2008 Generic Stacking Order Loss Factors

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	Name	Signature	Date
Prepared by:	Ashikur Bhuiya, P.Eng.		Aug 28, 2007
Approved by:	Robert Baker, P.Eng.		20070828
Approved by:	Jerry Mossing, CET.		Aug 28/07

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TABLE OF CONTENTS

1.0 Purpose

The purpose of this document is to describe the 2008 Generic Stacking Order as the order applies to the loss factor calculation.

2.0 Introduction

The Generic Stacking Order (GSO) is a key component in the loss factor calculation, operational forecasts, planning studies, and General Tariff Application process. Generators are dispatched to meet system demand in the base cases according to the order and generation amount specified in the GSO.

The GSO contains two key pieces of information –

1. Generation supply levels on a net-to-grid basis (NTG) for 12 seasonal cases[1] (four seasons and three load levels as defined below) for all generators, and

Season	Timeframe	Scenario
Winter	December, 2007 – February, 2008	High
		Medium
		Low
Spring	March, 2008 – May, 2008	High
		Medium
		Low
Summer	June, 2008 – August, 2008	High
		Medium
		Low
Fall	September, 2008 – November, 2008	High
		Medium
		Low

2. Generation dispatch order.

Starting in 2006, the Rule governing the determination of the GSO generation supply levels can be located at **www.aeso.ca** > Rules & Procedures > ISO Rules > Current Rules. In summary, the generation supply levels are

[1] Loss Factor base cases are relevant to NTG amount whereas operations and planning security base cases use more detailed modeling of the system including the behind the fence elements.

determined using historical data for existing generators (in service for more than a year). For generators that have been in service for less than one year, the supply levels are estimated by the Incapability Factors. To determine dispatch order, a statistical analysis is used to determine a relationship between the generator output and the actual historical hourly pool price. The process is explained in 'Section 4.0. AESO will request annually from generation owners confirmation that the previous year's historical data is appropriate to use. Additional blocks are used where necessary to reflect generators' multiple bidding strategies.

The TMR requirement (please refer to www.aeso.ca > Rules and Procedures >Current Operating Policies and Procedures > ISO Operating Policies and Procedures for details) supersedes all other operational criteria and hence TMR generators are dispatched first on the list when required to fulfill the reliability criteria.

3.0 Background

In 2006, the AESO began utilizing a new methodology, 50% Area Load Corrected R-Matrix, for the determination of generator and opportunity service loss factors. The new methodology reflects the requirements of the Alberta Department of Energy (DOE) 2004 Transmission Regulation. The regulation indicates loss factors must be calculated from the average impact of generators on the Alberta Interconnected Electric System (AIES). The regulation directed the AESO to implement a new methodology to meet these requirements. The AESO has consulted with stakeholders in the development of the new loss factor methodology including the development of new rules for the preparation of the GSO.

Previous GSO's, up to 2005, used generators STS contract levels as capacity amounts. Moving to a one year historical generation basis as was done in 2006 has several advantages, including;

- Amounts of actual generator energy market dispatch representative for the previous year

- Addresses the issue of confidentiality of maintenance data by including actual maintenance and forced outages from the previous period
- Treats all facilities on the same basis
- Reduces necessity for the AESO to forecast generator / pool price relationships

4.0 2008 GSO Key Features

The highlights of the 2008 GSO preparation process are;

1. Average historical net-to-grid (NTG) output of a generator is considered for each of the twelve seasonal cases.
2. Generator owners are provided an opportunity to comment on and suggest revisions to the GSO capacities to correct calculation errors by the AESO on historical data or proposed operational characteristics on new generation
3. The numbers of hours (H values) used for averaging the historical generator output are taken from the AIES seasonal load duration curve analysis (Please see Appendix-A of AESO Loss Factor Rules).
4. No maintenance or outage data is used in the 2008 GSO as average historical net-to-grid output of a generator inherently contains this information.
5. 12 seasonal net-to-grid generations are assigned to each individual generator at the point of supply (POS).
6. The order except for units such as wind and hydro generation is determined by the actual price responses of the generators in each group.
7. New generators that are expected to be connected in the forecast year will be included in the GSO. These are generators with signed contracts to

connect or who have made significant financial commitments to connect. Generators who have filed decommissioning plans with the AESO will be removed accordingly.

AESO relies on the Canadian Electricity Association (CEA) information in the event of new generators or in the case of a lack of updated information from the generators on their availability. The incapability Factors (ICBF) is used to calculate the power available to the AIES. (1- ICBF) has been considered as equivalent to Available Capacity Factors (ACF). The ICBFs are obtained from CEA's latest annual report on Generation Equipment Status.

