Information Document
Available Transfer Capability and Transfer Path Management
ID #2011-001R

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[1] in effect, the authoritative document governs.

1 Purpose

This information document relates to the following authoritative documents:

- Section 203.6 of the ISO rules, *Available Transfer Capability and Transfer Path Management* ("Section 203.6");
- Section 303.1 of the ISO rules, *Load Shed Service* ("Section 303.1"); and
- reliability standard IRO-006-WECC-AB-2, *Qualified Transfer Path Unscheduled Flow Relief* ("IRO-006-WECC-AB-2").

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

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.

3 AESO Determinations of Capability Limits

This section provides information on subsection 2 of Section 203.6. 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. Authoritative documents include: the ISO rules, the reliability standards, and the ISO tariff.

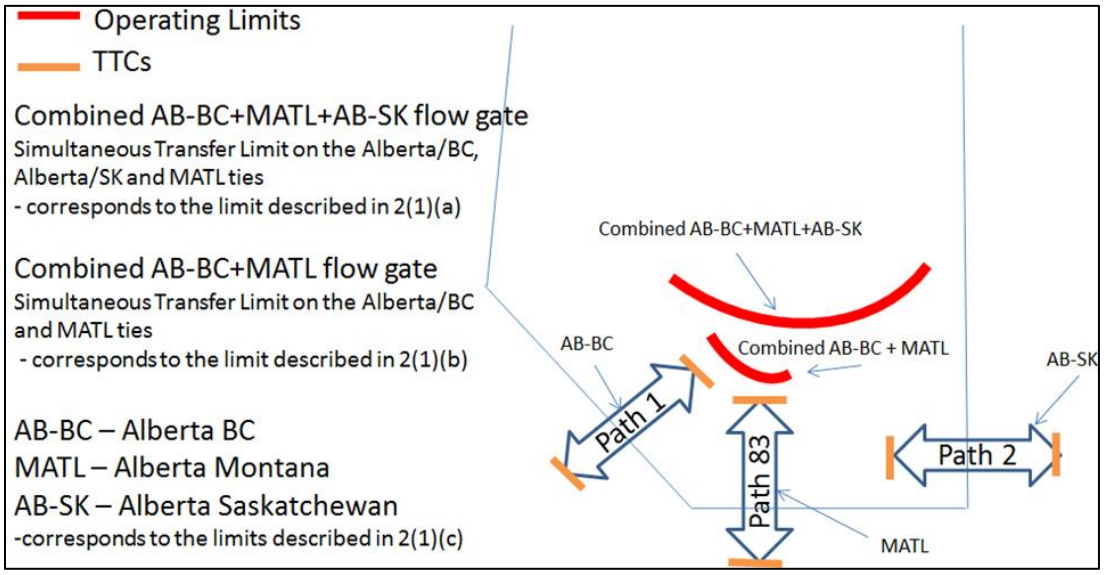

Figure 1: Alberta Capability Levels

Figure Note: References to 2(1)(a),(b), and (c) correspond to the subsection 2(1)(a), (b), and (c) in Section 203.6.

4 AESO Determinations of Total Transfer Capability

This section provides information on subsection 3 of Section 203.6.

The calculation of total transfer capability and available transmission capability in Section 203.6 is based upon requirements established in the 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 lines and generating units; and

c) other conditions, including any seasonal restrictions based on Alberta internal load.

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 (MW)
Summer Season (May 1 to October 31)

Alberta Internal Load	System Normal[1]		1201L[1] Out of Service	Path 1 Out of Service
Montana-Alberta Intertie Status	**In**	**Out**	**Out**	
All Alberta Internal Load	800	700	65	0

Table Notes:

1. When 1114L (102S Langdon-520S Bennet) or Bennett 520S 500 kV / 240 kV transformer is out of service, 1201L is also out of service.

