

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 Documents:¹ section 203.6 of the ISO rules, *Available Transfer Capability and Transfer Path Management*, section 303.1 of the ISO rules, *Load Shed Service*, and reliability standard IRO-006-WECC-AB-1, *Qualified Transfer Path Unscheduled Flow Relief*. The purpose of this Information Document is to provide information on the limits and calculations related to the import and export of energy in interchange transactions. This Information Document is likely of most interest to market participants who import and export energy to and from Alberta.

2 Tables and acronyms contained in this Information Document

The tables set out in this Information Document are intended to reflect the total transfer capabilities under various Alberta internal load levels and transmission element outage conditions.

The following acronyms are used in this Information Document:

- a) Alberta internal load (AIL);
- b) Contingency reserve obligation (CRO);
- c) Direct transfer trip (DTT);
- d) Kilovolt (kV);
- e) Line (L);
- f) Load shed service for import (LSSI);
- g) Montana Alberta Tie Line (MATL);
- h) Megawatts (MW);
- i) Megavolt-ampere reactive (MVAR);
- j) Most severe single contingency (MSSC);
- k) North West Power Pool Reserve Sharing Group (NWPP RSG);
- I) Northern American Electric Reliability Corporation (NERC).
- m) Out of service (OOS);
- n) Remedial action scheme (RAS);
- o) Substation (S);
- p) Static VAR compensator (SVC);
- q) Transmission reliability margin (TRM); and
- r) Total transfer capability refers to (TTC).

3 Capability Limits Determinations by the ISO

This section provides information on subsection 2 of section 203.6 of the ISO rules. Figure 1 below illustrates the available transfer capability on the interties as limited by individual line total transfer capabilities, system operating limits, and transmission reliability margin.

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.



Figure 1: Alberta Capability Levels

(references to 2(1)(a)(b) and (c) correspond to the subsections within section 203.6 of the ISO rules)



4 Total Transfer Capability Determinations by the ISO

This section provides information on subsection 3 of section 203.6 of the ISO rules.

The calculation of total transfer capability and available transmission capability in section 203.6 of the ISO rules is based upon requirements established in NERC's reliability standards MOD-001-1a, *Available Transmission System Capability* and MOD-029-1a, *Rated System Path Methodology*.

In general, when determining Alberta's total transfer capability, the AESO considers factors such as:

- a) Alberta internal load levels;
- b) any interconnected electric system forecast or real time conditions, including outages of bulk transmission line and generating units; and
- c) other conditions, including any seasonal restrictions based on AIL.

4.1 Alberta-British Columbia Transfer Path Import Total Transfer Capability Determinations

The Alberta-British Columbia transfer path import total transfer capability varies based on Alberta internal load system normal conditions and transmission element outage conditions. Tables 1(a) and 1(b) below set out the total transfer capability under these various conditions.



Table 1(a): British Columbia to Alberta Import Total Transfer Capability - Summer Season (May 1 to October 31)

AIL	System Normal (MW)		1201L out of service (MW)	102S Lango of servi	lon SVC out ce (MW)
MATL Status	In	Out	Out	In	Out
All AIL	800	700	65	800	650

Table 1(b): British Columbia to Alberta Import Total Transfer Capability – Winter Season (November 1 to April 30)

AIL	System Normal (MW)		1201L out of service (MW)	102S Lango of servi	lon SVC out ce (MW)
MATL Status	In	Out	Out	In	Out
All AIL	800	700	65	800	650

4.2 Alberta-British Columbia Transfer Path Export Total Transfer Capability Determinations

For any given system condition, the export total transfer capability will not exceed the maximum export total transfer capability as specified in Table 2 and Table 3 below.

For multiple outages to more than one transmission element, or for accumulated capacitor bank unavailability in the Calgary area greater than 395 MVAr, the maximum export total transfer capability limits are determined by studies based on the specific system conditions at the time of the multiple outages or unavailability. If such studies are not available, the export total transfer capability is reduced to 50 MW if the Alberta-Montana intertie is in service, or 65 MW if MATL is out of service.



