2010 Generic Stacking Order Loss Factors

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1.0 Purpose

The purpose of this document is to describe the 2010 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 loss factor 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, 2009 – February, 2010	High
		Medium
		Low
Spring	March, 2010 – May, 2010	High
		Medium
		Low
Summer	June, 2010 – August, 2010	High
		Medium
		Low
Fall	September, 2010 – November, 2010	High
		Medium
		Low

2. Generation dispatch order.

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 determined using

[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.

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 or by a combination of actual data and 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. The 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 methodology reflects the requirements Transmission Regulation. The regulation AR 86/2007 with amendments up to and including AR 255/2007 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 loss factor methodology including the development of rules for the preparation of the GSO.

Prior to 2006, GSO's 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 2010 GSO Key Features

The highlights of the 2010 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. The determination of TMR and the energy component is done using SCADA data. The historical TMR instruction amount as dispatched by the system controller is used as the TMR amount. The difference between the total SCADA amount and the TMR instruction amount is used as the energy component. For example, if TMR instruction is 25 MW and the actual amount is 45 MW then the TMR amount will be 25 MW and the energy component will be 20 MW.
3. 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.
4. The net of historical (or for Montana, estimated) levels of import and export (separately for BC, Montana, and Saskatchewan) is shown in the GSO only if the net is import. If the net is export the GSO shows zero for the scenario. The net import (if any) is added at the end of the 2nd block of Hydro. If the net is export then it will be reflected in the loss factor base cases. The DOS loads will be reflected in the loss factor base cases.

5. 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 6 of the AESO Rules).
6. No maintenance or outage data is used in the 2010 GSO as average historical net-to-grid output of a generator inherently contains this information.
7. 12 seasonal net-to-grid generations are assigned to each individual generator at the point of supply (POS).
8. The order except for units such as wind, import, and hydro generation is determined by the actual price responsiveness of the generators in each group.
9. New generators 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 typically relies on an operating profile submitted by the generator owner. In the event this information has not been provided the AESO will rely on the Canadian Electricity Association's (CEA) latest annual report on Generation Equipment Status utilizing The incapability factors (ICBF) to calculate the power available to the AIES. (1- ICBF) has been considered as equivalent to Available Capacity Factors (ACF)..
10. The 2010 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 2010 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.

11. 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 2008 to May 31 2009. 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 2009 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. The GSO is separated into two blocks (where necessary) and into similar generation technologies (i.e. wind, co-gen, coal, etc)

5.0 2010 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 2010 GSO is obtained from the following two sources:

   a) The average historical TMR total (SCADA) is calculated for 12 seasonal cases in the past twelve months (June 1 2008 to May 31 2009). The AIES seasonal load duration curve analysis is used to obtain the average TMR total amount of each generator.

   b) The average TMR instruction amount (as dispatched by the System Controller) is calculated for 12 seasonal cases in the past twelve months (June 1 2008 to May 31 2009). The AIES seasonal load duration curve analysis is used to obtain the average TMR instruction amount for each generator.

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.

2) **Data** – Most of the data used in 2010 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 2008 to May 31 2009.

3) **Dispatch Generator** – 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 2009 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 and placed with the same fuel type group.

8) **Import levels** – as per the 2007 Transmission Regulation, inter-tie levels are included in the loss factor calculation power flows. Imports are added in the GSO following the second block of hydro generation. The location reflects the relative level of availability of import resources for Alberta. The GSO provides a list of generation or equivalent entity (imports or industrial system designation) along with their predicted seasonal output capacity. Exports are not added in the GSO as they are not supply component of the system.

