

BC HYDRO

T&D SYSTEM OPERATIONS

SYSTEM OPERATING ORDER 7T-64

ROTATIONAL ENERGY TO SUPPORT TRANSFER LIMITS

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| Denotes revision

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1.0 GENERAL

This System Operating Order (SOO):

- Defines limits on net megawatt transfers into the BC Hydro (BCH) Balancing Authority (BA), as a function of system load and on-line rotational energy for equipment in the BA Area (See Sections 5.0 and 6.0),
- Defines limits on minimum generation as a generation RMR in the BCH BA Area (see Section 7.0).

These limits and RMR are a function of the BC Hydro Load and the level of rotational energy in the generators and synchronous condensers connected to the system. Higher loads and higher rotational energy both increase import capabilities. These limits are calculated by the TSA-PM advanced application in the BC Hydro Energy Management Systems (EMS). See Section 8.0.

Appendix 1 describes the rotational energy calculation for the BCH BA and details on the contributions of individual generating units and synchronous condensers.

2.0 RESPONSIBILITIES

BC Hydro Generation System Operations' Planning, Scheduling and Operations Shift Engineers (PSOSE) are responsible for providing hourly plant base points, economic participation factors, unit commitment tables, and unit instructions that are in compliance with this order.

The BCH Control Centre (BCHCC) Transmission Coordinator is responsible for ensuring that real time transfers into the BCH BA are in compliance with this order. If increases in generation and decreases in imports are required, then PSOSE must be involved to the extent possible.

3.0 5L61 TRIPPING RAS

To optimize the North Coast system performance, 5L61 will be tripped for the simultaneous loss of 5L51 and 5L52, OR loss of 5L51 (or 5L52) with 5L52 (or 5L51) out of service when BCH is importing more than a certain amount of MW from US and the MW transfer on 5L61 from WSN is less than 75 MW. See System Operating Order (SOO) 7T-18 Section 7.0 for the detailed information.

The status of the 5L61 RAS Arming (armed/disarmed) impacts the Net BCH Transfer Limit calculation, and therefore impacts the generation RMR for sustaining transfers to the load.

4.0 EXPECTED EVENTS FOLLOWING LOSS OF LARGE IMPORTS

The transfer limits in this order are based on the following sequence of events under heavy import conditions:

- Loss of both Ingledow – Custer 500kV circuits (5L51 and 5L52).
- Opening of the Nelway – Boundary 230kV circuit (2L112) by normal operation of the Eastern Controlled Separation Remedial Action Scheme (ECS RAS) (refer to SOO 7T-18 for details).
- Tripping of the BC – Alberta Intertie by the AB TIE RAS (refer to SOO 7T-18 for details).
- Tripping 5L61 by the 5L61 RAS or Tripping of the BCH – RTA tie by the slip relay on line 2L103 due to excess power flow from RTA.
- Operation of under frequency load shedding across the BCH Balancing Authority Area.
- Tripping of the following generation by under frequency relay operation:
 - 59.88 Hz NWE G1

- 59.5 Hz LB1 G1
- 58.5 Hz MAM G1 and G2
- 58.5 Hz MCM G1 and G2
- 58.5 Hz WDN generation
- BCH system frequency dropping no lower than 58.0 Hz before starting to recover.

5.0 DEFINITION OF “NET BCH TRANSFER”

The “Net BCH Transfer” in megawatts is defined as the transfers that will be lost as a result of the scenario described in Section 4.0.

Net BCH Transfer = BC - US transfer
 Plus BC - Alberta transfer
 Plus Minette - Kitimat transfer

BC-US Transfer = ING-to-Custer MW
 Plus NLY-to-BDY MW

BC-Alberta Transfer = CBK-to-LGN MW
 Plus 1L274 MW from the line into the POC bus
 Plus NTL to Coleman MW

Minette - Kitimat Transfer = MIN-to-KIT MW

Transfer is negative if the BCH Balancing Authority is importing and positive if exporting.

For each path, the value is positive if the flow is in the stated direction and the value is negative if the flow is in the opposite direction. This is the normal Balancing Authority sign convention.