Table 2: Alberta to British Columbia Export Total Transfer Capability - Summer Season (May 1 to October 31)

AIL	System Normal (MW)		1201L is out of service (MW)	102S Langdo of servio	on SVC is out ce (MW)
MATL Status	In	Out	Out	In	Out
All AIL	1000	1000	80	900	1000

Table 3: Alberta to British Columbia Export Total Transfer Capability - Winter Season (November 1 to April 30)

AIL	System Normal (MW)		1201L is out of service (MW)	102S Langdo of servi	on SVC is out ce (MW)
MATL Status	In	Out	Out	In	Out
All AIL	1000	1000	105	900	1000

4.3 Alberta-Montana Transfer Path Import Total Transfer Capability Determinations

The Alberta-Montana transfer path import total transfer capability varies based on Alberta internal load system normal conditions and transmission element outage conditions. Table 4 below sets out the total transfer capability under these various conditions.

 Table 4: Montana to Alberta Import Total Transfer Capability (see Note 1)
 1

AIL	System Normal (MW)	1201L out of service (see Note 2) or 1201L DTT is out of service or MATL Local RAS is out of service or AIES islanded from the Western Interconnection through BC Hydro (see Note 3) (MW)
All AIL	310	0



Notes:

- 1. If the high speed communication equipment used for orderly shutdown and line protection schemes is out of service, Path 83 (MATL 240/230 kV line) will be removed from service.
- 2. A 1201L outage in real time results in a direct transfer trip to MATL. For a planned outage to 1201L the AESO takes Path 83 (MATL 240/230 kV line) out of service prior to removing 1201L.
- 3. For any outage in British Columbia that causes the interconnected electric system to be islandedfrom the WECC, the AESO takes Path 83 (MATL 240/230 kV line) out of service.

4.4 Alberta-Montana transfer Path Export Total Transfer Capability Determinations

The AESO determines the Alberta-Montana transfer path export total transfer capability at the Alberta-Montana border.

AIL	System Normal (MW)	1201L out of service (see Note 2) or 1201L DTT is out of service or MATL Local RAS is out of servide or AIES islanded from the Western Interconnection through BC Hydro (see Note 3) (MW)
All AIL	315	0

Table 5: Alberta to Montana Export Total Transfer Capability (see Note 1)

Notes:

- 1. If the high speed communication equipment used for orderly shutdown and line protection schemes is out of service, Path 83 (MATL 240/230 kV line) will be removed from service.
- 2. A 1201L outage in real time results in a direct transfer trip to MATL. For a planned outage to 1201L the AESO takes Path 83 (MATL 240/230 kV line) out of service prior to removing 1201L.
- 3. For any outage in British Columbia that causes the interconnected electric system to be islanded from the WECC, the AESO takes Path 83 (MATL 240/230 kV line) out of service.

4.5 Alberta-Saskatchewan Transfer Path Import Total Transfer Capability



Table 6: Saskatchewan to Alberta Import Total Transfer Capability

	Import TTTC (MW)		
AIL	Winter	Summer	
For any AIL	153	153	

4.6 Alberta-Saskatchewan Transfer Path Export Total Transfer Capability

Table 7: Alberta to Saskatchewan Export Total Transfer Capability

	Export TTC (MW)				
AIL	System Normal	One McNeill capacitor unavailable	Two McNeill capacitors unavailable		
For any AIL	153	130	90		

5 Available Transfer Capability Determinations by the ISO for a Transfer Path

This section provides information on subsection 4 of section 203.6 of the ISO rules.

The AESO calculates both the import available transfer capability and the export available transfer path capability for each transfer path according to the formula below:

the total transfer capability; minus

the transmission reliability margin;

where the transmission reliability margin is:

that amount of transfer capability the AESO determines is necessary to ensure the reliable operation of the Alberta interconnected electric system taking into account uncertainties in system conditions and the need for operating flexibility; and

the transmission reliability margin is composed of (TRM_s) for variations due to balancing of generation and load on the interconnected electric system

plus

the allocation transmission reliability margin (TRM_a) associated with joint operation of the transfer paths in the presence of a combined system operating limit.

Or simply: ATC = TTC - $(TRM_s + TRM_a)$

Please refer to section 5.2 of this Information Document for further information regarding the determination of system transmission reliability margin and section 5.3 of this Information Document for the determination of allocation transmission reliability margin.

5.1 Posting the Available Transfer Capability

The AESO posts available transfer capability for 24 hour periods on the AESO website in the Real-time ATC Allocation Report. The posting automatically updates at 85 minutes in advance of the settlement



interval, at 15 minutes in advance of the settlement interval if required, and in real-time if system operating limits change in the current settlement interval. In addition to the Real-time ATC Allocation Report, the AESO provides forward looking intertie capability reports, and historical intertie capability reports.