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

Alberta Internal Load	System Normal		1201L[1] Out of Service	Path 1 Out of Service
Montana-Alberta Intertie Status	**In**	**Out**	**Out**	
All Alberta Internal Load	800	780	65	0

Table Note:

1. When 1114L (102S Langdon-520S Bennet) or Bennett 520S 500 kV / 240 kV transformer is out of service, 1201L is also out of service.

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(a) and Table 2(b) 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 AESO determines the maximum export total transfer capability limits 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 Montana-Alberta intertie is in service, or 65 MW if it is out of service.

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

Alberta Internal Load	System Normal		1201L[1] Out of Service	Path 1 Out of Service
Montana-Alberta Intertie Status	**In**	**Out**	**Out**	
All Alberta Internal Load	1000	1000	80	0

Table Note:

1. When 1114L (102S Langdon-520S Bennet) or Bennett 520S 500 kV / 240 kV transformer is out of service, 1201L is also out of service.

Table 2(b): Alberta to British Columbia Export Total Transfer Capability (MW)
Winter Season (November 1 to April 30)

Alberta Internal Load	System Normal		1201L[1] Out of Service	Path 1 Out of Service
Montana-Alberta Intertie Status	In	Out	Out	
All Alberta Internal Load	1000	1000	105	0

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 3(a) below sets out the total transfer capability under these various conditions.

Table 3(a): Montana to Alberta Import Total Transfer Capability[1] (MW)

Alberta Internal Load	System Normal	1201L out of service[2,3] or 1201L Direct Transfer Trip is out of service or Montana-Alberta intertie local remedial action scheme is out of service or interconnected electric system islanded from the Western Interconnection through BC Hydro[4]
All Alberta Internal Load	310	0

Table Notes:

1. The interconnected electric system is also referred to as the AIES.
2. If the high speed communication equipment used for orderly shutdown and line protection schemes is out of service, Path 83 (Montana-Alberta intertie 240/230 kV line) will be removed from service.
3. A 1201L outage in real time results in a direct transfer trip to the Montana Alberta intertie, also referred to as MATL. For a planned outage to 1201L, the AESO takes Path 83 (Montana-Alberta intertie 240/230 kV line) out of service prior to removing 1201L.
4. When 1114L (102S Langdon-520S Bennet) or Bennett 520S 500 kV / 240 kV transformer is out of service, 1201L is also out of service.
5. The AESO takes Path 83 (Montana-Alberta intertie 240/230 kV line) out of service for any outage in British Columbia that causes the interconnected electric system to be islanded from the WECC.

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 as specified in Table 3(b) below.

Table 3(b): Alberta to Montana Export Total Transfer Capability[1] (MW)

Alberta Internal Load	System Normal	1201L out of service[2,3] or 1201L Direct Tranfer Trip is out of service or Montana-Alberta intertie local remedial action scheme is out of service or interconnected electric system islanded from the Western Interconnection through BC Hydro[4]
All Alberta Internal Load	315	0

Table 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 the Montana-Alberta intertie, also referred to as MATL. For a planned outage to 1201L, the AESO takes Path 83 (Montana-Alberta intertie 240/230 kV line) out of service prior to removing 1201L.
3. When 1114L (102S Langdon-520S Bennet) or Bennett 520S 500 kV / 240 kV transformer is out of service, 1201L is also out of service.
4. The AESO takes Path 83 (Montana-Alberta intertie 240/230 kV line) out of service for any outage in British Columbia that causes the interconnected electric system to be islanded from the WECC.

4.5 Alberta-Saskatchewan Transfer Path Import Total Transfer Capability

Table 4(a): Saskatchewan to Alberta Import Total Transfer Capability (MW)

Alberta Internal Load	Import Total Transfer Capability	
	Winter	Summer
All Alberta Internal Load	153	153

4.6 Alberta-Saskatchewan Transfer Path Export Total Transfer Capability

Table 4(b): Alberta to Saskatchewan Export Total Transfer Capability (MW)

Alberta Internal Load	Export Total Transfer Capability		
	System Normal	One McNeill capacitor unavailable	Two McNeill capacitors unavailable
All Alberta Internal Load	153	130	90

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

This section provides information on subsection 4 of Section 203.6.