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New GSO Number	Name	MP_ID	Gen with 2nd Block	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	RAINBOW 4	RL1	1	Co-gen	31.5	32.7	33.9	38.7	32.3	27.5	19.3	30.8	28.8	28.5	27.2	28.0
2	RAINBOW 5	RB5	1	Gas	24.0	21.0	16.1	20.3	21.3	22.2	25.8	13.7	8.1	32.3	25.8	21.2
3	POPLAR HILL	PH1	1	Gas	3.7	5.2	1.3	6.6	5.1	2.1	3.7	1.8	2.2	8.5	4.4	0.4
4	VALLEYVIEW	VVW1	1	Gas	0.2	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	FORT NELSON	FNG1	1	Gas	25.6	36.8	39.3	35.9	29.7	25.9	24.6	35.9	40.1	34.5	31.2	36.5
6	BEAR CREEK G1	BCRK	1	Co-Cycle	5.0	6.8	4.6	12.0	2.7	0.0	14.3	10.5	11.7	2.7	2.0	0.1
7	RAINBOW 2	RB2	1	Gas	2.3	4.2	3.0	0.0	2.6	4.1	3.4	2.5	3.9	2.1	3.9	2.9
8	RAINBOW 1	RB1	1	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
9	BEAR CREEK G2	BCR2	1	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
10	NORTHSTONE ELMWORTH	NPC1	1	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
11	RAINBOW 3	RB3	1	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
12	GRANDE PRAIRIE ECOPOWER CENTRE	GPEC	1	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
13	TABER WIND	TAB1		Wind	26.4	26.0	28.5	22.2	29.3	33.6	15.9	19.2	16.8	37.6	23.4	29.5
14	SUNCOR HILLRIDGE WIND FARM	SCR3		Wind	12.9	12.4	13.4	10.8	14.0	14.5	7.0	9.1	6.3	18.2	11.1	13.6
15	GLENWOOD	0000022911		Wind, DG	0.0	0.0	0.1	0.0	0.1	0.2	0.0	0.2	0.6	0.0	0.2	0.4
16	SUNCOR MAGRATH	SCR2		Wind	10.1	11.9	13.7	9.3	12.4	11.6	4.7	8.7	7.1	16.0	11.7	10.9
17	FT MACLEOD	0000001511		Wind, 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
18	McBRIDE	AKE1		Wind	22.9	30.8	33.1	23.7	29.1	22.7	9.7	19.6	10.8	41.4	30.9	25.6
19	CASTLE RIVER	CR1		Wind	10.6	15.4	16.5	13.6	13.4	8.2	3.8	9.0	4.1	20.7	15.1	12.0
20	SODERGLEN	GWW1		Wind	22.7	31.9	33.7	26.5	29.1	25.9	11.7	20.8	13.1	38.4	31.1	26.3
21	PINCHER CREEK	0000039611		Wind, DG	0.2	0.5	1.2	0.3	0.8	0.9	0.3	1.0	0.6	1.4	1.4	1.5
22	KETTLES HILL WIND ENERGY PHASE 2	KHW1		Wind	18.8	27.4	29.0	23.7	25.4	19.1	10.4	16.8	9.4	37.5	26.2	20.6
23	TAYLOR WIND PLANT	TAY2		Wind	0.6	0.9	1.0	0.4	0.8	0.6	0.3	0.5	0.4	0.8	0.7	0.5