At 25 minutes prior to each settlement interval, the AESO updates the Real-time ATC Allocation Report for the next settlement interval plus one settlement interval and beyond as follows:

- a) the AESO recalculates total transfer capabilities and system transmission reliability margin based on forecast system conditions according to the tables described within this Information Document; and
- b) the AESO calculates allocation transmission reliability margin as described in section 5.3 below.

Within 15 minutes prior to the start of the settlement interval, if the operating limit on a given path(s) changes, and the sum of the e-tags violates a path limit, the AESO will curtail e-tags as per subsection 11 of section 203.6 of the ISO rules. As soon as practicable, the AESO will update the Real-time ATC Allocation Report for the next settlement interval, due to system operating limit and/or total transfer capability and/or transmission reliability margin changes since the last update.

During the settlement interval, the AESO updates the Real-time ATC Allocation Report and recalculates the transfer path scheduling parameters, if required due to real-time changes to total transfer capability and/or system operating limits and/or transmission reliability margin.

5.2 Determination of System Transmission Reliability Margin

5.2.1 System Transmission Reliability Margin for the Alberta-British Columbia and Alberta-Montana Transfer Paths

For other system conditions that are not listed below, the AESO may change the transmission reliability margin if it is required to ensure system reliability.

	Import TRM (MW)			Export TRM (MW)		
	British Columb	pia Intertie		British Colu	mbia Intertie	
System Conditions	MATL is in service	MATL is out of service	Montana Intertie	MATL is in service	MATL is out of service	Montana Intertie
System Normal; or 1201L is out of service	50	65				
1201L is in service; and That amount of Alberta's most severe single contingency (MSSC) that is > CRO to the NWPP RSG	The greater of: 50; or MSSC – CRO	The greater of: 65; or MSSC – CRO		50	65	15
1201L is in service; and the Ford Elk area load is served by Alberta; and 887L/1L274 open at Natal or open between Natal and 48S Pocaterra; or	50; plus MW flow on 887L/1L274 at Pocaterra	65; plus MW flow on 887L/1L274 at Pocaterra	15			

 Table 8: System Transmission Reliability Margin for the Alberta-British Columbia and

 Alberta-Montana transfer paths under various system conditions



Both 887L/1L274 and 786L/1L275 open at Natal					
1201L in service and British Columbia transmission outage(s) result in British Columbia area load being serviced by Alberta via 138kv system.	50; plus British Columbia area load served by Alberta	65; plus Bristish Columbia area load served by Alberta			
When 1203L or 1209L is out of service for various Genesee MSSC ¹ level ²	Determined in real-time such Columbia intertie ATC = 0	that final British	Determined in real- time such that final Montana lintertie ATC = 0		

Notes:

- 1. Most severe single contingency.
- 2. If system conditions permit, the AESO may adjust the transmission reliability margin in real-time to allow an available transfer capability > 0 MW.

5.2.2 System Transmission Reliability Margin for the Alberta-Saskatchewan Transfer Path

Because the Alberta-Saskatchewan intertie is a direct current connection, and controls to a set point with no variance, the system transmission reliability margin equals zero (0).

The minimum flow over the McNeill back-to-back direct current converter is 15 MW in either direction due to technical limitations and, therefore, the net interchange schedule over the converter cannot be less than 15 MW (other than zero) in either direction.

If the minimum flow limit is not met, the AESO curtails the net interchange schedule to plus15 MW, 0 MW, or minus15 MW, whichever is the least.

5.3 Determination of Allocation Transmission Reliability Margin

Allocation transmission reliability margins are required to reflect the system limitations associated with joint operation of the transfer paths. Engineering studies determine system operating limits for the Alberta interconnected electric system which may apply to combinations of transfer paths to ensure that the Alberta interconnected electric system is operated in a reliable state. If the operating limits described in this subsection 5.3 of this Information Document are less than the sum of the total transfer capability of the affected transfer paths, and are expected to be binding based on energy offers received, then the AESO reduces the available transfer capability of each applicable transfer path by increasing allocation transmission reliability margins such that the final sum of available transfer capabilities equals the operating limit adjusted for a transmission reliability margin. To determine the available transfer capability limit which applies to the transfer path combination, or maximum volume which can be scheduled across the transfer path combination, the AESO subtracts a transmission reliability margin, generally composed of the sum of the individual transfer path system transmission reliability margin values, from the operating limit.