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 the system transmission reliability margin (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)

Refer to section 5.3 of this information document for further information regarding the determination of system transmission reliability margin and section 5.4 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 5.4 below.

Within 15 minutes prior to the start of the settlement interval, if the operating limit on any given path 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. As soon as practicable, the AESO will update the *Real-time ATC Allocation Report* for the next settlement interval, due to any one or more of system operating limit, total transfer capability, and 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 any one or more of total transfer capability,system operating limits, and 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.

Table 5(a): Import Transmission Reliability Margin for the Alberta-British Columbia and Alberta-Montana transfer paths under various system conditions (MW)

System Conditions	Import Transmission Reliability Margin				
	British Columbia		Montana	British Columbia /Montana	System
	Montana-Alberta Intertie in service	Montana-Alberta Intertie out of service	Montana-Alberta Intertie in service	Connected to WECC	British Columbia/Montana/ Saskatchewan
System Normal (N-0)	50	65	15	65	65
1201L Out of Service[1]	n/a	65	n/a		
1201L in service with insufficient contingency reserves and/or Fast Frequency Response product	50	65	15	Higher value of 65 **or** TRM = TTC – ATC[2]	

System Conditions		Import Transmission Reliability Margin				
		British Columbia		Montana	British Columbia /Montana	System
		Montana-Alberta Intertie in service	Montana-Alberta Intertie out of service	Montana-Alberta Intertie in service	Connected to WECC	British Columbia/Montana/ Saskatchewan
Path 1 Out of Service		0	0	0	0	0
1201L In Service; **and** any BC Hydro transmission outages result in BC Hydro area load being serviced by or potentially being served by Alberta.						
	2L113 outage	50; **plus** MW flow on 887L and 786L	65; **plus** MW flow on 887L and 786L	15	Higher value of 65 **or** TRM = TTC – ATC[2,3]	65
	5L92 outage	50	65	15	Higher value of 65 **or** TRM = TTC – ATC[2,4]	65
	2L294 outage	50	65	15	Higher value of 65 **or** TRM = TTC – ATC[2,,5]	65
	1L274/L274 Any section between Natal and Fording Coal Britt Creek	50; **plus** MW flow on 887L	65; **plus** MW flow on 887L	15	Higher value of 65 **or** TRM =TTC – ATC[2,6]	65

Table Notes:

1. When 1114L (102S Langdon-520S Bennet) or Bennett 520S 500 kV / 240 kV transformer is out of service, 1201L is also out of service.
2. The calculated available transfer capability is determined by the Fast Frequency Response available, Contingency Reserves, and Alberta Internal Load.
3. Calculation for British Columbia/Montana import available transfer capability equals the calculated available transfer capability minus the flow on 887L and 786L into British Columbia.
4. Calculation for British Columbia/Montana import available transfer capability equals the calculated available transfer capability minus Alberta internal MSSC.
5. Calculation for British Columbia/Montana import available transfer capability equals the calculated available transfer capability minus British Columbia island load.
6. Calculation for British Columbia/Montana import available transfer capability equals the calculated available transfer capability minus the flow on 887L into British Columbia.

Table 5(b): Export Transmission Reliability Margin for the Alberta-British Columbia and Alberta-Montana transfer paths under various system conditions (MW)

System Conditions	Export Transmission Reliability Margin				
	British Columbia		Montana	British Columbia/ Montana	System[1]
	Montana-Alberta Intertie in service	Montana-Alberta Intertie out of service		Connected to WECC	British Columbia/Montana/Saskatchewan
System Normal (N-0)	50	65	15	65	65
1201L Out of Service[1]	N/A	65	N/A		
Path 1 Out of Service	0	0	0	0	0

Table Note:

1. When 1114L (102S Langdon-520S Bennet) or Bennett 520S 500 kV / 240 kV transformer is out of service, 1201L is also out of service.