24	SUMMERVIEW 1	IEW1		Wind	16.0	25.6	27.5	17.2	23.8	18.8	9.9	12.1	6.3	35.7	18.8	15.0
25	COWLEY EXPANSION 1	CRE1		Wind	0.1	0.3	0.3	0.3	0.3	0.2	0.1	0.2	0.1	0.4	0.3	0.2
26	COWLEY EXPANSION 2	CRE2		Wind	0.3	0.4	0.4	0.4	0.4	0.2	0.2	0.3	0.1	0.6	0.4	0.3
27	COWLEY NORTH	CRE3		Wind	4.9	7.3	7.4	7.1	6.2	3.9	3.6	4.2	1.6	9.8	7.1	5.7
28	COWLEY RIDGE WIND POWER PHASE1	PKNE		Wind	2.0	3.8	3.9	3.7	3.8	2.4	2.1	2.5	1.0	5.5	4.0	3.1
29	COWLEY RIDGE WIND POWER PHASE2	CRWD		Wind	1.9	3.3	3.5	3.3	3.3	2.0	1.6	2.0	0.7	4.8	3.4	2.6
30	BLUE TRAIL WIND FARM	BTR1		Wind	29.7	29.7	29.7	22.7	22.7	22.7	16.9	16.9	16.9	25.1	25.1	25.1
31	SUMMERVIEW 2	Project_393_2		Wind	28.4	28.4	28.4	21.7	21.7	21.7	16.1	16.1	16.1	24.0	24.0	24.0
32	PEACE BUTTE WIND FARM	Project513_1_SUP		Wind	0.0	0.0	0.0	39.9	39.9	39.9	29.7	29.7	29.7	44.2	44.2	44.2
33	GREENGATE HALKIRK WIND PROJECT	Project723_1_SUP		Wind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	57.2	57.2	57.2
34	OLD MAN RIVER WIND FARM	Project519_1_SUP		Wind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.8	17.8	17.8
35	WESGEN	WST1		Bio-mass	9.2	9.9	9.7	10.8	12.7	12.2	9.6	10.8	9.0	14.6	13.3	12.4
36	WHITE COURT	EAGL		Bio-mass	21.1	20.6	21.1	23.7	23.1	23.7	23.5	24.1	24.3	13.8	19.2	20.0
37	BRIDGE CREEK	GOC1		Gas-decomp	3.1	3.3	3.4	3.6	3.2	3.4	2.0	1.9	1.3	3.6	2.9	3.0
38	DRAYTON VALLEY PL IPP	DV1		Bio-mass	5.7	5.9	6.1	8.4	8.1	8.8	8.7	8.9	9.7	8.5	8.3	8.2
39	BELLY RIVER IPP	BLYR		Hydro	0.0	0.0	0.0	0.0	0.7	1.2	2.7	2.7	2.1	0.0	1.1	1.4
40	CHIN CHUTE	CHIN		Hydro	0.0	0.0	0.0	0.0	1.9	3.3	9.1	10.0	11.0	0.0	2.7	3.6
41	DICKSON DAM 1	DKSN		Hydro	5.1	5.0	5.0	4.6	5.8	6.5	10.2	12.4	12.6	5.2	7.5	8.1
42	WATER IPP	WTRN		Hydro	0.7	0.7	0.7	0.7	0.9	1.1	2.3	2.4	2.6	0.7	0.8	0.9
43	ST MARY IPP	STMY		Hydro	1.8	1.7	1.8	1.7	1.8	1.8	2.3	2.3	2.2	1.8	2.1	2.1
44	RAYMOND RESERVOIR	RYMD		Hydro	0.0	0.0	0.0	0.0	2.5	4.0	17.3	17.0	15.5	0.0	2.8	3.3
45	P&G WEYERHAUSER	WEY1		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
46	DIASHOWA	DAI1		Co-gen	3.4	2.7	2.6	3.9	2.8	1.9	4.1	1.9	2.0	2.8	2.7	2.3

