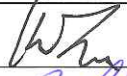


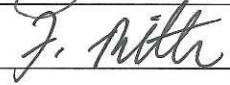


2014 Loss Factors Generic Stacking Order

OCTOBER 10, 2013



	Name	Signature	Date
Prepared by:	Han Yu		Oct. 10, 2013
Reviewed by:	John Kehler		Oct 10, 2013
	Peng Wang		Oct 10, 2013
Approved by:	Fred Ritter, P.Eng		Oct. 10, 2013

APEGGA Permit to Practice P-8200

Table of Contents

1	Purpose	1
2	Introduction.....	1
3	Background.....	2
4	2014 GSO Key Features	2
5	2014 Generic Stacking Order	3
	Appendix 1: 2014 Generic Stacking Order	5

1 Purpose

The purpose of this document is to describe the 2014 Generic Stacking Order as the order applies to the loss factor calculation.

2 Introduction

The Generic Stacking Order (GSO) is a key component in the loss factor calculation. 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 cases¹ (four seasons and three load levels as defined below) for all generators, and

Season	Timeframe	Scenario
Winter	December, 2013 – February, 2014	High
		Medium
		Low
Spring	March, 2014 – May, 2014	High
		Medium
		Low
Summer	June, 2014 – August, 2014	High
		Medium
		Low
Fall	September, 2014 – November, 2014	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 & Standards > ISO Rules > Current ISO Rules > Section 501.10 Transmission Loss Factor Requirements. In summary, the generation supply levels are 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, data is provided by the owner or the supply levels are estimated by the Incapability Factors (ICBF) or by a combination of actual data and ICBF. To determine the 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. 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 transmission must-run (TMR) requirement supersedes all other operational criteria and hence TMR generators are dispatched first on the list when required to fulfill the reliability criteria.

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

3 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 of the Transmission Regulation. More information on the methodology can be found in the Current ISO Rules (www.aeso.ca > Rules and Standards > ISO Rules > Current ISO Rules > Section 501.10 Transmission Loss Factor Requirements).

4 2014 GSO Key Features

The highlights of the 2014 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 were provided an opportunity to comment on and suggest revisions to the GSO capacities² to correct calculation errors by the AESO on historical data or proposed operational characteristics on new generation.
- 4) The net of import and export (separately for BC, Saskatchewan, and Montana) 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 second 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 the Current ISO Rules www.aeso.ca > Rules and Standards > ISO Rules > Current ISO Rules > Section 501.10 Transmission Loss Factor Requirements, Appendix 1).
- 6) No maintenance or outage data is used in the 2014 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 generator 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) Future generators expected to be connected in the forecast year that have Alberta Utilities Commission (AUC) approval through their filing are included in the GSO.
- 10) Generators who have filed decommissioning plans with the AESO are removed accordingly.

² [http://www.aeso.ca/downloads/GSO_Data_Confirmation_Request_Letter\(Sep3\).pdf](http://www.aeso.ca/downloads/GSO_Data_Confirmation_Request_Letter(Sep3).pdf)

- 11) The AESO typically relies on an operating profile submitted by the generator owner of a new generator. 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 to calculate the power available to the AIES. (1- ICBF) has been considered as equivalent to Available Capacity Factors (ACF).
- 12) The 2014 GSO considers the NTG amount at the point of supply (POS). Since any given loss factor is primarily the function of the NTG amount of generation, the 2014 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
- 13) An energy stacking order is created for all generation units based on lowest operating cost for units of the same fuel type. If multiple units have the same operating costs the unit's previous year's loss factors are used to determine dispatch order. 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 month period (June 1, 2012 - May 31, 2013). The generation unit is then divided into two blocks. Two blocks are chosen to avoid additional complexity for limited modeling improvement. A first block price is determined by calculating the average bid price per MW dispatched as a first block in the 12 month period. The first block size is defined as the percentage of first block MW dispatched divided by total MW dispatched multiplied by the GSO value for that seasonal scenario. Generation volumes above the first block size belong to the second block. The second block price is determined by calculating the average bid price per MW dispatched for every block above the first block for the same 12 month period. The second block size is calculated as the percentage of MW dispatched outside of the first block divided by the total MW dispatched then multiplied by the GSO value for that seasonal scenario. However, not all generators have a second block. The statistical analysis shows that some generators have an insignificant amount of generation in the second 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 annual weighted average is 5 MW or greater. In some cases a second block is not assigned to a generator even though the weighted average is more than 5 MW such as for small power research and development (SPR&D) and Wind generators.