8. The 2008 GSO considers the NTG amount at the point of supply (POS). Since any given loss factor is primarily the function of net to grid amount of generation, the 2008 GSO represents an aggregate of generation at the point of supply. An equivalent generator is considered at the bus from which the NTG amount related to the Measurement Point Identification (MPID) is obtained. For example, Horseshoe has 4 generators with a single MPID which is HSH. The 4 generators are connected to Bus 172 (12 kV). They are represented as a single unit at Bus 171 (138 kV) because the AESO billing database contains NTG data for all of these four units (related to MPID HSH) at Bus 171. The same approach is applied to the Industrial System Designations (ISD). All ISDs are represented by a single equivalent generator and load. The GSO contains a column with bus numbers for corresponding MPIDs.

9. An energy stacking order is created for all generation units based on 12 months of historical data. The generation energy market behavior analysis is updated with the latest historical data from the period June 1 2006 to May 31 2007. Each generator's hourly bidding prices and associated generation MW changes are combined and sorted as a multi-block stacking order for that generation unit for the 12 months period. The generation unit is then divided into two blocks. Two blocks are chosen to

avoid additional complexity for limited modeling improvement. A statistical analysis is applied to define the first and second blocks from its multi-block stacking order. A low end price with the highest occurring percentage in the 12 months period is selected as the first block. Its block size is defined as the average size based on occurrence. Generation volumes above the first bock size belong to the second block. This block price is defined by using weighted average of all the prices above the first block. The weighted factor is generation MW changes at each price and its percentage in history. The second block size is calculated by averaging of all blocks above the first block. However, not all generators have a 2nd block. The statistical analysis shows that some generators have an insignificant amount of generation in the 2nd block which indicates their price insensitivity. A weighted average of generator output of 12 seasonal outputs is calculated based on the H values or duration of the scenarios. A second block for a generator is considered, in general, if the weighted average is equal to or more than 5 MW. In some cases the second block is not assigned to a generator even though the weighted average is more than 5 MW such as for SPR&D or Wind generators.

The price response analysis used to construct the GSO is consistent with the losses forecast as filed with the AESO's General Tariff Application.

The 2008 GSO is similar to its predecessors in the following aspects:

1. The wind and hydro units are ranked according to their relative loss factors.
2. No bid price, specific TMR, maintenance schedules, or heat rate information is revealed.
3. Multiple blocks (two blocks) are used to represent the historical response of the generators to pool price.
4. STS contract and incapability factors (ICBF) is used to determine the amount of predicted generation level for new generators.

5. The GSO is separated into two blocks (where necessary) and into similar generation technologies (i.e. wind, co-gen, coal, etc)

5.0 2008 Generic Stacking Order

The following describes the application of the GSO to the loss factor base cases:

1) Transmission Must Run (TMR) generators – the generators represent the expected TMR dispatch (of gas, combined cycle, or other units) beyond area generation energy market participation. The TMR units are listed in the AESO OPPs 501, 510 and 521. TMR is required in specific areas of the AIES to meet reliability criteria The total net-to-grid (NTG) amount assigned to the TMR generators in the 2008 GSO is obtained from the following two sources:

   a) The average historical net-to-grid (NTG) is calculated for 12 seasonal cases in the past twelve months (June 1 2006 to May 31 2007). The AIES seasonal load duration curve analysis is used to obtain the NTG amount of each generator.

   b) The minimum TMR requirement is obtained using OPPs 501, 510 and 521.

      According to the OPPs when the area criteria requirement is not met by the generation from local generators through energy market dispatches, TMR dispatches will be issued to TMR-contracted generators to make up the shortfall. TMR-contracted generators will be dispatched according to the TMR dispatch orders. The actual TMR dispatch order is confidential to the AESO.

      Area load is required to determine the minimum TMR requirement for any TMR area such as North-West area. The minimum TMR requirement is function of local area load. The area load forecast is applied for high, medium and low seasonal cases. Using the historical hourly area load levels and using the regression analysis as explained in Appendix-A of the AESO Rule on Loss Factors, a minimum TMR generation requirement is assigned to generators listed in the OPPs according to these seasonal load levels. The historical TMR level as calculated in Appendix A is adjusted as per the relevant OPP if necessary to meet the minimum reliability requirements.

2) Most of the data used in 2008 GSO such as Alberta system load, hourly pool price and generation amount at each POS are historical and taken from the most recent 12 months' data found in the AESO's billing system. The data extraction period is June 1 2006 to May 31 2007.

3) In general, the energy stacking order is formed to more closely reflect an actual operational perspective. The generators may bid multiple blocks but the typical block size beyond the 2nd block is very small.

4) **Wind Generation** – Wind generation does not have a relationship to pool price.