New GSO Number	Name	MP_ID	Gen with 2nd Block	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*
47	ALTAGAS PARKLAND	0000034911		Gas, 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
48	CARSELAND	TC01	1	Co-gen	38.6	39.5	39.3	35.6	39.4	40.1	40.1	34.7	20.2	41.3	41.0	39.9
49	CAVAILIER	EC01	1	Co-Cycle	11.8	6.4	4.3	9.5	5.3	2.8	8.6	3.5	0.5	8.1	6.2	3.1
50	BALZAC	NX01	1	Co-Cycle	57.8	43.5	30.2	61.3	32.4	17.7	42.7	20.3	7.9	44.3	39.8	32.4
51	ENMAX CALGARY ENERGY CENTRE CTG	CES1	1	Co-Cycle	19.6	9.1	4.4	22.4	9.9	1.5	16.4	4.7	4.6	14.0	11.7	5.2
52	ENMAX CALGARY ENERGY CENTRE STG	CES2	1	Co-Cycle	44.2	20.2	10.0	49.1	22.6	2.5	40.4	11.2	11.3	33.7	28.5	12.0
53	CITY OF MEDICINE HAT	CMH1	1	Gas	3.3	3.3	0.5	3.4	2.2	0.4	1.2	1.1	0.0	3.5	3.1	0.4
54	NOVA JOFFRE	NOVAGEN15M	1	Co-gen	102.7	85.7	71.4	86.4	54.6	25.7	64.9	28.8	4.5	80.0	53.6	39.1
55	BUCK LAKE	0000045411		Co-gen, DG	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
56	DOW GTG	DOWGEN15M	1	Co-gen	40.3	25.5	13.0	31.3	19.6	12.5	22.1	12.9	6.0	31.0	19.6	10.5
57	REDWATER	TC02	1	Co-gen	14.8	12.2	11.9	12.8	10.7	10.3	9.6	11.6	12.7	11.6	10.9	10.9
58	WAUPISOO	0000040511		Co-gen, DG	3.3	4.2	4.4	4.9	3.0	1.9	4.1	3.6	3.2	4.7	4.6	4.1
59	SHELL SCOTFORD	SCTG		Co-gen	0.3	0.0	0.0	3.5	0.2	0.0	0.0	0.0	0.0	0.0	0.3	0.3
60	MAHKESES COLD LAKE	IOR1		Co-gen	52.6	50.6	48.6	50.1	24.1	13.8	34.3	44.3	50.1	47.7	48.4	49.4
61	PRIMROSE	PR1	1	Co-gen	12.3	14.3	13.5	22.0	16.9	15.7	10.8	14.2	16.1	0.0	4.5	6.5
62	McKAY RIVER	MKRC	1	Co-gen	163.4	163.3	162.4	164.5	149.8	147.7	124.9	141.2	141.1	155.8	136.5	142.7
63	CNRL HORIZON	CNR5		Co-gen	24.4	22.5	20.6	27.5	18.6	14.5	0.0	0.0	0.0	9.3	4.4	2.4
64	SUNCOR MILLENIUM	SCR1	1	Co-gen	147.5	144.8	123.3	143.8	106.5	85.6	114.2	102.8	99.7	137.5	100.4	89.4
65	SYNCRUDE	SCL1		Co-gen	46.8	44.6	42.2	13.9	31.2	30.0	12.8	20.0	11.9	44.2	39.2	39.4
66	MUSKEG	MKR1	1	Co-gen	65.9	54.1	43.9	71.2	48.7	38.2	45.0	39.1	35.6	59.8	26.2	20.2
67	NEXEN OPTI	NX02		ISD	18.9	27.8	32.8	34.8	23.0	27.7	71.9	76.8	62.2	39.9	67.1	75.6
68	FOSTER CREEK G1	EC04	1	Co-gen	60.3	57.2	56.3	53.3	28.9	30.8	37.0	42.7	49.7	51.5	50.5	52.1