6.0 NET BCH TRANSFER LIMIT

The Net BCH Transfer Limit is a function of the expected operating topology. A significant impact is due to the presence of north coast load on the interconnected BC Hydro system after a separation of the BC-US intertie. The 5L61 RAS arming status changes the value significantly, and is noted in the sequence of events in Section 4.0. The impact on the transfer limit is:

IF 5L61 RAS is not armed, then:

Net BCH Transfer Limit. = the value in the table below

IF 5L61 RAS is armed, then:

Net BCH Transfer Limit = the value in the table below
 + 2L103 MIN
 – 5L61 WSN
 + 0.01 × (BCH load -3800 MW)
 + 45 MW

For use in Table 6.1 below, the Net BCH Transfer Limit equations should be assessed compared to BCH Load. The definition for BCH Balancing Authority Load and BCH Load is:

BCH Balancing Authority Load
 = Total Generation in the BCH Balancing Authority
 - BC-US Transfer
 - BC-AB Transfer

- Minette-Kitimat Transfer

BCH Load

- = BCH Balancing Authority Load
- FBC Generation
- BCH-FBC Transfer

Table 6.1 The “Net BCH Transfer” Limit

BCH Load (MW)	Rotational Energy						
	20,000 Mega-Joules	25,000 Mega-joules	30,000 Mega-joules	35,000 Mega-Joules	40,000 Mega-Joules	45,000 Mega-joules	50,000 Mega-joules
3800	-1689	-1838	-1987	-2136			
3900	-1726	-1867	-2008	-2149			
4000	-1761	-1896	-2031	-2165			
4100	-1797	-1925	-2054	-2183			
4200	-1831	-1955	-2078	-2201			
4300	-1866	-1984	-2103	-2222	-2340		
4400	-1900	-2014	-2129	-2243	-2357		
4500	-1934	-2044	-2155	-2265	-2375		
4600	-1968	-2074	-2181	-2288	-2394		
4700	-2001	-2105	-2208	-2311	-2415	-2518	
4800	-2035	-2135	-2235	-2336	-2436	-2536	
4900	-2068	-2165	-2263	-2360	-2458	-2555	
5000	-2101	-2196	-2291	-2386	-2480	-2575	
5100	-2134	-2227	-2319	-2411	-2504	-2596	-2688
5200	-2167	-2257	-2347	-2437	-2527	-2617	-2708
5300	-2209	-2297	-2386	-2475	-2563	-2652	-2741
5400	-2264	-2352	-2440	-2529	-2617	-2705	-2793
5500	-2319	-2407	-2495	-2583	-2670	-2758	-2846
5600	-2375	-2462	-2549	-2637	-2724	-2811	-2899
5700	-2430	-2517	-2604	-2691	-2778	-2864	-2951
5800	-2486	-2572	-2658	-2745	-2831	-2918	-3004
5900	-2541	-2627	-2713	-2799	-2885	-2971	-3057
6000	-2597	-2682	-2768	-2853	-2939	-3024	-3110
6100	-2652	-2737	-2822	-2907	-2992	-3077	-3162
6200	-2708	-2793	-2877	-2962	-3046	-3131	-3215
6300	-2764	-2848	-2932	-3016	-3100	-3184	-3268
6400	-2820	-2903	-2987	-3070	-3154	-3238	-3321
6500	-2876	-2959	-3042	-3125	-3208	-3291	-3374
6600	-2932	-3014	-3097	-3179	-3262	-3345	-3427
6700	-2988	-3070	-3152	-3234	-3316	-3398	-3480
6800	-3044	-3125	-3207	-3289	-3370	-3452	-3534
6900	-3100	-3181	-3262	-3343	-3424	-3506	-3587
7000	-3156	-3237	-3317	-3398	-3479	-3559	-3640

Note: Values in the table are in MW. Then negative values indicate these are net import transfers.

7.0 **GENERATION RELIABILITY MUST RUN (RMR)**

The generation Reliability Must Run requirement (RMR) for the BCH Balancing Authority is a function of load and the rotational energy of the generators and synchronous condensers in the Balancing Authority. The RMR is the necessary requirement for support of energy transfers at all times. Energy transfers must be curtailed if the RMR requirement cannot be met for support of the actual transfers.

BCH Balancing Authority RMR = (Balancing Authority Load) minus (limit for "Net BCH Transfer").