5) **Small Power Research & Development** – The relative order remains the same as the 2007 GSO. SPR&D generators are exempt by law from paying for losses.

6) **Distribution Connected Generation** – consists of distribution connected generators with STS contracts who occasionally supplies power to the AIES. Several prime movers may exist at a distribution generation location. The placement of the distribution generation in the stacking order is determined mainly by the predominant source of generation at the STS location and ranked by historical hourly pool price.

7) **Preliminary Generation** – consists of the generators with preliminary status.

2008 Generic Stacking Order Version 1, Released August 27, 2007

New GSO Number	Gen with 2nd Block	Name	MP_ID	PSS/E Bus	Generation Type	Winter Peak Capacity, MW*	Winter Med Capacity, MW*	Winter Low Capacity, MW*	Spring Peak Capacity, MW*	Spring Med Capacity, MW*	Spring Low Capacity, MW*	Summer Peak Capacity, MW*	Summer Med Capacity, MW*	Summer Low Capacity, MW*	Fall Peak Capacity, MW*	Fall Med Capacity, MW*	Fall Low Capacity, MW*
1	1	CALPINE CTG	CES1	187	Co-Cycle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	1	CALPINE STG	CES2	187	Co-Cycle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	1	BEAR CREEK G2	BCR2	10142	Co-Cycle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	1	BEAR CREEK G1	BCRK	10142	Co-Cycle	50.0	30.0	0.0	30.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	0.0
5	1	FORT NELSON	FNG1	1016	Gas	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
6	1	POPLAR HILL	PH1	1118	Gas	off	off	SCM	off	SCM	off	SCM	off	off	off	off	off
7	1	RAINBOW 2	RB2	1032	Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	1	RAINBOW 5	RB5	1037	Gas	25.0	20.0	10.0	30.0	15.0	15.0	25.0	15.0	30.0	30.0	15.0	15.0
9	1	RAINBOW 4, RL1	RL1	1035	Co-gen	45.0	45.0	45.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
10	1	VALLEYVIEW	VVW1	1171	Gas	off	off	off	off	off	off	off	off	off	off	off	off
11		CASTLE RIVER	CR1	234	Wind	15.2	18.4	18.2	14.8	14.0	11.2	8.5	6.7	5.5	13.2	11.9	9.9
12		McBRIDE	AKE1	901	Wind	33.5	35.6	40.0	28.2	28.7	28.7	10.5	16.0	20.0	31.6	24.9	24.9
13		SUNCOR MAGRATH	SCR2	251	Wind	16.3	14.5	16.2	11.0	12.1	12.0	3.6	6.8	9.9	13.9	10.7	11.2
14		SUMMERVIEW 1	IEW1	336	Wind	26.6	32.7	36.5	28.5	26.9	23.1	15.3	14.3	16.3	25.8	23.0	20.8
15		COWLEY RIDGE WIND POWER PHASE1	PKNE	264	Wind	3.0	4.1	4.5	4.3	3.5	3.0	2.5	2.1	1.6	3.2	3.2	2.6
16		COWLEY EXPANSION 1	CRE1	264	Wind	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2
17		COWLEY EXPANSION 2	CRE2	264	Wind	0.3	0.5	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.3
18		COWLEY NORTH	CRE3	264	Wind	7.8	8.3	9.2	6.4	6.4	5.2	4.1	3.7	2.7	7.1	5.6	4.9
19		COWLEY RIDGE WIND POWER PHASE2	CRWD	264	Wind	3.1	3.7	4.1	3.7	3.1	2.5	2.0	1.8	1.1	2.9	2.8	2.3
20		TABER WIND	TAB1	343	Wind	36.0	36.0	36.0	27.5	27.5	27.5	20.5	20.5	20.5	30.5	30.5	30.5
21		TAYLOR WIND PLANT	TAY2	670	Wind	1.2	1.0	1.1	0.6	0.9	0.7	0.2	0.4	0.5	0.9	0.7	0.6
22		PINCHER CREEK	0000039611	4224	Wind, DG	0.2	0.3	0.9	0.7	1.4	1.6	0.0	0.0	0.0	0.3	0.2	0.4