69	CASCADE	CAS	1	Hydro	16.1	10.0	0.6	11.3	5.1	0.1	12.3	4.7	0.0	15.2	7.8	0.3
70	RUNDLE	RUN	1	Hydro	11.6	9.8	1.6	11.3	7.5	1.3	10.8	7.3	0.7	13.1	9.4	1.3
71	SPRAY	SPR	1	Hydro	38.8	28.9	4.4	36.4	19.8	3.7	29.0	19.4	1.8	34.7	25.0	3.5
72	GHOST	GHO	1	Hydro	21.5	11.7	2.4	14.6	9.3	2.2	27.7	26.0	30.5	20.3	17.0	4.8
73	HORSESHOE	HSH	1	Hydro	9.5	7.7	7.3	7.7	6.5	5.5	10.7	11.4	12.1	9.1	8.8	8.4
74	BARRIER	BAR		Hydro	8.3	6.2	0.2	7.7	5.1	0.4	8.4	6.2	8.7	2.4	5.9	1.1
75	POCATERRA	POC		Hydro	11.5	7.0	0.0	6.5	3.3	0.0	5.5	1.1	0.0	11.6	3.9	0.0
76	THREE SISTERS	THS		Hydro	1.3	0.8	0.5	0.2	0.0	0.0	1.6	0.6	0.0	1.1	0.9	0.2
77	BEARSPAW	BPW	1	Hydro	5.0	5.2	5.4	4.9	5.4	5.7	9.5	10.6	11.2	3.3	4.9	5.5
78	KANANASKIS	KAN	1	Hydro	9.3	7.7	7.2	7.8	7.0	5.8	13.6	14.5	15.5	9.3	6.8	6.0
79	INTERLAKES	INT		Hydro	2.3	1.7	0.2	1.8	0.6	0.0	1.5	0.4	0.0	0.0	1.3	0.1
80	SPRING COULEE	0000038511		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
81	STIRLING	0000006711		Hydro, DG	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.9	2.2	0.0	0.0	0.2
82	TAYLOR HYDRO	TAY1		Hydro	0.0	0.0	0.0	0.0	2.3	3.9	13.1	13.1	13.0	0.0	3.1	3.9
83	BRAZEAU	BRA	1	Hydro	8.2	3.6	0.2	5.0	3.4	0.5	12.4	10.7	14.9	6.7	2.8	0.5
84	OLDMAN	OMRH		Hydro	1.7	1.7	1.8	2.0	8.0	11.3	23.7	25.8	29.8	3.8	6.8	7.6
85	BIGHORN	BIG	1	Hydro	38.4	30.7	24.0	29.0	25.4	19.9	62.4	36.9	17.7	44.3	39.3	26.9
86	SHEERNESS #1	SH1	1	Coal	238.1	222.5	221.6	201.1	197.7	180.9	237.9	161.2	75.3	248.4	237.5	228.0
87	SHEERNESS #2	SH2	1	Coal	187.0	125.6	111.7	178.1	158.0	125.9	209.0	179.8	139.3	208.9	179.4	164.9
88	KEEPHILLS #1	KH1	1	Coal	243.6	285.1	281.3	318.4	151.1	53.4	202.5	227.8	215.8	317.0	292.9	275.4
89	KEEPHILLS #2	KH2	1	Coal	318.4	267.3	263.7	0.0	186.9	259.7	323.5	297.2	252.9	307.6	261.6	245.6
90	GENESEE 1	GN1	1	Coal	192.0	189.7	190.4	195.7	189.1	189.1	196.7	196.0	183.1	198.0	193.0	189.4
91	GENESEE 2	GN2	1	Coal	198.3	196.0	195.8	197.9	195.0	191.4	198.5	195.4	176.6	195.6	173.1	172.2
92	GENESEE 3	GN3	1	Coal	202.9	206.5	204.2	211.7	204.2	185.7	209.0	177.2	99.0	113.3	113.9	123.4
93	WABAMUN #4	WB4	1	Coal	252.6	224.6	225.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