See Section 6.0 of this System Operating Order for the limit calculation. Use linear interpolation of the BCH load and the rotational energy for the appropriate limit for "Net BCH Transfer"; calculate the RMR using the formula above.

8.0 **TSA-PM and PI APPLICATIONS**

The Net BCH Transfer Limit:

- is calculated in TSA-PM every 2 minutes.
- is displayed on the EMS Generation Coordinator and System Overview displays with a reversed sign (i.e. indicates magnitude only).
- associated PI tag is "TSA:SYS_PAR.IMPLMT_NEG".
- calculation is capped at -3686 MW.
- calculation uses rotational energy calculated by TSA. The associated PI tag for rotational energy is "TSA:SYS_PAR.SYSRE.SE".
- calculation uses the BCH load calculated by TSA using state estimator values. The associated PI tag for TSA calculated load is "TSA:SYS_PAR:BCHMWLD"

The Actual Total Net Transfer:

- is calculated in TSA-PM every 2 minutes.
- is displayed on the EMS Generation Coordinator and System Overview displays.
- associated PI tag is "TSA:SYS_PAR.BCHIMP"

The TSA application alarms when the Actual Total Net Transfer violates the Net BCH Transfer Limit. The associated PI tag for this alarm is "TSA:SYS_PAR.VSTATUS". The associated SCADA alarms are:

- TOTAL IMPORT LIMIT VIOLATED
- TOTAL IMPORT RETURNED TO BELOW LIMIT

A shadow calculation of the rotational energy is done by an energy management system PDC routine. The associated PI tag for this shadow calculation is "TSA:SYS_PAR.SYSRE".

9.0 REVISION HISTORY

Revised By	Revision Date	Summary of Revision
RAC/LBu	23 September 2014	<ul style="list-style-type: none"> • Appendix 2 revisions include: <ul style="list-style-type: none"> ○ Duplicates in Appendix 2 are removed and table is re-ordered alphabetically (by plant) ○ Deleted previous Note 4 in regarding the 1000 MJ margin for FBC inertia and revised Note 5 to exclude the margin. Included WAX G1 and G2, MCA G5 in Rotating Energy calculation. ○ Revision to MCA G1-4 values.
YLC/LBao/RAC	24 March 2016	<ul style="list-style-type: none"> • Appendix 2: <ul style="list-style-type: none"> ○ Changed BGS to BSY (Burrard Synchronous condenser) ○ Included MCA G6 in Rotating Energy calculation and revised the inertia of MCA G5.
RAC/LBao	13 November 2018	<ul style="list-style-type: none"> • Section 1.0 – clarified the purpose of the SOO and the description of appendices • Section 2.0 – re-order of responsibilities and revised name for generation group • Section 8.0 – revised Alstom reference to EMS and revised names of EMS displays used. • Minor changes to acronyms and formatting not marked as revisions • Appendix 2 – revised to reflect John Hart (JHN) additions and removals (JHT), and Cheakamus (CMS) replacement. Revise Ruskin for new acronym (RSN)
RAC/LBAo	28 December 2018	<ul style="list-style-type: none"> • Revised contribution for RSN generators in Appendix 2. • Moved the Table 6.1 title, revised label, and added note.
RAC	01 March 2021	<ul style="list-style-type: none"> • Removed previous Appendix 1. Renumbered Appendix 2 to Appendix 1. Reformatted document.

APPENDIX 1 – ROTATIONAL ENERGY CALCULATION

The Net BCH Transfer Limit calculation uses the rotational energy of the units that will remain connected following loss of the interties during high import conditions.

Note 1 70% of the small units without status indication are estimated to be in service. This corresponds to approximately 530 mega-joules in the total energy calculation.

Note 2 Some units have under frequency relaying that will trip the units above 58.0 Hertz. These units are not included in the rotational energy calculation because they will no longer be connected to the electric system following the loss of the interties under heavy import conditions.

Note 3 The Kemano units are not included in the rotational energy calculation because it is assumed that the Kitimat - Minette tie will trip on over-power following the loss of the interties under heavy import conditions.