The AESO determines the allocation transmission reliability margin for a transfer path as follows:

a) if the volume of offers and bids for a transfer path combination is greater than the relevant operating limit then the AESO calculates the allocation transmission reliability margin for each transfer path based on the results of the available transfer capability allocation



protocol defined in subsection 10 of section 203.6 where $TRM_a = TTC - TRM_s - ATC$; or

If the volume of offers and bids for a transfer path combination is not greater than the relevant operating limits then the AESO sets the allocation transmission reliability margin to zero (0). This indicates there were not enough offers or bids to require an available transfer capability allocation. Even though an allocation is not required, the operating limit is still the constraining factor on the transfer path, or combinations of transfer paths. The AESO identified operating limits for the following intertie combinations:

- a) combined British Columbia/Montana to Alberta as per subsection 2(1)(b) of section 203.6 of the ISO rules;
- Alberta to combined British Columbia/Montana as per subsection 2(1)(b) of section 203.6 of the ISO rules;
- c) combined British Columbia/Montana and Saskatchewan to Alberta as per subsection 2(1)(a) of section 203.6 of the ISO rules; and
- d) Alberta to Combined British Columbia, Montana and Saskatchewan as per subsection 2(1)(a) of section 203.6 of the ISO rules.

5.3.1 The Combined British Columbia and Montana to Alberta operating limit for Import

The British Columbia and Montana to Alberta system operating limit for import under various system conditions is provided in Tables 9(a) and 9(b) below.

The transmission reliability margin applied to the combined British Columbia and Montana to Alberta cutplane is normally the sum of the individual transmission reliability margins for each of the British Columbia and Montana interties. The AESO may also increase the combined British Columbia and Montana to Alberta transmission reliability margin during normal opeating conditions if the available load under load shed service for import is insufficient (refer to Table 10 below). Further details on load shed service for import can be found in section 303.1 of the ISO rules, *Load Shed Service*.

Table 9(a): Combined British Columbia and Montana to Alberta Operating Limit for Import – Summer Season (May 1 to October 31)

AIL	System Normal (MW)	1201L out of service (MW)
All AIL	1110	65

Table 9(b): Combined British Columbia and Montana to Alberta Operating Limit for Import – Winter Season (November 1 to April 30)

AIL	System Normal (MW)	1201L out of service (MW)
All AIL	1110	65



Table 10: Minimum amount of Load Shed Service for Import load requirement

Minimum amount of load shed service for import load requirement based on combined British Columbia/Montana net import schedule and the Alberta internal load.

				Minimum LSSI load required (MW) (Note 3 below)													
							AIL (MW) (Note 1 below)										
Combined BC/MT/SOL Import Level (MW) (Note 2 below)		/MT/SOL I (MW) Iow)	Combined BC/MT ATC Import Level (MW) (Note 2 below)		less than or equal	7500	8000	8500	9000	9500	10000	10500	11000	11500	12000	12500	
						to	to	to	to	to	to	to	to	to	to	to	to
						7499	7999	8499	8999	9499	9999	10499	10999	11499	11999	12499	12999
Below 715 Below 650		0	0	0	0	0	0	0	0	0	0	0	0				
716	to	765	651	to	700	75	0	0	0	0	0	0	0	0	0	0	0
766	to	815	701	to	750	128	99	81	73	66	63	55	0	0	0	0	0
816	to	865	751	to	800	182	157	133	129	118	114	108	101	88	69	64	0
866	to	915	801	to	850	240	212	187	182	171	166	161	154	139	120	115	67
916	to	965	851	to	900	302	267	242	232	225	221	215	208	196	178	171	116
966	to	1015	901	to	950	349	323	293	282	278	272	268	264	252	235	222	170
1016	to	1065	951	to	1000	408	375	348	336	333	326	321	317	306	291	272	228
1066	to	1115	1001	to	1050	473	430	394	392	386	383	374	372	360	345	325	274
1116	to	1165	1051	to	1100	517	494	453	449	433	428	426	423	413	398	386	338
1166	to	1215	1101	to	1150	577	562	510	496	494	484	492	485	473	460	446	394
1216	to	1265	1151	to	1200	641	615	569	555	553	542	540	539	533	517	499	453
1266	to	1315	1201	to	1250	678	669	632	612	606	599	596	596	590	575	552	499

Notes:

1. If the Alberta internal load falls on or very close to a boundary of Table 1 ranges, the AESO uses the lower Alberta internal load range to determine the amount of load shed service for imports to arm.