The 2014 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 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 2014 Generic Stacking Order

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

- 1) **Transmission Must-Run 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 Information Document # 2011-004(R) Northwest Area Transmission Constraint Management. TMR is required in specific areas of the AIES to meet reliability criteria. The total NTG amount assigned to the TMR generators in the 2014 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, 2012 to May 31, 2013). 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, 2012 to May 31, 2013). 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.
- 2) **Data** – Most of the data used in the 2014 GSO such as Alberta system load, and generation amount at each POS are historical and taken from the most recent 12 months' data in the AESO's billing system. The data extraction period is June 1, 2012 to May 31, 2013.
- 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 second 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 2013 GSO. SPR&D generators are exempt by law from paying for losses.
- 6) **Distribution Connected Generation** – consists of distribution connected generators with STS contracts that occasionally results in supply of power to the AIES. Several prime movers may exist at a distribution generation location. The placement of the distribution generation in the GSO is determined mainly by the predominant source of generation at the STS location and ranked by historical hourly pool price.
- 7) **Future Generation** – generators expected to be connected in the forecast year that have AUC approval per their filing will be included in the GSO 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 a supply component of the system.

Appendix 1: 2014 Generic Stacking Order

New GSO Number	Name	MPID	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	POPLAR HILL	PH1	1	Gas	8.1	8.4	7.4	0.0	2.4	2.0	1.1	1.4	0.5	8.5	3.2	1.6
2	VALLEYVIEW	VVW1	1	Gas	0.0	0.5	0.2	0.0	0.6	0.3	0.0	0.0	0.0	4.9	1.2	0.3
3	BEAR CREEK G1	BCRK	1	Co-Cycle	0.0	0.2	0.0	0.0	0.5	0.3	0.0	0.0	0.0	5.3	0.7	0.0
4	CARSELAND	TC01	1	Co-gen	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	TABER WIND	TAB1		Wind	25.7	29.5	32.3	15.2	24.4	28.0	5.7	18.9	29.2	13.8	21.2	28.3
6	FT MACLEOD	0000001511		Wind, DG	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	SUNCOR HILLRIDGE WIND FARM	SCR3		Wind	12.1	13.7	14.1	7.5	10.2	12.1	3.5	8.9	13.6	7.2	10.5	12.5