Note 4 Deleted

Note 5 BCH rotational energy = Sum of rotational energy of on-line units in following list plus 530 MJ

Plant or Station	Generator or Synchronous Condenser	SCADA Indication Available	H (Stored Energy at Synchronous Speed per MVA)	MVA Base	H*MBASE (Rotating Energy in Mega-joules)	Unit Status Used for Rotational Energy	Comments
Aberfeldie	ABF G1	Yes	3	2.5	8	No. See Note 1	
Aberfeldie	ABF G2	Yes	3	2.5	8	No. See Note 1	
Akokolex	AKO IPP	No	3	12	36	No. See Note 1	Illecillewaet 25F63
Arrow Lakes	ALH G1	Yes	2.28	102.8	234.4	Yes	
Arrow Lakes	ALH G2	Yes	2.28	102.8	234.4	Yes	
Alouette	ALU G1	No	2.66	10	27	No. See Note 1	
Ash River	ASH G1	Yes	3.2214	28	90	Yes	
Boston Bar Hydro	BBH IPP	No	3	7.5	23	No. See Note 1	
Burrard	BSY G1	Yes	1.51	180	274	Yes	
Burrard	BSY G2	Yes	1.24	180	223	Yes	
Burrard	BSY G3	Yes	1.59	180	286	Yes	
Burrard	BSY G4	Yes	1.24	180	223	Yes	
Lower Bear Hydro	BHL G1	Yes	0.810	5.56	4.5	Yes	
Lower Bear Hydro	BHL G2	Yes	0.810	5.56	4.5	Yes	
Upper Bear Hydro	BHU G1	Yes	1.42	14.67	20.8	Yes	
Bone Creek IPP	BNC G1	Yes	2.80	10.35	29.0	Yes	
Bone Creek IPP	BNC G2	Yes	2.80	10.35	29.0	Yes	
Bridge River	BR1 G1	Yes	3.28	50	164	Yes	
Bridge River	BR1 G2	Yes	3.28	50	164	Yes	

Plant or Station	Generator or Synchronous Condenser	SCADA Indication Available	H (Stored Energy at Synchronous Speed per MVA)	MVA Base	H*MBASE (Rotating Energy in Mega-joules)	Unit Status Used for Rotational Energy	Comments
Bridge River	BR1 G3	Yes	3.28	50	164	Yes	
Bridge River	BR1 G4	Yes	3.28	50	164	Yes	
Bridge River	BR2 G5	Yes	3.63	65.3	237	Yes	
Bridge River	BR2 G6	Yes	3.63	65.3	237	Yes	
Bridge River	BR2 G7	Yes	3.63	65.3	237	Yes	
Bridge River	BR2 G8	Yes	3.63	65.3	237	Yes	
Brilliant	BRD G1	Yes	2.28	44.5	101	Yes	
Brilliant	BRD G2	Yes	2.28	44.5	101	Yes	
Brilliant	BRD G3	Yes	1.7	44.5	76	Yes	
Brilliant	BRD G4	Yes	1.7	44.5	76	Yes	
Brilliant Expansion	BRX G1	Yes	3.9	141.2	551	Yes	
Browns Lake	BRL IPP	No	2.5	6.7	17	No. See Note 1	
Cheakamus	CMS G1	Yes	3.11	100	311	Yes	
Cheakamus	CMS G2	Yes	3.11	100	311	Yes	
Clowhom	COM G1	Yes	2.55	31.6	81	Yes	
Corra Lynn	COR-G1	Yes	2.1	15	32	Yes	
Corra Lynn	COR-G2	Yes	2.1	15	32	Yes	
Corra Lynn	COR-G3	Yes	1.575	20	32	Yes	
Crestbrook	CRS G2	No	3	54	162	No. See Note 1	
Doran Taylor	DTR IPP	No	2.5	5.8	15	No. See Note 1	
Douglas	DGL G1	Yes	1.2	14.8	17.7	Yes	
Douglas	DGL G2	Yes	1.2	14.8	17.7	Yes	
Elko	ELK G1	Yes	3	6	18	No. See Note 1	
Elko	ELK G2	Yes	3	6	18	No. See Note 1	
East Toba	ETR G1	Yes	3.2	81.2	260	Yes	
East Toba	ETR G2	Yes	3.2	81.2	260	Yes	
East Twin Creek	ETC - 3 units	No	2.5	2	5	No. See Note 1	Valemount 25F52
Evans Power	EVP	No		7.5		No. See Note 1	Golden 12F51
Falls River	FLS G1	No	3	6	18	No. See Note 1	
Falls River	FLS G2	No	3	6	18	No. See Note 1	
Fire	FRE G1	Yes	1.45	14.8	21.4	Yes	
Fire	FRE G2	Yes	1.45	14.8	21.4	Yes	
GM Shrum	GMS G01	Yes	5	239	1195	Yes	
GM Shrum	GMS G02	Yes	5	239	1195	Yes	
GM Shrum	GMS G03	Yes	5	239	1195	Yes	
GM Shrum	GMS G04	Yes	5	239	1195	Yes	
GM Shrum	GMS G05	Yes	5	239	1195	Yes	