- 2. When 5L92 is out of service, the AESO uses the total net combined British Columbia/Montana import plus the Alberta interconnected electric system most severe single contingency to determine the import level when applying this table.
- 3. When 2L113 or the Natal transformers are out of service, the AESO uses the total net combined British Columbia/Montana import and the AIES load plus the British Columbia load served from Alberta via the 138kv system to determine the LSSi required level.

5.3.2 The Alberta to the combined British Columbia and Montana operating limit for export

The British Columbia and Montana to Alberta system operating limits for export under various system conditions are given in Table 11 and Table 12 below.

Table 11: Alberta to Combined British Columbia and Montana Operating Limit for Export – Summer Season (May 1 – October 31)

AIL	System Normal (MW)	1201L out of service (MW)
All AIL	1000	80

Table 12: Alberta to Combined British Columbia and Montana Operating Limit for Export – Winter Season (November 1 – April 30)

AIL	System Normal (MW)	1201L out of service (MW)
All AIL	1000	105



5.3.3 The Alberta (British Columbia/Montana/Saskatchewan) Operating limit for Export

The AESO calculates the summer system operating limit for export from Alberta by adding the results derived from Table 7, which describes the Alberta to Saskatchewan total transfer capability for export, to the results of Table 11, which defines the maximum summer export system operating limits affecting the combination of the British Columbia and Montana transfer paths.

The AESO calculates the winter system operating limit for export from Alberta by adding the results derived from Table 7, which describes the Alberta to Saskatchewan total transfer capability for export, to the results of Table 12, which defines the maximum winter export system operating limits affecting the combination of the British Columbia and Montana transfer paths.

5.3.4 The Alberta (British Columbia/Montana/Saskatchewan) Operating limit for Import

The AESO calculates the system operating limit for import into Alberta by adding the results derived from Table 6, which describes the Alberta to Saskatchewan total transfer capability for import, to the results of Table 9, which defines the maximum import system operating limits affecting the combination of the British Columbia and Montana transfer paths.

6 Submission of Interchange Transaction Bids and Offers by Pool Participants

This section provides information on subsection 5 of section 203.6 of the ISO rules.

Subsection 5 of section 203.6 of the ISO rules may be read together with other general bid, offer and dispatch provisions contained in Division 203, Energy Market, of the existing ISO rules. In this regard, the AESO encourages section 203.3 of the ISO rules, *Energy Restatements* to be read in concert with section 203.6 of the ISO rules and that an importing pool participant must continue to submit offers for their available capability, in accordance with section 203.3 of the ISO rules.

7 Validation of E-tags by the ISO

This section provides information on subsection 7 of section 203.6 of the ISO rules.

Any balancing authority or transmission provider impacted by an interchange transaction schedule has its own criteria, priorities and timelines and the authority to validate and deny an e-tag. In current practice, some adjacent balancing authorities curtail e-tag transactions up to 15 minutes prior to the settlement interval according to their priority order to ensure that the total of the schedules submitted are within capacity limits. However, the AESO takes steps at approximately 15 minutes prior to the settlement interval to address any constraint that continues to exist even if the adjacent balancing authority is still in the process of taking action. The balancing authorities adjacent to the AESO are BC Hydro, SaskPower and Northwestern Energy.

8 Interchange Schedules and Dispatches by the AESO

This section provides information on subsection 8 of section 203.6 of the ISO rules.

The current ramp rates for hourly fixed transactions are as follows, but may be subject to change based on agreement between the AESO and the adjacent balancing authority:

- 1. the Alberta-Saskatchewan interchange ramping duration is 10 minutes and ramping starts 5 minutes before the interchange schedule start time and end time;
- 2. the Alberta-British Columbia interchange ramping duration is 20 minutes and ramping starts 10 minutes before the interchange schedule start time and end time; and
- 3. the Alberta-Montana interchange ramping duration is 20 minutes and ramping starts 10 minutes before the interchange schedule start time and end time.



9 Available Transfer Capability Allocations for Transfer Paths

This section provides information on subsection 10 of section 203.6 of the ISO rules.

9.1 Allocation examples

The following is intended to provide examples of the available transfer capability allocations for transfer paths set out in subsection 10 of section 203.6 of the ISO rules. In these examples, assume the AESO determined the following available transfer capability limits based on the procedure detailed in subsection 2 of section 203.6 of the ISO rules.

Import capability limits and export capability limits in Table 13 below are for the example purposes only, and are not meant to imply any particular ongoing or expected future limitations. Please refer to sections 4 and 5 of this Information Document for more detail regarding the calculation of import capability limits and export capability limits.