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 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 0) in either direction.

If the minimum flow limit is not met, the AESO curtails the net interchange schedule to plus 15 MW, 0 MW, or minus 15 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 interconnected electric system which may apply to combinations of transfer paths to ensure that the interconnected electric system is operated in a reliable state. If the operating limits described in this subsection 5.4 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. This is done 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

(b) 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 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;

(b) Alberta to combined British Columbia/Montana as per subsection 2(1)(b) of Section 203.6;

(c) combined British Columbia/Montana and Saskatchewan to Alberta as per subsection 2(1)(c) of Section 203.6; and

(d) Alberta to Combined British Columbia, Montana and Saskatchewan as per subsection 2(1)(c) of Section 203.6.

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 6(a) and 6(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 operating conditions if the available load under load shed service for import is insufficient, as shown in Table 7 below. Further details on load shed service for import can be found in Section 303.1.

Table 6(a): Combined British Columbia and Montana to Alberta Operating Limit for Import (MW)
Summer Season (May 1 to October 31)

Alberta Internal Load	System Normal Import Limit	1201L[1] Out of Service	Path 1 Out of Service
All Alberta Internal Load	1110	65	0

Table Notes:

1. When 1114L (102S Langdon-520S Bennet) or Bennett 520S 500 kV / 240 kV transformer is out of service, 1201L is also out of service.

Table 6(b): Combined British Columbia and Montana to Alberta Operating Limit for Import (MW)
Winter Season (November 1 to April 30)

Alberta Internal Load	System Normal Import Limit	1201L[1] Out of Service	Path 1 Out of Service
All Alberta Internal Load	1110	65	0

Table Notes:

1. When 1114L (102S Langdon-520S Bennet) or Bennett 520S 500 kV / 240 kV transformer is out of service, 1201L is also out of service.

Table 7a: Minimum Amount of Load Shed Service for Import Load Requirement (MW)

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

BC / MT Import ATC (MW) [2,3]	AIL (MW)[1]											
	7000 to 7499	7500 to 7999	8000 to 8499	8500 to 8999	9000 to 9499	9500 to 9999	10000 to 10499	10500 to 10999	11000 to 11499	11500 to 11999	12000 to 12499	12500 and above
Below 299	0	0	0	0	0	0	0	0	0	0	0	0
300 to 303	4	0	0	0	0	0	0	0	0	0	0	0
304 to 307	8	4	0	0	0	0	0	0	0	0	0	0
308 to 311	12	8	4	0	0	0	0	0	0	0	0	0
312 to 315	16	12	8	4	0	0	0	0	0	0	0	0
316 to 319	20	16	12	8	4	0	0	0	0	0	0	0
320 to 323	24	20	16	12	8	4	0	0	0	0	0	0
324 to 327	28	24	20	16	12	8	4	0	0	0	0	0
328 to 331	32	28	24	20	16	12	8	4	0	0	0	0
332 to 335	36	32	28	24	20	16	12	8	4	0	0	0
336 to 339	40	36	32	28	24	20	16	12	8	4	0	0
340 to 343	44	40	36	32	28	24	20	16	12	8	4	0
344 to 350	51	47	43	39	35	31	27	23	19	15	11	7
351 to 400	101	97	93	89	85	81	77	73	69	65	61	57
401 to 450	151	147	143	139	135	131	127	123	119	115	111	107
451 to 500	201	197	193	189	185	181	177	173	169	165	161	157
501 to 550	251	247	243	239	235	231	227	223	219	215	211	207
551 to 600	301	297	293	289	285	281	277	273	269	265	261	257
601 to 650	351	347	343	339	335	331	327	323	319	315	311	307
651 to 700	401	397	393	389	385	381	377	373	369	365	361	357
701 to 750	451	447	443	439	435	431	427	423	419	415	411	407
751 to 800	501	497	493	489	485	481	477	473	469	465	461	457
801 to 850	551	547	543	539	535	531	527	523	519	515	511	507
851 to 900	601	597	593	589	585	581	577	573	569	565	561	557
901 to 950	651	647	643	639	635	631	627	623	619	615	611	607
951 to 1000	701	697	693	689	685	681	677	673	669	665	661	657
1001 to 1050	751	747	743	739	735	731	727	723	719	715	711	707

