BC HYDRO GENERATING PLANT INTERCONNECTIONS

WHEREAS:

A. On April 1, 2005, British Columbia Hydro and Power Authority ("BC Hydro") and British Columbia Transmission Corporation ("BCTC") executed the Generating Plants and Operational Obligations Agreement ("GPOOA") whereby, inter alia, the parties identified BC Hydro's existing generating plant interconnections to the Transmission System for which BC Hydro receives transmission service as a Transmission Customer under its Open Access Transmission Tariff ("OATT");

B. On February 2, 2006, BCTC filed with the Commission Articles 2 to 8, and related sections, of the GPOOA for approval and pursuant to Commission Letter dated February 27, 2006, BCTC's application was approved;

C. On December 23, 2009, the Commission approved amendments to the GPOOA by Commission Order No. G-168-09;

D. On June 3, 2010, the *Clean Energy Act*, S.B.C. 2010, c. 16 ("CEA") received Royal Assent and on July 5, 2010, sections 21 to 33 regarding the integration of BC Hydro and BCTC came into force in accordance with the commencement provisions in section 77 of the CEA.

E. Part B (Articles 2 to 8), and related provisions, of the GPOOA had formed BCTC's (now BC Hydro's) Tariff Supplement 2; and

F. This Tariff Supplement amends and replaces the GPOOA to reflect the integration of BC Hydro and BCTC, but does not materially change the interconnection requirements and procedures which have been approved by the Commission as provided above.

ARTICLE 1 INTERPRETATION

1.1 Definitions

In this Tariff Supplement, the following terms will have the following meanings respectively:

(a) "**Applicable Reliability Standards**" has, at any time, the meaning then ascribed to that term in Attachment M-1 of the Tariff..

(b) "**BC Hydro Generation System**" means the Generating Plants, and their respective Interconnection Facilities and Metering Equipment, which are owned,

operated and controlled by BC Hydro, and includes all additions and modifications thereto and repairs and replacements thereof.

(c) "**Commission**" means the British Columbia Utilities Commission, and includes any successor regulatory body.

(d) "**Control Area**" has, at any time, the meaning then ascribed to that term in the Tariff.

(e) "**Generating Plant**" means each BC Hydro plant for the production of electricity, as identified in Attachment 1, but shall not include a Generating Plant's Interconnection Facilities; and "**Generating Plants**" means all such plants as provided in Attachment 1.

(f) "**Governmental Authority**" has, at any time, the meaning then ascribed to that term in Attachment M-1 of the Tariff.

(g) "**Good Utility Practice**" has, at any time, the meaning then ascribed to that term in the Tariff.

(h) "**Interconnection Facilities**" means all facilities and equipment, as identified in Attachment 2 of this Agreement, that are located between a Generating Plant and each respective Point of Interconnection, including any modification, addition, or upgrades to such facilities and equipment necessary to physically and electrically interconnect the Generating Plant to the Transmission System, including, for applicable Generating Plants, transmission facilities connected to the Transmission System for the purpose of providing station service power to the Generating Plant.

(i) "**Interconnection Customer**" has, at any time, the meaning then ascribed to that term in Attachment M-1 of the Tariff.

(j) "**Interconnection Requirements**" means the published "60 kV to 500 kV Interconnection Requirements for Power Generators" BC Hydro, as the same may be amended from time to time.

(k) "**Interconnection Service**" means the service provided by the Transmission Provider associated with the interconnection of the Generating Plants to the Transmission System enabling the transfer of electric energy and capacity from each Generating Plant at each Point of Interconnection. For greater certainty, Interconnection Service does not include transmission delivery service.

(l) "**Metering Equipment**" means all metering equipment installed pursuant to this Tariff Supplement at the metering points and all related metering equipment

within the Transmission System required for each Generating Plant, including but not limited to instrument transformers, MWh-meters, data acquisition equipment, transducers, remote terminal units, communications equipment, phone lines, and fibre optics.

(m) "**Modification**" has the meaning set forth in Section 2.4.

(n) "**Operating Order**" means any operating instruction that governs and defines the responsibilities and procedures for operating the Integrated Electric System.

(o) "**Point of Interconnection**" means each point, as set forth in Attachment 1 of this Tariff Supplement, where a Generating Plant's Interconnection Facilities connect to the Transmission System; and "**Points of Interconnection**" means all such Points of Interconnection as provided in Attachment 1.

(p) "**Tariff**" means BC Hydro's Open Access Transmission Tariff ('OATT"), as amended from time to time.

(q) "**Transmission Provider**" has, at any time, the meaning then ascribed to that term in the Tariff.

(r) "**Transmission System**" has, at any time, the meaning then ascribed to that term in the Tariff.

1.2 Attachments

The following Attachments are attached hereto and form part of this Tariff Supplement:

Attachment 1(a)	Generating Plants Interconnected to the Transmission System
Attachment 1(b)	Separation of Assets between Generation and Transmission Lines of Business, dated 4 April 2002 (as amended from time to time)
Attachment 2	Interconnection Facilities for Generating Plants
Attachment 3	Planned Modifications
Attachment 4	Procedures for Interconnection of Modifications to Generating Plants

ARTICLE 2 INTERCONNECTED OPERATION

2.1 Interconnection of Generating Plants

Interconnection Service is provided for each Generating Plant at each Point of Interconnection in accordance with the terms and conditions of this Tariff Supplement.

2.2 Applicability of Tariff

Unless otherwise expressly contemplated by this Tariff Supplement, the terms and conditions of this Tariff Supplement will supercede and apply to the exclusion of the Standard Generator Interconnection Procedures ("SGIP"), including the Standard Generator Interconnection Agreement ("SGIA"), set forth in Attachment M-1 of the Tariff. In addition, for the purposes of a BC Hydro Interconnection Request, Schedule A of Attachment 4 of this Tariff Supplement ("Terms and Condition for Modifications") is deemed to be a SGIA.

2.3 Technical Requirements for Interconnection Service

The existing technical requirements for Interconnection Service for each Generating Plant at the Points of Interconnection and the existing Interconnection Facilities for each Generating Plant are set out in Attachment 2. It is acknowledged that such requirements and facilities, and existing related facilities on the Transmission System, may not meet the Interconnection Requirements and, subject to Section 2.4, are deemed to be adequate for Interconnection Service and are exempt from meeting any Interconnection Requirements which they do not meet as of the date of this Tariff Supplement.

2.4 Modification to Interconnection and Generating Plants

(a) The BC Hydro Generation System shall be designed and constructed to meet the applicable Interconnection Requirements in effect at the time, provided that any existing facilities exempt from meeting the Interconnection Requirements, pursuant to Attachment 2, shall not be required to be modified, repaired, or replaced if such existing facilities are not impacted by the Modification.

(b) If BC Hydro, as the Interconnection Customer, requires a modification which will change the Point of Interconnection or increase the generating capacity of a Generating Plant or which may reasonably be expected to materially affect the stability or reliability of the Transmission System (each a "**Modification**"), then BC Hydro, as the Interconnection Customer, will submit an Interconnection Request to the Transmission Provider for the Modification in accordance with the Tariff and Attachment 4. For greater certainty, an Interconnection Request will not be required pursuant to this Section 2.4(b) for any Modification which is listed in Attachment 3 unless any such Modification would result in a material impact to the Transmission System.

ARTICLE 3 METERING

3.1 General

Existing Metering Equipment, as documented in Attachment 2, is deemed to be adequate to meet the metering requirements for interconnection to the Transmission System.

ARTICLE 4 GENERATING PLANT COMMUNICATIONS

4.1 Communication Obligations

Existing operating communications, as documented in Attachment 2, are deemed to be adequate to meet the operating communications requirements for Generating Plant dispatch and reporting, including reporting by remote telemetry.

ARTICLE 5 OPERATIONS RELATED TO GENERATING PLANTS

5.1 General

BC Hydro shall comply with the Applicable Reliability Standards.

5.2 Operating Orders

Operating Orders will be developed, implemented, reviewed and amended, as necessary, with respect to the Interconnection Services and the operation of the Generating Plant interconnections.

5.3 Start-Up and Synchronization

BC Hydro, as the Interconnection Customer, is responsible for the proper synchronization of each Generating Plant to the Transmission System in accordance with the applicable Operating Orders.

5.4 Reactive Power

Transmission Provider shall treat all sources of reactive power in the Control Area in an equitable non-discriminatory manner, subject to Transmission Provider's duty to maintain Transmission System reliability.

ATTACHMENT 1(a)
Generating Plants and Points of Interconnection

Attachment 1(a)

Generating Plants Interconnected to the Transmission System

	Station
1	Aberfeldie
2	Alouette
3	Ash River
4	Bridge River 1
5	Bridge River 2
6	Burrard
7	Cheakamus
8	Clowhoim
9	Elko
10	Falls River
11	Fort Nelson
12	GMS
13	John Hart
14	Jordan River
15	Kootenay Canal
16	Ladore
17	Lajoie
18	Lake Buntzen 1
19	Mica
20	Peace Canyon
21	Puntledge
22	Revelstoke
23	Rupert Gas Turbine
24	Ruskin
26	Seton
26	Seven Mile
27	Shuswap
28	Spillimacheen
29	Stave Falls
30	Strathcona
31	Wahleach
32	Walter Hardman
33	Whatshan

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ATTACHMENT 1(b)

BCHydro THE POWER IS YOURS

Inter-office memo

TO: Paul Adams
Elizabeth Hong

April 4, 2002

FROM: Ron Rogers
Brent Larsen

SUBJECT: G/T Asset Split Update

As requested, we have been successful in reaching common agreement in dividing the substation assets at generating station between T and G. Please find attached the GT Asset Split document identifying boundaries at each facility.

In addition, please find below a financial overview of proprosed asset transfers:

Description	Net Book Value ($,000)	Comments
Transfer from G to T	$54,389	Revelstoke and GMS switchyards represent over half of this value.
Transfer from T to G	$872	Elko unit transformer represents most of this
Transfer from T to Shared Services Corporate	$246	Prince Rupert Service Center is surplus to T needs
Proposed Common Assets includes Revelstoke Building Telecom Facilities RTU's	$30,632 $14,316 $2,386 $870	Further direction required. See Note 1.

Note 1—Further direction required on asset ownership of Revelstoke building, Telecom facilities and RTU's.

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Please find attached the final version of the asset separation between Generation and Transmission. To augment this, two sets of official signed marked up one-line diagrams have been prepared which identify the boundaries between G and T.

Please advise if you would like to meet to review.

Attachment

C: Carol Kucharski
Bryan Harrap
Stu Connacher
Hugh Litz

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Separation of Asset Between Generation and Transmission Lines of Business

Introduction

As part of BC Hydro's move to three distinct lines of business, the division of assets is being re-examined. The Corporate restructuring team has provided general guidance on the separation of Transmission and Generation Assets in the present Power Supply switchyards. This should help to reduce the appearance of conflict of interest for new generators wanting to connect to the transmission system. Thus, these new generators will be dealing solely with the Transmission Line of Business and not with their competitor, the Generation Line of Business, for a new connection.

Business Rules/Guiding Principles

Where practical, Generation Assets are to be considered at or around the high side of the step up transformer or unit circuit breaker and where possible include the associated disconnects.

Where practical, a natural physical boundary should be chosen such that it is relatively clear where Generation ends and Transmission starts.

The establishment of the boundaries at each generation station will be based on the above but will reflect the uniqueness of each facility.

Ownership of the land and major improvements such as buildings in which the substations reside will continue to reside with the Generation Business.

For those generation stations where the remaining Transmission components would be small, for simplicity it has been decided that the whole switchyard will remain with the Generation Line of Business.

As the boundary will establish ownership, asset management responsibilities such as maintenance, end of life replacement and enhancement will become the sole responsibility of the new owner. Current business arrangements for performing maintenance and operations work will continue for the short term. Further work is required to resolve how to best implement the different safety/work practices used by the two different lines of business.

Switchyards and generating facilities typically have common sub-systems such as the station service, DC systems, air systems, and communication systems which are essential to both lines of business. Where possible, logical physical boundaries have been established similar to the other major equipment. By way of an example, the station service transformers located in the switchyard have been deemed part of the Transmission Line of Business and the cables which brings this supply to the generating station would then be assigned to Generation Line of Business.

AUTHORS: Ron Rogers/Brent Larsen

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Separation of Asset Between Generation and Transmission Lines of Business

Unresolved Issues

The present split of assets between Transmission and Generation at Mica leaves a gap in the transmission supply system. The 500 kv bulk supply transmission system ends at the lead shafts and the starts again at the 60 kv transmission switchyard. A site-specific agreement needs to be developed for use of the Generation assets to supply this local transmission system.

Further work is required to address the liabilities and obligation of each party with respect to specific perils such as fire, oil spills, etc.

AUTHORS: Ron Rogers/Brent Larsen

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Separation of ...et Between
Generation and Transmission Lines of Business

Station	Boundary for Generation	Station Service	Comments
Aberfeldie	Up to and including T1	Included within G	
Alouette	Up to and including 60SA1	Included within G	
Ash River	Up to and including 1CVT1	Included within G	
Bridge River 1	Up to and including 3SA15 & 16 Up to but not including 12VR1 T3 and associate equipment are in Transmission	Included within G	
Bridge River 2	Up to and including 3DS-8 and 3SA14 & 15	Included within G	
Burrard	Up to and including 2D1-6	Up to and including 2D7 and 8	
Cheakamus	Up to and including 2DCB1 and 2DCB2	Up to but not including T3 and 0 4D51	
Clayton Falls	Part of NIA – not connected to the grid		
Clowhoim	Up to and including 1D21	Up to but not including 13D21	
Elko	Up to and including 60D1	Included within G	
Falls River	Up to and including 60CC1	Included within G	The camp is hydro therefore feeder is G
Fort Nelson	Up to and including 89-A101	Included within G	T concern over the Taps
GMS	Up to and including T1 – 10	Up to but not including 12VR1,12BP1,12VR2, and 12BP2	
John Hart	Up to and including 1D1-6	Up to and including 0 6FU1	
Jordan River	Up to and including 13CB1and 13CB2	Up to and including 25DSS1 and 25DSS2	
Keogh Gas Turbine	Whole station is G	Included within G	
Kootenay Canal	Up to and including 2D1-4	Up to and including 12D2CB5 and 12DCB7	
Ladore	Up to and including 1D2CB1 and 1D2CB2	Up to and including fuses to SS2 and to the Dam	
Lajoie	Up to and including 60DCB1	Up to and including 60D1	

AUTHORS: Ron Rogers/Brent Larsen

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Separation of ...et Between
Generation and Transmission Lines of Business

Station	Boundary for Generation	Station Service	Comments
Lake Buntzen 1	Up to and including 60DCB1	Up to and including Fuse disconnect 2 3DSS2	
Lake Buntzen 2	Whole station is G	Included within G	
Mica	Up to and including 5D36 and 5D37 Up to but not including 12D11 T11 and associated equipment are in Transmission	Included within G	Gap in Power Delivery machine for T
Peace Canyon	Up to and including T1, T2, 5LA1 and 5LA2	Up to and including Pole top disconnect on 12F54	
Punteledge	Up to and including 1DCB1	SS1 included with G Up to and including 25D2SS4 (SS4)	
Revelstoke	Up to and including 5D34 and 5D35	Up to but not including SST1 and SST2	
Rupert Gas Turbine	Whole station is G	Included within G	
Ruskin	Up to and including 60DCB1,60DCB2 and 60DCB4	Up to and including 60DCB3 Up to and including 13D251	
Seton	Up to and including 60DCB1	Up to but not including SS3	
Seven Mile	Up to and including 2LA21, 2PT21, 2LA22 and 2PT22	Up to and including 12D251	SEL 12F51 – G owns pole equipment but not the line
Shuswap	Up to and including 2 4D1	Included within G	
Spillimacheen	Up to and including 4CB1 and 2	Included within G	
Stave Falls (SFY/SFN)	Up to and including 60DBC20 and 60DCB10	Up to and including 60DSS1 and 60DSS2	
Strathcona	Up to and including 1D1-3	Included within G	
Wahleach	Up to and including 3D1 and 13DCB2 but not including 13DCB5	Up to and including 25DSS1 and 25DSS2	
Walter Hardman	Present—Up to and including 46D4 and 46D5 Future—Up to and including 60D1 and 60D2	Included within G	
Whatshan	Up to and including 1CC1	Up to and including 12DSS2	

