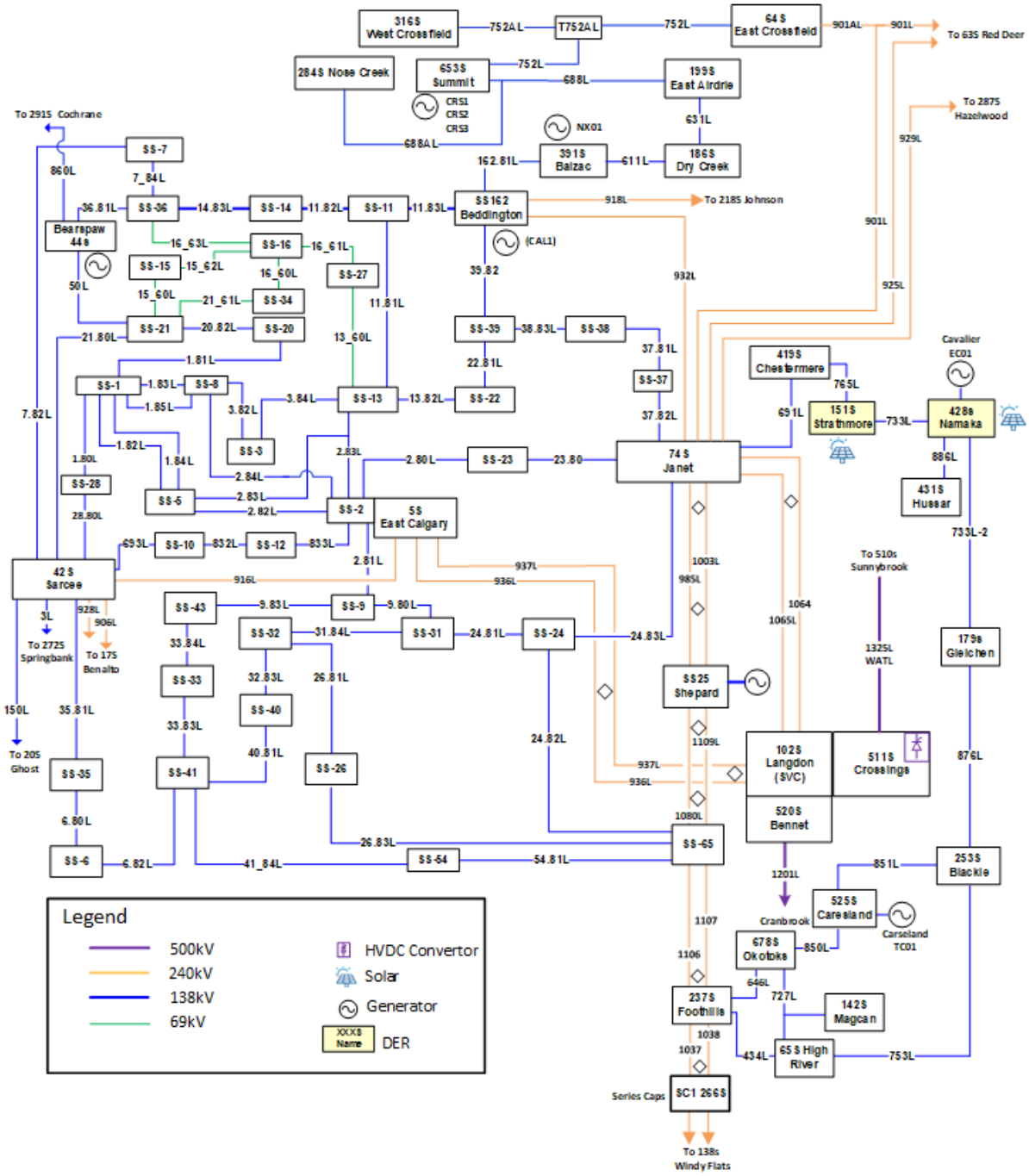
NMK1

TC01

STR1

STR2

Appendix 2 – Calgary Area Single Line Drawing



Appendix 3 – Cavalier Transient Stability Limits

Outage		Number of Cavalier units online[1]	Maximum Output Limit (MW)
N-0 (System Normal)	None	3	N/A
		2	
N-1	691L 74s Janet - 419s Chestermere	3	112
		2	71
	765L 151s Strathmore - 419s Chestermere	3	110
		2	70
	733L 151s Strathmore - 428s Namaka	3	105
		2	65

Note:

1. The Cavalier asset (EC01) is comprised of three units: G1, G2, G3.

Appendix 4 – Crossfield Energy Centre Transient Stability Limits[1]

Outage		Number of Crossfield Energy Centre[2] units online	Maximum Output Limit (MW)
N-0 (System Normal)	None	3	126
		2	88

Note:

1. If the bus voltage at 653s Summit can be maintained at or above 141 kV there are no transient stability limits.
2. The Crossfield Energy Centre assets is comprised of three units: CRS1, CRS2, CRS3.

Appendix 5 – Cavalier, Carseland and area Distributed Energy Resources Thermal Constraints[1]

Overloaded Element	Possible Mitigation
24.82L (ss24-ss65)	Apply CDG as required to: a) EC01 b) NMK1 c) STR1 d) STR2 e) TC01
26.83L (ss26-ss65)	
733L (179s Gleichen - 428s Namaka)	
753L (65s High River - 253s Blackie)	
765L (151s Strathmore - 419s Chestermere)	
850L (525s Carseland - 678s Okotoks)	
851L (525s Carseland - 253s Blackie)	
876L (179s Gleichen - 253s Blackie)	
765L (151s Strathmore - 419s Chestermere), 691L (74s Janet - 419s Chestermere) and 733L (151s Strathmore - 428s Namaka)[2]	

Note:

1. Real Time Contingency Analysis will determine the amount of constraint applied.
2. This mitigation is based on potential overloads caused by multiple contingencies.