BC / MT Import ATC (MW) [2,3]	AIL (MW)[1]											
	7000 to 7499	7500 to 7999	8000 to 8499	8500 to 8999	9000 to 9499	9500 to 9999	10000 to 10499	10500 to 10999	11000 to 11499	11500 to 11999	12000 to 12499	12500 and above
1050 to 1100	801	797	793	789	785	781	777	773	769	765	761	757
1101 to 1150	851	847	843	839	835	831	827	823	819	815	811	807
1151 to 1200	901	897	893	889	885	881	877	873	869	865	861	857
1201 to 1250	951	947	943	939	935	931	927	923	919	915	911	907

Table 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 2L294, 2L113, 1L274/L274 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 138 kV system to determine the LSSi required level.

Table 7 (b): Minimum Amount of Load Shed Service for Import Load Requirement for Severe Weather Conditions along the Alberta-British Columbia intertie transmission corridor (MW)

Minimum amount of load shed service for import load requirement when severe weather conditions, such as lightning activity occur along the Alberta-British Columbia intertie transmission corridor.

BC / MT Import ATC (MW) [2,3]	AIL (MW)[1]											
	7000 to 7499	7500 to 7999	8000 to 8499	8500 to 8999	9000 to 9499	9500 to 9999	10000 to 10499	10500 to 10999	11000 to 11499	11500 to 11999	12000 to 12499	12500 and above
Below 279	0	0	0	0	0	0	0	0	0	0	0	0
280 to 283	4	0	0	0	0	0	0	0	0	0	0	0
284 to 287	8	4	0	0	0	0	0	0	0	0	0	0
288 to 291	12	8	4	0	0	0	0	0	0	0	0	0
292 to 295	16	12	8	4	0	0	0	0	0	0	0	0
296 to 299	20	16	12	8	4	0	0	0	0	0	0	0
300 to 303	24	20	16	12	8	4	0	0	0	0	0	0
304 to 307	28	24	20	16	12	8	4	0	0	0	0	0
308 to 311	32	28	24	20	16	12	8	4	0	0	0	0
312 to 315	36	32	28	24	20	16	12	8	4	0	0	0
316 to 319	40	36	32	28	24	20	16	12	8	4	0	0
320 to 323	44	40	36	32	28	24	20	16	12	8	4	0
324 to 350	71	67	63	59	55	51	47	43	39	35	31	27
351 to 400	121	117	113	109	105	101	97	93	89	85	81	77
401 to 450	171	167	163	159	155	151	147	143	139	135	131	127
451 to 500	221	217	213	209	205	201	197	193	189	185	181	177
501 to 550	271	267	263	259	255	251	247	243	239	235	231	227
551 to 600	321	317	313	309	305	301	297	293	289	285	281	277
601 to 650	371	367	363	359	355	351	347	343	339	335	331	327
651 to 700	421	417	413	409	405	401	397	393	389	385	381	377
701 to 750	471	467	463	459	455	451	447	443	439	435	431	427
751 to 800	521	517	513	509	505	501	497	493	489	485	481	477
801 to 850	571	567	563	559	555	551	547	543	539	535	531	527
851 to 900	621	617	613	609	605	601	597	593	589	585	581	577
901 to 950	671	667	663	659	655	651	647	643	639	635	631	627
951 to 1000	721	717	713	709	705	701	697	693	689	685	681	677
1001 to 1050	771	767	763	759	755	751	747	743	739	735	731	727
1050 to 1100	821	817	813	809	805	801	797	793	789	785	781	777
1101 to 1150	871	867	863	859	855	851	847	843	839	835	831	827