Transfer Path	Import Available Transfer Capability (TTC – TRM _s)	Export Available Transfer Capability (TTC – TRM₅)
British Columbia intertie	600	600
Montana intertie	300	300
Saskatchewan intertie	150	150
Grouping	Import Capability Limit (operating limit – TRM)	Export Capability Limit (operating limit – TRM)
Combined British Columbia/Montana intertie	600	600
Combined British Columbia/Montana/Saskatchewan interties	725	600

Table 13: Capability Limits Illustration

Example 1 - All limits exceeded on import

Assume the following energy offers received at T-2 as referenced in subsection 5(1) of section 203.6 of the ISO rules. Assume also that all import offers are priced at \$0/MWh and all exports at \$999.99/MWh:

British Columbia Intertie			Мо	ntana Inte	rtie	Saskatchewan Intertie		
Import	Export	Net	Import	Export	Net	Import	Export	Net
1,000	200	800	450	0	450	200	0	200
		(Import)			(Import)			(Import)



Co Columb	ombined Briti bia/Montana I	ish Interties	Combined British Columbia/Montana/Saskatchewan Interties			
Import	Export	Net	Import	Export	Net	
1,450	200	1,250	1,650	200	1,450	
		(Import)			(Import)	

In accordance with subsection 10(1) of section 203.6 of the ISO rules the assessment of this example is as follows:

Based on energy offers received 2 hours prior to the settlement interval, all three individual transfer paths would exceed their available transfer capability limits if the interchange transactions were realized during the settlement interval. Additionally, both the combined British Columbia/Montana and combined British Columbia/Montana/Saskatchewan capability limits would be exceeded. Therefore, the AESO determines and posts individual transfer path available transfer capability allocations by adjusting allocation transmission reliability margin (TRM_a) values as detailed in section 4.3 of this Information Document.

The AESO must make available transfer capability allocation calculations in accordance with subsection 10(2)(a) of section 203.6 of the ISO rules, so net import volumes for each individual transfer path are first compared to the respective transfer path import available transfer capability limit and, if the net import volume exceeds the respective transfer path import available transfer capability limit, the allocation is set at that limit. After this step, the individual transfer path allocations would be:

British Columbia intertie	600 MW (Import)
Montana intertie	300 MW (Import)
Saskatchewan intertie	150 MW (Import)

In accordance with subsection 10(2)(b) and (c) of section 203.6 of the ISO rules, the combined allocations for the British Columbia and Montana interties are compared to the combined British Columbia/Montana capability limit. In this example, the combined allocation is a net import of 900 MW, while the combined British Columbia/Montana import capability limit is 600 MW. A further allocation of capability on these two transfer paths is required such that their total allocation does not exceed 600 MW.

Furthermore, as all transactions are priced equally, the step under subsection 10(2)(c)(i) of section 203.6 of the ISO rules does not result in any change to the allocations calculated under subsection 10(2)(a) of section 203.6 of the ISO rules. As there are equally priced transactions, allocations are reduced on a pro rata basis in accordance with subsection 10(2)(c)(i) of section 203.6 of the ISO rules as follows:

the allocation resulting from subsection 10(2)(a) of section 203.6 of the ISO rules;

divided

by the sum from subsection 10(2)(b) of section 203.6 of the ISO rules;

multiplied

by the amount by which the combined British Columbia/Montana import capability limit is exceeded.

In this example, the reduction for British Columbia is:

 $600 / 900 \times 300 = 200$ MWIn this example, the reduction for MATL is:



300 / 900 x 300 = 100 MW

After completing the requirements of subsection 10(2)(c) of section 203.6 of the ISO rules are as follows:

British Columbia intertie	400 MW (Import)
Montana intertie	200 MW (Import)
Saskatchewan intertie	150 MW (Import)

In accordance with subsection 10(2)(d) and (e) of section 203.6 of the ISO rules, the combined allocations for the British Columbia, Montana and Saskatchewan interties are now compared to the combined British Columbia/Montana/Saskatchewan capability limit. In this example, the combined allocation at this stage is a net import of 750 MW, while the combined British

Columbia/Montana/Saskatchewan import capability limit is 725 MW. A further allocation of combined British Columbia/Montana/Saskatchewan capability on all three transfer paths is required such that their total allocation does not exceed 725 MW.