AUTHORS Ron Rogers/Brent Larsen

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ATTACHMENT 2
Interconnection Facilities for Generating Plants

as of February 2005

Description	Cheakmus GS	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	2CB1, 2CB2	One Line Diagram Dwg No. 417-E06-D6-R2 & LOO: 3P05-61A
B.3 Blackstart		
Blackstart Capability	Yes, 1 - 375kVA Diesel Genset	Local Operationg Order 3P06-61A & One Line Diagram Dwg No. 417-E06-D6-R2
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	2CB1: 2000A ; 2CB2: 2000A	One Line Diagram; 417-E06-D6-R2
B) Disconnect Switches	2DCB1: 1200A ; 2DCB2: 1200A	One Line Diagram; 417-E06-D6-R2
2. Circuit breaker fault current rating	2CB1: 40kA ; 2CB2: 40kA	One Line Diagram; 417-E06-D6-R2
C.3 Generator Max Power Output		
Nameplate	G1 & G2: 80 MVA, 0.875 p.f., 13.8kV rated voltage	Powertch Report # 12046-21-00 CMS-1
MPO (plant)	157 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.O.
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	Local Operating Order; 3P05-61A for CMS
3. Line-Drop-Compensation (LDC) equipment and setting	Feature Not Available	Powertch Report # 12045-21-00 CMS-1
4. Joint Voltage Control Equipment	Feature Not Available	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1, G2: 0.9 p.u. - 1.1 p.u.	
B) Manual	Indeterminable	
6. ULTC capability	T1, T2: No ULTC	
C.5 Excitation Equipment		
1. Time for Vt to change from rated to 0.95% following a large step change	G1, G2: 0.03 sec	
2. Negative field voltage capability	-4.04 p.u. at 107 Vbase	Powertch Report # 12046-21-00 CMS-1. Exciter One line: 417-H06-0105 Sh. 8AA
3. PSS	G1, G2	

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Description	Cheakmus GS	Reference For Additional Information
C.6 Voltage Regulator when generator in Synchronous Condenser Mode or Minimum MW Mode		
A) Maximum Voltage	G1, G2: 1.1 p.u	Powertch Report # 12045-21-00 CMS-1
B) Minimum Voltage	G1, G2: 0.8 p.u	Powertch Report # 12045-21-00 CMS-1
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	No OEL	Powertch Report # 12045-21-00 CMS-1
2. UELs (Reactive Ampere Limiting)	For UEL curve(s), see reference	Powertch Report # 12045-21-00 CMS-1
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	No O/F and U/F protection but mechanical overspeed protection at 140%	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	51G sustained O/V protection: 122% of rated voltage with inverse time characteristics, no U/V protection	PI Sheets
D.1 General Protective Relay Requirements		
1. Relay Information	Refer to DWG 417-E06-D0000 R004 & Generator No 1 and Unit Transformer Protection Upgrade 2004 Revision 1. The Generating Station P&C Setting Sheets should also be consulted	
E.1 Operations Control and Telecommunications Facilities		

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Description	Cheakmus GS	Reference For Additional Information
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	RTU 016 / S231, T117	Communication Block Diagram
Control Center	SCC / LMC	Communication Block Diagram
Control Points	Point Assignment	417-R05-A22 Sh.1 to 7 / 417-H05-A7
Point Assignment	417-R05-A22 Sh.1 to 7 / 417-H05-A7	
Communication Block Diagram	417-R06-D0	
E.1.2 Automatic Generation Control System (AGC)	Yes / No	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	No	"http://w3/td/pcontrol/Subsites/Planning/pdf/RAS Summary.pdf"
E.1.4 Telemetry	Point Assignment	417-R05-A22 Sh.1 to 7 / 417-H05-A7
E.1.5 Alarm Points	Point Assignment	417-R05-A22 Sh.1 to 7 / 417-H05-A7
E.1.6 Equipment Status	Point Assignment	417-R05-A22 Sh.1 to 7 / 417-H05-A7
E.1.7 Battery/Charger System		Telecontrol Manual Unit 22 Section 1
System	24V DC System	417-R16-B26
E.1.8 Revenue Metering System	Feature Not Available	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		
Telecommunications Media	Power Line Carrier / UHF Radio to Black Tusk	

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Description	Jordan River GS	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	13CB1, 13CB2	One Line Diagram Operating one line Dwg No. 544-E06-U8000 R004 & LDO: 3P05-01A
B.3 Blackstart		
Blackstart Capability	Yes 1-25kVA, 600V AC Diesel Generator	LDO: 3P05-01A
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	13CB1,2 = 4000A	One Line Diagram: 544-E06-D16
B) Disconnect Switches	13DCB1,2 = 4.2kA	One Line Diagram: 544-E06-D16
2. Circuit breaker fault current rating	13CB1,2 = 60kA	One Line Diagram: 544-E06-D16
C.3 Generator Max Power Output		
Nameplate	G1: 200 MVA, 0.90 p.f., 13.8kV rated voltage	Report # PSE418 for JOR
MPO (plant)	170 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.O.
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	Local Operating Order 3P05-01A
3. Line-Drop-Compensation (LDC) equipment and setting	Feature Not Equipped	Report # PSE318 for JOR
4. Joint Voltage Control Equipment	Feature Not Equipped	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1: 0.8 p.u. - 1.1 p.u.	Report # PSE318 for JOR
B) Manual	Indeterminable	
6. ULTC capability	T1, T2: No ULTC	
C.5 Excitation Equipment		
1. Time for Vt to change from rated to 0.95% following a large step change	G1: 0.02 sec	Report # PSE318 for JOR
2. Negative field voltage capability	-4.5 p.u. at 170.4 Vbase	Report # PSE318 for JOR
3. PSS	G1	

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Description	Jordan River GS	Reference For Additional Information
C.6 Voltage Regulator when generator in Synchronous Condenser Mode or Minimum MW Mode		
A) Maximum Voltage	G1: 1.1 p.u.	Report # PSE318 for JOR
B) Minimum Voltage	G1: 0.8 p.u.	Report # PSE318 for JOR
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	Terminal Voltage limiter acts to limit the maximum terminal voltage to 1.1 p.u.	Report # PSE418 for JOR
2. UELs (Reactive Ampere Limiting)	For UEL curves, see reference	Report # PSE418 for JOR
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	81G: 63Hz for 50 sec	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	51G sustained O/V protection: 120% of rated voltage with inverse time delay characteristics; no U/V protection	PI Sheets
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for JOR, also see Protection Information on SIS	
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	RTU 046	Communication Block Diagram

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Description	Jordan River G9	Reference For Additional Information
Control Center	VIC, SCC	Communication Block Diagram
Control Points	Point Assignment	544-R04-A411 Sh 1 to 16
Point Assignment	544-R04-A411 Sh.1 to 16	
Communication Block Diagram	544-R04-54	
E.1.2 Automaec Generation Control System (AGC)	No	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	No	"http://w3ltd/pcontrol/Subsites/Planning/pdf/RAS5 ummary.pdf"
E.1.4 Telemetry	Point Assignment	544-R04-A411 Sh 1 to 16
E.1.5 Alarm Points	Point Assignment	544-R04-A411 Sh 1 to 16
E.1.6 Equipment Status	Point Assignment	544-R04-A411 Sh 1 to 16
E.1.7 Battery/Charger System		Telecontrol Manual Unit 22 Section 1
System	24V DC System	544-R16-B4 Sh 1 to C3
E.1.8 Revenue Metering System	Feature Not Equipped	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		
Telecommunications Media	Power Line Carrier	

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Description	Revelstoke GS	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	5CB1, 5CB2, 5CB3, 5CB4	One Line Diagram 212-P05-B9 Dwg No. 212-E05-U1801-R4 & LOO: 3P03-46f
B.3 Blackstart		
Blackstart Capability	Yes, 7-450kW, 347/600V AC Diesel Gensets	LOO: 6P03-66
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	5CB1-4 = 3000A	One Line Diagram Dwg No. 212-E05-U1801-R4
B) Disconnect Switches	5D1-4 = 3000A	One Line Diagram Dwg No. 212-E05-U1801-R4
2. Circuit breaker fault current rating	5CB1-4 = 40kA	One Line Diagram Dwg No. 212-E05-U1801-R4
C.3 Generator Max Power Output		
Nameplate	G1-G4: 485 MVA, 0.95 p.f., 16kV rated voltage	Report # PS-PSE-5
MPO (plant)	1980 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.D.
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	Local Operating Order 5P03-60
3. Line-Drop-Compensation (LDC) equipment and setting	AVR, 0.085 p.u.	Report # PS-PSE-5
4. Joint Voltage Control Equipment	Feature Not Equipped	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1-G4: 0.8 p.u. - 1.1 p.u.	
B) Manual	Indeterminable	
6. ULTC capability	T1 - T4: No LR TC	
C.5 Excitation Equipment		
1. Time for VT to change from rated to 0.95% following a large step change	G1-G4: 0.03	Report # PS-PSE-5
2. Negative field voltage capability	-7.41 p.u. at 173.35 Vbase	Report # PS-PSE-5
3. PSS	G1 - G4	

ACCEPTED: JAN 17 2011

ORDER NO. G 192 '10

COMMISSION SECRETARY

Description	Revelstoke GS	Reference For Additional Information
C.6 Voltage Regulator when generator in Synchronous Condenser Mode Or Minimum MW Mode		
A) Maximum Voltage	G1-G4: 1.1 p.u	Report # PS-PSE-5
B) Minimum Voltage	G1-G4: .96 p.u	Report # PS-PSE-5
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	G1 - G4: Field Current limiters act to limit If to 3120A Terminal Voltage limiter act to limit Vt to 17.6kV on all units	Report # PS-PSE-5
2. UELs (Reactive Ampere Limiting)	For UEL curve(s), see reference	Report # PS-PSE-5_CRO
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	81G O/F relay: 65 Hz for more that 60 sec. 12M rotor overspeed protection at 150%	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	59G sustained O/V protection at 120% of rated voltage with inverse time characteristics, and instantaneous protection at 140%	PI Sheets
C.10 Governor Specifications		
1. Speed Droop	G1, G2, G3, G4 = 5%	Report # PS-PSE-5
2. Dead Band	0.02% or less	
D.1 General Protective Relay Requirements		
1. Relay information	See Generating Station P&C Setting Sheets for REV	LOO: 3P03-46A2 & 3P03-46B

ACCEPTED: JAN 17 2011

ORDER NO. G192 10

COMMISSION SECRETARY

Description	Revelstoke GS	Reference For Additional Information
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	RTU 077 / RTU 078	Communication Block Diagram
Control Center	SIC / SCC, SIC	Communication Block Diagram
Control Points	Point Assignment	212-R05-A16 Sh.1 to 27 / 212-R05-A17 Sh.1 to 29
Point Assignment	212-R05-A16 Sh.1 to 27 / 212-R05-A17 Sh. 1 to 29	
Communication Block Diagram	212-R06-B0 Sh.1 to 14	
E.1.2 Automatic Generation Control System (AGC)	Yes	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	Yes	"http://w3hdpcontrol/Subsites/Planning/pdf/RASSummary.pdf"
E.1.4 Telemetry	Point Assignment	212-R05-A16 Sh.1 to 27 / 212-R05-A17 Sh.1 to 29
E.1.5 Alarm Points	Point Assignment	212-R05-A16 Sh.1 to 27 / 212-R05-A17 Sh.1 to 29
E.1.6 Equipment Status	Point Assignment	212-R05-A16 Sh.1 to 27 / 212-R05-A17 Sh.1 to 29
E.1.7 Battery/Charger System		Telecontrol Manual Unit 22 Section 1
System	48V DC System	212-A18-B23 Sh. 1 to 01
E.1.8 Revenue Metering System	Feature Not Equipped	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		
Telecommunications Media	Digital Radio	

ACCEPTED: JAN 17 2011

ORDER NO. G 192 10

COMMISSION SECRETARY

Description	Gordon M Shrum G8	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	13CB1, 13CB2, 13CB3, 13CB4, 13CB5, 13CB6, 13CB7, 13CB8, 13CB9, 13CB10	One Line Diagram 1006-P06-B21 Dwg No. 1006-E06-U0004 R009 & LOO: 3P02-60F
B.3 Blackstart		
Blackstart Capability	Yes, 4-350kW, 4.16kV Diesel Genset	LOO: 3P02-64D
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	13CB1-5 = 11.5kA, 13CB6-8 = 12kA, 13CB9,10 = 14kA	One Line Diagram Dwg No. 1006-E06-U0004 R009
B) Disconnect Switches	13DC81 - 10 = Not Available	One Line Diagram Dwg No. 1006-E06-U0004 R009
2. Circuit breaker fault current rating	Not Available	One Line Diagram Dwg No. 1006-E06-U0004 R009
C.3 Generator Max Power Output		
Nameplate	G1-G8: 239 MVA, 0.95 p.f., 13.8KV rated voltage G9,G10: 316 MVA, 0.95 p.f., 13.8kV rated voltage	Report # PS-PSE-1
MPO (plant)	2730 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.O.
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	LOO: 3P02-64D
3. Line-Drop-Compensation (LDC) equipment and setting	Feature Not Equipped	Report # PSE461
4. Joint Voltage Control Equipment	The JVC circuitry exists but it is out of service	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1-G10: 0.8 p.u. - 1.1 p.u.	Report # PS-PSE-1
B) Manual	Indeterminable	
6. ULTC capability	T1 - T10: No ULTC	
C.5 Excitation Equipment		
1. Time for Vt to change from rated to 0.95% following a large step change	G1 - G10: 0.03 sec	Report # PS-PSE-1

ACCEPTED: JAN 17 2011

ORDER NO. G 192 10

COMMISSION SECRETARY

Description	Gordon M Shrum GS	Reference For Additional Information
2. Negative field voltage capability	G1 - G5: -9.06 p.u. at 118 Vbase G6 - G8: -8.84 p.u. at 98.38 Vbase G9: -9.25 p.u. at 100.5 Vbase G10: -10.82 p.u. at 98.3 Vbase	Report # PS-PSE-1
3. PSS	G1 - G10	
C.6 Voltage Regulator when generator in Synchronous Condenser Mode Or Minimum MW Mode		
A) Maximum Voltage	G1-G10: 1.1 p.u.	Report # PS-PSE-1
B) Minimum Voltage	G1-G10: 0.8 p.u.	Report # PS-PSE-1
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current/V/Hz)	G1-G5: Field Current limiters act to to limit if to 1720A G6-G8: Field Current limiters act to to limit if to 2750A G9,G10: Field Current limiters act to limit if to 2560A Terminal Voltage limiter act to limit Vt to 14.9kV on all units; V/Hz limiter at 1.08 p.u. for all units	Report # PS-PSE-1
2. UELs (Reactive Ampere Limiting)	For UEL curve(s), see reference	Report # PS-PSE-1
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	Except G6, all units have 81G O/F relay at 70 Hz for 40 sec; Rotor overspeed protection 12M is set at 170% G6: 81G O/F relay at 65 Hz for 60 sec	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	59G sustained O/V protection: 120% of rated voltage with inverse time characteristics, no U/V protection	PI Sheets
C.10 Governor Specifications		
1. Speed Droop	G1 - G5 = 5%; G6 - G8 = 3.2%; G9, G10 = 4.6%	Report # PS-PSE-1

ACCEPTED: JAN 17 2011

ORDER NO. G 192 10

COMMISSION SECRETARY

Description	Gordon M Shrum GS	Reference For Additional Information
2. Dead Band	0.02% or less	
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for GMS, also see Protection Information on SIS	
E.1 Operations Control and Telecommunications Facilities		
E 1.1 Remote Control Facility and Control Center		
Remote Control Facility	RTU 025 / RTU 026	Communication Block Diagram
Control Center	SCC / SIC	Communication Block Diagram
Control Points	Point Assignment	1006-R05-A78 Sh.1 to 24 / 1006-R05-A79 Sh.1 to 15
Point Assignment	1006-R05-A78 Sh.1 to 24 / 1006-R05-A79 Sh.1 to 15	
Communication Block Diagram	1006-R05-D0 Sh.1 to 15	
E.1.2 Automatic Generation Control System (AGC)	Yes	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	Yes	"http://w3hd/pcontrol/Subsites/Planning/pdf/RASSummary.pdf"
E.1.4 Telemetry	Point Assignment	1006-R05-A78 Sh.1 to 24 / 1006-R05-A79 Sh.1 to 15
E.1.5 Alarm Points	Point Assignment	1006-R05-A78 Sh.1 to 24 / 1006-R05-A79 Sh.1 to 15
E.1.6 Equipment Status	Point Assignment	1006-R05-A78 Sh.1 to 24 / 1006-R05-A79 Sh.1 to 15
E.1.7 Battery/Charger System		Telecontrol Manual Unit 22 Section 1
System	24V DC System	1006-R05-B68
E.1.8 Revenue Metering System	Feature Not Equipped	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		

ACCEPTED: JAN 17 2011
ORDER NO. G192'10

COMMISSION SECRETARY

Description	Gordon M Shrum GS	Reference For Additional Information
Telecommunications Media	Microwave Radio	

