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# 307 ALBERTA-SASKATCHEWAN INTERCONNECTION TRANSFER LIMITS

## 1. Purpose

To establish the transfer limits on the Alberta-Saskatchewan interconnection and to define the policies and procedures for establishing the export and import transfer capability on the Alberta-Saskatchewan interconnection while ensuring system security ~~in on the Alberta Interconnected Electric System (AIES).~~

## 2. Background

The Alberta and Saskatchewan electric systems are interconnected through the McNeil back-to-back DC converter station, which is owned and operated by ATCO Electric Ltd. This interconnection links the two asynchronous Eastern and Western Interconnections.

The Alberta-Saskatchewan interconnection is constrained by the transfer capability of the McNeil converter station and other restrictions in the Alberta and SaskPower system.

Operational studies ~~conducted in late 2005~~ have verified that the power flow on the north-south 240 kV transmission system has a direct relationship to the export capability from Alberta. In turn, the power flow on the north-south 240 kV transmission system depends on the power generation and load in the south. The north-south transfer limits, named the south of Keephills/Ellerslie/Genesee (KEG) or SOK-240 operating limits, are defined in [OPP 521](#). The SOK-240 operating limit, together with SOK generation and SOK load, determine the total Alberta export capability, including the Alberta-BC interconnection and the Alberta-Saskatchewan interconnection.

## 3. Policy

### 3.1 Transfer limits - general

- Because the Alberta-Saskatchewan interconnection is a DC connection, there is no requirement for a transmission reliability margin (TRM), and hence the available transfer capability (ATC) is the same as the total transfer capability (TTC).
- The Alberta to Saskatchewan export and Saskatchewan to Alberta import available transfer capability (ATC), which is defined as the maximum transfer that meets all of the specified pre-contingency and post-contingency criteria, is determined by the DC converter, various load conditions and transmission element outages and risk to those elements.
- Loss of reactive elements within the McNeil station could reduce its ability to adequately regulate the AC system voltage and/or the harmonic current flow from the station. In either case, power transfer limits could be imposed in accordance with ATCO Electric System Operations Policies and Procedures SO-105.
- Minimum flow over the McNeill back-to-back DC converter is 15 MW in either direction; that is, the net interchange over the converter must not be less than 15 MW in either direction. For details, refer to [OPP 302](#).

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- The transfer limits on the Alberta-Saskatchewan interconnection are determined as the lesser of :
  - Transfer limits as determined by the ISO based on Alberta’s system conditions and constraints (as posted on the AESO web site).
  - Transfer limits as determined by SaskPower based on the Saskatchewan system conditions and constraints.

**3.2 Export TTC/ATC**

- The Alberta-Saskatchewan interconnection export TTC/ATC is the lesser of the following two calculated values:

1. Total Alberta export capability as calculated with the SOK-240 limits: (see OPP 521 for details).

[SOK-240 Available Transfer Capability (ATC) minus Forecast SOK load plus Forecast SOK generation] multiplied by Export Conversion Factor

where:

- SOK-240 ATC is as defined in [OPP 521](#), and
- Forecast SOK load is the sum of the forecast loads downstream of the SOK cut plane as defined in [OPP 521](#), and
- Forecast SOK generation is the estimated in-merit generation downstream of the SOK cut plane as defined in [OPP 521](#), and
- Export Conversion Factor is a factor to convert SOK capability to export capability and to account for the associated increase in losses; it is deemed to be 0.95 as confirmed by studies.

2. ~~Seventy-five 75 MW, but will increase to 153 MW on the date of completion of the installation of the two 27 MVar capacitor banks at McNeill 840S. Export TTC/ATC on the Alberta-Saskatchewan interconnection as determined by the Empress area load limit:~~

~~Maximum Empress area load minus the Empress area demand transmission service (DTS) minus the Empress area demand opportunity service (DOS)~~

~~For example: Sask. export ATC = 355 MW maximum Empress area load – 295 MW (DTS) – 50 MW (DOS) = 10 MW Saskatchewan export TTC/ATC.~~

- If the total submitted etags for the Alberta-BC interconnection and the Alberta-Saskatchewan interconnection exceeds the total Alberta export capability as determined by the SOK-240 limit, then the export etags on both interconnections will be managed in real time as the SC monitors the actual SOK-240 flow and the export on both interconnections may be curtailed on a pro rata basis.

- ~~The export available transfer capacity to Saskatchewan will be posted to equal the maximum Empress area load, minus the Empress area demand transmission service (DTS), minus the Empress area demand opportunity service (DOS). The Empress area load is defined in [OPP 503](#). For example:~~

~~Sask. export ATC = 355 MW (Empress area load) – 295 MW (DTS) – 50 MW (DOS) = 10 MW Saskatchewan export ATC.~~

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**3.32 Import TTC/ATC**

- The maximum Alberta to Saskatchewan import TTC/ATC is 153 MW under normal system conditions.