In this example, as all transactions are priced equally, the step under subsection 10(2)(e)(i) of section 203.6 of the ISO rules does not result in any change to the allocations calculated under subsections 10(2)(a) or 10(2)(c) of section 203.6 of the ISO rules. As there are equally priced transactions, allocations are reduced on a pro rata basis in accordance with subsection 10(2)(e)(i) which proceeds as follows:

the allocation resulting from subsections 10(2)(a) or 10(2)(c) of section 203.6 of the ISO rules;

divided

by the sum from subsection 10(2)(d) of section 203.6 of the ISO rules;

multiplied

by the amount by which the combined British Columbia/Montana/Saskatchewan import capability limit is exceeded.

In this example, the reduction for British Columbia is:

400 / 750 x 25 = 13 MW

In this example, the reduction for MATL is:

200 / 750 x 25 = 7 MW

In this example, the reduction for Saskatchewan is:

150 / 750 x 25 = 5 MW

The resulting individual transfer path allocations after completing the requirements of subsection 10(2)(e) of section 203.6 of the ISO rules are as follows:

British Columbia intertie	387 MW (Import)
Montana intertie	193 MW (Import)
Saskatchewan intertie	145 MW (Import)



If interchange transactions were implemented in the volumes as allocated above, all individual transfer paths and relevant combinations of transfer paths would be within capability limits. The AESO would use the above available transfer capability allocations for the individual transfer paths in the determination of the allocation transmission reliability margin as described in section 6.3 above and would post them at approximately 85 minutes prior to the start of the settlement interval. The AESO would then use these allocations, if necessary, in the curtailment procedures described in subsection 11 of section 203.6 of the ISO rules.

Example 2 – Wheel through transaction with capability limit exceeded

Assume the following energy offers are received at T-2 as referenced in subsection 5(1) of section 203.6 of the ISO rules. Assume that all import offers are priced at \$0/MWh and all exports at \$999.99/MWh. In this case, the AESO identifies a wheel through transaction from Montana to British Columbia, as the same market participant submits an import offer and an export bid in the same volume, but across two separate interties.

British Columbia Intertie			Мо	ntana Inte	rtie	Saska	Saskatchewan Intertie		
Import	Export	Net	Import	Export	Net	Import	Export	Net	
800	200	600	200	0	200	0	0	0	
		(Import)			(Import)				

British Columbia	a/Montana Co	British Columbia/Montana/Saskatchewan Combined			
Import Export Net		Net	Import	Export	Net
1,000 200 8		800	1,000	200	800
(Import)				(Import)	

In accordance with subsection 10(1) of section 203.6 of the ISO rules the assessment of this example is as follows:

Based on energy offers received at T-2, all three individual transfer paths are within their available transfer capability limits if the interchange transactions were realized during the settlement interval. However, both the combined British Columbia/Montana import capability limit and the combined British Columbia/Montana/Saskatchewan import capability limit would be exceeded. Therefore, the AESO determines and posts individual transfer path available transfer capability allocations. As the AESO has identified a wheel through transaction from Montana to British Columbia and it does not result in the violation of the capability limits on either the Montana or British Columbia interties, the AESO excludes this transaction from the allocation calculation in accordance with subsection 10(1)(b) of section 203.6 of the ISO rules.

The AESO makes available transfer capability allocation calculations in accordance with subsection 10(2)(a) of section 203.6 of the ISO rules, so net import volumes for each individual transfer path are first compared to the respective transfer path available transfer capability limit and, if the net amount exceeds the limit, the allocation is set at the limit. After this step, the individual transfer path allocations would be:

British Columbia 60 intertie	0 MW (Import)
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Montana intertie200 MW (Import)Saskatchewan
intertie0 MW

In accordance with subsections 10(2)(b) and (c) of section 203.6 of the ISO rules, the combined allocations for the British Columbia and Montana interties are now compared to the combined British Columbia/Montana capability limit. In this example, the combined allocation is a net import of 800 MW, while the combined British Columbia/Montana import capability limit is 600 MW. A further allocation of available transfer capability on these two transfer paths is required such that their total allocation does not exceed 600 MW.

In this simple example, as all transactions are priced equally, the step under subsection 10(2)(c)(i) of section 203.6 of the ISO rules does not result in any change to the allocations calculated under subsection 10(2)(a). As the AESO has identified a wheel through transaction from Montana, these volumes are excluded from the allocation calculations. After adjusting for the wheel through transaction, the allocation in accordance with subsection 10(2)(c)(i) of section 203.6 of the ISO rules proceeds as follows:

the allocation resulting from subsection 10(2)(a) of section 203.6 of the ISO rules;

divided

by the sum from subsection 10(2)(b) of section 203.6 of the ISO rules;

multiplied

by the amount by which the combined British Columbia/Montana capability limit is exceeded.