ACCEPTED: JAN 17 2011

ORDER NO. G 192 10

COMMISSION SECRETARY

Description	Peace Canyon GS	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	13CB1, 13CB2, 13CB3, 13CB4	1- line Dwg 1007-E06-O2, 1007-H04-U2 Dwg No. 1007-E04-U165-R1 & LOO: 3P02-90M
B.3 Blackstart		
Blackstart Capability	Yes, 1 - 500kW, 600V AC Diesel Genset	LOO: 3P02-93E
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	13CB1,4 = 9000A	One Line Diagram, 1007-E04-U165-R1
B) Disconnect Switches	13D1,4 = N/A	One Line Diagram, 1007-E04-U165-R1
2. Circuit breaker fault current rating	13CB1, 4 = 65kA	One Line Diagram, 1007-E04-U165-R1
C.3 Generator Max Power Output		
Nameplate	G1-4: 184 MVA, 0.95 p.f., 13.8kV rated voltage	Report # PSE461
MPO (plant)	694 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.O.
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Fut	Local Operating Order: 3P02-68B
3. Line-Drop-Compensation (LDC) equipment and setting	AVR; 0.05 p.u.	Report # PSE461
4. Joint Voltage Control Equipment	The JVC circuitry exists but it is out of service	Contact: Larry Nettleton/Shane Kronebush
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1-G4: 0.8 p.u. - 1.1 p.u.	Report # PSE461 Contact: Larry Nettleton/Shane Kronebush
B) Manual	Indeterminable	
6. ULTC capability	T1, T2: No ULTC	
C.5 Excitation Equipment		
1. Time for Vf to change from rated to 0.95% following a large step change	G1 - G4: 0.005 sec	Report #PSE461
2. Negative field voltage capability	-8.62 p.u. at 197.4 Vbase	Report # PSE461
3. PSS	G1 - G4	

ACCEPTED: JAN 17 2011
ORDER NO. G 192 10

COMMISSION SECRETARY

Description	Peace Canyon GS	Reference For Additional Information
C.6 Voltage Regulator when generator in Synchronous Condenser Mode Or Minimum MW Mode		
A) Maximum Voltage	G1-G4: 1.1 p.u.	Report # PSE461
B) Minimum Voltage	G1-G4: 0.8 p.u.	Report # PSE461
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current/V/Hz)	Field Current limiters acts to to limit if to 1500A; Terminal Voltage limits max voltage to 14.9kV	Report # PSE461
2. UELs (Reactive Ampere Limiting)	For UEL curves, see reference	Report # PSE461, C R O
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	81G O/F relay: 64 Hz for more that 30 sec	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	51G O/V protection: 114% of rated voltage with inverse time characteristics; no U/V protection	PI Sheets
C.10 Governor Specifications		
1. Speed Droop	G1, G2, G3, G4 = 5%	
2. Dead Band	0.02% or less	
D.1 General Protective Relay Requirements		
1. Relay information	See Generating Station P&C Setting Sheets for PCN, also see Protection Information on SIS	

ACCEPTED: JAN 17 2011

ORDER NO. G 192 10

COMMISSION SECRETARY

Description	Peace Canyon GS	Reference For Additional Information
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		
Remote Control Facaity	RTU 072	Communication Block Diagram
Control Center	SCC / SIC	Communication Block Diagram
Control Points	Point Assignment	1007-R05-A2 Sh 1 to 27
Point Assignment	1007-R05-A2 Sh.1 to 27	
Communication Block Diagram	1007-R24-D1 Sh 1 to 5	
E.1.2 Automatic Generation Control System (AGC)	Yes	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	No	"http://w3/td/pcontrol/Subsites/Planning/pdf/RASSummary.pdf"
E.1.4 Telemetry	Point Assignment	1007-R05-A2 Sh 1 to 27
E.1.5 Alarm Points	Point Assignment	1007-R05-A2 Sh 1 to 27
E.1.6 Equipment Status	Point Assignment	1007-R05-A2 Sh 1 to 27
E.1.7 Battery/Charger System		Telecontrol Manual Unit 22 Section 1
System	24V DC System	1007-R24-D12
E.1.8 Revenue Metering System	Feature Not Equipped	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		
Telecommunications Media	Microwave Radio	

ACCEPTED: JAN 17 2011
ORDER NO. G 192 10

COMMISSION SECRETARY

Description	Shuswap GS	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	2 4CB1, 2 4CB2	One Line Diagram, 310-H06-D1 R3 LOO: 3P03-76B
B.3 Blackstart		
Blackstart Capability	Yes, 1-12.5kVA, 480Vac Diesel Genset	LOO: 3P03-76B
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	2 4CB1, 2 = 1200A	One Line Diagram Dwg No. 310-H06-D1 R3
B) Disconnect Switches	No Disconnects	One Line Diagram Dwg No. 310-H06-D1 R3
2. Circuit breaker fault current rating	2 4CB1, 2 = 16kA	One Line Diagram Dwg No. 310-H06-D1 R3
C.3 Generator Max Power Output		
Nameplate	G1, G2: 3.5 MVA, 0.8 p.f., 2.3kV rated voltage	Generator Data Book
MPO (plant)	6 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.D., Generator Data Book
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	LOO: 3P03-76B
3. Line-Drop-Compensation (LDC) equipment and setting	Feature Not Equipped	
4. Joint Voltage Control Equipment	Feature Not Equipped	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1, G2: 0.8 p.u. - 1.1 p.u.	
B) Manual	Indeterminable	
6. U/LTC capability	T1: No ULTC	
C.5 Excitation Equipment		
1. Time for Vt to change from rated to 0.95% following a large step change	Not Available	
2. Negative field voltage capability	Not Available	
3. PSS	Feature Not Available	

ACCEPTED: JAN 17 2011

ORDER NO. G 192 10

COMMISSION SECRETARY

Description	Shuswap GS	Reference For Additional Information
C.6 Voltage Regulator when generator in Synchronous Condenser Mode or Minimum MW Mode		
A) Maximum Voltage	G1, G2: 1.1 p.u.	
B) Minimum Voltage	G1, G2: 0.8 p.u.	
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	Not Available	
2. UELs (Reactive Ampere Limiting)	Not Available	
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	No 81G O/F and U/F protection but overspeed protection at 150%	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	59G sustained O/V protection at 122% of rated voltage with inverse time characteristics	PI Sheets
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for SHU	
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	RTU 116	Communication Block Diagram
Control Center	SCC	Communication Block Diagram

ACCEPTED: JAN 17 2011
G 192 10

ORDER NO.

COMMISSION SECRETARY

Description	Shuswap GS	Reference For Additional Information
Control Points	Point Assignment	310-R05-A2 Sh.1 to 2 and SIC SCADA Database - Point Assignment
Point Assignment	310-R05-A2 Sh 1 to 2 and SIC SCADA Database - Point Assignment	
Communication Block Diagram	Not Available	
E.1.2 Automatic Generation Control System (AGC)	No	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	No	"http://w3hb/pcontrol/Subsites/Planning/pdf/RASSummary.pdf"
E.1.4 Telemetry	Point Assignment	310-R05-A2 Sh 1 to 2 and SIC SCADA Database - Point Assignment
E.1.5 Alarm Points	Point Assignment	310-R05-A2 Sh 1 to 2 and SIC SCADA Database - Point Assignment
E.1.6 Equipment Status	Point Assignment	310-R05-A2 Sh 1 to 2 and SIC SCADA Database - Point Assignment
E.1.7 Battery/Charger System	24V DC System	Telecontrol Manual Unit 22 Section 1
E.1.8 Revenue Metering System	Feature Not Equipped	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		
Telecommunications Media	Telephone Line	

ACCEPTED: JAN 17 2011

ORDER NO. G192 10

COMMISSION SECRETARY

Description	Whapshan GS	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	13CB1	One Line Diagram 203C-P06-HZ Dwg No. 203C-E06-D0005 R004 & LOO 3P04-08
B.3 Blackstart		
Blackstart Capability	No	LOO 3P04-08
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	13CB1 = 3000A	One Line Diagram Dwg No. 203C-E06-D0005 R004
B) Disconnect Switches	No Disconnects	One Line Diagram Dwg No. 203C-E06-D0005 R004
2. Circuit breaker fault current rating	13CB1 = 40kA	One Line Diagram Dwg No. 203C-E06-D0005 R004
C.3 Generator Max Power Output		
Nameplate	G1: 55.5 MVA, 0.90 p.f., 13.8kV rated voltage	PSE Report# PSE297 for WGS
MPO (plant)	54 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.Q.
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	Local Operating Order 3P04-08
3. Line Drop Compensation (LDC) equipment and setting	Feature Not Equipped	PSE Report# PSE297 for WGS
4. Joint Voltage Control Equipment	Feature Not Equipped	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1: 0.8 p.u. - 1.1 p.u.	PSE Report# PSE297 for WGS
B) Manual	Indeterminable	
6. ULTC capability	T1: No ULTC	
C.5 Excitation Equipment		
1. Time for Vt to change from rated to 0.95% following a large step change	G1: 0.03 sec	
2. Negative field voltage capability	-3.2 p.u. at 90.5 Vbase	PSE Report# PSE297 for WGS
3. PSS	G1	

ACCEPTED: JAN 17 2011

ORDER NO. G192/10

COMMISSION SECRETARY

Description	Whatshan GS	Reference For Additional Information
C.6 Voltage Regulator when generator in Synchronous Condenser Mode or Minimum MW Mode		
(A) Maximum Voltage	G1: 1.1 p.u.	PSE Report# PSE297 for WGS
(B) Minimum Voltage	G1: 0.8 p.u.	PSE Report# PSE297 for WGS
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	Field Current limiters acts to to limit if to 1035A. Terminal Voltage limits max voltage to 15.18kV	PSE Report# PSE297 for WGS
2. UELs (Reactive Ampere Limiting)	For UEL curves, see reference	PSE Report# PSE297 for WGS
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	There is no 81 for U/F or O/F but relay 12 protects against overspeed	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	51G sustained O/V protection: 114% of rated voltage with inverse time characteristics, instantaneous protection at 145%; no U/V protection	PI Sheets
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for WGS	
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		

ACCEPTED: JAN 17 2011

ORDER NO. G192'10

COMMISSION SECRETARY

Description	Whalehan GS	Reference For Additional Information
Remote Control Facility	RTU 106	Communication Block Diagram
Control Center	SIC	Communication Block Diagram
Control Points	Point Assignment	203C-R04-A412 Sh 1 to 14
Point Assignment	203C-R04-A412 Sh.1 to 14	
Communication Block Diagram	203C-R04-D6	
E.1.2 Automatic Generation Control System (AGC)	No	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	No	"http://w3rld/pcontrol/Subsites/Planning/pdf/RASSummary.pdf"
E.1.4 Telemetry	Point Assignment	203C-R04-A412 Sh.1 to 14
E.1.5 Alarm Points	Point Assignment	203C-R04-A412 Sh.1 to 14
E.1.6 Equipment Status	Point Assignment	203C-R04-A412 Sh.1 to 14
E.1.7 Battery/Charger System	Not Available	Telecontrol Manual Unit 22 Section 1
E.1.8 Revenue Metering System	Feature Not Equipped	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		
Telecommunications Media	Telephone Lease to Monshee Substation	

ACCEPTED: JAN 17 2011

ORDER NO. G192 10

COMMISSION SECRETARY

Description	Seven Mile GS	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	SEV has no generator breakers; switchyard ring bus breakers are used for connecting generators to the transmission system	One Line Diagram: 224-E14-D0010 R004 LOO: 3P04-06 224-P06-84
B.3 Blackstart		
Blackstart Capability	Yes, 2-2500kW & 1-100kW, 347/600V AC Diesel Genset	LOO: 3P04-06J
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	2CB1, 2CB2 = 2kA; 2CB3, 2CB4 = 2.5kA	One Line Diagram: 224-E14-D0010 R004
B) Disconnect Switches	13D1,2,3 = 10kA; 13D4 = 12kA 2DCB1,2 = 2kA; 2DCB3,4 = 2.5kA	One Line Diagram: 224-E14-D0010 R004
2. Circuit breaker fault current rating	2CB1, 2CB2 = 50kA; 2CB3, 2CB4 = 31 NA	One Line Diagram: 224-E14-D0010 R004
C.3 Generator Max Power Output		
Nameplate	G1 - G3: 225 MVA, 0.95 p.f. G4 233 MVA, 0.95 p.f., 13.8kV rated voltage	PSE Report# PSE463 for SEV
MPO (plant)	707 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.O.
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	Local Operating Order: 3P04-06
3. Line-Drop-Compensation (LDC) equipment and setting	AVR: 0.033 p.u.	PSE Report# PSE463 for SEV
4. Joint Voltage Control Equipment	Feature Not Equipped	Contact: Larry Nettleton/Shane Kronebusch
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1-G4: 0.8 p.u. - 1.1 p.u.	PSE Report# PSE463 for SEV
B) Manual	Indeterminable	
6. ULTC capability	T1 - T4: No ULTC	
C.5 Excitation Equipment		
1. Time for VT to change from rated to 0.95% following a large step change	G1 - G4: 0.03 sec	PSE Report# PSE463 for SEV
2. Negative field voltage capability	G1 - G3: -6.46 p.u. at 197.9 Vbase G4: -5.37 p.u. at 134 Vbase	PSE Report# PSE463 for SEV

ACCEPTED: JAN 17 2011
G1 92 '10
ORDER NO.

COMMISSION SECRETARY

Description	Seven Mile G5	Reference For Additional Information
3. PSS	G1 - G4	
C.6 Voltage Regulator when generator in Synchronous Condenser Mode Or Minimum MW Mode		
A) Maximum Voltage	G1-G4 1.1 p.u.	PSE Report# PSE463 for SEV
B) Minimum Voltage	G1-G4 0.8 p.u.	PSE Report# PSE463 for SEV
C.7 Excitation System Limiters		
1. DELs (Terminal Voltage/Field Current)	Field Current limiters acts to to limit if to 1563A for G4 and 1800A for G1 - G3, Terminal Voltage limits max voltage to 15.18kV for all units	PSE Report# PSE463 for SEV
2. UELs (Reactive Ampere Limiting)	See Reference	PSE Report# PSE463 for SEV
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	G1 - G3: No O/F or U/F protection, but electrical overspeed protection at 150%; mechanical overspeed at 160% G4: Electrical overspeed protection at 145% and mechanical overspeed protection at 160%	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	G1 - G3: 59G sustained O/V protection: 120% of rated voltage with inverse time characteristics, instantaneous at 140% G4: 59G sustained O/V protection at 121% with inverse time characteristics, no U/V protection on any units	PI Sheets
C.10 Governor Specifications		

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COMMISSION SECRETARY

Description	Seven Mile GS	Reference For Additional Information
1. Speed Droop	G1, G2, G3, G4 = 5%	PSE Report# PSE453
2. Dead Band	0.02% or less	
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for SEV, also see Protection Information on SES	
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	RTU 087 / RTU 088 / RTU 125	Communication Block Diagram
Control Center	SIC / SCC, SIC / SIC	Communication Block Diagram
Control Points	Point Assignment	224-R05-A2003 Sh.1 to 5 / 224-R05-A2004 Sh.1 to 22 / 224-R05-A2005 Sh.1 to 23
Point Assignment	224-R05-A2003 Sh.1 to 5 / 224-R05-A2004 Sh.1 to 22 / 224-R05-A2005 Sh.1 to 23	
Communication Block Diagram	224-R06-B0 Sh. 1 to 14	
E.1.2 Automatic Generation Control System (AGC)	No / Yes / No	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	Yes	"http://w3rld/pcontrol/Subsites/Planning/pdf/RASSummary.pdf"
E.1.4 Telemetry	Point Assignment	224-R05-A2003 Sh.1 to 5 / 224-R05-A2004 Sh.1 to 22 / 224-R05-A2005 Sh.1 to 23
E.1.5 Alarm Points	Point Assignment	224-R05-A2003 Sh.1 to 5 / 224-R05-A2004 Sh.1 to 22 / 224-R05-A2005 Sh.1 to 23
E.1.6 Equipment Status	Point Assignment	224-R05-A2003 Sh.1 to 5 / 224-R05-A2004 Sh.1 to 22 / 224-R05-A2005 Sh.1 to 23
E.1.7 Battery/Charger System		Telecontrol Manual Unit 22 Section 1
System	48V DC System	224-R16-B7 Sh.1 to D1
E.1.8 Revenue Metering System	Feature Not Equipped	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		

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Description	Seven Mile GS	Reference For Additional Information
Telecommunications Media	Digital Radio	