23		SODERGLEN	GWW1	358	Wind	31.7	31.7	31.7	24.3	24.3	24.3	18.0	18.0	18.0	26.9	26.9	26.9
24		SUNCOR HILLRIDGE WIND FARM	SCR3	389	Wind	13.5	13.5	13.5	10.3	10.3	10.3	7.7	7.7	7.7	11.4	11.4	11.4
25		GLENWOOD	0000022911	4245	Wind, DG	0.0	0.0	0.1	0.0	0.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0
26		KETTLES HILL WIND ENERGY PHASE 2	KHW1	402	Wind	28.1	29.2	29.8	30.8	29.4	28.8	26.3	26.5	27.3	28.0	27.4	27.4
27		WESGEN	WST1	14	Bio-mass	8.7	9.6	9.0	11.0	9.9	9.1	9.1	9.2	6.7	9.0	10.8	11.4
28		WHITE COURT	EAGL	410	Bio-mass	21.1	22.6	22.9	18.7	21.6	22.0	23.5	23.5	23.9	23.5	22.3	22.7
29		BRIDGE CREEK	GOC1	19145	Gas-decomp	3.9	3.9	3.9	3.7	3.7	3.9	2.1	2.8	2.9	3.4	3.0	3.2
30		DRAYTON VALLEY PL IPP	DV1	4332	Bio-mass	8.6	8.9	9.0	8.7	8.5	8.8	9.3	8.4	8.6	8.9	7.6	7.9
31		BELLY RIVER IPP	BLYR	447	Hydro	0.0	0.0	0.0	0.0	1.2	1.5	2.8	2.8	2.8	0.0	1.2	1.2
32		CHIN CHUTE	CHIN	406	Hydro	0.0	0.0	0.0	0.0	2.3	3.3	7.5	8.4	5.9	0.0	3.4	4.1
33		DICKSON DAM 1	DKSN	4006	Hydro	4.9	4.9	4.9	4.0	8.4	9.3	8.2	8.9	11.1	5.6	10.0	10.8
34		WATER IPP	WTRN	3449	Hydro	1.2	1.0	1.0	1.1	2.1	2.2	2.0	1.9	2.5	2.3	1.2	1.1
35		ST MARY IPP	STMY	3448	Hydro	1.1	1.1	1.1	1.3	2.0	2.1	2.2	2.2	2.3	1.1	1.1	1.1
36		RAYMOND RESERVOIR	RYMD	413	Hydro	0.0	0.0	0.0	0.0	3.4	4.7	15.1	15.2	8.8	0.0	5.3	6.4
37		DOW GTG	DOWGEN15M	61	Co-gen	82.4	71.1	40.3	116.3	51.1	21.6	0.3	0.6	0.0	115.9	38.8	26.4
38	1	NOVA JOFFRE	NOVAGEN15M	383	Co-gen	70.2	51.6	37.6	4.9	10.8	4.1	77.0	52.9	22.9	80.5	79.3	76.9
39		PLAMONDON	0000035311	4304	Co-gen, DG	0.3	0.5	0.4	0.1	0.1	0.1	1.8	0.7	0.0	1.1	0.4	0.2
40		BUCK LAKE	0000045411	80	Gas, DG	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
41		DIASHOWA	DAI1	1088	Co-gen	3.4	3.2	2.9	2.1	1.7	1.5	1.1	1.7	0.2	3.2	3.8	3.0
42		SHELL SCOTFORD	SCTG	43	Co-gen	5.6	1.5	0.3	1.4	0.9	0.1	0.0	0.2	0.0	0.8	0.1	0.1
43		P&G WEYERHAUSER	WEY1	1141	Co-gen	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
44		NEXEN OPTI	NX02	1241	ISD	43.7	43.7	43.7	43.7	43.7	43.7	43.7	43.7	43.7	43.7	43.7	43.7
45		CITY OF MEDICINE HAT	CMH1	680	Gas	5.9	5.5	1.9	4.2	4.5	1.9	14.1	6.7	0.4	15.4	19.2	14.4
46	1	CAVAILIER	EC01	247	Co-Cycle	34.2	25.8	8.8	31.5	18.5	2.7	39.5	23.5	2.8	42.8	41.0	22.9
47	1	FOSTER CREEK G1	EC04	1301	Co-gen	63.1	61.0	61.7	59.8	53.4	54.9	43.2	50.6	56.7	57.3	48.9	49.4
48		GRANDE PRAIRIE ECOPOWER CENTRE	GPEC	1101	Co-gen	9.6	9.8	10.8	7.2	11.7	13.1	9.8	7.8	5.9	7.0	11.6	14.0
49		MAHKESES, COLD LAKE	IOR1	1310	Co-gen	55.8	54.8	53.4	58.2	53.2	53.6	33.8	38.1	43.1	58.8	45.2	44.8
50	1	MUSKEG	MKR1	1236	Co-gen	72.2	65.6	52.7	63.4	53.1	50.7	57.4	52.1	46.6	72.0	70.2	49.8
51	1	McKAY RIVER	MKRC	1274	Co-gen	131.1	116.4	108.4	114.1	101.5	94.4	129.9	123.5	109.3	157.8	129.1	105.9
52		NORTHSTONE ELMWORTH	NPC1	19134	Co-gen	4.8	1.1	0.0	1.9	0.9	0.0	7.5	1.2	0.0	4.9	3.6	0.8
53	1	BALZAC	NX01	290	Co-Cycle	23.4	19.2	8.2	19.2	4.4	1.3	25.8	12.4	6.2	22.6	20.2	11.4
54	1	PRIMROSE	PR1	1302	Co-gen	31.3	30.2	29.7	29.3	22.0	21.9	16.5	20.2	24.4	7.5	22.5	23.8
55		SYNCRUDE	SCL1	1205	Co-gen	45.6	45.5	44.6	45.3	37.1	35.8	12.1	11.3	3.3	39.9	41.2	41.2
56	1	SUNCOR MILLENIUM	SCR1	1208	Co-gen	123.0	125.7	113.6	181.1	130.2	102.4	73.9	77.2	37.6	123.5	104.2	88.6