Plant or Station	Generator or Synchronous Condenser	SCADA Indication Available	H (Stored Energy at Synchronous Speed per MVA)	MVA Base	H*MBASE (Rotating Energy in Mega-joules)	Unit Status Used for Rotational Energy	Comments
GM Shrum	GMS G06	Yes	5.29	239	1264	Yes	
GM Shrum	GMS G07	Yes	5.29	239	1264	Yes	
GM Shrum	GMS G08	Yes	5.29	239	1264	Yes	
GM Shrum	GMS G09	Yes	4.29	316	1356	Yes	
GM Shrum	GMS G10	Yes	4.29	316	1356	Yes	
Hystad Creek	HYC 2 units	No		5.7		No. See Note 1	Valemount 25F51
Howe Sound Pulp & Paper	HSP G1	Yes	2.2	69.4	152.7	Yes	
Howe Sound Pulp & Paper	HSP G2	Yes	4.3	58.8	252.8	Yes	
Island Co-Generation	ICG G1	Yes	8.1	280	2268	Yes	
John Hart	JHN G1	Yes	2.71	51	138	Yes	
John Hart	JHN G2	Yes	2.71	51	138	Yes	
John Hart	JHN G3	Yes	2.71	51	138	Yes	
Jamie Creek Hydro	JME G1	Yes	2.41	12.2	29.5	Yes	
Jamie Creek Hydro	JME G2	Yes	2.41	12.2	29.5	Yes	
Jordan River	JOR G1	Yes	4.77	167	797	Yes	
Kwoiek Creek	KCH G1	Yes	1.52	16	24.3	Yes	
Kwoiek Creek	KCH G2	Yes	1.52	16	24.3	Yes	
Kwoiek Creek	KCH G3	Yes	1.52	16	24.3	Yes	
Kwoiek Creek	KCH G4	Yes	1.52	16	24.3	Yes	
Kootenay Canal	KCL G1	Yes	5.07	147	745	Yes	
Kootenay Canal	KCL G2	Yes	5.07	147	745	Yes	
Kootenay Canal	KCL G3	Yes	5.07	147	745	Yes	
Kootenay Canal	KCL G4	Yes	5.07	147	745	Yes	
Keogh	KGT G2	No	2.33	69.6	162	No. See Note 1	
Kelly Lake	KLY SC2	Yes	1.42	75	107	Yes	
Kemano	KMO 8 units	No		880		No. See Note 3	
Lajoie	LAJ G1	Yes	2.79	24.4	68	Yes	
Lake Buntzen 1	LB1 G1	Yes	4	62.5	250	No. See Note 2	
Lake Buntzen 2	LB2 G2	No		8.9		No. See Note 1	
Lake Buntzen 2	LB2 G3	No		8.9		No. See Note 1	
Lower Bonnington	LBO G1	Yes	2	17.5	35	Yes	
Lower Bonnington	LBO G2	Yes	2.1	20	42	Yes	
Lower Bonnington	LBO G3	Yes	2	17.5	35	Yes	
Lower Clowhom	LCH G1	Yes	1.5	12.2	18.3	Yes	
Ladore	LDR G1	Yes	2.36	30	71	Yes	
Ladore	LDR G2	Yes	2.36	30	71	Yes	
Lamont	LMN G1	Yes	1.25	16.8	20.9	Yes	