BC / MT Import ATC (MW) [2,3]	AIL (MW)[1]											
	7000 to 7499	7500 to 7999	8000 to 8499	8500 to 8999	9000 to 9499	9500 to 9999	10000 to 10499	10500 to 10999	11000 to 11499	11500 to 11999	12000 to 12499	12500 and above
1151 to 1200	921	917	913	909	905	901	897	893	889	885	881	877
1201 to 1250	971	967	963	959	955	951	947	943	939	935	931	927

Table 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 2L294, 2L113, 1L274/L274 or the Natal transformers are out of service, the AESO uses the total net combined British Columbia/Montana import and the Alberta interconnected electric system load plus the British Columbia load served from Alberta via the 138 kV system to determine the LSSi required level.

Table 7c: Minimum Amount of Fast Frequency Response and Load Shed Service for MSSC with 1201L Out of Service (MW)

Table 7c is used to determine the required volume of fast frequency response service to be armed in order to increase the MSSC above 425MW when 1201L is out of service.

1201L out of service MSSC	AIL (MW)											
	7000 to 7499	7500 to 7999	8000 to 8499	8500 to 8999	9000 to 9499	9500 to 9999	10000 to 10499	10500 to 10999	11000 to 11499	11500 to 11999	12000 to 12499	12500 and above
425	126	122	118	114	110	106	102	98	94	90	86	82
426 to 450	151	147	143	139	135	131	127	123	119	115	111	107
451 to 466	167	163	159	155	151	147	143	139	135	131	127	123

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 8(a) and Table 8(b) below.

Table 8(a): Alberta to Combined British Columbia and Montana Operating Limit for Export Summer Season (May 1– October 31) (MW)

Alberta Internal Load	System Normal Export Limit	1201L[1] Out of Service	Path 1 Out of Service
All Alberta Internal Load	1000	80	0

Table Note:

1. When 1114L (102S Langdon-520S Bennet) or Bennett 520S 500 kV / 240 kV transformer is out of service, 1201L is also out of service.

Table 8(b): Alberta to Combined British Columbia and Montana Operating Limit for Export Winter Season (November 1 – April 30) (MW)

Alberta Internal Load	System Normal Export Limit	1201L[1] Out of Service	Path 1 Out of Service
All Alberta Internal Load	1000	80	0

Table Note:

1. When 1114L (102S Langdon-520S Bennet) or Bennett 520S 500 kV / 240 kV transformer is out of service, 1201L is also out of service.

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 4(b), which describes the Alberta to Saskatchewan total transfer capability for export, to the results of Table 8(a), 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 4(b), which describes the Alberta to Saskatchewan total transfer capability for export, to the results of Table 8(b), 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 4(a), which describes the Alberta to Saskatchewan total transfer capability for import, to the results of Tables 6(a) and 6(b), 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.

Subsection 5 of Section 203.6 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 and that an importing pool participant must continue to submit offers for their available capability, in accordance with Section 203.3.

7 Validation of E-tags by the AESO

This section provides information on subsection 7 of Section 203.6.

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.

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:

(a) the Alberta-Saskatchewan interchange ramping duration is 10 minutes and ramping starts 5 minutes before the interchange schedule start time and end time;

(b) 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

(c) 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.

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. 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.

Import capability limits and export capability limits in Table 9 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.

Table 9: Capability Limits Illustration (MW)

Transfer Path	**Import Available Transfer Capability (TTC – TRM_s)**	**Export Available Transfer Capability (TTC – TRM_s)**
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

Example 1 – All Limits Exceeded on Import

Assume the following energy offers are received 2 hours prior to the settlement interval ("T-2") as referenced in subsection 5(1) of Section 203.6. Assume also that all import offers are priced at $0/MWh and all exports at $999.99/MWh:

British Columbia Intertie			**Montana Intertie**			**Saskatchewan Intertie**		
Import	Export	Net	Import	Export	Net	Import	Export	Net
1,000	200	800 (Import)	450	0	450 (Import)	200	0	200 (Import)

Combined British Columbia/Montana Interties			**Combined British Columbia/Montana/Saskatchewan Interties**		
Import	Export	Net	Import	Export	Net
1,450	200	1,250 (Import)	1,650	200	1,450 (Import)

In accordance with subsection 10(1) of Section 203.6, the assessment of this example is as follows:

Based on energy offers received at T-2, 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 5 of this information document.