8	GLENWOOD	0000022911		Wind, DG	0.0	0.0	0.0	0.0	0.1	0.6	0.0	0.0	0.1	0.0	0.1	0.2
9	SUNCOR MAGRATH	SCR2		Wind	13.2	15.7	15.0	5.5	10.3	10.6	4.4	7.6	11.6	6.3	10.1	10.1
10	MCBRIDE	AKE1		Wind	34.5	41.3	38.5	11.9	21.0	19.8	12.3	16.9	24.6	24.4	23.5	20.9
11	CASTLE RIVER	CR1		Wind	15.6	20.7	17.6	11.1	11.0	8.1	7.9	7.8	9.6	12.8	12.9	9.4
12	ENEL ALBERTA CASTLE ROCK WIND FARM	CRR1		Wind	34.5	41.7	36.8	17.0	21.2	18.1	17.0	15.9	19.2	24.5	25.7	21.2
13	PINCHER CREEK	0000039611		Wind, DG	1.2	1.8	2.2	0.4	1.4	1.5	0.7	1.1	2.0	1.3	1.6	1.4
14	KETTLES HILL WIND ENERGY PHASE 2	KHW1		Wind	28.0	36.4	33.2	15.1	20.5	19.1	14.5	14.9	22.8	22.1	23.2	19.2
15	SODERGLEN	GWW1		Wind	33.7	38.8	36.4	15.5	22.7	23.6	10.8	17.5	25.8	23.0	25.8	23.2
16	SUMMERVIEW 2	IEW2		Wind	24.4	30.7	27.7	11.7	15.1	10.0	9.2	10.1	14.8	22.1	19.1	13.4
17	TRANSALTA ARDENVILLE WIND FARM	ARD1		Wind	27.8	32.2	33.0	11.6	19.9	22.9	9.5	14.9	24.8	21.5	21.3	21.6
18	COWLEY EXPANSION 1	CRE1		Wind	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1
19	COWLEY EXPANSION 2	CRE2		Wind	0.1	0.2	0.2	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1
20	COWLEY NORTH	CRE3		Wind	6.5	8.1	7.1	1.6	4.0	3.0	3.5	3.3	4.3	5.0	5.3	4.4
21	COWLEY RIDGE WIND POWER PHASE1	PKNE		Wind	1.9	2.7	2.3	0.7	1.0	0.8	0.8	0.7	0.9	1.7	1.7	1.4
22	COWLEY RIDGE WIND POWER PHASE2	CRWD		Wind	1.6	2.4	2.1	0.6	1.0	0.7	1.0	0.7	0.8	1.3	1.3	1.1
23	GHOST PINE WIND FARM	NEP1		Wind	22.4	20.9	24.5	12.2	25.0	22.7	7.9	17.8	23.9	16.0	21.1	22.2
24	SUNCOR WINTERING HILLS WIND ENERGY PROJECT	SCR4		Wind	36.3	33.2	37.0	14.8	30.8	36.3	10.9	29.8	38.6	29.4	30.1	32.8
25	CAPITAL POWER HALKIRK WIND PROJECT	HAL1		Wind	55.8	58.2	58.1	30.8	55.5	64.1	37.4	37.4	37.4	55.6	55.6	55.6
26	SUMMERVIEW 1	IEW1		Wind	25.6	30.1	27.5	11.7	17.5	13.2	9.9	12.8	16.0	21.3	20.0	15.1
27	BLUE TRAIL WIND FARM	BTR1		Wind	28.7	31.4	29.2	12.1	17.7	16.4	8.2	13.4	17.4	19.4	18.7	17.3
28	ALBERTA WIND ENERGY OLD MAN RIVER WIND FARM	Project519_1_GEN		Wind	0.0	0.0	0.0	0.0	0.0	0.0	11.8	11.8	11.8	17.5	17.5	17.5
29	BLACKSPRING RIDGE I WIND PROJECT	Project728_1_GEN		Wind	0.0	0.0	0.0	103.2	103.2	103.2	76.8	76.8	76.8	114.3	114.3	114.3
30	WESGEN	WST1		Bio-mass	15.4	14.2	14.2	15.9	12.7	13.6	8.6	9.6	12.1	13.8	13.7	13.8
31	WHITE COURT	EAGL		Bio-mass	23.5	22.7	22.4	24.2	21.8	21.7	22.5	22.3	21.3	22.9	21.6	20.6
32	CHIN CHUTE	CHIN		Hydro	0.0	0.0	0.0	0.0	3.3	7.6	6.9	6.4	5.2	0.0	3.6	4.8
33	RAYMOND RESERVOIR	RYMD		Hydro	0.0	0.0	0.0	0.0	4.3	10.6	14.6	12.6	10.3	0.0	5.7	7.8
34	NORTHSTONE ELMWORTH	NPC1		Co-gen	0.4	0.2	0.1	0.0	0.1	0.0	0.4	0.1	0.0	1.6	0.6	0.1