In this example, the reduction for British Columbia is:

600 / (800 – wheel through of 200) x 200 = 200 MW

In this example, the reduction for MATL is:

(200 - wheel through of 200) / (800 - wheel through of 200) x 200 = 0 MW

The individual transfer path allocations after the application of subsection 10(2)(c) of section 203.6 of the ISO rules are as follows:

British Columbia intertie	400 MW (Import)
Montana intertie	200 MW (Import)
Saskatchewan intertie	0 MW

In accordance with the provisions of subsection 10(2)(d) and (e) of section 203.6 of the ISO rules, the combined allocations for the British Columbia, Montana and Saskatchewan interties are now compared to the combined British Columbia/Montana/Saskatchewan capability limit. In this wheel through example, the combined allocation at this stage is a net import of 600 MW while the combined British Columbia/Montana/Saskatchewan import of 600 MW while the combined British Columbia/Montana/Saskatchewan import capability limit is 725 MW, so no further allocation is required. If the AESO implemented interchange transactions in the volumes as allocated above, all individual transfer paths and relevant combinations of transfer paths would be within capability limits. The AESO would post the above available transfer capability allocations for the individual transfer paths at approximately 85 minutes prior to the start of the settlement interval. The AESO would then use these allocations, if necessary, in the curtailment procedures described in subsection 11 of section 203.6 of the ISO rules.



10 Transfer Path Constraint Management

This section provides information on subsection 11 of section 203.6 of the ISO rules.

At any time at or after 15 minutes prior to the settlement interval the AESO determines whether any of the current available transfer capability or system operating limits are exceeded and if so, curtails the effective e-tags to the available transfer capability limits of the individual transfer paths. If the constraint still exists, the AESO curtails the effective e-tags on both the Alberta-British Columbia transfer path and the Alberta-Montana transfer path to the combined British Columbia/Montana capability limit. If the constraint still continues to exist, the AESO curtails e-tags to the combined British Columbia/Montana/Saskatchewan capability limit.

11 Unscheduled Flow Reduction and Reliability Standard IRO-006-WECC-AB-1, *Qualified Transfer Path Unscheduled Flow Relief*

This section provides additional information on reliability standard IRO-006-WECC-AB-1, *Qualified Transfer Path Unscheduled Flow Relief*, which details the AESO's standards for managing unscheduled flows across a transfer path, further describing the impact to pool participants of the AESO acting to reduce or prevent additional unscheduled flow across a transfer path.

When a reduction to an interchange transaction is required to reduce unscheduled flow on a constrained qualified path, the sink control area can reduce the contributing interchange transaction or any other interchange transaction, provided the reduction achieves the equivalent effect on reducing unscheduled flow on the affected transfer path.

The AESO denies new e-tags submitted after an unscheduled flow event is declared with a transfer distribution factor on the qualified path in the qualified direction of 5% or more.

The AESO denies adjustments or extensions to (non-expired) or replacements of (expired) e-tags submitted after an unscheduled flow event is at step 4 (first level curtailment) or higher, as set out in Appendix 1 of reliability standard IRO-006-WECC-AB-1, *Qualified Transfer Path Unscheduled Flow Relief*, and with a transfer distribution factor on the qualified path in the qualified direction of 5% or more.

Posting Date	Description of Changes
2011-10-01	Initial draft release
2013-03-14	Second draft release
2013-08-13	Initial release
2013-11-12	Administrative Updates
2014-01-30	Updated Table 1, Table 4, Table 9 and Table 10; administrative changes to improve consistency and alignment.
2014-02-27	Updated Table 4
2014-05-01	Updated Table 1 and Table 9
2014-11-01	Updated Tables 3, 8, 10 and 12
2014-12-11	Updated Tables 1(a), 9(a) and 10
2015-06-04	Updated Tables 1(a), 2, 9(a) and 11
2015-08-20	Updated Table 4

Revision History



2045 40 20	Updated Tables 1(b), 3, 9(b) and 12; revised definition of transmission reliability margin in section 5; updated section 5.1 to reflect the AESO's
	operating procedure in the event of a change to the operating limit within 15
2015-10-29	that the transmission reliability margin will be increased to reflect available
	load shed service for import volumes; administrative changes to improve
	consistency and alignment.