Description	Fort Nelson GS	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	52B1	Operating One line diagram CI 300
B.3 Blackstart		
Blackstart Capability	Yes, but only when blackstart power is available from Duke Energy plant	
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	89-A106 and 89-A107: 1200A ; 2CB2: 1200A	Refer to FNG one line diagram
B) Disconnect Switches	2DCB1: 1200A ; 2DCB2: 1200A	Refer to FNG one line diagram
2. Circuit breaker fault current rating	89-A106: 40kA ; 89-A107: 40kA	Refer to FNG one line diagram
C.3 Generator Max Power Output		
Nameplate	36.588kVA, 0.85pf 13.8kV rated voltage	
MPO (plant)	49.8MW	
C.4 Generator Reactive Capability		
1. Capability Curves	Please see the attachment	
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	N/A	BCTC can't remotely control the voltage. FNG is tied to the Alberta Grid through Rainbow Lake substation.
3. Line-Drop-Compensation (LDC) equipment and setting	Adjustable 0-10%	
4. Joint Voltage Control Equipment	N/A	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	0.9-1.0 pu	
B) Manual	0.9-1.1 pu	
6. ULTC capability	No ULTC	
C.5 Excitation Equipment		
1. Time for VI to change from rated to 0.95% following a large step change	0.175 sec	
2. Negative field voltage capability	No	
3. PSS	Yes	

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ORDER NO. G-192-10

COMMISSION SECRETARY

Description	Fort Nelson GS	Reference For Additional Information
C.6 Voltage Regulator when generator in Synchronous Condenser Mode or Minimum MW Mode	Synchronous condensor operation not available	
A) Maximum Voltage	N/A	
B) Minimum Voltage	N/A	
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	Please see the attachment	
2. UELs (Reactive Ampere Limiting)	Please see the attachment	
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)	55-65Hz	
2. O/F and U/F settings (Unit)	Relay: UF: 58Hz (alarm) OF:62Hz (alarm) Turbine speed switch: 63Hz (alarm) 64 Hz (trip)	
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)	0.9 - 1.1 pu	Flux limit: 1.1 V/Hz
2. O/V and U/V settings (Unit)	UV relay setting: 0.9 pu (alarm)	
D.1 General Protective Relay Requirements		
1. Relay Information	Please see the attachment	
E.1 Operations Control and Telecommunications Facilities		Communication provided by BCH T&D.
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	No control. Indicaton only	
Control Center	Northern Control Centre (NOC)	
Control Points	None	

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COMMISSION SECRETARY

Description	Fort Nelson GS	Reference For Additional Information
Point Assignment		
Communication Block Diagram		
E.1.2 Automatic Generation Control System (AGC)		
E.1.3 Remedial Action Schemes (RAS)		
E.1.4 Telemetry	Line frequency, 7L81R - MW, kV, 7L81W MW, kV, G1-UNW	
E.1.5 Alarm Points	FNG PMI, 1 and 2 Meter Fail Alarm	
E.1.6 Equipment Status	52-A106, 52-A107, 52-81, 89-A104, 89-A105, 89-A108, AVR on/off, PSS on/off	
E.1.7 Battery/Charger System		
System		
E.1.8 Revenue Metering System		
E.2 Telecommunications Media		
Telecommunications Media	Telephone- (Telus/NW Tel), continuous	

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ORDER NO. G-12-11

COMMISSION SECRETARY

Description	John Hart GS	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	13CB1, 13CB2, 13CB3, 13CB4, 13CB5, 13CB6	One Line Diagram 502-H06-E2 Dwg No. 502-E06-D0001 R007 & LOO: 3P05-03A
B.3 Blackstart		
Blackstart Capability	No	
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	13CB1-6 = 1600A	One Line Diagram Dwg No. 502-E06-D0001 R007
B) Disconnect Switches	1D1-6 = 1.2kA; 13D1CB1-6 = 3kA; 13D1-6 = 1.6kA	One Line Diagram Dwg No. 502-E06-D0001 R007
2. Circuit breaker fault current rating	13CB1-6 = 22kA	One Line Diagram Dwg No. 502-E06-D0001 R007
C.3 Generator Max Power Output		
Nameplate	G1-G6: 25 MVA, 0.8 p.f., 13.8kV rated voltage	Powertech Report # 12045-21-00-JHT1
MPO (plant)	126 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C R D
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	Local Operating Order: 3P05-03A
3. Line-Drop-Compensation (LDC) equipment and setting	Feature Not Available	
4. Joint Voltage Control Equipment	Feature Not Available	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1-G6: 0.8 p.u. - 1.1 p.u.	
B) Manual	Indeterminable	
6. ULTC capability	T1-T6: No ULTC	
C.5 Excitation Equipment		
1. Time for Vf to change from rated to 0.95% following a large step change	G1-G6: 2.14 sec	Powertech Report # 12045-21-00-JHT1
2. Negative field voltage capability	0 at 84.6 Vbase	Powertech Report # 12045-21-00-JHT1
3. PSS	Feature Not Available	

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ORDER NO. G-192-10

COMMISSION SECRETARY

Description	John Hart GS	Reference For Additional Information
C.6 Voltage Regulator when generator in Synchronous Condenser Mode or Minimum MW Mode		
A) Maximum Voltage	G1-G5: 1.1 p.u.	
B) Minimum Voltage	G1-G5: 0.8 p.u.	
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	None	Powertech Report # 12045-21-00-JHT1
2. UELs (Reactive Ampere Limiting)	None	Powertech Report # 12045-21-00-JHT1
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	81G time delayed O/F relay: 65 Hz	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	51G O/V protection: 113% of rated voltage with inverse time characteristics, 125% instantaneous; no U/V protection	PI Sheets
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for JHT	
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		

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COMMISSION SECRETARY

Description	John Hart GS	Reference For Additional Information
Remote Control Facility	RTU 037 / RTU 038 / RTU 039 / RTU 040 / RTU 041 / RTU 042 / RTU 043	Communication Block Diagram
Control Center	VIC	Communication Block Diagram
Control Points	Point Assignment	502-R05-A90 Sh.1 to 12 / 502-R05-A91 Sh.1 to 12 / 502-R05-A92 Sh.1 to 13 / 502-R05-A93 Sh.1 to 12 / 502-R05-A94 Sh.1 to 12 / 502-R05-A95 Sh.1 to 12 / 502-R05-A96 Sh.1 & 10
Point Assignment	502-R05-A90 Sh.1 to 12 / 502-R05-A91 Sh.1 to 12 / 502-R05-A92 Sh.1 to 13 / 502-R05-A93 Sh.1 to 12 / 502-R05-A94 Sh.1 to 12 / 502-R05-A95 Sh.1 to 12 / 502-R05-A96 Sh.1 & 10	
Communication Block Diagram	502-R06-B0 Sh.1 to 18	
E.1.2 Automatic Generation Control System (AGC)	No	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	No	"http://w3id/pcontrol/Subsites/Planning/pdf/RASSummary.pdf"
E.1.4 Telemetry	Point Assignment	502-R05-A90 Sh.1 to 12 / 502-R05-A91 Sh.1 to 12 / 502-R05-A92 Sh.1 to 13 / 502-R05-A93 Sh.1 to 12 / 502-R05-A94 Sh.1 to 12 / 502-R05-A95 Sh.1 to 12 / 502-R05-A96 Sh.1 & 10
E.1.5 Alarm Points	Point Assignment	502-R05-A90 Sh.1 to 12 / 502-R05-A91 Sh.1 to 12 / 502-R05-A92 Sh.1 to 13 / 502-R05-A93 Sh.1 to 12 / 502-R05-A94 Sh.1 to 12 / 502-R05-A95 Sh.1 to 12 / 502-R05-A96 Sh.1 & 10
E.1.6 Equipment Status	Point Assignment	502-R05-A90 Sh.1 to 12 / 502-R05-A91 Sh.1 to 12 / 502-R05-A92 Sh.1 to 13 / 502-R05-A93 Sh.1 to 12 / 502-R05-A94 Sh.1 to 12 / 502-R05-A95 Sh.1 to 12 / 502-R05-A96 Sh.1 & 10
E.1.7 Battery/Charger System		Telecontrol Manual Unit 27 Section 1
System	48V DC System	502-R16-B38
E.1.8 Revenue Metering System	Feature Not Available	Metering equipment is present but there is no revenue metering "system"

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ORDER NO. G 192 10

COMMISSION SECRETARY

Description	John Hart GS	Reference For Additional Information
E.2 Telecommunications Media		
Telecommunications Media	Digital Radio	

Description	Strathcona GS	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	13CB1, 13CB2	One Line Diagram 524-E06-D3 Dwg No. 524-E05-B8000 & LOD:3P05-06A
B.3 Blackstart		
Blackstart Capability	No	
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	13CB1, 2 = 2000A	One Line Diagram: 524-P06-B8
B) Disconnect Switches	13D1, 2 = 2000A; 1D1,2 = 600A	One Line Diagram: 524-P06-B8
2. Circuit breaker fault current rating	13CB1, 2 = 37kA	One Line Diagram: 524-P06-B8
C.3 Generator Max Power Output		
Nameplate	G1, G2: 37.5 MVA, 0.90 p.f., 13.8kV rated voltage	Powertech Report# 12137-21-00 SCA-1
MPO (plant)	64 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.O.
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	Local Operating Order: 3P05-06A
3. Line-Drop-Compensation (LDC) equipment and setting	Feature Not Equipped	Powertech Report# 12137-21-00 SCA-1
4. Joint Voltage Control Equipment	Feature Not Equipped	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1, G2: 0.8 p.u. - 1.1 p.u.	
B) Manual	Indeterminable	
6. ULTC capability	T1, T2: No ULTC	
C.5 Excitation Equipment		
1. Time for Vf to change from rated to 0.95% following a large step change	G1: 0.03 sec	
2. Negative field voltage capability	-6.0 p.u. at 86.3 Vbase	Exciter Single Line: 524-H06-D149 SH. SAB
3. PSS	Feature Not Equipped	

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ORDER NO. G 19270

COMMISSION SECRETARY

Description	Strathcona G5	Reference For Additional Information
C.6 Voltage Regulator when generator in Synchronous Condenser Mode or Minimum MW Mode		
A) Maximum Voltage	G1, G2: 1.1 p.u.	Contact: Larry Nettleton/Shane Kronebush
B) Minimum Voltage	G1, G2: 0.8 p.u.	Contact: Larry Nettleton/Shane Kronebush
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	None	Powertech Report# 12137-21-00 SCA-1
2. UELs (Reactive Ampere Limiting)	UEL's are set at If = 320A	Powertech Report# 12137-21-00 SCA-1
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	There is no 81 for U/F or O/F but overspeed relay 12 is set at 1.34 p.u.	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	59G Sustained O/V protection: 110% of rated voltage with inverse time characteristics, no U/V protection	PI Sheets
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for SCA, also see Protection Information on SIS	LOC:3P05-DEA
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	RTU 087	Communication Block Diagram
Control Center	JHT, VIC	Communication Block Diagram

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ORDER NO. E 192 10

COMMISSION SECRETARY

Description	Strathcona GS	Reference For Additional Information
Control Points	Point Assignment	524-R05-A26 Sh 1 to 16
Point Assignment	524-R05-A26 Sh.1 to 16	
Communication Block Diagram	524-R06-D0	
E.1.2 Automatic Generation Control System (AGC)	No	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	No	"http://w3/td/pcontrol/Subsites/Planning/pdf/RASSummary.pdf"
E.1.4 Telemetry	Point Assignment	524-R05-A26 Sh.1 to 16
E.1.5 Alarm Points	Point Assignment	524-R05-A26 Sh.1 to 16
E.1.6 Equipment Status	Point Assignment	524-R05-A26 Sh.1 to 16
E.1.7 Battery/Charger System		Telecontrol Manual Unit 22 Section 1
System	24V DC System	524-R16-B21 Sh.1 to C2
E.1.8 Revenue Metering System	Feature Not Equipped	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		
Telecommunications Media	Power Line Carrier	

ACCEPTED: JAN 17 2011

ORDER NO. G 1 92 10

COMMISSION SECRETARY

Description	Pumbelga G6	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	13CB6	One Line Diagram Dwg No. 525-E06-D0001 R015 SH.1 & Dwg No. 525-E06-D0001 R006 SH.2 & LOO: 3P05-05A
B.3 Blackstart		
Blackstart Capability	No	LOO: 3P05-05A
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	13CB1 = 1200A, 13CB6 = 2000A	One Line Diagrams Dwg No. 525-E06-D0001 R015 SH.1 & Dwg No. 525-E06-D0001 R006 SH.2
B) Disconnect Switches	No Disconnects	One Line Diagrams Dwg No. 525-E06-D0001 R015 SH.1 & Dwg No. 525-E06-D0001 R006 SH.2
2. Circuit breaker fault current rating	Not Available	
C.3 Generator Max Power Output		
Nameplate	G1: 30 MVA, 0.90 p.f., 13.8kV rated voltage	Powertech Report# 12137-21-00 PUN-1
MPO (plant)	24 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.G.
2. Unit/Plant MVar or terminal voltage adjustment by SCTC	Full	Local Operating Order: 3P05-05A
3. Line-Drop-Compensation (LDC) equipment and setting	Feature Not Equipped	Powertech Report# 12137-21-00 PUN-1
4. Joint Voltage Control Equipment	Feature Not Equipped	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1: 0.8 p.u. - 1.1 p.u.	
B) Manual	Indeterminable	
6. ULTC capability	T1: No ULTC	
C.5 Excitation Equipment		
1. Time for Vf to change from rated to 0.95% following a large step change	G1: 0.03	

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ORDER NO. G-192-10

COMMISSION SECRETARY

Description	Puntledge G3	Reference For Additional Information
2. Negative field voltage capability	-5.9 p.u. at 73.2 Vbase	Exciter Single Line: 525-H04-D111 SH. RAA
3. PSS	Feature Not Equipped	
C.6 Voltage Regulator when generator in Synchronous Condenser Mode or Minimum MW Mode		
A) Maximum Voltage	G1: 1.1 p.u.	
B) Minimum Voltage	G1: 0.8 p.u.	
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	None	Powertech Report# 12137-21-00 PUN-1
2. UELs (Reactive Ampere Limiting)	for UEL curves, see reference	Powertech Report# 12137-21-00 PUN-1
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	There is no 81 for U/F or O/F but overspeed relay 12 is set at 1.3 p.u.	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	59L sustained O/V protection: 122% of rated voltage with inverse time characteristics; no U/V protection	PI Sheets
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for PUN	
E.1 Operations Control and Telecommunications Facilities		

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COMMISSION SECRETARY

Description	Puntledge G5	Reference For Additional Information
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	RTU 075	Communication Block Diagram
Control Center	VIC	Communication Block Diagram
Control Points	Point Assignment	525-R05-A14 Sh.1 to 17
Point Assignment	525-R05-A14 Sh.1 to 17	
Communication Block Diagram	525-R06-D0 Sh.1 to 5	
E.1.2 Automatic Generation Control System (AGC)	No	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	No	"http://w3/td/pcontrol/Substes/Planning/pdf/RASSummary.pdf"
E.1.4 Telemetry	Point Assignment	525-R05-A14 Sh.1 to 17
E.1.5 Alarm Points	Point Assignment	525-R05-A14 Sh.1 to 17
E.1.6 Equipment Status	Point Assignment	525-R05-A14 Sh.1 to 17
E.1.7 Battery/Charger System		Telecontrol Manual Unit 22 Section 1
System	24V DC System	525-R16-B17
E.1.8 Revenue Metering System	Feature Not Equipped	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		
Telecommunications Media	Telephone Lease to John Hart G.S.	