The AESO must make available transfer capability allocation calculations in accordance with subsection 10(2)(a) of Section 203.6, 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 provided in the table below:

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

> the allocation resulting from subsection 10(2)(a) of Section 203.6;
>
> *divided*
>
> by the sum from subsection 10(2)(b) of Section 203.6;
>
> *multiplied*
>
> by the amount by which the combined British Columbia/Montana import capability limit is exceeded.

In this example, the reduction for the British Columbia intertie is:

600 / 900 x 300 = 200 MW

In this example, the reduction for the Montana Alberta intertie is:

300 / 900 x 300 = 100 MW

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

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

In accordance with subsection 10(2)(d) and (e) of Section 203.6, the combined allocations for the British Columbia, Montana Alberta 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 does not result in any change to the allocations calculated under subsections 10(2)(a) or 10(2)(c) of Section 203.6. As there are equally priced transactions, allocations are reduced on a pro rata basis in accordance with subsection 10(2)(e)(ii) which proceeds as follows:

the allocation resulting from subsections 10(2)(a) or 10(2)(c) of Section 203.6;

divided

by the sum from subsection 10(2)(d) of Section 203.;

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 Montana Alberta 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 are as follows:

British Columbia intertie	387 MW (Import)
Montana Alberta 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 5.4 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.

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. 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			**Montana Alberta Intertie**			**Saskatchewan Intertie**		
Import	Export	Net	Import	Export	Net	Import	Export	Net
800	200	600 (Import)	200	0	200 (Import)	0	0	0

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

In accordance with subsection 10(1) of Section 203.6 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 Alberta to British Columbia and it does not result in the violation of the capability limits on either the Montana Alberta or British Columbia interties, the AESO excludes this transaction from the allocation calculation in accordance with subsection 10(1)(b) of Section 203.6.

The AESO makes available transfer capability allocation calculations in accordance with subsection 10(2)(a) of Section 203.6, 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 intertie	600 MW (Import)
Montana Alberta intertie	200 MW (Import)
Saskatchewan intertie	0 MW

In accordance with subsections 10(2)(b) and (c) of Section 203., the combined allocations for the British Columbia and Montana Alberta 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 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 Alberta, these volumes are excluded from the allocation calculations. After adjusting for the wheel through transaction, the allocation in accordance with subsection 10(2)(c)(ii) of Section 203.6 proceeds as follows:

the allocation resulting from subsection 10(2)(a) of Section 203.6;

divided

by the sum from subsection 10(2)(b) of Section 203.6;

multiplied

by the amount by which the combined British Columbia/Montana Alberta 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 Montana Alberta 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 are as follows:

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

In accordance with the provisions of subsection 10(2)(d) and (e) of Section 203.6, the combined allocations for the British Columbia, Montana Alberta 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 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.

10 Transfer Path Constraint Management

This section provides information on subsection 11 of Section 203.6.

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 IRO-006-WECC-AB-2

This section provides additional information on IRO-006-WECC-AB-2 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 and with a transfer distribution factor on the qualified path in the qualified direction of 5% or more.

12 Intertie Restatements

The AESO recognizes that interchange transactions may be impacted by scheduling practices of different jurisdictions, and notes the following course of action to pool participants. For one or more curtailments to approved e-tags that take effect inside T-2, energy restatements are not required as the e-tag serves as the final schedule. If the transmission constraint is resolved inside T-2, the e-tag may be re-loaded to the original MW level before the end of the settlement interval.