New GSO Number	Gen with 2nd Block	Name	MP_ID	PSS/E Bus	Generation Type	**Winter Peak** Capacity, MW*	**Winter Med** Capacity, MW*	**Winter Low** Capacity, MW*	**Spring Peak** Capacity, MW*	**Spring Med** Capacity, MW*	**Spring Low** Capacity, MW*	**Summer Peak** Capacity, MW*	**Summer Med** Capacity, MW*	**Summer Low** Capacity, MW*	**Fall Peak** Capacity, MW*	**Fall Med** Capacity, MW*	**Fall Low** Capacity, MW*
57	1	CARSELAND	TC01	5251	Co-gen	49.1	49.1	48.0	49.0	48.5	47.4	53.2	49.6	48.0	57.0	51.9	50.5
58	1	REDWATER	TC02	50	Co-gen	14.3	12.0	11.4	10.3	10.6	10.4	11.9	10.8	10.0	17.6	13.5	12.5
59		POCATERRA	POC	214	Hydro	11.2	8.7	0.4	7.9	4.9	0.1	8.3	1.6	0.0	9.1	4.5	0.2
60		INTERLAKES	INT	376	Hydro	3.6	2.6	0.3	1.8	0.6	0.0	3.4	0.8	0.0	3.7	2.0	0.0
61	1	CASCADE	CAS	175	Hydro	15.3	10.2	1.8	9.9	7.3	1.0	0.0	0.1	0.0	12.4	5.0	0.6
62	1	HORSESHOE	HSH	171	Hydro	9.4	7.7	6.3	7.6	8.1	7.8	12.2	11.0	10.3	8.1	7.9	6.9
63	1	KANANASKIS	KAN	193	Hydro	8.7	7.3	6.1	7.6	8.6	8.4	14.4	13.2	15.1	8.0	7.9	6.8
64	1	BARRIER	BAR	216	Hydro	6.8	6.0	0.6	6.9	5.7	1.5	7.7	3.3	2.1	6.5	4.6	0.4
65	1	RUNDLE	RUN	197	Hydro	16.8	10.4	2.7	13.0	9.9	4.1	13.9	8.1	0.7	9.5	5.0	0.9
66		THREE SISTERS	THS	379	Hydro	0.9	0.7	0.3	0.3	0.1	0.0	1.4	0.8	0.2	0.7	0.7	0.2
67	1	GHOST	GHO	180	Hydro	18.6	13.0	3.2	13.4	14.5	6.9	27.7	19.0	18.9	16.4	14.6	3.4
68	1	SPRAY	SPR	310	Hydro	45.2	28.7	7.7	34.4	26.1	11.0	37.5	21.7	1.9	28.4	17.0	3.1
69	1	BEARSPAW	BPW	183	Hydro	4.7	4.8	4.8	4.9	6.6	7.3	9.0	9.3	11.3	4.7	5.6	5.8
70		TAYLOR HYDRO	TAY1	670	Hydro	0.0	0.0	0.0	0.0	2.0	2.8	11.4	11.4	7.4	0.0	4.3	5.1
71		STIRLING	0000006711	4280	Hydro, DG	0.0	0.0	0.0	0.0	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0
72		SPRING COULEE	0000038511	4246	Hydro, DG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
73	1	BIGHORN	BIG	103	Hydro	39.1	34.2	26.0	34.3	34.9	23.7	44.6	34.5	20.1	45.2	32.8	21.6
74	1	BRAZEAU	BRA	153,33	Hydro	11.2	7.3	1.1	6.5	4.9	0.8	10.0	4.6	2.4	7.2	5.2	0.8
75		OLDMAN	OMRH	230	Hydro	3.2	3.5	3.6	9.0	20.1	22.1	22.3	23.2	29.3	9.6	10.5	10.9
76	1	BATTLE RIVER #3	BR3	1491	Coal	58.8	57.6	56.4	66.5	49.8	39.5	53.4	56.9	48.6	62.7	55.1	53.3
77	1	BATTLE RIVER #4	BR4	1491	Coal	86.6	95.7	97.7	105.5	98.3	97.4	87.2	90.0	89.4	84.3	71.2	75.7
78	1	BATTLE RIVER #5	BR5	1469	Coal	158.3	162.2	162.2	139.9	152.4	113.1	153.9	155.7	130.1	124.7	78.6	68.2
79	1	GENESEE 1	GN1	524	Coal	200.0	199.1	200.1	200.8	182.4	176.1	196.7	195.4	191.7	199.1	182.4	180.0
80	1	GENESEE 2	GN2	524	Coal	184.8	190.9	192.9	197.0	196.9	195.5	193.6	190.8	197.7	181.0	141.6	122.6
81	1	GENESEE 3	GN3	524	Coal	340.5	336.1	319.2	267.1	310.1	300.6	319.1	332.9	338.3	297.7	306.6	295.7
82	1	HR MILNER	HRM	1147	Coal	97.5	97.1	93.0	53.1	65.1	75.3	97.8	89.7	66.9	100.9	101.1	100.5
83	1	SUNDANCE #1	SD1	135	Coal	238.3	223.3	221.8	238.8	221.7	215.7	188.9	184.7	237.9	243.8	234.3	216.6