ACCEPTED: JAN 17 2011

ORDER NO. G-12-10

COMMISSION SECRETARY

Description	Kootenay Canal GS	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	KCL has no generator breakers; switchyard ring bus breakers are used for connecting generators to the transmission system	Tielne dwg 217-E04-D101 Dwg No. 217-E05-D0101 R002 & Dwg No. 217-E05-D0102 R007 & LOO:3P04-05
B.3 Blackstart		
Blackstart Capability	Yes, 1-187.5kVA, 347/600Vac Diesel Genset	LOO: 3P04-05J
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	2CB2,4,7,9,13,16 = 3kA; 2CB3,5,6,8,11,12,14: 1.2kA 2CB10,15: 3.15 kA	One Line Diagrams Dwg No. 217-E05-D0101 R002 & Dwg No. 217-E05-D0102 R007
B) Disconnect Switches	2D1-5, 2D31,32 = 2kA	One Line Diagrams Dwg No. 217-E05-D0101 R002 & Dwg No. 217-E05-D0102 R007
2. Circuit breaker fault current rating	2CB2,4,7,9,10,13,15,16 = 40kA; 2CB3,5,6,8,11,12,14: 25kA	One Line Diagrams Dwg No. 217-E05-D0101 R002 & Dwg No. 217-E05-D0102 R007
C.3 Generator Max Power Output		
Nameplate	G1 - G4: 147 MVA at 0.90 p.f., 13.8kV rated voltage	PSE Report# PSE462
MPO (plant)	530 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C R O
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	Local Operating Order: 3P04-05
3. Line-Drop-Compensation (LDC) equipment and setting	AVR; 0.05 p.u.	PSE Report# PSE462
4. Joint Voltage Control Equipment	The JVC circuitry exists but it is out of service	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1 - G4: 0.8 p.u. - 1.1 p.u.	PSE Report# PSE462
B) Manual	Indeterminable	
6. ULTC capability	T1, T2, T3, T4: No ULTC	
C.5 Excitation Equipment		

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ORDER NO. G 192 10

COMMISSION SECRETARY

Description	Kootenay Canal G5	Reference For Additional Information
1. Time for Vf to change from rated to 0.05% following a large step change	G1 - G4: 0.005 sec	PSE Report# PSE462
2. Negative field voltage capability	-5.59 p.u. at 100.4 Vbase	PSE Report# PSE462
3. PSS	G1 - G4	
C.6 Voltage Regulator when generator in Synchronous Condenser Mode Or Minimum MW Mode		
A) Maximum Voltage	G1 - G4: 1.1 p.u.	PSE Report# PSE462
B) Minimum Voltage	G1 - G4: 0.9 p.u.	PSE Report# PSE462
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current/V/Hz)	Field Current limiters acts to to limit if to 1840A; Terminal Voltage limits max voltage to 14.9kV	PSE Report# PSE462
2. UELs (Reactive Ampere Limiting)	Minimum Excitation limit: 0.95 p.u.	PRF Report# PSE462
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	81G O/F relay: 66 Hz for 50 sec	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	59G sustained O/V protection: 120% of rated voltage with inverse time characteristics, instantaneous O/V protection at 139%;no U/V protection	PI Sheets
C.10 Governor Specifications		
1. Speed Droop	G1, G2, G3, G4 = 4%	PSE Report# PSE462
2. Dead Band	0.02% or less	

ACCEPTED: JAN 17 2011

ORDER NO. G 192 10

COMMISSION SECRETARY

Description	Kootenay Canal GS	Reference For Additional Information
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for KCL	
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	RTU 053 / RTU 054	Communication Block Diagram
Control Center	SIC / SCC, SIC	Communication Block Diagram
Control Points	Point Assignment	217-R05-A45 Sh.1 to 9 / 217-R05-A46 Sh.1 to 50
Point Assignment	217-R05-A45 Sh.1 to 9 / 217-R05-A46 Sh.1 to 50	
Communication Block Diagram	217-R06-80 (All Sheets)	
E.1.2 Automatic Generation Control System (AGC)	No / Yes	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	Yes	"http://w2kfd/pcontrol/Subsites/Planning/pdf/RASSummary.pdf"
E.1.4 Telemetry	Point Assignment	217-R05-A45 Sh.1 to 9 / 217-R05-A46 Sh.1 to 50
E.1.5 Alarm Points	Point Assignment	217-R05-A45 Sh.1 to 9 / 217-R05-A46 Sh.1 to 50
E.1.6 Equipment Status	Point Assignment	217-R05-A45 Sh.1 to 9 / 217-R05-A46 Sh.1 to 50
E.1.7 Battery/Charger System		Telecontrol Manual Unit 22 Section 1
System	48V DC System	217-R16-B12
E.1.8 Revenue Metering System	Feature Not Equipped	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		
Telecommunications Media	Digital Radio	

ACCEPTED: JAN 17 2011

ORDER NO. G-192-10

COMMISSION SECRETARY

Description	Ladore Falls G3	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	1GCB1, 1GCB2	One Line Diagram: 1011-E14-A0001 LDD: 3P05-04A 514-ED6-D2
B.3 Blackstart		
Blackstart Capability	No	
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	1GB1, 2 = 1200A	One Line Diagram Dwg No. 1011-E14-A0001
B) Disconnect Switches	1DCB1, 1DCB2, 2DCB1, 2DCB2 = Not Available	One Line Diagram Dwg No. 1011-E14-A0001
2. Circuit breaker fault current rating	1CB1, 2 = 15kA	One Line Diagram Dwg No. 1011-E14-A0001
C.3 Generator Max Power Output		
Nameplate	G1, G2: 30 MVA, 0.90 p.f., 13.8kV rated voltage	Powertech Report# 12137-21-00 LDR-1
MPO (plant)	47 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.O.
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	Local Operating Order: 3P05-04A
3. Line-Drop-Compensation (LDC) equipment and setting	Feature Not Equipped	Powertech Report# 12137-21-00 LDR-1
4. Joint Voltage Control Equipment	Feature Not Equipped	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1, G2: 0.8 p.u. - 1.1 p.u.	
B) Manual	Indeterminable	
6. ULTC capability	T1, T2: No ULTC	
C.5 Excitation Equipment		
1. Time for Vt to change from rated to 0.95% following a large step change	G1: 0.03 sec	
2. Negative field voltage capability	-8.83 p.u. at 78.01 Vbase	Exciter Single Line: 514-H06-D1021 SH. 5AA
3. PSS	Feature Not Equipped	

ACCEPTED: JAN 17 2011

ORDER NO. G-9-10

COMMISSION SECRETARY

Description	Lajoie Falls G3	Reference For Additional Information
C.6 Voltage Regulator when generator in Synchronous Condenser Mode or Minimum MW Mode		
A) Maximum Voltage	G1, G2: 1.1 p.u.	
B) Minimum Voltage	G1, G2: 0.8 p.u.	
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	None	Powertech Report# 12137-21-00 LDR-1
2. UELs (Reactive Ampere Limiting)	For UEL curves, see reference	Powertech Report# 12137-21-00 LDR-1
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	There is no 81 for U/F or O/F but overspeed relay 12 is set at 1.3 p.u.	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	59G sustained O/V protection: 109% of rated voltage with inverse time characteristics; no U/V protection	PI Sheets
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station PAC Setting Sheets for LDR	
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	RTU 055	Communication Block Diagram
Control Center	JHT / VIC	Communication Block Diagram

ACCEPTED: JAN 17 2011

ORDER NO. G 192 10

COMMISSION SECRETARY

Description	Ladore Falls GS	Reference For Additional Information
Control Points	Point Assignment	514-R05-A10 Sh 1 & 12
Point Assignment	514-R05-A10 Sh 1 & 12	
Communication Block Diagram	514-R06-D0 SS 1 & 2	
E.1.2 Automatic Generation Control System (AGC)	No	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	No	"http://w3hb/pcontrol/Subsites/Planning/pdf/RASSummary.pdf"
E.1.4 Telemetry	Point Assignment	514-R05-A10 Sh 1 & 12
E.1.5 Alarm Points	Point Assignment	514-R05-A10 Sh 1 & 12
E.1.5 Equipment Status	Point Assignment	514-R05-A10 Sh 1 & 12
E.1.7 Battery/Charger System		Telecontrol Manual Unit 22 Section 1
System	48V DC System	514-R16-B20
E.1.8 Revenue Metering System	Feature Not Equipped	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		
Telecommunications Media	Digital Radio	

ACCEPTED: JAN 17 2011

ORDER NO. G 192 10

COMMISSION SECRETARY

Description	Bridge River 1 GS	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (A) used	13CB1, 13CB2, 13CB3, 13CB4	T-line dwg: 621-H06-D50 R3 & D51 R1 LCO: 3P05-21A
B.3 Blackstart		
Blackstart Capability	No	
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	13CB1-4 = 3000A	One Line Diagram Dwg No. 621-H06-D50
B) Disconnect Switches	No Disconnects	One Line Diagram Dwg No. 621-H06-D50
2. Circuit breaker fault current rating	13CB1-4 = 40kA	One Line Diagram Dwg No. 621-H06-D50
C.3 Generator Max Power Output		
Nameplate	G1 - G4: 50 MVA at 0.95 p.f., 13.8kV rated voltage	Powertech Report# 11464-21-00 BR1-2
MPD (plant)	181 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.D.
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	Local Operating Order: 3P05-21A
3. Line-Drop-Compensation (LDC) equipment and setting	AVR: -0.041	Powertech Report# 11464-21-00 BR1-2
4. Joint Voltage Control Equipment	Feature Not Equipped	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1-G4: 0.8 p.u. - 1.1 p.u.	
B) Manual	Indeterminable	
6. ULTC capability	T1,T2: No ULTC	
C.5 Excitation Equipment		
1. Time for Vf to change from rated to 0.05% following a large step change	G1-G4: 0.05	
2. Negative field voltage capability	-3.2 p.u. at 82.04 Vbase	
3. PSS	G1 - G4	

ACCEPTED: JAN 17 2011

ORDER NO. G-192-10

COMMISSION SECRETARY

Description	Bridge River 1 GS	Reference For Additional Information
C.6 Voltage Regulator when generator in Synchronous Condenser Mode Or Minimum MW Mode		
A) Maximum Voltage	G1-G4: 1.1 p.u.	Powertech Report# 11464-21-00 BR1-2
B) Minimum Voltage	G1-G4: 0.8 p.u.	Powertech Report# 11464-21-00 BR1-2
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current/V/Hz)	G1,G3,G3,G4: OEL starts at 780A field current; V/Hz = 1.1 p.u.	Powertech Report# 11464-21-00 BR1-2
2. UELs (Reactive Ampere Limiting)	G1: UEL at -24MAR; G2: UEL at -25MVAR; G3: UEL at -24.8MVAR; G4: UEL at -26MVAR	Powertech Report# 11464-21-00 BR1-2
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	81G O/F relay; 66 Hz for more that 50 sec	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	59G O/V protection: 114% sustained and 140% instantaneous; no U/V protection	PI Sheets
C.10 Governor Specifications		
1. Speed Droop	G1, G2: 7%; G3 = 4.5%; G4 = 4%	Powertech Report# 11464-21-00 BR1-2
2. Dead Band	0.02% or less	
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for BR1, also see Protection Information on SIS	P&C Setting Sheets: Generation Projects SIS: BCH Intranet

ACCEPTED: JAN 17 2011

ORDER NO. G 192 10

COMMISSION SECRETARY

Description	Bridge River 1 GS	Reference For Additional Information
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	RTU 006 / RTU 007	Communication Block Diagram
Control Center	SIC / SIC, SCC	Communication Block Diagram
Control Points	Point Assignment	
Point Assignment	621-R05-A123 Sh 1 to 23 / 621-R05-A124 Sh 1 to 11	621-R05-A123 Sh.1 to 23 / 621-R05-A124 Sh.1 to 11
Communication Block Diagram	621-R05-D0 Sh 1 to Sh 5	
E.1.2 Automatic Generation Control System (AGC)	Yes	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	Yes	"http://w3/int/powinfo/05utilities/Planning/pdf/RASSummary.pdf"
E.1.4 Telemetry	Point Assignment	621-R05-A123 Sh.1 to 23 / 621-R05-A124 Sh.1 to 11
E.1.5 Alarm Points	Point Assignment	621-R05-A123 Sh.1 to 23 / 621-R05-A124 Sh.1 to 11
E.1.6 Equipment Status	Point Assignment	621-R05-A123 Sh.1 to 23 / 621-R05-A124 Sh.1 to 11
E.1.7 Battery/Charger System		Telecomm Manual Unit 22 Section 1
System	24V DC System	621-R10-D38
E.1.8 Revenue Metering System	Feature Not Equipped	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		
Telecommunications Media	Microwave Radio	

ACCEPTED: JAN 17 2011
ORDER NO. G 1 7 / 10

COMMISSION SECRETARY

Description	Bridge River 2 GS	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	13CB5, 13CB6, 13CB7, 13CB8	One Line Diagram Dwg No. 622-H06-D1-R15 & D2 R17 LOD: 3P05-22A
B.3 Blackstart		
Blackstart Capability	No	
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	13CB5-8: 4000A	One Line Diagram: 622-H06-D1, 2
B) Disconnect Switches	13DCB5-8 = 4000A; 305-8 = 2000A	One Line Diagram: 622-H06-D1, 2
2. Circuit breaker fault current rating	Not Available	
C.3 Generator Max Power Output		
Nameplate	G5 - G8: 65.25 MVA at 0.95 p.f., 13.8 kV rated voltage	Powertech Report# 11464-21-00 BR2-2
MPO (plant)	275 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	Comptroller of Water Rights
2. Unit/Plant MVar or terminal voltage adjustment by SCTC	Fut	Local Operating Order: 3P05-22A
3. Line-Drop-Compensation (LDC) equipment and setting	Feature Not Available	Powertech Report# 11464-21-00 BR2-2
4. Joint Voltage Control Equipment	Feature Not Available	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G5-G8: 0.8 p.u. - 1.1 p.u.	Powertech Report# 11464-21-00 BR2-2
B) Manual	Indeterminable	
6. ULTC capability	T5-T8: No ULTC	
C.5 Excitation Equipment		
1. Time for Vt to change from rated to 0.95% following a large step change	G5, G6: 2.0 sec; G6, G7: 2.5 sec	Powertech Report# 11464-21-00 BR2-2
2. Negative field voltage capability	-3.42 p.u. at 98.1 Vbase	Powertech Report# 11464-21-00 BR2-2
3. PSS	Feature Not Available	

ACCEPTED: JAN 17 2011

ORDER NO. G-12-10

COMMISSION SECRETARY

Description	Bridge River 2 G5	Reference For Additional Information
C.6 Voltage Regulator when generator in Synchronous Condenser Mode Or Minimum MW Mode		
A) Maximum Voltage	G5-G8: 1.1 p.u.	Powertech Report# 11464-21-00 BR2-2
B) Minimum Voltage	G5-G8: 0.9 p.u.	Powertech Report# 11464-21-00 BR2-2
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current/V/Hz)	G5: No OEL, Max set at 20MVAR G6: No OEL, Max set at 24MVAR G7: No OEL, Max set at 30MVAR G8: No OEL, Max field current of 900A	Powertech Report# 11464-21-00 BR2-2
2. UELs (Reactive Ampere Limiting)	G5: No UEL, Min Stator Current of 2900 A G6: No UEL, Min Stator Current of 3100 A G7: No UEL, Min Reactive Power at -30MVAR G5: No UEL, Min Stator Current of 3300 A	Powertech Report# 11464-21-00 BR2-2
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	No O/F and U/F protection. Overspeed trip set at 419 rpm (137%)	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	51G sustained O/V protection: 114% overvoltage with inverse time characteristics; no U/V protection	PI Sheets
C.10 Governor Specifications		
1. Speed Droop	G5, G7: 5%; G6 = 7.3%; G8 = 6%	Powertech Report# 11464-21-00 BR2-2
2. Dead Band	0.02% or less	

ACCEPTED: JAN 17 2011

ORDER NO. G 192 10

COMMISSION SECRETARY

Description	Bridge River 2 GS	Reference For Additional Information
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for BR2	
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	RTU 009 / RTU 009	Communication Block Diagram
Control Center	SIC / SCC, SIC	Communication Block Diagram
Control Points	Yes	Point Assignment
Point Assignment	622-R05-A15 Sh.1 to 21 / 622-R05-A16 Sh.1 & 9	622-R05-A15 Sh.1 to 21 / 622-R05-A16 Sh.1 & 9
Communication Block Diagram	622-R06-D0 Sh.1 & Sh.2	
E.1.2 Automatic Generation Control System (AGC)	Yes	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	Yes	"http://intranet/pcontrol/Substation/Planning/pdf/RASSummary.pdf"
E.1.4 Telemetry	Point Assignment	622-R05-A15 Sh.1 to 21 / 622-R05-A16 Sh.1 & 9
E.1.5 Alarm Points	Point Assignment	622-R05-A15 Sh.1 to 21 / 622-R05-A16 Sh.1 & 9
E.1.6 Equipment Status	Point Assignment	622-R05-A15 Sh.1 to 21 / 622-R05-A10 Sh.1 & 9
E.1.7 Battery/Charger System		Telecontrol Manual Unit 22 Section 1
System	24V DC System	622-R18-D18
E.1.8 Revenue Metering System	Feature Not Available	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		
Telecommunications Media	Microwave Radio	

ACCEPTED: JAN 17 2011

ORDER NO. G-192-10

COMMISSION SECRETARY

Description	Wahleach 99	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	13CB1, 13CB11	One Line Diagram Dwg No. 425-E06-B0003 R001 & LOO: 3P05-84A
B.3 Blackstart		
Blackstart Capability	No	
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	13CB1, 11: 4000A	Single Line Diagram: 425-H06-D1
B) Disconnect Switches	Not Available	Single Line Diagram: 425-H06-D1
2. Circuit breaker fault current rating	13CB1, 11: 38kA	Single Line Diagram: 425-H06-D1
C.3 Generator Max Power Output		
Nameplate	G1: 75 MVA, 0.80 p.f., 13.8kV rated voltage	Powertech Report# 12045-21-00 WAH-1
MPO (plant)	84 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.O.
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	Local Operating Order: 3P05-84A
3. Line-Drop-Compensation (LDC) equipment and setting	Feature Not Equipped	Powertech Report# 12045-21-00 WAH-1
4. Joint Voltage Control Equipment	Feature Not Equipped	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1: 0.8 p.u. - 1.1 p.u.	
B) Manual	Indeterminable	
6. ULTC capability	T1: No ULTC	
C.5 Excitation Equipment		
1. Time for Vf to change from rated to 0.95% following a large step change	G1: 0.03 sec	
2. Negative field voltage capability	-4.01 p.u. at 110.8 Vbase	Exciter Single Line: 425-H06-D211 SH 5AA
3. PSS	Feature Not Equipped	