**4. Responsibilities**

**4.1 ISO**

The ISO ~~will~~must:

- Review, as required from time to time and in coordination with the Transmission Facility Owners and SaskPower, the Alberta-Saskatchewan interconnection transfer limits.
- Post the ATC for the Alberta-Saskatchewan interconnection on the AESO website.

**System Controller**

The SC ~~will~~must:

- Determine the ATC on the Alberta-Saskatchewan interconnection based on AIES conditions in real time and:
  1. Adjust the ATC posted on the AESO's website if required by system conditions in real time.
  2. Inform the SaskPower System Operator of any adjustment to the export or import ATC on the Alberta-Saskatchewan interconnection based on system conditions in real time.
- Report unusual operating conditions or difficulties in adhering to the transfer limits for review.

**4.2 SaskPower**

SaskPower ~~will~~must:

- Inform the ISO and SC of any operating conditions that will affect the ATC of the Alberta-Saskatchewan interconnection.
- Post the transfer limit for the Alberta-Saskatchewan interconnection on the SaskPower OASIS node.

**4.3 ATCO Electric**

ATCO Electric ~~will~~must:

- Inform the ISO and SC of any operating conditions at the McNeill station (A840S) that will affect the ATC of the Alberta-Saskatchewan interconnection.

**5. System Controller Procedures**

**5.1 Establishing the hourly Alberta to Saskatchewan export ATC**

Before T-70 minutes before the scheduling hour, and also on an as-required basis when operating conditions change, the SC ~~will~~must:

1. Determine the SOK-240 ATC as described in [OPP 521](#).
2. Determine the forecast SOK load and forecast SOK generation for the next scheduling hour.
3. Calculate the export TTC based on SOK-240 limits by the following:

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Export TTC = SOK-240 ATC *minus* forecast SOK load *plus* forecast SOK generation

~~4. Calculate the export TTC based on the maximum Empress area load by the following:~~

~~Export TTC = Empress area load *minus* the Empress area demand transmission service (DTS) *minus* the Empress area demand opportunity service (DOS)~~

~~54. Determine the export TTC to be lesser value derived from the following sources: lowest of the following:~~

~~a. The lesser of the results from step 3 and 75 MW, or 153 MW after the installation of two 27 MVar capacitor banks at McNeill 840S.~~

~~The lesser of the results from step 3 and step 4.~~ b. Export ATC as constrained by McNeill converter's operating conditions, as advised by ATCO Electric.

c. Export ATC as constrained by SaskPower system conditions, as advised by SaskPower.

~~56. Post export ATC (ATC=TTC) if it is different from the previously posted value.~~

**5.2 Re-posting the hourly Alberta to Saskatchewan export ATC**

If the export ATC is changed from the posting on the AESO website, the SC ~~will~~must:

1. Revise the hourly export ATC on the Alberta-Saskatchewan interconnection posted on the AESO website by:
  - a. Logging onto the AESO website and following the instructions in the ATC Postings Override Maintenance User Document to enter the revised export ATC.
  - b. Confirming that the export ATC posting has been updated on the AESO website.
2. Call and inform the SaskPower ~~tr~~Transmission ~~o~~perator of the revised export ATC on the Alberta-Saskatchewan interconnection, considering the following timing guidelines:
  - a. For immediate ATC changes within the current hour, call immediately or as soon as possible.
  - b. For ATC changes effective the next scheduling hour, endeavour to call by hh:05.
  - c. For future hourly ATC changes, provide as much advance notice as possible.

**5.3 Establishing the hourly Saskatchewan to Alberta import ATC**

The SC ~~must~~will establish the hourly import ATC as the lowest of the following:

1. Import ATC based on transmission element/generating unit statuses for the hour. If the transmission element status is anticipated to change during the hour, use the status that poses greater constraint on the ATC limit (that is, assume it is out of service).
2. Import ATC based on system normal conditions.
3. Import ATC as constrained by SaskPower system conditions, as advised by SaskPower.
4. Import ATC as constrained by McNeill converter's operating conditions, as advised by ATCO Electric.

**5.4 Re-posting the hourly Saskatchewan to Alberta import ATC**

If the import ATC is changed from ~~that~~what is posted on the AESO website, the SC ~~will~~must:

1. Revise the hourly import ATC on the Alberta-Saskatchewan interconnection by:

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- a. Logging onto the AESO website and following the instructions in the ATC Postings Override Maintenance User Document to enter the revised import ATC.
- b. Confirming that the import ATC posting has been updated on AESO’s website.
- 2. Call and inform the SaskPower Transmission Operator of the revised import ATC on the Alberta-Saskatchewan interconnection, considering the following timing guidelines:
  - a. For immediate ATC changes within the current hour, call immediately or as soon as possible.
  - b. For ATC changes effective the next scheduling hour, endeavor to call by hh:05.
  - c. For future hourly ATC changes, provide as much advance notice as possible.

**6. Revision History**

Issued	Description
<del>2009-</del>	<del>Supersedes 2008-05-01</del>
2008-05-01	Supersedes 2006-09-29
2006-09-29	New Issue