Plant or Station	Generator or Synchronous Condenser	SCADA Indication Available	H (Stored Energy at Synchronous Speed per MVA)	MVA Base	H*MBASE (Rotating Energy in Mega-joules)	Unit Status Used for Rotational Energy	Comments
Lamont	LMN G2	Yes	1.25	16.8	20.9	Yes	
Long Lake IPP	LNL G1	Yes	1.38	19.0	26.2	Yes	
Long Lake IPP	LNL G2	Yes	1.38	19.0	26.2	Yes	
Mamquam	MAM G1	Yes	3.2214	27.5	88.5	Yes	
Mamquam	MAM G2	Yes	3.2214	27.5	88.5	Yes	
Mica	MCA G1	Yes	5.45	526	2867	Yes	
Mica	MCA G2	Yes	5.45	526	2867	Yes	
Mica	MCA G3	Yes	5.45	526	2867	Yes	
Mica	MCA G4	Yes	5.45	526	2867	Yes	
Mica	MCA G5	Yes	5.18	570	2953	Yes	
Mica	MCA G6	Yes	5.18	570	2953	Yes	
McMahon	MCM G1	Yes	5.6025	68.8	385	No. See Note 2	
McMahon	MCM G2	Yes	5.6025	68.8	385	No. See Note 2	
Miller Creek	MCP G1	No				Not commissioned.	Not commissioned.
Miller Creek	MCP G2	No		4.25		No. See Note 1	Pemberton 25F61
McDonald Ranch	MDH	No		0.1		No. See Note 1	Winsor 25F52
Montrose	MTC G1	Yes	3.7	49.1	182	Yes	
Montrose	MTC G2	Yes	3.7	49.1	182	Yes	
NW Energy	NWE G1	No	2.933	75	220	No. See Note 2	
Northwest Stave River	NWS G1	Yes	1.19	9.0	10.8	Yes	
Northwest Stave River	NWS G2	Yes	1.19	9.0	10.8	Yes	
Northwest Stave River	NWS G3	Yes	0.6644	3.4	2.3	Yes	
Peace Canyon	PCN G1	Yes	6.02	184	1108	Yes	
Peace Canyon	PCN G2	Yes	6.02	184	1108	Yes	
Peace Canyon	PCN G3	Yes	6.02	184	1108	Yes	
Peace Canyon	PCN G4	Yes	6.02	184	1108	Yes	
Pingston	PIN G1	Yes		15		No. See Note 1	
Pingston	PIN G2	Yes		15		No. See Note 1	
Puntledge	PUN G1	Yes	3.19	30	96	Yes	
Robson Valley	RBV IPP	No	2.5	5	13	No. See Note 1	Valemount 25F52
Revelstoke	REV G1	Yes	4.65	526	2446	Yes	
Revelstoke	REV G2	Yes	4.65	526	2446	Yes	
Revelstoke	REV G3	Yes	4.65	526	2446	Yes	
Revelstoke	REV G4	Yes	4.65	526	2446	Yes	
Revelstoke	REV G5	Yes	4.45	557	2479	Yes	
Rupert	RPG G1	Yes	3.62	38.8	140	Yes	
Rupert	RPG G2	Yes	3.01	38.8	117	Yes	

