November 1, 2006

To: Loss Factor Stakeholder Team

Re: Final Loss Factors for 2007

The AESO has completed the final calculation and analysis of 2007 loss factors and the results are attached. The analysis includes the application of the 2007 Generic Stacking Order (GSO) results published earlier this summer to the 2007 Base Cases published in early October on the AESO web site. The results have been posted on the AESO web site. The following items are examples meant to illustrate the difference between the 2006 and 2007 loss factors.

1. *Load Treatment in the Loss Factor Software*. In the development of the 2007 loss factor base cases, a small adjustment in the software employing the methodology was necessary to account for transmission and behind the fence loads. In the 2006 loss factor determination, all loads (transmission and behind the fence) were unassigned in the loss factor calculation process. Loss Factors were calculated based on Generation Levels at the Generation Bus. The base cases were correctly adjusted to maintain the Net-To-Grid (NTG) MW level at the measurement point (MPID) bus as indicated in the 2006 GSO. In the 2007 loss factor calculation, only transmission loads were unassigned and were not included in the calculation. This refinement represents a more appropriate load assignment process. Therefore the loss factors are based on generation less the behind the fence load levels at all relevant Generation Buses while maintaining the appropriate GSO level at the MPID bus.
2. *Generation & Load Levels*. The 2006 Generic Stacking Order was used to populate the base cases for the 2006 loss factor calculation. The 2007 GSO has been utilized in the same way for the 2007 Cases. The 2006 and 2007 loss factors use average actual generation levels to determine loss factors based on the AESO Rule. Please refer to Appendix #1 for a sample comparison. In general, the total gross generation level is lower in the 2007 cases (8 out of 12 cases). The load scaling used in the 2007 cases to meet the total GSO capacity is mainly responsible for the lower 2007 gross generations. In the 2006 cases historical loads (June 01, 2004 – May 31, 2005) were used where as the latest AESO load forecast for 2007 is used in the 2007 cases.
3. *Additions and Decommissioning of Generation.* There are no large changes in the existing generators' NTG output except for few generators where scheduled outages forced the NTG to a lower value such as SD4 in summer scenarios. In the 2006 GSO, the Genesee 3 unit was included as a new generator and an ICBF factor taken from the CEA report for the calculation of NTG amount. The ICBF factor of the Genesee 2 unit was used which was quite low and resulted in high NTG amount. The Genesee 3 unit has historical data available now for the use of 2007 GSO and subsequently loss factor calculation. The 2007 Genesee 3 NTG amount is considerably lower than the 2006 Genesee 3 NTG amount. There are large changes in the status of the 2006 preliminary generators – the 2006 GSO and the cases contain many preliminary generators, primarily wind generators. In the 2007 GSO and cases most of these preliminary

generators are not included because of the changed In Service Date and/or 900 MW wind threshold limit. In the 2007 GSO and cases only one preliminary generator (SD4 extension) is added in the Fall scenarios.

4. *ISD Equivalents*. The Industrial System Designations (ISDs) are modeled in the same way as they were modeled in the 2006 cases. The total ISD load and generations are modeled at the ISD interface bus with the rest of the AIES.
5. *Topology*. In the 2006 cases, information up to late 2005 was used in the determination of loss factors. In the 2007 cases, additions during 2006 and expected additions in 2007 have been added. Major components include:
    - Cordel to Metiskow transmission line
    - Michichi Creek to Three Hills transmission line
    - Cordel to Hansman Lake transmission line
    - High voltage capacitor additions in the Calgary area (Sarcee, Janet, and East Calgary stations)

    Southwest 240 kV upgrade project (Project 416) is not included in the 2007 cases although part of it was included in the 2006 cases. Current information indicates the approved Northwest transmission development is underway, with the in-service dates of the first components late in 2007. As such, the Northwest development is not included in the 2007 cases.

6. *Average System Losses and Shift Factor*. Average system losses are 5.41% for 2006. The higher average losses are a result of AESO's 2006 GTA forecasted submission of 3.18 TWHs of losses. In the 2007 GTA, the annual loss forecast is 2.897 TWH or 5.20%. The AESO expects the 2.897 TWH is more in line with the actual losses. The change in the load treatment and the lower annual loss forecast result in a lower shift factor. Please refer to Table 1 to see the effects of the change in average losses and load treatment.