ACCEPTED: JAN 17 2011

ORDER NO. G1 92 10

COMMISSION SECRETARY

Description	Wahleach GS	Reference For Additional Information
C.6 Voltage Regulator when generator in Synchronous Condenser Mode or Minimum MW Mode		
A) Maximum Voltage	G1: 1.1 p.u.	
B) Maximum Voltage	G1: 0.8 p.u.	
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	None	Powertech Report# 12045-21-00 WAH-1
2. UELs (Reactive Ampere Limiting)	None	Powertech Report# 12045-21-00 WAH-1
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	There is no 81 for U/F or O/F but overspeed relay 12 is set at 1.25 p.u.	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	59G instantaneous O/V protection: 135% of rated voltage; no U/V protection	PI Sheets
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for WAH	
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	RTU 186 / Not Available	Communication Block Diagram
Control Center	SCC 7 / MC	Communication Block Diagram

ACCEPTED: JAN 17 2011

ORDER NO. G-22-10

COMMISSION SECRETARY

Description	Wahtash G5	Reference For Additional Information
Control Points	Point Assignment	425-R05-A32 Sh.1 to 7 425-H05-A28 Sh.1 to 7
Point Assignment	425-R05-A32 Sh.1 to 7 425-H05-A28 Sh.1 to 7	
Communication Block Diagram	425-R06-D0	
E.1.2 Automatic Generation Control System (AGC)	No	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	No	"http://w3ld/pcontrol/Subsites/Planning/pdf/RASSummary.pdf"
E.1.4 Telemetry	Point Assignment	425-R05-A32 Sh.1 to 7 425-H05-A28 Sh.1 to 7
E.1.5 Alarm Points	Point Assignment	425-R05-A32 Sh.1 to 7 425-H05-A28 Sh.1 to 7
E.1.6 Equipment Status	Point Assignment	425-H05-A32 Sh.1 to 7 425-H05-A28 Sh.1 to 7
E.1.7 Battery/Charger System		Telecontrol Manual Unit 22 Section 1
System	24V DC System	425-K10-B51 Sh.1 to C2
E.1.8 Revenue Metering System	Feature Not Equipped	
E.2 Telecommunications Media		
Telecommunications Media	Power Line Carrier	

ACCEPTED: JAN 17 2011

ORDER NO. G-192-10

COMMISSION SECRETARY

Description	Selon GS	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	60CB1	One Line Diagram Dwg No. 623-E06-U0001 R003 & LOO: 3P05-25A
B.3 Blackstart		
Blackstart Capability	No	
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	60CB1 = 2000A	One Line Diagram Dwg No. 623-E06-U0001 R003
B) Disconnect Switches	60DCB1 = 2000A	One Line Diagram Dwg No. 623-E06-U0001 R003
2. Circuit breaker fault current rating	60CB1 = 20kA	One Line Diagram Dwg No. 623-E06-U0001 R003
C.3 Generator Max Power Output		
Nameplate	G1: 42 MVA, 1.0 p.f., 13.8kV rated voltage	Powertech report# 11464-21-00 SON-2
MPO (plant)	48 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.O.
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	Local Operating Order: 3P05-25A
3. Line-Drop-Compensation (LDC) equipment and setting	AVR: -0.047 p.u.	Powertech report# 11464-21-00 SON-2
4. Joint Voltage Control Equipment	Feature Not Equipped	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1: 0.8 p.u. - 1.1 p.u.	Powertech report# 11464-21-00 SON-2
B) Manual	Indeterminable	
6. ULTC capability	T1: No ULTC	
C.5 Excitation Equipment		
1. Time for Vf to change from rated to 0.95% following a large step change	G1: 1.4 sec	Powertech report# 11464-21-00 SON-2
2. Negative field voltage capability	-5.37 p.u. at 103.2 Vbase	Powertech report# 11464-21-00 SON-2
3. PSS	Feature Not Equipped	

ACCEPTED: JAN 17 2011

ORDER NO. G-192-10

COMMISSION SECRETARY

Description	Seton GS	Reference For Additional Information
C.6 Voltage Regulator when generator in Synchronous Condenser Mode or Minimum MW Mode		
A) Maximum Voltage	G1: 1.1 p.u.	Powertech report# 11464-21-00 SON-2
B) Minimum Voltage	G1: 0.8 p.u.	Powertech report# 11464-21-00 SON-2
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	There is no OEL for the unit. The maximum reactive power is reached with the maximum possible excitation control	Powertech report# 11464-21-00 SON-2
2. UELs (Reactive Ampere Limiting)	There is no UEL for the unit. The minimum power is limited by the terminal voltage which can not fall below 13.2kV according to the operating order	Powertech report# 11464-21-00 SON-2
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	81G O/F relay: 64 Hz for 7.8 sec	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	59G sustained O/V protection: 120% overvoltage with inverse time characteristics; no U/V protection	PI Sheets
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for SON, also see Protection Information on SIS	
E.1 Operations Control and Telecommunications Facilities		

ACCEPTED: JAN 17 2011

ORDER NO. G-02-10

COMMISSION SECRETARY

Description	Seton G8	Reference For Additional Information
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	RIU 503	Communication Block Diagram
Control Center	SIC	Communication Block Diagram
Control Points	Point Assignment	823-R05-A6 Sh.1 to 11
Point Assignment	823-R05-A6 Sh.1 to 11	
Communication Block Diagram	823-R06-D8 Sh.1 & 2	
E.1.2 Automatic Generation Control System (AGC)	No	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	No	"http://w3hd/pcontrol/Substest/Planning/pcn RASSummary.pdf"
E.1.4 Telemetry	Point Assignment	823-R05-A6 Sh.1 to 11
E.1.5 Alarm Points	Point Assignment	823-R05-A6 Sh.1 to 11
E.1.6 Equipment Status	Point Assignment	823-R05-A6 Sh.1 to 11
E.1.7 Battery/Charger System		Telecontrol Manual Unit 22 Section 3
System	24V DC System	823-R16-B8
E.1.8 Revenue Metering System	Feature Not Equipped	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		
Telecommunications Media	Microwave Radio	

ACCEPTED: JAN 17 2011

ORDER NO. G 1 92 10

COMMISSION SECRETARY

Description	Lajoie G5	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	60CB1	One Line Diagram: 620-E06-B0001 R007 LOO: 3P05-24A
B.3 Blackstart		
Blackstart Capability	Yes, 1 - 250kVA Diesel Genset	LOO: 3P05-24A
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	60CB1 = 2000A	One Line Diagram Dwg No. 620-E06-B0001 R007
B) Disconnect Switches	60DCB1 = Not Available	One Line Diagram Dwg No. 620-E06-B0001 R007
2. Circuit breaker fault current rating	Not Available	One Line Diagram Dwg No. 620-E06-B0001 R007
C.3 Generator Max Power Output		
Nameplate	G1: 24.44 MVA, 0.90 p.f., 13.8kV rated voltage	Powertech Report # 11464-21-00 LAJ-2
MPO (plant)	25 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.D.
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	Local Operating Order: 3P05-24A
3. Line-Drop-Compensation (LDC) equipment and setting	Feature Not Equipped	Powertech Report # 11464-21-00 LAJ-2
4. Joint Voltage Control Equipment	Feature Not Equipped	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1: 0.8 p.u. - 1.1 p.u.	Powertech Report # 11464-21-00 LAJ-2
B) Manual	Indeterminable	
6. ULTC capability	T1: No ULTC	
C.5 Excitation Equipment		
1. Time for Vt to change from rated to 0.95% following a large step change	G1: 2.14 sec	Powertech Report # 11464-21-00 LAJ-2
2. Negative field voltage capability	-4.69 p.u. at 100.2 Vbase	Powertech Report # 11464-21-00 LAJ-2
3. PSS	Feature Not Equipped	

ACCEPTED: JAN 17 2011

ORDER NO. C 1 92 10

COMMISSION SECRETARY

Description	Lajoie GS	Reference For Additional Information
C.6 Voltage Regulator when generator in Synchronous Condenser Mode or Minimum MW Mode		
A) Maximum Voltage	G1: 1.1 p.u.	
B) Minimum Voltage	G1: 0.8 p.u.	
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	OEL is set at 9 amp for the pilot exciter field current. There is no V/Hz limiter for the unit	Powertech Report # 11464-21-00 LAJ-2
2. UELs (Reactive Ampere Limiting)	There is no UEL for this unit. The minimum reactive power is limited by the generator stator current	Powertech Report # 11464-21-00 LAJ-2
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	81G time delayed O/F relay: 62 Hz	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	59G sustained O/V protection: 122% of rated voltage with inverse time characteristics; no U/V protection	PI Sheets
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for LAJ	
E.1 Operations Control and Telecommunications Facilities		

ACCEPTED: JAN 17 2011

ORDER NO. G 192 10

COMMISSION SECRETARY

Description	Lakela GS	Reference For Additional Information
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	RSU 501	Communication Block Diagram
Control Center	SIC	Communication Block Diagram
Control Points	Point Assignment	620-R05-A6 Sh.1 to 10
Point Assignment	620-R05-A6 Sh.1 to 10	
Communication Block Diagram	620-R05-D0	
E.1.2 Automatic Generation Control System (AGC)	No	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	No	"http://w3idl/pcontrol/Subsites/Planning/pdf/RASSummary.pdf"
E.1.4 Telemetry	Point Assignment	620-R05-A6 Sh.1 to 10
E.1.5 Alarm Points	Point Assignment	620-R05-A6 Sh.1 to 10
E.1.6 Equipment Status	Point Assignment	620-R05-A6 Sh.1 to 10
E.1.7 Battery/Charger System		Telecontrol Manual, Unit 22 Section 1
System	24V DC System	620-R10-B1
E.1.8 Revenue Metering System	Feature Not Equipped	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		
Telecommunications Media	Power Line Carrier	

ACCEPTED: JAN 17 2011

ORDER NO. G 192 10

COMMISSION SECRETARY

Description	Falls River G5	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	6.6CB1, 6.6CB2, 6.6CB4	One Line Diagram Dwg No. 908-E06-C0006 & LOO: 3P05-42A
B.3 Blackstart		
Blackstart Capability	Yes, 1-100kW, 600V AC Diesel Genset	LOO: 3P05-42A
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	6.6CB1 = 800A; 6.6CB2,4 = 1200A	One Line Diagram Dwg No. 908-E06-C0006
B) Disconnect Switches	6.6DCB2 = 1200A; 6.6D1,3 = 400A	One Line Diagram Dwg No. 908-E06-C0006
2. Circuit breaker fault current rating	Not Available	One Line Diagram Dwg No. 908-E06-C0006
C.3 Generator Max Power Output		
Name/Mark	G1, G2: 6 MVA, 0.8 p.f., 6.6kV rated voltage	Generator Data Book
MPO (plant)	7 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.G., Generator Data Book
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	
3. Line-Drop-Compensation (LDC) equipment and setting	Feature Not Equipped	
4. Joint Voltage Control Equipment	Feature Not Equipped	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1, G2: 0.8 p.u. - 1.1 p.u.	
B) Manual	Indeterminable	
6. ULTC capability	T1: No ULTC	
C.5 Excitation Equipment		
1. Time for Vf to change from rated to 0.95% following a large step change	Not Available	
2. Negative field voltage capability	Not Available	
3. PSS	Feature Not Available	

ACCEPTED: JAN 17 2011

ORDER NO. G 1 92 10

COMMISSION SECRETARY

Description	Falls River G5	Reference For Additional Information
C.6 Voltage Regulator when generator in Synchronous Condenser Mode or Minimum MW Mode		
A) Maximum Voltage	G1, G2: 1.1 p.u.	
B) Minimum Voltage	G1, G2: 0.8 p.u.	
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	Not Available	
2. UELs (Reactive Ampere Limiting)	Not Available	
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	No U/F or O/F protection but rotor overspeed protection at 150%	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	59G sustained O/V protection at 112% of rated voltage for 10 sec with inverse time characteristics; U/V at 80% for 5 sec	PI Sheets
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for FLS, also see Protection information on SIS	
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	S297, T188	Communication Block Diagram
Control Center	NCC	Communication Block Diagram

ACCEPTED: JAN 17 2011
ORDER NO. G-192-10

COMMISSION SECRETARY

Description	Falls River GS	Reference For Additional Information
Control Points	Point Assignment	
Point Assignment	839-R05-B5 Sh.27A, 27B & 27C	839-R05-B5 Sh.27A, 27B & 27C
Communication Block Diagram	908-R06-D0	
E.1.2 Automatic Generation Control System (AGC)	No	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	No	"http://w3id/pcontrol/Substation/Planning/pdf/RASSummary.pdf"
E.1.4 Telemetry	Point Assignment	839-R05-B5 Sh.27A, 27B & 27C
E.1.5 Alarm Points	Point Assignment	839-R05-B5 Sh.27A, 27B & 27C
E.1.6 Equipment Status	Point Assignment	839-R05-B5 Sh.27A, 27B & 27C
E.1.7 Battery/Charger System		Telecontrol Manual, Unit 22 Section 1
System	24V DC System	908-R18-B7
E.1.8 Revenue Metering System	Feature Not Equipped	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		
Telecommunications Media	Power Line Carrier	

ACCEPTED: JAN 17 2011

ORDER NO. G 192 10

COMMISSION SECRETARY

Description	Ash River GS	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	13CB1	One Line Diagram: 534-E06-B14 LOO: 3P05-02A
B.3 Blackstart		
Blackstart Capability	Yes, 1-100kW, 600V AC Diesel Generator	LOO: 3P05-02A
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	13CB1 = 2000A	One Line Diagram Dwg No. 534-E06-B14
B) Disconnect Switches	13D1 = 2000A, 1D1 = 600A	One Line Diagram Dwg No. 534-E06-B14
2. Circuit breaker fault current rating	13CB1 = 20kA	One Line Diagram Dwg No. 534-E06-B14
C.3 Generator Max Power Output		
Nameplate	G1: 28.0 MVA, 0.80 p.f., 13.8kV rated voltage	Powertech Report# 12137-21-00 ASH-1
MPO (plant)	28 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.K.O., Contact: Larry NeCelson/Shane Kronebush
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	Local Operating Order: 3P05-02A
3. Line-Drop-Compensation (LDC) equipment and setting	Feature Not Available	Powertech Report# 12137-21-00 ASH-1
4. Joint Voltage Control Equipment	Feature Not Available	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1: 0.8 p.u. - 1.1 p.u.	Powertech Report# 12137-21-00 ASH-1
B) Manual	Indeterminable	
6. ULTC capability	T1: No ULTC	
C.5 Excitation Equipment		
1. Time for Vt to change from rated to 0.95% following a large step change	G1: 0.03 sec	
2. Negative field voltage capability	-4.84 p.u. at 111.54 Vbase	Exciter Single Line: 534-H06-D60 SH. 5AA

ACCEPTED: JAN 17 2011

ORDER NO. G-192-10

COMMISSION SECRETARY

Description	Ash River GS	Reference For Additional Information
3. PSS	Feature Not Available	
C.6 Voltage Regulator when generator in Synchronous Condenser Mode or Minimum MW Mode		
A) Maximum Voltage	G1: 1.1 p.u.	
B) Minimum Voltage	G1: 0.8 p.u.	
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	None	Powertech Report# 12137-21-00 ASH-1
2. UELs (Reactive Ampere Limiting)	For UEL curve, see reference	Powertech Report# 12137-21-00 ASH-1
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	No B1G O/F or U/F protection but 12G initiates shutdown in case of overspeed	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	59G O/V protection set at 130%; 27G U/V set at 56%	PI Sheets
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for ASH, also see Protection Information on S&S	P&C Setting Sheets LDO: 3PC8-02A
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	RIU 506	Communication Block Diagram
Control Center	VIC	Communication Block Diagram

ACCEPTED: JAN 17 2011

ORDER NO. G-192-10

COMMISSION SECRETARY

Description	Ash River GS	Reference For Additional Information
Control Points	Point Assignment	534-R05-A12 Sh.1 to 7
Point Assignment	534-R05-A12 Sh.1 to 7	
Communication Block Diagram	534-R06-D0	
E.1.2 Automatic Generation Control System (AGC)	No	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	No	"http://w3sd/pcontrol/Subsites/Planning/pdf/RASSummary.pdf"
E.1.4 Telemetry	Point Assignment	534-R05-A12 Sh.1 to 7
E.1.5 Alarm Points	Point Assignment	534-R05-A12 Sh.1 to 7
E.1.6 Equipment Status	Point Assignment	534-R05-A12 Sh.1 to 7
E.1.7 Battery/Charger System		Telecontrol Manual Unit 22 Section 1
System	24V DC System	534-R16-B10
E.1.8 Revenue Metering System	Feature Not Available	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		
Telecommunications Media	Power Line Carrier	