84	1	SUNDANCE #2	SD2	135	Coal	241.0	235.4	230.4	212.1	192.5	155.0	233.9	219.6	217.4	242.7	229.5	219.0
85	1	SUNDANCE #3	SD3	135	Coal	258.1	264.3	250.6	279.1	271.6	260.5	231.2	237.1	250.4	268.7	111.7	87.6
86	1	SUNDANCE #4	SD4	135	Coal	266.4	259.8	246.4	208.6	282.3	274.8	287.1	266.1	251.7	289.7	270.7	252.1
87	1	SUNDANCE #5	SD5	135	Coal	313.8	303.0	291.9	302.6	276.1	250.4	98.5	151.8	113.3	302.7	308.9	302.1
88	1	SUNDANCE #6	SD6	135	Coal	278.5	259.6	226.6	301.2	293.4	271.3	271.5	253.8	208.8	202.8	281.6	249.0
89	1	SHEERNESS #1	SH1	1484	Coal	176.2	167.0	159.6	173.4	161.9	142.8	177.2	124.5	41.6	145.2	164.6	155.6
90	1	SHEERNESS #2	SH2	1484	Coal	202.8	198.3	186.9	193.6	148.0	128.5	204.1	164.7	101.4	188.1	195.1	186.0
91	1	WABAMUN #4	WB4	133	Coal	252.6	239.1	243.1	186.3	125.9	139.8	222.4	147.7	153.2	217.5	234.5	234.0
92	1	KEEPHILLS #1	KH1	420	Coal	367.3	353.6	348.4	365.4	364.4	350.9	366.7	357.5	317.1	356.2	334.7	328.9
93	1	KEEPHILLS #2	KH2	420	Coal	364.4	357.2	336.5	372.7	341.6	331.0	370.1	364.7	327.8	358.9	349.8	347.7
94	2	BATTLE RIVER #3	BR3	1491	Coal	71.4	70.0	68.5	80.8	60.4	48.0	64.9	69.1	59.0	76.1	66.9	64.8
95	2	BATTLE RIVER #4	BR4	1491	Coal	39.8	44.0	45.0	48.5	45.2	44.8	40.1	41.4	41.1	38.8	32.7	34.8
96	2	BATTLE RIVER #5	BR5	1469	Coal	197.2	202.2	202.1	174.4	189.9	141.0	191.7	194.1	162.1	155.3	98.0	85.0
97	2	GENESEE 1	GN1	524	Coal	182.2	181.4	182.4	183.0	166.2	160.4	179.2	178.0	174.6	181.4	166.2	164.0
98	2	GENESEE 2	GN2	524	Coal	170.8	176.4	178.3	182.0	182.0	180.7	178.9	176.4	182.7	167.3	130.8	113.3
99	2	GENESEE 3	GN3	524	Coal	104.9	103.5	98.3	82.3	95.5	92.6	98.3	102.5	104.2	91.7	94.4	91.1
100	2	HR MILNER	HRM	1147	Coal	19.2	19.2	18.4	10.5	12.8	14.9	19.3	17.7	13.2	19.9	19.9	19.8
101	2	SUNDANCE #1	SD1	135	Coal	28.3	26.5	26.3	28.3	26.3	25.6	22.4	21.9	28.2	28.9	27.8	25.7
102	2	SUNDANCE #2	SD2	135	Coal	31.4	30.7	30.0	27.6	25.1	20.2	30.5	28.6	28.3	31.6	29.9	28.5
103	2	SUNDANCE #3	SD3	135	Coal	52.9	54.1	51.3	57.2	55.6	53.4	47.4	48.6	51.3	55.0	22.9	17.9
104	2	SUNDANCE #4	SD4	135	Coal	48.6	47.4	45.0	38.1	51.5	50.1	52.4	48.6	45.9	52.8	49.4	46.0
105	2	SUNDANCE #5	SD5	135	Coal	44.1	42.5	41.0	42.5	38.8	35.2	13.8	21.3	15.9	42.5	43.4	42.4
106	2	SUNDANCE #6	SD6	135	Coal	90.0	83.9	73.3	97.4	94.9	87.7	87.8	82.0	67.5	65.6	91.0	80.5
107	2	SHEERNESS #1	SH1	1484	Coal	210.2	199.2	190.4	206.8	193.2	170.4	211.3	148.5	49.7	173.2	196.4	185.6
108	2	SHEERNESS #2	SH2	1484	Coal	182.9	178.9	168.6	174.7	133.5	115.9	184.1	148.6	91.5	169.6	176.0	167.8
109	2	WABAMUN #4	WB4	133	Coal	8.0	7.6	7.7	5.9	4.0	4.4	7.1	4.7	4.9	6.9	7.5	7.4
110	2	KEEPHILLS #1	KH1	420	Coal	12.1	11.7	11.5	12.1	12.1	11.6	12.1	11.8	10.5	11.8	11.1	10.9
111	2	KEEPHILLS #2	KH2	420	Coal	8.8	8.6	8.1	9.0	8.2	8.0	8.9	8.8	7.9	8.6	8.4	8.4
112	2	POCATERRA	POC	214	Hydro	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
113	2	INTERLAKES	INT	376	Hydro	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