Table 1 – 2006 vs. 2007 Final Loss Factors

	2006	2007
System average loss	5.41%	5.20%
Shift Factor	1.93%	1.34%
Loss recovered by RLF	3.48%	3.86%

7. *Weighting Factor*. In a continuing effort to enhance accuracy, the AESO is applying unequal weighting factor to the raw loss factors based on historical load levels. In 2006, the AESO applied equal weighting for all 12 scenarios. Please see Table 2 for the 2007 weighting factors used in the loss factor calculation.

Table 2 – 2007 Weighting Factors

	Winter		Spring		Summer		Fall	
	Duraion (Hr)	Weight	Duraion (Hr)	Weight	Duraion (Hr)	Weight	Duraion (Hr)	Weight
High	125	5.8%	50	2.3%	25	1.1%	75	3.4%
Medium	1150	53.2%	1150	52.1%	2075	94.0%	1075	49.2%
Low	885	41.0%	1007	45.6%	108	4.9%	1035	47.4%

8. *Overall Results*. The 2007 loss factors are similar to the 2006 loss factors with some minor changes reflecting the results of changed load treatment, load scaling, dispatched generation and transmission projects. The high level results are summarized below:
    - The Northwest area has less credit than in the 2006 posted Loss Factors. The Rainbow area generation dispatched in the 2007 cases is higher than what was dispatched in the 2006 cases, even though the 2006 GSO values are numerically higher.
    - The South West area (including the majority of existing and proposed wind generation) receives less credits/more charges due to the delays in the SW transmission development project. The project is not included in the base cases in 2007 as the expected in-service-date has moved to 2008. For the 2006 loss factors, the SW development was included. Higher

generation is dispatched in most of the base cases in 2007 than was dispatched in the 2006 base cases.

- The Lake Wabamun area loss factors are lower than 2006 loss factors due to the historically lower generation in the area which reduces the flow in the backbone in most of the cases. Also, the Genesee 3 output is lower than the estimate made in 2006.
- Sheerness and Battle River generation are higher in most of the 2007 base cases than in the 2006 cases resulting in higher loss factors.
- The Fort McMurray area loss factors are lower in general except for Syncrude, in 2007 due to lower generation dispatches in the cases. The Syncrude dispatch is higher in 2007 cases in most of the scenario base cases.
- Import and export loss factors on both Alberta and Saskatchewan inter-ties is more favorable than listed in the 2006 posted loss factors with the exception of Import to Saskatchewan.

9. *Map*. The AESO has provided a loss factor map (Figure #1) showing the maximum and minimum loss factors in each area. The tie lines and DOS loss factors are also shown. Each facility with a loss factor is shown in the designated area.

Yours truly,

Original signed by

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cc:
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Attachments:

- Appendix #1
- AESO Loss Factor Map

Appendix #1

Winter Peak Case

	Generation (MW)	Load (MW)			Loss (MW)		Import (MW)	Export (MW)
		Static	Motor	Total	Shunt	Transmission		
2006	9153.4	8412.4	373.9	8786.3	20.0	347.2	-	0.1
2007	8662.4	7916.0	401.2	8317.2	19.1	326.1	-	0.2
2007 - 2006	**-491.0**	**-496.4**	**27.3**	**-469.1**	**-0.9**	**-21.1**		

Winter Medium Case

	Generation (MW)	Load (MW)			Loss (MW)		Import (MW)	Export (MW)
		Static	Motor	Total	Shunt	Transmission		
2006	8283.6	7564.6	384.7	7949.3	20.2	314.2	-	1
2007	8633.4	7881.3	408.2	8289.5	19.2	324.6	0.9	-
2007 - 2006	**349.7**	**316.8**	**23.5**	**340.3**	**-1.0**	**10.4**		

Winter Low Case

	Generation (MW)	Load (MW)			Loss (MW)		Import (MW)	Export (MW)
		Static	Motor	Total	Shunt	Transmission		
2006	7295.0	6657.7	373.9	7031.6	20.2	243.2	0.7	-
2007	7731.6	7004.8	422.0	7426.8	19.3	285.5	-	0.3
2007 - 2006	**436.5**	**347.1**	**48.1**	**395.2**	**-0.9**	**42.3**		