13 Internal Most Severe Single Contingency reduction during a 1201L outage

When 1201L is out of service, and to reduce the risk of underfrequency load shed, the most severe single contingency for generators and transmission elements within the interconnected electric system is reduced to 425 MW. MSSC may be increased up to 466 MW while 1201L is out of service if the volume of Load Shed Service and Fast Frequency Response products required are available to arm. Refer to Table 7c: Minimum Amount of Fast Frequency Response and Load Shed Service for MSSC with 1201L Out of Service (MW) for arming volume requirements at 425MW and above. For islanded operation, the AESO has contracted FFR services from battery storage facilities and amended the LSSi agreements to allow for LSSi providers to provide load shed services during islanded conditions.

The AESO may reduce the most severe single contingency:

(a) Immediately after an unplanned 1201L outage; or

(b) At the beginning of a planned 1201L outage in accordance with the *Alberta Electric System Operator System Co-ordination Plan Approved Outages* list.

Revision History

Posting Date	Description of Changes
2024-09-17	Updated Table 5(a). Updated Section 12.
2023-08-22	Updated Table 5(a): Import Transmission Reliability Margin for the Alberta-British Columbia and Alberta-Montana transfer paths under various system conditions (MW). Added Table 7c: Minimum Amount of Fast Frequency Response and Load Shed Service for MSSC with 1201L Out of Service (MW). Updated Section 13 reference.
2023-03-31	Removed references to Section 203.4 in Section 12 to align with the administrative amendment filing.
2023-03-10	Updated Table 7a and 7b with newly implemented LSSi values based on Ops Planning study results. (New table 7a and 7b are effective as of 1:00 pm March 15, 2023) Removed Section 5.1.1 Inertia
2021-08-06	Added Section 13 for internal most severe single contingency reduction during a 1201L outage. Updated throughout to align document to current AESO drafting principles.
2021-03-04	Limit change to Table 7a: Minimum Amount of Load Shed Service for Import Load Requirement based on Ops Engineering study results.
2020-11-09	Limit change to Table 1b from 700-780MW based on Ops Engineering study results
2020-08-12	Updated to reflect changes to import ATC due to inclement

Posting Date	Description of Changes
	weather and real-time system inertia.
2020-06-23	Updated Table 7 with newly implemented LSSi values Added various table note(s) pertaining to 1201L outage Administrative amendments
2018-07-20	Updated Table 7 with newly implemented LSSi values Updated Table 5(a) and the associated “Notes” section
2018-06-01	Addition of Table 7b which included the new LSSi values as of 10:00 am July 3, 2018
2017-06-15	Updated section 12
2017-06-01	Updated Tables 1(a), 1(b), 2(a), 2b, 5(a), 5(b), 6(a), 6(b), 8(a), 8(b) for Path 1 out-of-service TTC; Updated section 2 and section 12; and Administrative amendments.
2017-02-28	Updated section 12; and Administrative revisions.
2016-11-30	Updated Tables 1(a), 1(b), 2(a), 2b; Addition of Table 5(a); Table renumbering; and Administrative revisions.
2016-08-23	Addition of section 12, Intertie Restatements.
2015-10-29	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 minutes prior to the start of a settlement interval; revised section 5.3 to reflect that the transmission reliability margin will be increased to reflect available load shed service for import volumes; administrative changes to improve consistency and alignment.
2015-08-20	Updated Table 4.
2015-06-04	Updated Tables 1(a), 2, 9(a) and 11.
2014-12-11	Updated Tables 1(a), 9(a) and 10.
2014-11-01	Updated Tables 3, 8, 10 and 12.

Posting Date	Description of Changes
2014-05-01	Updated Table 1 and Table 9.
2014-02-27	Updated Table 4.
2014-01-30	Updated Table 1, Table 4, Table 9 and Table 10; administrative changes to improve consistency and alignment.
2013-11-12	Administrative Updates.
2013-08-13	Initial release.
2013-03-14	Second draft release.
2011-10-01	Initial draft release.