New GSO Number	Gen with 2nd Block	Name	MP_ID	PSS/E Bus	Generation Type	**Winter Peak** Capacity, MW*	**Winter Med** Capacity, MW*	**Winter Low** Capacity, MW*	**Spring Peak** Capacity, MW*	**Spring Med** Capacity, MW*	**Spring Low** Capacity, MW*	**Summer Peak** Capacity, MW*	**Summer Med** Capacity, MW*	**Summer Low** Capacity, MW*	**Fall Peak** Capacity, MW*	**Fall Med** Capacity, MW*	**Fall Low** Capacity, MW*
114	2	CASCADE	CAS	175	Hydro	5.2	3.4	0.6	3.3	2.5	0.4	0.0	0.0	0.0	4.2	1.7	0.2
115	2	HORSESHOE	HSH	171	Hydro	1.5	1.2	1.0	1.2	1.3	1.2	1.9	1.7	1.6	1.3	1.2	1.1
116	2	KANANASKIS	KAN	193	Hydro	1.6	1.4	1.1	1.4	1.6	1.6	2.7	2.4	2.8	1.5	1.5	1.3
117	2	BARRIER	BAR	216	Hydro	1.7	1.5	0.2	1.7	1.4	0.4	1.9	0.8	0.5	1.6	1.1	0.1
118	2	RUNDLE	RUN	197	Hydro	3.3	2.1	0.5	2.6	2.0	0.8	2.8	1.6	0.1	1.9	1.0	0.2
119	2	THREE SISTERS	THS	379	Hydro	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
120	2	GHOST	GHO	180	Hydro	9.4	6.5	1.6	6.7	7.3	3.5	13.9	9.5	9.5	8.3	7.4	1.7
121	2	SPRAY	SPR	310	Hydro	14.5	9.2	2.5	11.0	8.4	3.5	12.0	6.9	0.6	9.1	5.4	1.0
122	2	BEARSPAW	BPW	183	Hydro	1.2	1.2	1.2	1.2	1.7	1.9	2.3	2.4	2.9	1.2	1.4	1.5
123	2	BIGHORN	BIG	103	Hydro	16.3	14.2	10.8	14.3	14.5	9.9	18.6	14.4	8.4	18.8	13.7	9.0
124	2	BRAZEAU	BRA	153,33	Hydro	70.3	46.0	7.2	40.9	31.0	5.3	62.5	28.9	15.0	45.1	32.6	5.0
125	2	CALPINE CTG	CES1	187	Co-Cycle	111.1	65.1	25.6	55.9	30.4	3.9	152.7	99.8	8.0	123.9	120.9	72.8
126	2	CALPINE STG	CES2	187	Co-Cycle	62.6	38.1	14.9	33.1	18.4	1.8	109.7	65.9	2.5	72.5	76.9	46.0
127	2	NOVA JOFFRE	NOVAGEN15M	383	Co-gen	39.5	29.1	21.1	2.8	6.1	2.3	43.3	29.8	12.9	45.3	44.6	43.3
128	2	CAVAILIER	EC01	247	Co-Cycle	39.4	29.7	10.2	36.3	21.3	3.2	45.5	27.1	3.3	49.3	47.3	26.4
129	2	FOSTER CREEK G1	EC04	1301	Co-gen	5.6	5.4	5.5	5.3	4.7	4.9	3.8	4.5	5.0	5.1	4.3	4.4
130	2	MUSKEG	MKR1	1236	Co-gen	15.1	13.7	11.0	13.3	11.1	10.6	12.0	10.9	9.8	15.1	14.7	10.4
131	2	McKAY RIVER	MKRC	1274	Co-gen	4.1	3.6	3.4	3.6	3.2	2.9	4.1	3.9	3.4	4.9	4.0	3.3
132	2	BALZAC	NX01	290	Co-Cycle	42.1	34.5	14.7	34.5	8.0	2.4	46.5	22.3	11.2	40.6	36.4	20.6
133	2	PRIMROSE	PR1	1302	Co-gen	3.5	3.4	3.3	3.3	2.5	2.5	1.9	2.3	2.8	0.8	2.5	2.7
134	2	SUNCOR MILLENIUM	SCR1	1208	Co-gen	16.0	16.3	14.7	23.5	16.9	13.3	9.6	10.0	4.9	16.0	13.5	11.5
135	2	CARSELAND	TC01	5251	Co-gen	13.5	13.5	13.2	13.5	13.3	13.0	14.6	13.6	13.2	15.6	14.2	13.8