New GSO Number	Name	MPID	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)
35	GRANDE PRAIRIE ECOPOWER CENTRE	GPEC		Co-gen	7.7	7.9	8.8	6.9	10.0	10.9	7.4	8.9	10.0	9.6	9.6	10.9
36	P&G WEYERHAUSER	WEY1		Co-gen	0.3	0.7	0.9	0.3	0.7	0.7	0.1	0.1	0.1	0.1	0.1	0.1
37	BEAR CREEK G2	BCR2	1	Co-Cycle	15.0	15.1	14.8	20.0	17.2	16.0	20.4	14.7	10.3	16.6	18.0	17.6
38	DIASHOWA	DAI1	1	Co-gen	13.4	10.5	8.9	15.9	10.9	6.2	11.1	8.0	7.7	15.1	12.0	9.7
39	HARMATTAN GAS PLANT DG	0000025611		Gas	2.6	3.6	3.9	9.7	7.0	6.3	8.8	9.9	9.9	0.2	6.8	9.3
40	SHELL CAROLINE	SHCG		Co-gen	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.2
41	GOLD CREEK	GOC1		Gas-decomp	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.7	0.1	0.0	0.3	0.6
42	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
43	BALZAC	NX01	1	Co-Cycle	53.9	47.0	28.8	54.0	43.3	20.8	44.3	24.3	9.0	52.0	33.9	21.8
44	ENMAX CALGARY ENERGY CENTRE CTG	CES1	1	Co-Cycle	106.2	82.9	61.4	108.7	46.1	45.3	111.7	62.0	43.0	118.2	75.8	45.8
45	ENMAX CALGARY ENERGY CENTRE STG	CES2	1	Co-Cycle	68.6	51.9	37.6	71.7	27.9	26.6	75.8	41.7	28.7	77.4	48.4	29.4
46	FORTISALBERTA AL-PAC PULP MILL	AFG1TX	1	Gas	14.7	11.0	9.8	20.4	12.7	9.0	12.8	8.6	8.4	12.4	12.8	9.4
47	CITY OF MEDICINE HAT	CMH1	1	Gas	24.2	16.1	9.0	48.8	29.0	12.4	17.7	8.8	4.8	20.5	19.8	12.0
48	CAVALIER	EC01	1	Co-Cycle	79.7	69.0	48.3	83.8	69.8	43.9	71.6	45.1	27.7	79.6	72.9	61.0
49	NOVA JOFFRE	NOVAGEN15M	1	Co-gen	133.6	101.8	86.0	105.3	104.2	75.4	94.6	71.4	67.5	72.5	48.3	48.2
50	BUCK LAKE	0000045411		Co-gen, 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
51	PRIMROSE	PR1		Co-gen	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.0	0.2	0.3	0.7
52	SHELL SCOTFORD	SCTG		Co-gen	0.0	0.0	0.0	4.1	1.4	0.4	2.7	1.1	0.6	6.5	3.0	0.7
53	REDWATER	TC02	1	Co-gen	13.6	14.0	14.7	18.7	15.1	15.3	11.1	14.1	17.1	13.7	14.7	16.3
54	FOSTER CREEK G1	EC04		Co-gen	34.8	34.9	35.5	31.7	23.0	10.0	22.0	24.0	25.1	35.5	26.7	23.4
55	MEG ENERGY	MEG1		Co-gen	140.8	139.5	139.0	142.3	129.7	118.9	124.8	127.7	131.3	142.2	122.2	115.2
56	NEXEN OPTI	NX02		Co-gen	33.9	37.8	35.9	40.1	33.9	41.0	26.6	27.2	37.3	45.6	42.0	39.3
57	MAHKESES COLD LAKE	IOR1		Co-gen	40.9	38.3	37.3	37.9	14.1	12.2	31.2	37.4	43.0	42.8	47.4	48.8
58	MUSKEG	MKR1	1	Co-gen	48.6	42.9	37.0	34.5	29.7	41.4	30.2	25.0	20.0	58.3	43.7	40.5
59	MCKAY RIVER	MKRC	1	Co-gen	143.7	143.2	149.7	151.8	156.4	161.6	103.1	120.3	145.1	171.4	103.0	77.2
60	CNRL HORIZON	CNR5		Co-gen	0.9	1.3	1.0	0.0	4.1	11.0	0.9	2.8	3.8	0.9	3.1	3.5
61	SUNCOR MILLENIUM	SCR1	1	Co-gen	411.2	408.3	404.6	385.7	370.9	361.8	334.5	340.6	358.0	413.2	351.1	326.8
62	SYNCRUDE	SCL1		Co-gen	0.0	0.2	0.4	0.0	4.3	13.3	10.6	21.2	48.0	3.4	1.5	0.6
63	DOW GTG	DOWGEN15M	1	Co-gen	86.0	72.7	47.3	85.0	72.7	55.6	62.7	40.4	25.8	97.8	72.6	52.3
64	CASCADE	CAS	1	Hydro	17.6	11.8	8.1	18.3	7.5	1.4	13.9	11.4	9.2	11.4	5.3	3.0
65	RUNDLE	RUN	1	Hydro	9.4	8.6	3.9	12.2	7.9	1.2	24.3	18.6	9.3	9.1	7.4	3.3
66	THREE SISTERS	THS		Hydro	0.9	0.8	0.4	0.3	0.1	0.0	0.8	0.6	0.5	1.1	0.7	0.3
67	GHOST	GHO	1	Hydro	16.8	16.6	10.8	17.9	17.4	17.1	46.8	44.2	42.6	15.0	16.0	11.0
68	SPRAY	SPR	1	Hydro	41.0	37.9	20.8	45.9	32.8	9.7	76.1	60.4	32.3	36.3	28.7	15.4
69	BEARSPAW	BPW	1	Hydro	2.9	3.8	3.7	6.1	7.5	9.6	13.5	13.7	13.9	0.0	3.9	5.3
70	HORSESHOE	HSH	1	Hydro	9.2	8.5	7.7	8.8	8.6	9.3	11.7	12.1	13.2	5.5	7.2	7.9
71	KANANASKIS	KAN	1	Hydro	7.4	7.3	6.6	8.0	9.0	9.7	9.4	9.8	10.7	8.6	7.8	8.0