ACCEPTED: JAN 17 2011

ORDER NO. G 192 10

COMMISSION SECRETARY

Description	Walter Hardman G8	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	4CB11, 4CB12	One Line Diagram Dwg No. 221-H06-D0001 R012 SH.1 & Dwg No. 221-H06-D0001 R012 SH.2 & LOO: 3P03-868
B.3 Blackstart		
Blackstart Capability	No	
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	4CB1, 2, 11, 12 = 1200A	One Line Diagram: 221-P06-B2
B) Disconnect Switches	No Disconnects	One Line Diagram: 221-P06-B2
2. Circuit breaker fault current rating	4CB1, 2, 11, 12 = 18kA	One Line Diagram: 221-P06-B2
C.3 Generator Max Power Output		
Nameplate	G1, G2: 5 MVA, 0.8 p.f., 4.33kV rated voltage	Generator Data Book
MPO (plant)	8 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.O., Generator Data Book
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	FLS	Local Operating Order: 3P03-868
3. Line-Drop-Compensation (LDC) equipment and setting	Feature Not Equipped	
4. Joint Voltage Control Equipment	Feature Not Equipped	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1, G2: 0.8 p.u. - 1.1 p.u.	
B) Manual	Indeterminable	
6. ULTC capability	T6, T7: No ULTC	
C.5 Excitation Equipment		
1. Time for Vf to change from rated to 0.95% following a large step change	Not Available	
2. Negative field voltage capability	Not Available	
3. PSS	Feature Not Available	

ACCEPTED: JAN 17 2011

ORDER NO. 61926

COMMISSION SECRETARY

Description	Walter Hardman GS	Reference For Additional Information
C.6 Voltage Regulator when generator in Synchronous Condenser Mode or Minimum MW Mode		
A) Maximum Voltage	G1, G2: 1.1 p.u.	
B) Minimum Voltage	G1, G2: 0.8 p.u	
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	Not Available	
2. UELs (Reactive Ampere Limiting)	Not Available	
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	81G O/F relay 65 Hz for more that 50 sec, 123M rotor overspeed protection at 150%	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	59G sustained O/V protection at 120% of rated voltage with inverse time characteristics, and instantaneous protection at 140%	PI Sheets
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for WHN	
E.1 Operations Control and Telecommunications Facilities		
E 1.1 Remote Control Facility and Control Center		
Remote Control Facility	RTU 197	Communication Block Diagram
Control Center	SIC	Communication Block Diagram
Control Points	Point Assignment	221-R05-A3 Sh.1 to 12

ACCEPTED: JAN 17 2011

ORDER NO. G 192 10

COMMISSION SECRETARY

Description	Walter Hardman GS	Reference For Additional Information
Point Assignment	221-R05-A3 Sh.1 to 12	
Communication Block Diagram	221-R08-D0	
E.1.2 Automatic Generation Control System (AGC)	No	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	No	"http://w3hydro.com/Subsites/Planning/pdf/RASSummary.pdf"
E.1.4 Telemetry	Point Assignment	221-R05-A3 Sh.1 to 12
E.1.5 Alarm Points	Point Assignment	221-R05-A3 Sh.1 to 12
E.1.6 Equipment Status	Point Assignment	221-R05-A3 Sh.1 to 12
E.1.7 Battery/Charger System		Telecontrol Manual Unit 22 Section 1
System	24V DC System	221-R16-A1 Sh.1 to D1
E.1.8 Revenue Metering System	Feature Not Equipped	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		
Telecommunications Media	V.H.F. Radio to Bellkewael Substation	

ACCEPTED: JAN 17 2011

ORDER NO. G-192-10

COMMISSION SECRETARY

Description	Clowhom Falls GS	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	13CB1	One Line Diagram Dwg No. 404-E06-U0001 R002 & LOO: 3P05-62A
B.3 Blackstart		
Blackstart Capability	Yes; 175KVA, 120/208V at 1800rpm	LOO: 3P05-62A
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	13CB1 = 1400 A	One Line Diagram Dwg No. 404-E06-U0001 R002
B) Disconnect Switches	No Disconnects	One Line Diagram Dwg No. 404-E06-U0001 R002
2. Circuit breaker fault current rating	13CB1 = 18.3 kA	One Line Diagram Dwg No. 404-E06-U0001 R002
C.3 Generator Max Power Output		
Nameplate	G1: 31.58 MVA, 0.95 p.f., 13.8kV rated voltage	Powertech Report# 12137-21-00 COM-1
MPO (plant)	33 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.O.
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	Local Operating Order: 3P05-62A
3. Line-Drop-Compensation (LDC) equipment and setting	Feature Not Available	Powertech Report# 12137-21-00 COM-1
4. Joint Voltage Control Equipment	Feature Not Available	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1: 0.8 p.u. - 1.1 p.u.	
B) Manual	Indeterminable	
6. ULTC capability	1; No ULTC	
C.5 Excitation Equipment		
1. Time for Vt to change from rated to 0.95% following a large step change	G1: 0.65 sec	Powertech Report# 12137-21-00 COM-1
2. Negative field voltage capability	-3.2 p.u. at 102 Vbase	Powertech Report# 12137-21-00 COM-1
3. PSS	Feature Not Available	

ACCEPTED: JAN 17 2011

ORDER NO. G-192-10

COMMISSION SECRETARY

Description	Clowhom Falls GS	Reference For Additional Information
C.6 Voltage Regulator when generator in Synchronous Condenser Mode or Minimum MW Mode		
A) Maximum Voltage	G1: 1.1 p.u.	
B) Minimum Voltage	G1: 0.8 p.u.	
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	None	Powertech Report 12137-21-00 COM-1
2. UELs (Reactive Ampere Limiting)	For UEL curve, see reference	Powertech Report 12137-21-00 COM-1
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	There is no 81 for U/F or O/F but overspeed relay 12 is set at 1.25 p.u. The timer is set at 120 seconds	PI Sheets
C.8 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	59L sustained O/V protection: 122% of rated voltage with inverse time characteristics; no U/V protection	PI Sheets
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for CGM; also see Protection Information on SIS	
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	RTU 018 / 5233, 7119	Communication Block Diagram

ACCEPTED: JAN 17 2011

ORDER NO. G-192-10

COMMISSION SECRETARY

Description	Clowholm Falls GS	Reference For Additional Information
Control Center	SCC / UMC	Communication Block Diagram
Control Points	Point Assignment	404-R05-A3 Sh.1 to 5 / 404-H05-A7
Point Assignment	404-R05-A3 Sh.1 to 5 / 404-H05-A7	
Communication Block Diagram	404-R05-D0	
E.1.2 Automatic Generation Control System (AGC)	No	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	No	"http://w3/sl/pcontrol/Substas/Planning/pdf/RASSummary.pdf"
E.1.4 Telemetry	Point Assignment	404-R05-A3 Sh.1 to 5 / 404-H05-A7
E.1.5 Alarm Points	Point Assignment	404-R05-A3 Sh.1 to 5 / 404-H05-A7
E.1.6 Equipment Status	Point Assignment	404-R05-A3 Sh.1 to 5 / 404-H05-A7
E.1.7 Battery\Charger System		Telecontrol Manual Unit 22 Section 1
System	24V DC System	Not Available
Reference		
E.1.8 Revenue Metering System	Feature Not Available	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		
Telecommunications Media	Power Line Carrier	

ACCEPTED: JAN 17 2011

ORDER NO. G-192-10

COMMISSION SECRETARY

Description	Alouette GS	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	6.6CB1	One Line Diagram : 421-E06-D1-R2 LOO: 3P05-81A
B.3 Blackstart		
Blackstart Capability	Yes, 1 - 75kW, 120/208V AC Diesel Genset	LOO: 3P05-81A
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	6.6CB1 = 1200A	One Line Diagram Dwg No. 421-E06-D1-R2
B) Disconnect Switches	6.6D1, 6.6DCB1, 66D1 – Not Available	One Line Diagram Dwg No. 421-E06-D1-R2
2. Circuit breaker fault current rating	6.6CB1 = 18kA	One Line Diagram Dwg No. 421-E06-D1-R2
C.3 Generator Max Power Output		
Nameplate	G1: 10 MVA, 0.8 p.f., 6.83kV rated voltage	Generator Data Book
MPO (plant)	9 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.O., Generator Data Book
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	LOO: 3P05-81A
3. Line-Drop-Compensation (LDC) equipment and setting	Feature Not Equipped	
4. Joint Voltage Control Equipment	Feature Not Equipped	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1: 0.8 p.u. - 1.1 p.u.	
B) Manual	Indeterminable	
6. ULTC capability	T1: No ULTC	
C.5 Excitation Equipment		
1. Time for VT to change from rated to 0.95% following a large step change	Not Available	
2. Negative field voltage capability	Not Available	
3. PSS	Feature Not Available	

ACCEPTED: JAN 17 2011
ORDER NO. 61920

COMMISSION SECRETARY

Description	Alouette GS	Reference For Additional Information
C.6 Voltage Regulator when generator in Synchronous Condenser Mode or Minimum MW Mode		
A) Maximum Voltage	G1: 1.1 p.u.	
B) Minimum Voltage	G1: 0.8 p.u.	
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	Not Available	
2. UELs (Reactive Ampere Limiting)	Not Available	
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	Time delayed O/F at 62.5 Hz and U/F at 56.0 Hz	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	Instantaneous O/V at 118%, sustained O/V at 111% with inverse time characteristics	PI Sheets
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for ALU	
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	RTU 145	Communication Block Diagram

ACCEPTED: JAN 17 2011
ORDER NO. G-192-10

COMMISSION SECRETARY

Description	Alouette GS	Reference For Additional Information
Control Center	LMC	Communication Block Diagram
Control Points	Point Assignment	
Point Assignment	421-R05-A3 Sh.1 to 8	421-R05-A3 Sh.1 to 8
Communication Block Diagram	421-R06-00	
E.1.2 Automatic Generation Control System (AGC)	No	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	No	"http://w3/dpcontrol/Subsites/Planning/pdf/RAS-Summary.pdf"
E.1.4 Telemetry	Point Assignment	421-R05-A3 Sh.1 to 8
E.1.5 Alarm Points	Point Assignment	421-R05-A3 Sh.1 to 8
E.1.6 Equipment Status	Point Assignment	421-R05-A3 Sh.1 to 8
E.1.7 Battery/Charger System		Telecontrol Manual Unit 22 Section 1
System	24V DC System	
E.1.8 Revenue Metering System	Feature Not Equipped	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		
Telecommunications Media	Power Line Carrier	

ACCEPTED: JAN 17 2011

ORDER NO. E-192-10

COMMISSION SECRETARY

Description	Lake Buntzen 1 G8	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	60CB1	One Line Diagram: 419-E06-D0032 R000 & LOO: 3P01-38 LB1
B.3 Blackstart		
Blackstart Capability	Yes, 150kW, 480V AC Diesel Genset	LOO: 3P01-38 LB1
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	60CB1 = 600A	One Line Diagram: 419-E06-D0032 R000
B) Disconnect Switches	60DCB1 = Not Available	One Line Diagram: 419-E06-D0032 R000
2. Circuit breaker fault current rating	60CB1 = 10kA	One Line Diagram: 419-E06-D0032 R000
C.3 Generator Max Power Output		
Nameplate	G1: 62.5 MVA, 0.80 p.f., 13.8KV rated voltage	Powertech Report# 12137-21-00 LB1-1
MPO (plant)	55 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.C.
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	Local Operating Order: 3P01-38 LB1
3. Line-Drop-Compensation (LDC) equipment and setting	Feature Not Equipped	Powertech Report# 12137-21-00 LB1-1
4. Joint Voltage Control Equipment	Feature Not Equipped	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1: 0.8 p.u. - 1.1 p.u.	
B) Manual	Indeterminable	
6. ULTC capability	T1: No ULTC	
C.5 Excitation Equipment		
1. Time for Vt to change from rated to 0.95% following a large step change	G1: 1.2 sec	Powertech Report# 12137-21-00 LB1-1
2. Negative field voltage capability	Zero	Powertech Report# 12137-21-00 LB1-1
3. PSS	Feature Not Equipped	

ACCEPTED: JAN 17 2011

ORDER NO. G 192 10

COMMISSION SECRETARY

Description	Lake Buntzen 1 GS	Reference For Additional Information
C.6 Voltage Regulator when generator in Synchronous Condenser Mode or Minimum MW Mode		
A) Maximum Voltage	G1: 1.1 p.u.	
B) Minimum Voltage	G1: 0.8 p.u.	
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	None	Powertech Report# 12137-21-00 LB1.1
2. UELs (Reactive Ampere Limiting)	None	Powertech Report# 12137-21-00 LB1.1
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	There is no 81 for U/F or O/F but overspeed relay 92 is set at 1.33 p.u.	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	69kV sustained O/V protection: 130% of rated voltage with inverse time characteristics; no U/V protection	PI Sheets
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for LB1	
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	RTU 057 / 5240, T125	Communication Block Diagram
Control Center	SCC / LMC	Communication Block Diagram

ACCEPTED: JAN 17 2011
ORDER NO. 61 92 10

COMMISSION SECRETARY

Description	Lake Buntzen 1 GS	Reference For Additional Information
Control Points	Point Assignment	419-R05-A8 Sh.1 to 7 / 419-R05-A11 Sh.1 to 4
Point Assignment	419-R05-A8 Sh.1 to 7 / 419-R05-A11 Sh.1 to 4	
Communication Block Diagram	419-R08-D0 SH.1 & 2 / 420-R06-D0	
E.1.2 Automatic Generation Control System (AGC)	No	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	No	"http://wd/bd/pcentral/Subsites/Planning/pct/RAS Summary.pdf"
E.1.4 Telemetry	Point Assignment	419-R05-A8 Sh.1 to 7 / 419-R05-A11 Sh.1 to 4
E.1.5 Alarm Points	Point Assignment	419-R05-A8 Sh.1 to 7 / 419-R05-A11 Sh.1 to 4
E.1.6 Equipment Status	Point Assignment	419-R05-A8 Sh.1 to 7 / 419-R05-A11 Sh.1 to 4
E.1.7 Battery/Charger System		Telecontrol Manual Unit 22 Section 1
System	24V DC System	419-R16-A17 Sh.1 to 17
Reference	Feature Not Equipped	Metering equipment is present but there is no revenue metering "system"
E.1.8 Revenue Metering System		
E.2 Telecommunications Media		
Telecommunications Media	Telephone Lease to Coquitlam	

ACCEPTED: JAN 17 2011

ORDER NO. 61992.10

COMMISSION SECRETARY

Description	Spillmacheen GS	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	60CB1, 4CB13	One Line Diagram Dwg No. 105-H06-D0001 R015 & LOO: 3P04-07F.
B.3 Blackstart		
Blackstart Capability	Yes, 1 - 62.5kVA AC Diesel Genset	LOO: 3P04-07F
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	CB1, 2, 11, 12, 13: 600A	One Line Diagram Dwg No. 105-H06-D0001 R015
B) Disconnect Switches	No Disconnects	One Line Diagram Dwg No. 105-H06-D0001 R015
2. Circuit breaker fault current rating	CB1, 2, 11, 12, 13: 7.6kA	One Line Diagram Dwg No. 105-H06-D0001 R015
C.3 Generator Max Power Output		
Nameplate	G1, G2: 1.125 MVA, 0.85 p.f., 4.16kV rated voltage G3: 2.75 MVAr, 0.85 p.f., 4.16 rated voltage	Generator Data Book
MPO (plant)	4 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.O., Generator Data Book
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	LOO: 3P04-07F
3. Line-Drop-Compensation (LDC) equipment and setting	Feature Not Equipped	
4. Joint Voltage Control Equipment	Feature Not Equipped	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1, G2: 0.8 p.u. - 1.1 p.u.	
B) Manual	Indeterminable	
6. ULTC capability	T2: No ULTC	
C.5 Excitation Equipment		
1. Time for Vf to change from rated to 0.85% following a large step change	Not Available	
2. Negative field voltage capability	Not Available	

ACCEPTED: JAN 17 2011

ORDER NO. G192-10

COMMISSION SECRETARY

Description	Spillimacheen G8	Reference For Additional Information
3. PSS	Feature Not Available	
C.6 Voltage Regulator when generator in Synchronous Condenser Mode or Minimum MW Mode		
A) Maximum Voltage	G1, G2: 1.1 p.u.	
B) Minimum Voltage	G1, G2: 0.8 p.u.	
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	Not Available	
2. UELs (Reactive Ampere Limiting)	Not Available	
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	No O/F or U/F relays but rotor overspeed protection set at 110%	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	No O/V or U/V protection	PI Sheets
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for SPN, also see Protection Information on SIS	
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	RTU 128	Communication Block Diagram
Control Center	SIC	Communication Block Diagram