136	2	REDWATER	TC02	50	Co-gen	5.9	5.0	4.7	4.3	4.4	4.3	4.9	4.5	4.1	7.3	5.6	5.2
137		ROSSDALE 9	RG9	507	Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	0.0
138		ROSSDALE 8	RG8	507	Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.3	0.0
139		ROSSDALE 10	RG10	507	Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.2	0.0
140		DRYWOOD 1	DRW1	4226	Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
141	2	BEAR CREEK G2	BCR2	10142	Co-Cycle	19.8	16.3	13.0	20.4	14.0	11.3	16.4	13.1	8.5	21.5	18.5	14.0
142		RAINBOW 3	RB3	1033	Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
143		RAINBOW 1	RB1	1031	Gas	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.3
144	2	BEAR CREEK G1	BCRK	10142	Co-Cycle	0.0	0.0	11.2	13.1	19.9	9.0	9.3	3.7	0.0	15.5	31.3	15.4
145	2	FORT NELSON	FNG1	1016	Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
146	2	POPLAR HILL	PH1	1118	Gas	7.4	4.5	0.5	6.9	3.3	0.2	3.8	2.5	0.1	3.2	1.8	0.6
147	2	RAINBOW 2	RB2	1032	Gas	0.1	0.1	0.0	0.0	1.7	0.8	5.6	1.2	0.0	7.4	6.3	4.2
148	2	RAINBOW 5	RB5	1037	Gas	0.8	2.4	6.5	0.0	5.2	0.0	0.0	2.5	0.0	0.8	9.6	4.1
149	2	RAINBOW 4, RL1	RL1	1035	Co-gen	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150		STURGEON 1	ST1	1166	Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.4	0.3
151		STURGEON 2	ST2	1166	Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.1	0.0
152	2	VALLEYVIEW	VVW1	1171	Gas	1.3	1.3	0.2	0.0	0.8	0.0	1.6	0.5	0.2	2.5	0.6	0.4
153		Shell Caroline 378S			Gas	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
154		SUNDANCE 4 UPGRADE	SD4	135	Coal	41.4	41.4	41.4	41.4	41.4	41.4	41.4	41.4	41.4	41.4	41.4	41.4
155		EPCOR CloverBar Peaker (Stage 1 - LM6000)	Project593_1_SUP		Gas	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1
156		ATCO Power Valleyview # 2	Project667_1_SUP		Gas	0.0	0.0	0.0	0.0	0.0	0.0	40.7	40.7	40.7	40.7	40.7	40.7
157		Peace Butte Wind Farm	Project513_1_SUP		Wind	0.0	0.0	0.0	0.0	0.0	0.0	29.8	29.8	29.8	44.3	44.3	44.3
158		Meg Energy	Project_444_2		Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	65.6	65.6	65.6
159		Northern Prairie Power Project	Project672_1_SUP		Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	86.6	86.6	86.6

* Capacity is determined as per AESO rules for the periods defined.