New GSO Number	Name	MPID	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)
72	BARRIER	BAR	1	Hydro	5.7	6.9	2.8	8.2	5.8	2.3	9.8	7.9	8.2	7.0	4.0	0.4
73	STIRLING	0000006711		Hydro, DG	0.0	0.0	0.0	0.0	0.2	1.3	0.0	0.1	0.3	0.0	0.1	0.4
74	POCATERRA	POC		Hydro	10.2	8.2	2.4	8.3	3.8	0.1	6.9	5.2	0.6	4.3	0.4	0.0
75	INTERLAKES	INT		Hydro	2.9	2.3	0.5	1.9	0.7	0.3	2.4	1.2	0.2	2.1	0.6	0.0
76	SPRING COULEE	0000038511		Hydro, DG	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
77	TAYLOR HYDRO	TAY1		Hydro	0.0	0.0	0.0	0.0	1.0	1.8	7.4	7.8	8.8	0.0	4.4	6.1
78	BRAZEAU	BRA	1	Hydro	48.8	35.9	10.8	58.7	29.7	3.7	152.9	126.5	152.2	41.6	36.9	4.9
79	OLDMAN	OMRH		Hydro	4.7	4.2	4.3	3.4	12.0	21.9	25.8	27.3	30.9	8.8	10.5	11.5
80	BIGHORN	BIG	1	Hydro	60.8	54.2	37.4	55.7	44.7	30.5	105.0	93.0	54.2	68.3	55.5	43.2
81	HR MILNER	HRM	1	Coal	77.5	55.0	45.0	91.8	70.4	52.5	80.0	45.0	29.0	90.8	75.3	59.9
82	SUNDANCE #4	SD4	1	Coal	271.0	271.6	273.0	109.0	104.8	144.1	244.5	176.7	128.3	246.0	253.4	238.0
83	SUNDANCE #5	SD5	1	Coal	144.6	160.1	166.6	109.1	151.2	152.9	182.0	136.8	72.4	8.3	82.7	120.8
84	SUNDANCE #6	SD6	1	Coal	192.3	229.9	253.5	129.0	208.9	198.9	259.5	261.6	266.3	213.5	214.2	219.6
85	SHEERNESS #1	SH1	1	Coal	184.4	176.4	155.9	158.1	169.2	118.7	191.5	104.9	19.9	191.7	200.9	186.0
86	SHEERNESS #2	SH2	1	Coal	178.1	167.0	145.4	155.4	170.1	137.8	179.0	140.5	86.3	169.2	187.1	187.8
87	KEEPPHILLS #3	KH3	1	Coal	233.7	225.0	232.9	213.2	210.2	185.2	220.1	206.9	171.7	228.3	223.1	209.4
88	GENESEE 1	GN1	1	Coal	208.8	212.2	210.1	226.6	158.4	126.5	225.6	207.9	147.2	214.3	204.2	201.5
89	GENESEE 2	GN2	1	Coal	191.1	192.3	188.4	224.9	216.6	191.9	219.0	165.9	59.0	216.5	214.3	216.8
90	GENESEE 3	GN3	1	Coal	245.3	240.6	243.2	248.5	230.9	237.4	230.3	205.7	168.0	190.3	106.8	105.9