Plant or Station	Generator or Synchronous Condenser	SCADA Indication Available	H (Stored Energy at Synchronous Speed per MVA)	MVA Base	H*MBASE (Rotating Energy in Mega-joules)	Unit Status Used for Rotational Energy	Comments
Raging River	RRH IPP	No		2.2		No. See Note 1	Jeune Landing 25F51
Ruskin	RSN G1	Yes	4.71	50	235.5	Yes	
Ruskin	RSN G2	Yes	4.71	50	235.5	Yes	
Ruskin	RSN G3	Yes	4.71	50	235.5	Yes	
Riverside	RVG IPP	Yes	3	24	72	No. See Note 1	
Strathcona	SCA G1	Yes	2.95	37.5	111	Yes	
Strathcona	SCA G2	Yes	2.95	37.5	111	Yes	
Sechelt Creek	SCG IPP	No	3	18	54	No. See Note 1	
Seven Mile	SEV G1	Yes	3.96	225	891	Yes	
Seven Mile	SEV G2	Yes	3.96	225	891	Yes	
Seven Mile	SEV G3	Yes	3.96	225	891	Yes	
Seven Mile	SEV G4	Yes	3.7	233.3	863.21	Yes	
Stave Falls	SFL G1	Yes	3.32	45	149	Yes	
Stave Falls	SFL G2	Yes	3.32	45	149	Yes	
Shuswap	SHU G1	Yes	1.74	3.5	6	No. See Note 1	
Shuswap	SHU G2	Yes	1.74	3.5	6	No. See Note 1	
South Slocan	SLC G1	Yes	2.6	17.5	46	Yes	
South Slocan	SLC G2	Yes	1.49	24	36	Yes	
South Slocan	SLC G3	Yes	2.6	17.5	46	Yes	
Seaton Creek	SNH 3 units	No		0.3		No. See Note 1	New Denver 12F52
Seton	SON G1	Yes	2.79	42	117	Yes	
Soo River	SOR IPP	No	3	12	36	No. See Note 1	Rainbow 25F65
Spillimacheen	SPN G1	No	3	1.1	3	No. See Note 1	
Spillimacheen	SPN G2	No	3	1.1	3	No. See Note 1	
Spillimacheen	SPN G3	No	3	2.8	8	No. See Note 1	
Silversmith	SVS	No		0.1		No. See Note 1	New Denver 12F52
Stokke	SKK G1	Yes	1.23	14.8	18.2	Yes	
Stokke	SKK G2	Yes	1.23	14.8	18.2	Yes	
Tipella	TPA G1	Yes	1.46	14.8	21.6	Yes	
Tipella	TPA G2	Yes	1.46	14.8	21.6	Yes	
Upper Clowhom	UCH G2	Yes	2.0	12.2	24.4	Yes	
Upper Mamquam Hydro	UMH G1	Yes	1.52	15.0	22.8	Yes	
Upper Mamquam Hydro	UMH G2	Yes	1.52	15.0	22.8	Yes	
Upper Stave	USR G1	Yes	1.1	4.8	5.3	No	
Upper Stave	USR G2	Yes	1.1	11.4	12.5	Yes	
Upper Stave	USR G3	Yes	1.1	11.4	12.5	Yes	
Upper Stave	USR G4	Yes	1.1	11.4	12.5	Yes	

Plant or Station	Generator or Synchronous Condenser	SCADA Indication Available	H (Stored Energy at Synchronous Speed per MVA)	MVA Base	H*MBASE (Rotating Energy in Mega-joules)	Unit Status Used for Rotational Energy	Comments
Upper Bonnington	UBO G1	Yes	2.69	7.5	20	Yes	
Upper Bonnington	UBO G2	Yes	2.89	7	20	Yes	
Upper Bonnington	UBO G3	Yes	2.89	7	20	Yes	
Upper Bonnington	UBO G4	Yes	2.69	7.5	20	Yes	
Upper Bonnington	UBO G5	Yes	2	17.5	35	Yes	
Upper Bonnington	UBO G6	Yes	2	17.5	35	Yes	
Vancouver Island Terminal	VIT SC1	Yes	2.1	50	105	Yes	
Vancouver Island Terminal	VIT SC2	Yes	2.1	50	105	Yes	
Vancouver Island Terminal	VIT SC3	Yes	2.2	100	220	Yes	
Vancouver Island Terminal	VIT SC4	Yes	2.2	100	220	Yes	
Wahleach	WAH G1	Yes	3.58	75	269	Yes	
Waneta	WAN G1	Yes	3.305	141.5	468	Yes	
Waneta	WAN G2	Yes	3.305	141.5	468	Yes	
Waneta	WAN G3	Yes	2.999	141.5	424	Yes	
Waneta	WAN G4	Yes	2.917	141.5	413	Yes	
Waneta Expansion	WAX G1	Yes	3.7	186	688.2	Yes	
Waneta Expansion	WAX G2	Yes	3.7	186	688.2	Yes	
Walden North	WDN IPP	No	0.6	18	11	No. See Note 2	
Whatshan	WGS G1	Yes	4.28	55.5	238	Yes	
Walter Hardman	WHN G1	Yes	2.5	5	13	No. See Note 1	
Walter Hardman	WHN G2	Yes	2.5	5	13	No. See Note 1	