Spring Peak Case

	Generation (MW)	Load (MW)			Loss (MW)		Import (MW)	Export (MW)
		Static	Motor	Total	Shunt	Transmission		
2006	8480.9	7690.3	455.0	8145.3	20.1	315.4	-	0.9
2007	8538.0	7770.7	430.3	8201.0	19.2	317.8	0.5	-
2007 - 2006	**57.1**	**80.4**	**-24.7**	**55.7**	**-0.9**	**2.4**		

Spring Medium Case

	Generation (MW)	Load (MW)			Loss (MW)		Import (MW)	Export (MW)
		Static	Motor	Total	Shunt	Transmission		
2006	8219.4	7457.7	445.8	7903.5	20.2	295.7	-	1
2007	7991.8	7288.5	402.1	7690.6	19.1	282.1	-	0.2
2007 - 2006	**-227.6**	**-169.1**	**-43.7**	**-212.8**	**-1.1**	**-13.6**		

Spring Low Case

	Generation (MW)	Load (MW)			Loss (MW)		Import (MW)	Export (MW)
		Static	Motor	Total	Shunt	Transmission		
2006	7391.3	6664.3	454.9	7119.2	20.1	252.0	-	0.2
2007	7295.0	6613.6	415.5	7029.1	19.2	246.8	-	0.0
2007 - 2006	**-96.3**	**-50.7**	**-39.4**	**-90.1**	**-0.9**	**-5.2**		

Summer Peak Case

	Generation (MW)	Load (MW)			Loss (MW)		Import (MW)	Export (MW)
		Static	Motor	Total	Shunt	Transmission		
2006	8728.8	7956.2	475.6	8431.8	20.2	276.9	-	0.1
2007	8369.3	7646.9	420.2	8067.1	19.5	282.8	0.4	-
2007 - 2006	**-359.5**	**-309.3**	**-55.4**	**-364.7**	**-0.7**	**5.9**		

Summer Medium Case

	Generation (MW)	Load (MW)			Loss (MW)		Import (MW)	Export (MW)
		Static	Motor	Total	Shunt	Transmission		
2006	7796.3	7038.2	464.2	7502.4	20.1	273.8	-	0.4
2007	7686.1	6953.2	469.5	7422.7	19.2	244.1	1	-
2007 - 2006	**-110.2**	**-84.9**	**5.3**	**-79.6**	**-0.9**	**-29.7**		

Summer Low Case

	Generation (MW)	Load (MW)			Loss (MW)		Import (MW)	Export (MW)
		Static	Motor	Total	Shunt	Transmission		
2006	7096.0	6345.4	478.0	6823.4	20.1	252.5	-	1.4
2007	7095.0	6393.9	475.8	6869.7	19.4	205.8	-	0.7
2007 - 2006	**-1.0**	**48.5**	**-2.2**	**46.3**	**-0.7**	**-46.7**		

Fall Peak Case

	Generation (MW)	Load (MW)			Loss (MW)		Import (MW)	Export (MW)
		Static	Motor	Total	Shunt	Transmission		
2006	8818.6	7996.5	475.3	8471.8	20.3	326.5	-	1.9
2007	8330.2	7596.2	426.0	8022.2	19.3	288.7	-	0.2
2007 - 2006	**-488.5**	**-400.3**	**-49.3**	**-449.6**	**-1.0**	**-37.8**		