91	BATTLE RIVER #5	BR5	1	Coal	269.5	242.7	177.4	280.4	263.1	212.6	213.2	205.0	183.2	270.0	254.1	183.5
92	KEEPPHILLS #1	KH1	1	Coal	297.0	293.0	288.2	27.1	18.8	3.0	277.3	305.1	276.9	299.1	326.0	303.0
93	KEEPPHILLS #2	KH2	1	Coal	308.6	301.8	291.5	333.8	312.8	299.8	322.4	303.5	277.2	253.0	314.0	308.6
94	BATTLE RIVER #3	BR3	1	Coal	90.3	82.6	60.5	94.3	84.5	67.5	92.0	78.2	62.3	96.3	85.2	58.4
95	BATTLE RIVER #4	BR4	1	Coal	82.0	82.2	61.0	97.0	92.0	77.8	94.3	81.0	61.1	97.4	87.7	58.5
96	SUNDANCE #3	SD3	1	Coal	266.5	266.5	266.4	271.1	226.2	223.6	88.1	98.2	116.8	173.6	161.1	135.7
97	HR MILNER	HRM	2	Coal	23.6	16.7	13.7	27.9	21.4	16.0	24.3	13.7	8.8	27.6	22.9	18.2
98	SHEERNESS #1	SH1	2	Coal	127.1	121.5	107.4	108.9	116.6	81.8	131.9	72.3	13.7	132.1	138.4	128.2
99	GENESEE 2	GN2	2	Coal	143.6	144.5	141.6	169.0	162.7	144.2	164.6	124.6	44.3	162.7	161.0	162.9
100	GENESEE 1	GN1	2	Coal	152.5	154.9	153.4	165.4	115.6	92.4	164.7	151.8	107.4	156.5	149.1	147.1
101	KEEPPHILLS #1	KH1	2	Coal	50.4	49.7	48.9	4.6	3.2	0.5	47.0	51.7	46.9	50.7	55.3	51.4
102	SUNDANCE #6	SD6	2	Coal	74.4	88.9	98.1	49.9	80.8	77.0	100.4	101.2	103.0	82.6	82.9	85.0
103	KEEPPHILLS #2	KH2	2	Coal	50.2	49.1	47.4	54.3	50.9	48.7	52.4	49.3	45.1	41.1	51.1	50.2
104	KEEPPHILLS #3	KH3	2	Coal	210.1	202.3	209.4	191.7	189.0	166.5	197.9	186.0	154.4	205.3	200.6	188.3
105	GENESEE 3	GN3	2	Coal	212.3	208.3	210.5	215.1	199.9	205.5	199.3	178.0	145.4	164.7	92.4	91.6
106	BATTLE RIVER #3	BR3	2	Coal	47.4	43.3	31.7	49.5	44.3	35.4	48.3	41.0	32.7	50.5	44.7	30.7
107	BATTLE RIVER #4	BR4	2	Coal	46.2	46.3	34.4	54.7	51.8	43.9	53.2	45.7	34.4	54.9	49.4	32.9
108	BATTLE RIVER #5	BR5	2	Coal	92.0	82.9	60.6	95.7	89.8	72.6	72.8	70.0	62.6	92.2	86.8	62.7