New GSO Number	Name	MP_ID	Gen with 2nd Block	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*
94	SUNDANCE #2	SD2	1	Coal	210.7	188.6	178.7	165.2	170.1	149.0	110.2	38.9	8.6	199.3	174.2	169.3
95	SUNDANCE #3	SD3	1	Coal	248.8	228.4	225.0	249.5	151.6	162.8	243.9	218.2	166.3	259.5	205.6	184.7
96	SUNDANCE #4	SD4	1	Coal	203.4	188.9	181.4	150.1	348.2	345.1	335.3	333.6	329.7	343.2	326.6	307.0
97	SUNDANCE #6	SD6	1	Coal	160.7	202.4	211.3	270.7	265.0	274.9	232.4	229.9	214.9	4.3	155.3	162.3
98	HR MILNER	HRM	1	Coal	103.2	92.7	82.7	71.7	61.2	47.8	95.4	69.1	73.7	79.5	94.3	81.4
99	SUNDANCE #5	SD5	1	Coal	240.3	228.0	211.8	263.1	241.2	220.8	217.3	173.6	180.1	269.8	249.3	230.1
100	SUNDANCE #1	SD1	1	Coal	209.4	179.4	182.6	221.9	217.0	197.7	228.1	223.7	239.5	238.0	196.2	183.9
101	BATTLE RIVER #3	BR3	1	Coal	71.3	68.9	62.8	57.7	47.6	32.4	74.9	62.2	34.6	72.6	66.5	59.8
102	BATTLE RIVER #5	BR5	1	Coal	185.8	181.4	162.6	193.6	174.6	139.9	197.6	167.3	84.4	181.2	172.1	148.5
103	BATTLE RIVER #4	BR4	1	Coal	83.9	80.6	70.4	88.2	71.1	54.8	78.8	75.5	51.9	86.9	83.1	69.3
104	GENESEE 3	GN3	2	Coal	229.3	233.4	230.8	239.3	230.8	209.9	236.2	200.3	111.9	128.0	128.7	139.5
105	SUNDANCE #6	SD6	2	Coal	35.4	44.6	46.5	59.6	58.3	60.5	51.1	50.6	47.3	0.9	34.2	35.7
106	SUNDANCE #5	SD5	2	Coal	66.6	63.2	58.7	72.9	66.8	61.2	60.2	48.1	49.9	74.8	69.1	63.8
107	SUNDANCE #4	SD4	2	Coal	9.0	8.3	8.0	6.6	15.4	15.2	14.8	14.7	14.5	15.1	14.4	13.5
108	HR MILNER	HRM	2	Coal	18.4	16.5	14.8	12.8	10.9	8.5	17.0	12.3	13.1	14.2	16.8	14.5
109	SHEERNESS #2	SH2	2	Coal	154.9	104.1	92.5	147.5	130.9	104.3	173.1	149.0	115.4	173.0	148.6	136.6
110	SUNDANCE #2	SD2	2	Coal	67.0	60.0	56.8	52.5	54.1	47.4	35.0	12.4	2.7	63.4	55.4	53.8
111	SHEERNESS #1	SH1	2	Coal	130.8	122.2	121.7	110.4	108.6	99.4	130.7	88.6	41.4	136.4	130.4	125.2
112	SUNDANCE #3	SD3	2	Coal	73.4	67.4	66.4	73.6	44.7	48.0	72.0	64.4	49.1	76.6	60.6	54.5
113	SUNDANCE #1	SD1	2	Coal	25.2	21.6	22.0	26.7	26.1	23.8	27.4	26.9	28.8	28.6	23.6	22.1
114	GENESEE 2	GN2	2	Coal	185.4	183.2	183.0	185.0	182.3	178.9	185.6	182.7	165.1	182.9	161.8	161.0
115	GENESEE 1	GN1	2	Coal	179.1	177.0	177.7	182.6	176.5	176.4	183.5	182.9	170.8	184.8	180.1	176.8