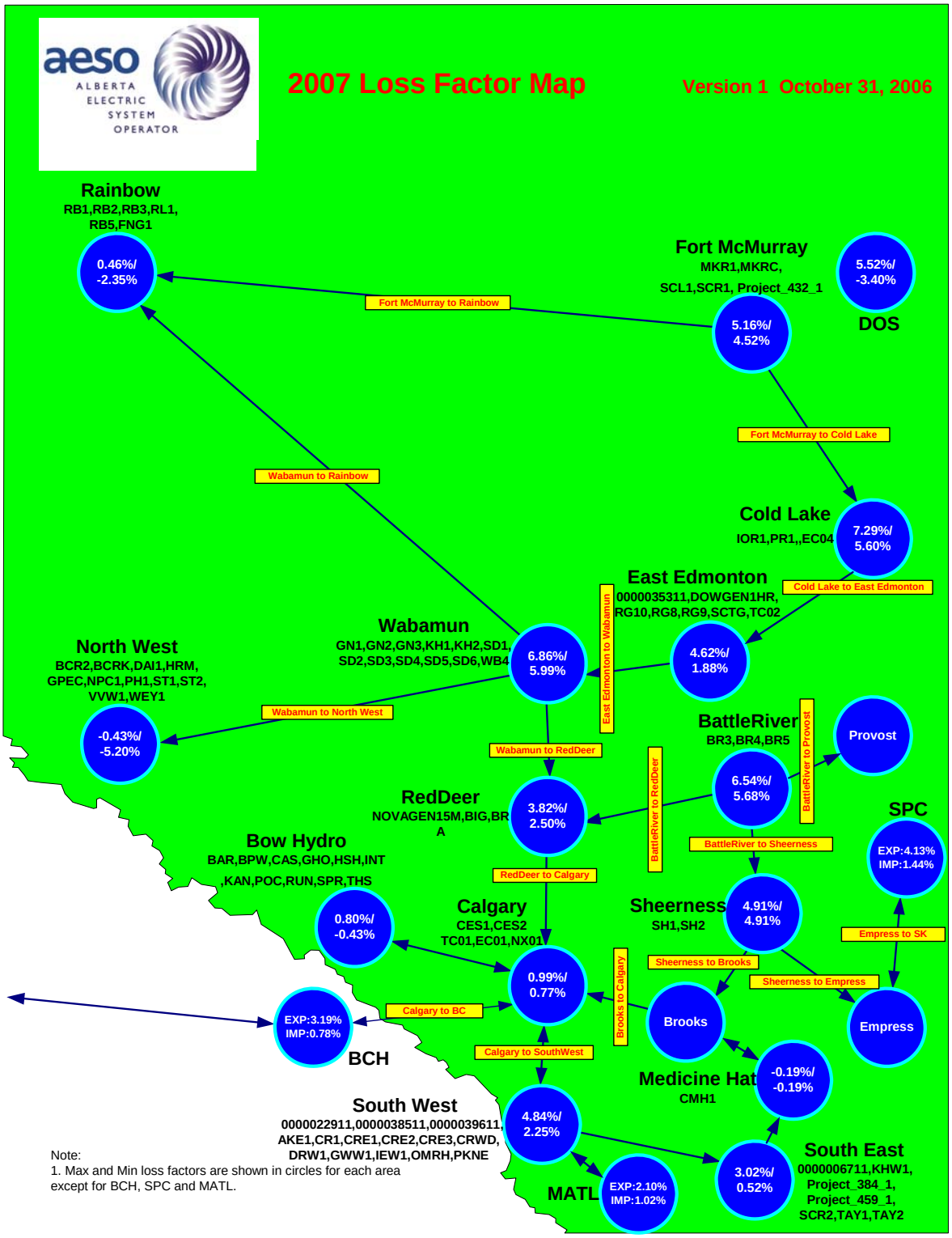
Fall Medium Case

	Generation (MW)	Load (MW)			Loss (MW)		Import (MW)	Export (MW)
		Static	Motor	Total	Shunt	Transmission		
2006	8182.6	7411.0	471.0	7882.0	20.1	280.5	0.3	-
2007	7930.8	7188.5	460.4	7648.9	19.4	262.5	0.9	-
2007 - 2006	**-251.8**	**-222.5**	**-10.6**	**-233.1**	**-0.7**	**-18.0**		

Fall Low Case

	Generation (MW)	Load (MW)			Loss (MW)		Import (MW)	Export (MW)
		Static	Motor	Total	Shunt	Transmission		
2006	7190.3	6468.0	472.7	6940.7	20.4	229.2	-	0.1
2007	7321.3	6616.6	443.1	7059.7	19.5	242.0	-	0.0
2007 - 2006	**131.0**	**148.6**	**-29.6**	**119.0**	**-0.9**	**12.8**		

Figure #1



Note:
1. Max and Min loss factors are shown in circles for each area except for BCH, SPC and MATL.