New GSO Number	Name	MPID	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)
109	SUNDANCE #5	SD5	2	Coal	134.1	148.6	154.6	101.2	140.3	141.9	168.9	126.9	67.2	7.7	76.8	112.0
110	SHEERNESS #2	SH2	2	Coal	137.6	129.0	112.3	120.1	131.5	106.5	138.3	108.5	66.7	130.7	144.6	145.1
111	SUNDANCE #4	SD4	2	Coal	51.4	51.5	51.7	20.7	19.9	27.3	46.3	33.5	24.3	46.6	48.0	45.1
112	SUNDANCE #3	SD3	2	Coal	31.5	31.5	31.4	32.0	26.7	26.4	10.4	11.6	13.8	20.5	19.0	16.0
113	SUNDANCE #1	SD1	1	Coal	243.0	225.0	216.0	235.0	235.0	217.0	250.0	241.0	237.0	239.0	210.0	199.0
114	SUNDANCE #2	SD2	1	Coal	191.0	185.0	177.0	232.0	226.0	206.0	186.0	131.0	104.0	253.0	232.0	228.0
115	BRAZEAU	BRA	2	Hydro	1.8	1.3	0.4	2.2	1.1	0.1	5.7	4.7	5.7	1.5	1.4	0.2
116	BIGHORN	BIG	2	Hydro	0.6	0.5	0.4	0.5	0.4	0.3	1.0	0.9	0.5	0.7	0.5	0.4
117	CASCADE	CAS	2	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
118	RUNDLE	RUN	2	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
119	GHOST	GHO	2	Hydro	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0
120	SPRAY	SPR	2	Hydro	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0
121	BEARSPAW	BPW	2	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
122	HORSESHOE	HSH	2	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
123	KANANASKIS	KAN	2	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
124	BARRIER	BAR	2	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
125	BC IMPORT	BCHIMP		Import	491.3	360.6	85.0	522.8	356.1	259.6	467.2	428.5	451.0	544.8	309.7	33.4
126	SASKATCHEWAN IMPORT	SPCIMP		Import	101.1	66.4	17.2	129.5	82.5	33.0	77.5	63.3	4.9	124.6	95.9	27.5
127	MONTANA TIE LINE	MATLIMP		Import	172.9	172.9	172.9	172.9	172.9	172.9	172.9	172.9	172.9	172.9	172.9	172.9
128	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
129	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
130	ATCO VALLEY VIEW 2	VVW2		Gas	0.9	0.2	0.0	9.8	3.3	0.2	2.8	0.5	0.0	8.5	1.7	0.2
131	ENMAX CROSSFIELD ENERGY CENTER	CRS3	1	Gas	14.7	6.6	1.9	31.6	25.1	5.0	14.5	6.3	0.2	17.6	5.6	1.9
132	ENMAX CROSSFIELD ENERGY CENTER	CRS1	1	Gas	17.2	7.2	1.7	32.8	22.4	2.9	14.1	5.9	0.1	22.9	7.6	2.1
133	RAINBOW 1	RB1		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
134	RAINBOW 4	RL1		Co-gen Gas	27.7	31.9	33.6	44.5	29.0	17.4	33.0	34.9	38.6	14.8	28.8	32.1
135	RAINBOW 3	RB3		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
136	RAINBOW 2	RB2		Gas	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.2	0.0	0.0	1.0	1.1
137	RAINBOW 5	RB5	1	Gas	25.2	15.3	7.8	28.5	15.1	3.4	17.3	5.7	0.1	21.8	15.7	5.7
138	DRYWOOD 1	DRW1		Gas	0.5	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.8	0.2	0.0
139	FORT NELSON	FNG1	1	Gas	14.4	8.0	2.9	30.3	18.0	12.2	16.4	6.1	0.2	28.8	20.8	11.0
140	CLOVER BAR 1	ENC1	1	Gas	3.1	1.0	0.2	3.1	2.5	0.5	5.1	0.8	0.0	6.7	3.9	1.1
141	CLOVER BAR 2	ENC2	1	Gas	27.1	11.1	2.9	30.1	22.3	3.9	32.2	9.6	0.6	48.7	25.7	5.5
142	CLOVER BAR 3	ENC3	1	Gas	36.5	18.7	6.2	25.1	22.5	4.7	32.6	12.2	0.4	46.8	31.1	6.9
143	ENMAX CROSSFIELD ENERGY CENTER	CRS2	1	Gas	14.3	6.6	1.1	32.4	22.6	3.2	15.9	6.4	0.1	21.5	6.4	2.4
144	NORTHERN PRAIRIE POWER PROJECT	NPP1	1	Gas	25.0	10.4	1.1	52.7	25.1	0.9	31.8	10.0	0.4	29.3	18.2	2.2
145	BEAR CREEK G2	BCR2	2	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