116	BATTLE RIVER #5	BR5	2	Coal	173.8	169.8	152.1	181.2	163.3	130.9	184.9	156.5	79.0	169.5	161.1	139.0
117	KEEPHILLS #2	KH2	2	Coal	50.7	42.5	42.0	0.0	29.7	41.3	51.5	47.3	40.3	49.0	41.6	39.1
118	KEEPHILLS #1	KH1	2	Coal	46.4	54.3	53.6	60.7	28.8	10.2	38.6	43.4	41.1	60.4	55.8	52.5
119	BATTLE RIVER #4	BR4	2	Coal	63.1	60.6	53.0	66.3	53.5	41.2	59.3	56.8	39.1	65.4	62.5	52.1
120	BATTLE RIVER #3	BR3	2	Coal	71.8	69.4	63.2	58.1	47.9	32.6	75.4	62.6	34.8	73.1	66.9	60.2
121	WABAMUN #4	WB4	2	Coal	4.0	3.6	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
122	SUNDANCE 5 UPGRADE	SD5		Coal	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7
123	KEEPHILLS #3	Project_500_1		Coal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	154.7	154.7	154.7
124	CASCADE	CAS	2	Hydro	5.4	3.4	0.2	3.8	1.7	0.0	4.1	1.6	0.0	5.1	2.6	0.1
125	RUNDLE	RUN	2	Hydro	2.3	1.9	0.3	2.2	1.5	0.3	2.1	1.4	0.1	2.6	1.9	0.3
126	SPRAY	SPR	2	Hydro	12.4	9.2	1.4	11.6	6.3	1.2	9.3	6.2	0.6	11.1	8.0	1.1
127	GHOST	GHO	2	Hydro	10.8	5.9	1.2	7.4	4.7	1.1	13.9	13.1	15.3	10.2	8.6	2.4
128	HORSESHOE	HSH	2	Hydro	1.5	1.2	1.1	1.2	1.0	0.9	1.7	1.8	1.9	1.4	1.4	1.3
129	BEARSPAW	BPW	2	Hydro	1.3	1.3	1.4	1.3	1.4	1.5	2.4	2.7	2.9	0.8	1.2	1.4
130	KANANASKIS	KAN	2	Hydro	1.7	1.4	1.3	1.5	1.3	1.1	2.5	2.7	2.9	1.7	1.3	1.1
131	BRAZEAU	BRA	2	Hydro	72.4	31.9	1.8	44.0	30.0	4.2	109.4	94.9	132.2	59.1	24.6	4.1
132	BIGHORN	BIG	2	Hydro	16.0	12.8	10.0	12.1	10.6	8.3	26.0	15.4	7.4	18.5	16.4	11.2
133	BC IMPORT	BCHIMP		Import	459.9	290.1	0.0	402.8	173.7	0.0	408.5	147.6	185.3	359.0	267.3	0.0
134	SASKATCHEWAN IMPORT	SPCIMP		Import	62.9	70.6	62.6	70.6	52.7	71.2	112.1	90.9	91.2	72.6	67.0	50.7
135	MATL IMPORT	MATLIMP		Import	0.0	0.0	0.0	0.0	0.0	0.0	25.0	25.0	0.0	25.0	25.0	0.0
136	SUNCOR MILLENIUM	SCR1	2	Co-gen	55.9	54.9	46.7	54.5	40.3	32.4	43.3	39.0	37.8	52.1	38.1	33.9
137	CAVAILIER	EC01	2	Co-Cycle	77.0	41.6	28.0	61.8	34.8	18.0	56.0	22.9	3.4	52.6	40.2	20.3
138	REDWATER	TC02	2	Co-gen	5.7	4.7	4.6	4.9	4.1	4.0	3.7	4.4	4.9	4.4	4.2	4.2
139	CARSELAND	TC01	2	Co-gen	20.5	21.0	20.8	18.9	20.9	21.3	21.3	18.4	10.7	21.9	21.7	21.2
140	MUSKEG	MKR1	2	Co-gen	29.5	24.2	19.6	31.9	21.8	17.1	20.1	17.5	15.9	26.7	11.7	9.0