New GSO Number	Name	MPID	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)
146	CARSELAND	TC01	2	Co-gen	63.2	63.5	63.9	69.4	66.0	65.4	65.9	64.4	63.5	67.0	67.6	66.7
147	REDWATER	TC02	2	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
148	MCKAY RIVER	MKRC	2	Co-gen	0.3	0.3	0.3	0.3	0.4	0.4	0.2	0.3	0.3	0.4	0.2	0.2
149	CAVAILIER	EC01	2	Co-Cycle	22.2	19.2	13.4	23.3	19.4	12.2	19.9	12.5	7.7	22.1	20.3	17.0
150	MUSKEG	MKR1	2	Co-gen	1.5	1.3	1.1	1.0	0.9	1.3	0.9	0.8	0.6	1.8	1.3	1.2
151	BALZAC	NX01	2	Co-Cycle	50.3	43.9	26.9	50.4	40.5	19.4	41.4	22.7	8.4	48.6	31.7	20.4
152	CITY OF MEDICINE HAT	CMH1	2	Gas	10.8	7.2	4.0	21.8	12.9	5.5	7.9	3.9	2.2	9.1	8.9	5.3
153	DOW GTG	DOWGEN15M	2	Co-gen	17.6	14.9	9.7	17.4	14.9	11.4	12.9	8.3	5.3	20.1	14.9	10.7
154	ENMAX CALGARY ENERGY CENTRE CTG	CES1	2	Co-Cycle	26.3	20.5	15.2	26.9	11.4	11.2	27.6	15.3	10.6	29.2	18.7	11.3
155	ENMAX CALGARY ENERGY CENTRE STG	CES2	2	Co-Cycle	17.0	12.8	9.3	17.7	6.9	6.6	18.7	10.3	7.1	19.1	12.0	7.3
156	DIASHOWA	DAI1	2	Co-gen	3.0	2.3	2.0	3.5	2.4	1.4	2.4	1.8	1.7	3.3	2.6	2.1
157	SUNCOR MILLENIUM	SCR1	2	Co-gen	2.4	2.4	2.4	2.3	2.2	2.1	2.0	2.0	2.1	2.4	2.1	1.9
158	FORTISALBERTA AL-PAC PULP MILL	AFG1TX	2	Gas	4.8	3.6	3.2	6.7	4.2	3.0	4.2	2.8	2.8	4.1	4.2	3.1
159	NOVA JOFFRE	NOVAGEN15M	2	Co-gen	45.1	34.4	29.0	35.5	35.2	25.4	31.9	24.1	22.8	24.5	16.3	16.3
160	IMPERIAL OIL COLD LAKE EXPANSION NABIYE PLANT	Project901_1_GEN		Co-gen	0.0	0.0	0.0	0.0	0.0	0.0	164.9	164.9	164.9	164.9	164.9	164.9
161	ENMAX SHEPARD ENERGY CENTRE	Project719_1_SUP		Co-Cycle	0.0	0.0	0.0	0.0	0.0	0.0	75.0	75.0	75.0	250.0	250.0	250.0
162	RAINBOW 5	RB5	2	Gas	15.9	9.7	4.9	18.0	9.6	2.2	10.9	3.6	0.1	13.7	9.9	3.6
163	CLOVER BAR 3	ENC3	2	Gas	24.1	12.3	4.1	16.6	14.8	3.1	21.5	8.1	0.3	30.8	20.5	4.5
164	NORTHERN PRAIRIE POWER PROJECT	NPP1	2	Gas	13.9	5.8	0.6	29.2	13.9	0.5	17.6	5.5	0.2	16.2	10.1	1.2
165	CLOVER BAR 2	ENC2	2	Gas	14.9	6.1	1.6	16.5	12.2	2.2	17.7	5.3	0.3	26.8	14.1	3.0
166	FORT NELSON	FNG1	2	Gas	0.5	0.3	0.1	1.1	0.7	0.5	0.6	0.2	0.0	1.1	0.8	0.4
167	CLOVER BAR 1	ENC1	2	Gas	8.6	2.7	0.6	8.5	7.0	1.3	14.0	2.2	0.0	18.7	10.9	3.0
168	ENMAX CROSSFIELD ENERGY CENTER	CRS1	2	Gas	1.6	0.6	0.2	3.0	2.0	0.3	1.3	0.5	0.0	2.1	0.7	0.2
169	ENMAX CROSSFIELD ENERGY CENTER	CRS2	2	Gas	1.3	0.6	0.1	2.9	2.1	0.3	1.4	0.6	0.0	2.0	0.6	0.2
170	ENMAX CROSSFIELD ENERGY CENTER	CRS3	2	Gas	1.2	0.5	0.2	2.6	2.1	0.4	1.2	0.5	0.0	1.5	0.5	0.2
171	POPLAR HILL	PH1	2	Gas	1.3	0.5	0.3	25.3	7.2	0.5	3.2	0.9	0.1	7.0	2.4	0.6
172	BEAR CREEK G1	BCRK	2	Co-Cycle	3.8	0.7	0.0	20.0	15.2	8.5	13.8	6.1	0.0	23.0	20.1	14.2
173	VALLEYVIEW	VVW1	2	Gas	0.9	0.4	0.0	22.1	6.2	0.2	2.6	0.6	0.2	3.7	1.5	0.3
174	NRGREEN WINDFALL POWER GENERATING STATION	NRG3		Gas	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6
175	FORTIS GENALTA CARSON CREEK GENERATOR - STS INCREASE	GEN5		Gas	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
176	FORTIS ANC (ALBERTA NEWSPRINT COMPANY) - GENERATION	BTF_NEWSPRNT_GEN		Gas	53.4	53.4	53.4	53.4	53.4	53.4	53.4	53.4	53.4	53.4	53.4	53.4