New GSO Number	Name	MP_ID	Gen with 2nd Block	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*
141	NORTHERN PRAIRIE POWER PROJECT	NPP1		Gas	13.2	5.7	0.0	3.1	2.1	1.2	11.3	11.3	11.3	6.9	6.9	6.9
142	CLOVER BAR 1	ENC1		Gas	30.5	5.3	0.3	2.7	1.7	0.0	4.3	2.2	0.0	3.4	7.0	1.4
143	McKAY RIVER	MKRC	2	Co-gen	2.6	2.6	2.6	2.7	2.4	2.4	2.0	2.3	2.3	2.5	2.2	2.3
144	NOVA JOFFRE	NOVAGEN15M	2	Co-gen	57.8	48.2	40.2	48.7	30.7	14.4	36.6	16.2	2.5	45.0	30.2	22.0
145	ATCO VALLEY VIEW 2	VVW2		Gas	2.5	0.6	0.0	0.7	0.5	0.0	6.4	6.4	6.4	1.0	1.5	0.3
146	PRIMROSE	PR1	2	Co-gen	1.4	1.6	1.5	2.5	1.9	1.8	1.2	1.6	1.8	0.0	0.5	0.7
147	ENMAX CALGARY ENERGY CENTRE CTG	CES1	2	Co-Cycle	92.4	43.1	20.6	105.6	46.4	7.0	77.1	22.3	21.5	66.0	55.2	24.3
148	ENMAX CALGARY ENERGY CENTRE STG	CES2	2	Co-Cycle	22.8	10.4	5.2	25.3	11.6	1.3	20.8	5.8	5.8	17.3	14.7	6.2
149	BALZAC	NX01	2	Co-Cycle	29.2	22.0	15.2	30.9	16.4	8.9	21.5	10.2	4.0	22.3	20.1	16.4
150	CITY OF MEDICINE HAT	CMH1	2	Gas	6.0	6.1	1.0	6.2	4.0	0.7	2.2	2.1	0.0	6.4	5.6	0.8
151	FOSTER CREEK G1	EC04	2	Co-gen	5.3	5.1	5.0	4.7	2.6	2.7	3.3	3.8	4.4	4.6	4.5	4.6
152	DOW GTG	DOWGEN15M	2	Co-gen	69.6	44.0	22.4	54.0	33.9	21.5	38.2	22.2	10.4	53.6	33.9	18.1
153	RAINBOW 4	RL1	2	Gas	4.9	0.3	0.2	0.2	0.4	0.6	2.5	1.8	5.9	1.4	2.3	0.8
154	RAINBOW 5	RB5	2	Gas	4.4	0.4	0.3	0.7	0.3	0.3	3.2	0.9	0.2	1.3	2.8	0.5
155	POPLAR HILL	PH1	2	Gas	2.5	0.4	0.0	0.1	0.7	0.1	0.7	0.5	0.1	1.1	1.4	0.2
156	VALLEYVIEW	VVW1	2	Gas	1.2	0.2	0.0	0.8	0.2	0.0	0.0	0.1	0.0	0.1	1.0	0.2
157	FORT NELSON	FNG1	2	Gas	14.7	3.7	0.6	4.9	1.6	0.5	15.9	4.3	0.4	7.8	7.7	2.7
158	BEAR CREEK G1	BCRK	2	Co-Cycle	24.8	9.2	1.9	7.4	1.9	0.3	17.4	3.3	0.5	10.5	15.8	6.8
159	RAINBOW 2	RB2	2	Gas	0.9	0.3	0.2	0.0	0.2	0.4	1.4	0.4	0.2	1.2	1.1	0.3
160	RAINBOW 1	RB1	2	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
161	BEAR CREEK G2	BCR2	2	Co-Cycle	16.3	14.2	12.1	16.4	11.7	9.8	22.8	16.2	15.9	13.9	17.5	14.8
162	NORTHSTONE ELMWORTH	NPC1	2	Co-gen	2.1	0.4	0.1	0.1	0.1	0.0	0.9	0.1	0.0	0.5	0.7	0.1
163	RAINBOW 3	RB3	2	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
164	GRANDE PRAIRIE ECOPOWER CENTRE	GPEC	2	Co-gen	15.4	13.8	13.6	19.3	18.6	18.4	16.3	16.9	13.1	16.6	16.2	17.3
165	SHELL CAROLINE	SHCG		Co-gen	0.1	0.9	1.1	0.6	1.4	1.8	0.0	1.2	2.4	4.1	2.3	2.2
166	STURGEON 1	ST1		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
167	STURGEON 2	ST2		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
168	DRYWOOD 1	DRW1		Gas	1.0	0.3	0.0	0.8	0.2	0.0	0.8	0.2	0.0	0.3	0.2	0.0
169	CLOVER BAR 2	ENC2		Gas	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2
170	DOW UPGRADE PHASE 1	DOWGEN15M		Co-gen	4.9	2.1	0.0	2.9	3.0	0.9	5.9	3.4	1.0	6.0	3.0	0.2
171	CLOVER BAR 3	Project593_3_SUP		Gas	70.7	70.7	70.7	70.7	70.7	70.7	70.7	70.7	70.7	70.7	70.7	70.7
172	MEG ENERGY	MEG1		Co-gen	65.6	65.6	65.6	65.6	65.6	65.6	65.6	65.6	65.6	65.6	65.6	65.6
173	SUMMIT CROSSFIELD ENERGY CENTRE	CRS1, CRS2, CRS3		Gas	120.0	120.0	20.8	120.0	120.0	25.8	118.0	118.0	36.4	120.0	120.0	29.0
174	DAPP POWER WESTLOCK EXPANSION	Project692_1_SUP		Gas	0	0	0	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25

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