ACCEPTED: JAN 17 2011

ORDER NO. G1 92 10

COMMISSION SECRETARY

Description	Spillimacheen GS	Reference For Additional Information
Control Points	Point Assignment	105-R05-A4 Sh.1 to 5 and SIC SCADA Database - Point Assignment
Point Assignment	105-R05-A4 Sh.1 to 5 and SIC SCADA Database - Point Assignment	
Communication Block Diagram	105-R05-D0	
E.1.2 Automatic Generation Control System (AGC)	No	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	No	"http://wGrid/pcentpl/Substass/Planning/pdf/RASSummary.pdf"
E.1.4 Telemetry	Point Assignment	105-R05-A4 Sh.1 to 5 and SIC SCADA Database - Point Assignment
E.1.5 Alarm Points	Point Assignment	105-R05-A4 Sh.1 to 5 and SIC SCADA Database - Point Assignment
E.1.6 Equipment Status	Point Assignment	105-R05-A4 Sh.1 to 5 and SIC SCADA Database - Point Assignment
E.1.7 Battery/Charger System	24V DC System	Telecontrol Manual Unit 22 Section 1
E.1.8 Revenue Metering System	Feature Not Equipped	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		
Telecommunications Media	Telephone Lease to Golden Substation	

ACCEPTED: JAN 17 2011

ORDER NO. G 192 10

COMMISSION SECRETARY

Description	MICA GS	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	16 CB 1, 2, 3, and 4	One Line Diagram Dwg No. 211-E04-D1401-R7 LOO: 3P03-18I
B.3 Blackstart		
Blackstart Capability	Yes, 2-400kW, 600V AC Diesel Genset	LOO: 5P03-35
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	16CB1 - 4 = 17.4kA	One Line Diagram Dwg No. 211-E04-D1401-R7
B) Disconnect Switches	SD1 - 4, 16, 17 = 3250A; 16CCB1, 4 = 17.4 kA	One Line Diagram Dwg No. 211-E04-D1401-R7
2. Circuit breaker fault current rating	16CB1 - 4 = Not Available	One Line Diagram Dwg No. 211-E04-D1401-R7
C.3 Generator Max Power Output		
Nameplate	G1-G4: 437 MVA, 0.95 p.f., 16kV rated voltage	Report # PS-PSE-04
MPO (plant)	1605 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.O.
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	Local Operating Order: 3P03-16F,G,H
3. Line-Drop-Compensation (LDC) equipment and setting	Feature Not Equipped	
4. Joint Voltage Control Equipment	The JVC circuitry exists but it is out of service	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1-G4: 0.8 p.u. - 1.1 p.u.	Report # PS-PSE-04
B) Manual	Indeterminable	
6. ULTC capability	T1 - T4: No ULTC	
C.5 Excitation Equipment		
1. Time for Vt to change from rated to 0.95% following a large step change	G1-G4: 0.03 sec	Report # PS-PSE-04
2. Negative field voltage capability	-6.5 p.u. at 146.87 Vbase	Report # PS-PSE-04
3. PSS	G1 - G4	

ACCEPTED: JAN 17 2011

ORDER NO. G-192-10

COMMISSION SECRETARY

Description	MICA GS	Reference For Additional Information
C.6 Voltage Regulator when generator in Synchronous Condenser Mode Or Minimum MW Mode		
A) Maximum Voltage	G1-G4: 1.1 p.u.	Report # PS-PSE-04
B) Minimum Voltage	G1-G4: 0.8 p.u.	Report # PS-PSE-04
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current/V/Hz)	Field Current limiters act to limit If to 3022A. Terminal Voltage limiter act to limit Vt to 17.0kV	Report # PS-PSE-04
2. UELs (Reactive Ampere Limiting)	For UEL curve(s), see reference	Report # PS-PSE-04, CRO
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	81G sustained O/F relay at 68Hz for 50 sec with inverse time delay characteristics; Overspeed protection at 145%	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	59G sustained O/V protection at 121% of rated voltage with inverse time characteristics, and instantaneous protection at 140%	PI Sheets
C.10 Governor Specifications		
1. Speed Droop	G1, G2, G3, G4 = 5%	Report # PS-PSE-04
2. Dead Band	0.02% or less	
D.1 General Protective Relay Requirements		

ACCEPTED: JAN 17 2011

ORDER NO. G-9-11

COMMISSION SECRETARY

Description	MICA GS	Reference For Additional Information
1. Relay Information	See Generating Station P&C Setting Sheets for MICA	
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	RTU 053 / RTU 054	Communication Block Diagram
Control Center	SIC / SCC, SIC	Communication Block Diagram
Control Points	Point Assignment	211-R05-A24 Sh.1 to 34 / 211-R05-A25 Sh.1 to 29
Point Assignment	211-R05-A24 Sh.1 to 34 / 211-R05-A25 Sh.1 to 29	
Communication Block Diagram	211-R08-B0 Sh.1 to 13	
E.1.2 Automatic Generation Control System (AGC)	No / Yes	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	Yes	http://w3hb/pcontrol/Substas/Planning/pdf/RASSummary.pdf
E.1.4 Telemetry	Point Assignment	211-R05-A24 Sh.1 to 34 / 211-R05-A25 Sh.1 to 29
E.1.5 Alarm Points	Point Assignment	211-R05-A24 Sh.1 to 34 / 211-R05-A25 Sh.1 to 29
E.1.6 Equipment Status	Point Assignment	211-R05-A24 Sh.1 to 34 / 211-R05-A25 Sh.1 to 29
E.1.7 Battery/Charger System		Telecontrol Manual Unit 22 Section 1
System	48V DC System	211-R16-B14 Sh.1 to D1
E.1.8 Revenue Metering System	Feature Not Equipped	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		
Telecommunications Media	Digital Radio	

ACCEPTED: JAN 17 2011

ORDER NO. 81920

COMMISSION SECRETARY

Description	Aberfeldie GS	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	2.4CB1, 2.4CB2, 2.4CB4	One Line Diagram Dwg No. 111-E06-D1-R8 & LOO: 3P04-01
B.3 Blackstart		
Blackstart Capability	Yes, 1-25kVA Diesel Genset	LOO: 3P04-01
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	2.4CB1 - 3: 1100A; 2.4CB4: 1500 A	One Line Diagram Dwg No. 111-E06-D1-R8
B) Disconnect Switches	2.4DCB1 - 4: Not Available	One Line Diagram Dwg No. 111-E06-D1-R8
2. Circuit breaker fault current rating	2.4CB1 - 4: 37kA	One Line Diagram Dwg No. 111-E06-D1-R8
C.3 Generator Max Power Output		
Nameplate	G1, G2: 2.5 MVA, 0.9 p.f., 2.2kV rated voltage	Generator Data Book
MPO (plant)	5 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.O. Generator Data Book
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	LOO: 3P04-01
3. Line-Drop-Compensation (LDC) equipment and setting	Feature Not Equipped	
4. Joint Voltage Control Equipment	Feature Not Equipped	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1, G2: 0.8 p.u. - 1.1 p.u.	
B) Manual	Indeterminable	
6. ULTC capability	T1: No ULTC	
C.5 Excitation Equipment		
1. Time for Vf to change from rated to 0.95% following a large step change	Not Available	
2. Negative field voltage capability	Not Available	
3. PSS	Feature Not Equipped	

ACCEPTED: JAN 17 2011

ORDER NO. G1 92 10

COMMISSION SECRETARY

Description	Aberfeldie GS	Reference For Additional Information
C.6 Voltage Regulator when generator in Synchronous Condenser Mode or Minimum MW Mode		
A) Maximum Voltage	G1, G2 = 1.1 p.u.	
B) Minimum Voltage	G1, G2 = 0.8 p.u.	
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	Not Available	
2. UELs (Reactive Ampere Limiting)	Not Available	
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	No 81G but overspeed relay 12G is set to trip at 110%	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	59G sustained O/V protection at 2.5kV for 1 sec; instantaneous protection at 3.3kV	PI Sheets
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for ABF, also see Protection Information on SIS	
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	Not Available	Communication Block Diagram
Control Center	SIC	Communication Block Diagram
Control Points	SIC SCADA Database - Point Assignment	

ACCEPTED: JAN 17 2011

ORDER NO. G-192-10

COMMISSION SECRETARY

Description	Aberfeldie GS	Reference For Additional Information
Point Assignment	SIC SCADA Database - Point Assignment	
Communication Block Diagram	111-R06-D6 Sh.1	
E.1.2 Automatic Generation Control System (AGC)	No	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	No	https://w3id/pcontrol/Subatlas/Planning/pdf/RASSummary.pdf
E.1.4 Telemetry	SIC SCADA Database - Point Assignment	
E.1.5 Alarm Points	SIC SCADA Database - Point Assignment	
E.1.6 Equipment Status	SIC SCADA Database - Point Assignment	
E.1.7 Battery/Charger System		Telecontrol Manual Unit 22 Section 1
System	24V DC System	111-R16-A6 Sh.1 to C1
E.1.8 Revenue Metering System	Feature Not Equipped	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		
Telecommunications Media	Power Line Carrier	

ACCEPTED: JAN 17 2011

ORDER NO. G 192 10

COMMISSION SECRETARY

Description	Elko GS	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	6.9CB1, 6.9CB2	One Line Diagram Dwg No. 112-E06-D0001 R008 & LOO: 3P04-03F
B.3 Blackstart		
Blackstart Capability	Yes, 1-37.5kVA, 120/208V AC Diesel Genset	LOO: 3J04-03
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	6.6CB1, 2 = 600A	One Line Diagram Dwg No. 112-E06-D0001 R008
B) Disconnect Switches	6.9D1B1, 2 = 600A	One Line Diagram Dwg No. 112-E06-D0001 R008
2. Circuit breaker fault current rating	Not Available	One Line Diagram Dwg No. 112-E06-D0001 R008
C.3 Generator Max Power Output		
Nameplate	G1, G2: 6 MVA, 0.8 p.f., 6.6kV rated voltage	Generator Data Book
MPO (plant)	12 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.O., Generator Data Book
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	LOO: 3J04-03
3. Line-Drop-Compensation (LDC) equipment and setting	Feature Not Equipped	
4. Joint Voltage Control Equipment	Feature Not Equipped	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1, G2: 0.8 p.u. - 1.1 p.u.	
B) Manual	Indeterminable	
6. ULTC capability	T1-T2: No ULTC	
C.5 Excitation Equipment		
1. Time for Vf to change from rated to 0.95% following a large step change	Not Available	
2. Negative field voltage capability	Not Available	
3. PSS	Feature Not Equipped	

ACCEPTED: JAN 17 2011

ORDER NO. G-192-10

COMMISSION SECRETARY

Description	Elko GS	Reference For Additional Information
C.6 Voltage Regulator when generator in Synchronous Condenser Mode or Minimum MW Mode		
A) Maximum Voltage	G1: 1.1 p.u	
B) Minimum Voltage	G1: 0.8 p.u.	
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	Not Available	
2. UELs (Reactive Ampere Limiting)	Not Available	
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	No O/F or U/F protection but rotor overspeed trip at 125%	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	SSG sustained O/V protection at 7.2kV of rated voltage with inverse time characteristics	PI Sheets
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for ELK, also see Protection Information on SIS	
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	Not Available	Communication Block Diagram
Control Center	SIC	Communication Block Diagram
Control Points	SIC SCADA Database - Point Assignment	

ACCEPTED: JAN 17 2011

ORDER NO. G-192-10

COMMISSION SECRETARY

Description	Elko GS	Reference For Additional Information
Point Assignment	SIC SCADA Database - Point Assignment	
Communication Block Diagram	112-H05-D0	
E.1.2 Automatic Generation Control System (AGC)	Not Available	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	No	"http://w3/bdpcontrol/Subsites/Planning/pdf/RASSummary.pdf"
E.1.4 Telemetry	SIC SCADA Database - Point Assignment	
E.1.5 Alarm Points	SIC SCADA Database - Point Assignment	
E.1.6 Equipment Status	SIC SCADA Database - Point Assignment	
E.1.7 Battery/Charger System	Not Available	Telecontrol Manual Unit 22 Section 1
E.1.8 Revenue Metering System	Feature Not Equipped	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		
Telecommunications Media	Not Available	

ACCEPTED: JAN 17 2011

ORDER NO. G-92-10

COMMISSION SECRETARY

Description	Ruskin G5	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	60CB1, 60CB2, 60CB4	One Line Diagram Dwg No. 423-E06-D0001 R011 & LOO 3P05-82A
B.3 Blackstart		
Blackstart Capability	No	
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	60CB1, 2, 4 = 1.2kA	One Line Diagram: 423-P06-B9
B) Disconnect Switches	60DCB1, 2, 4 = 1.2kA	One Line Diagram: 423-P06-B9
2. Circuit breaker fault current rating	60CB1, 2, 4 = 18kA	One Line Diagram: 423-P06-B9
C.3 Generator Max Power Output		
Nameplate	G1, G2, G3: 44.0 MVA, 0.80 p.f., 13.8kV rated voltage	Powertech Report# 12045-21-00 RUS-1
MPO (plant)	105 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.O.
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Flat	Local Operating Order: 3P05-82A
3. Line-Drop-Compensation (LDC) equipment and setting	Feature Not Equipped	Powertech Report# 12045-21-00 RUS-1
4. Joint Voltage Control Equipment	Feature Not Equipped	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1-G3: 0.8 p.u. - 1.1 p.u.	
B) Manual	Indeterminable	
6. ULTC capability	T1, T2, T3: No ULTC	
C.5 Excitation Equipment		
1. Time for Vt to change from rated to 0.95% following a large step change	G1, G2, G3: 1.34 sec	Powertech Report# 12045-21-00 RUS-1
2. Negative field voltage capability	Zero	Powertech Report# 12045-21-00 RUS-1
3. PSS	Feature Not Equipped	

ACCEPTED: JAN 17 2011

ORDER NO. G-192-10

COMMISSION SECRETARY

Description	Ruskin GS	Reference For Additional Information
C.6 Voltage Regulator when generator in Synchronous Condenser Mode or Minimum MW Mode		
A) Maximum Voltage	G1-G3: 1.1 p.u.	
B) Minimum Voltage	G1-G3: 0.8 p.u	
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	None	Powertech Report# 12045-21-08 RUS-1
2. UELs (Reactive Ampere Limiting)	None	Powertech Report# 12045-21-08 RUS-1
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	There is no 81 for U/F or O/F but overspeed relay 12 initiates shutdown in case of emergency	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	59G O/V protection starts at 104% of rated voltage with inverse time characteristics; 1.1 sec ams limit for 145%; no U/V protection	PI Sheets
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for RUS	
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	RTU D80 / ST25, T024	Communication Block Diagram
Control Center	SCC / LMC	Communication Block Diagram

ACCEPTED: JAN 17 2011

ORDER NO. G 192 10

COMMISSION SECRETARY

Description	Ruskin GS	Reference For Additional Information
Control Points	Point Assignment	423-R05-A26 Sh.1 to 6 / 423-H05-A21
Point Assignment	423-R05-A26 Sh.1 to 6 / 423-H05-A21	
Communication Block Diagram	423-R05-B8 Sh.1 to 5	
E.1.2 Automatic Generation Control System (AGC)	No	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	No	"http://w3/dirpcontrol/Subsites/Planning/pdf/RASSummary.pdf"
E.1.4 Telemetry	Point Assignment	423-R05-A26 Sh.1 to 6 / 423-H05-A21
E.1.5 Alarm Points	Point Assignment	423-R05-A26 Sh.1 to 6 / 423-H05-A21
E.1.6 Equipment Status	Point Assignment	423-R05-A26 Sh.1 to 6 / 423-H05-A21
E.1.7 Battery/Charger System		Telecontrol Manual Unit 22 Section 1
System	48V DC System	423-R15-D8 Sh.1 to 01
E.1.8 Revenue Metering System	Feature Not Equipped	
E.2 Telecommunications Media		
Telecommunications Media	Digital Radio	

ACCEPTED: JAN 17 2011

ORDER NO. G-192-10

COMMISSION SECRETARY

Description	Burrard GS	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	BG5 has no generator breakers; switchyard ring bus breakers are used for connecting generators to the transmission system	One Line Diagrams Dwg No. 416D7-U1
B.3 Blackstart		
Blackstart Capability	No	
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	2CB1-7,13 = 1600A; 2CB10-12,14,16 = 2000A	One Line Diagrams Dwg No. 416D7-U1
B) Disconnect Switches	2D1-8 = Not Available	One Line Diagrams Dwg No. 416D7-U1
2. Circuit breaker fault current rating	2CB1-7,10-13 = 38kA; 2CB14,16 = 36kA	One Line Diagrams Dwg No. 416D7-U1
C.3 Generator Max Power Output		
Nameplate	G1-G6: 180 MVA, 0.90 p.f., 16.5kV rated voltage	PSE Report# PSE289 for BGS
MPO (plant)	972 MW	PSE Report# PSE289 for BGS
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.O.
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	
3. Line-Drop-Compensation (LDC) equipment and setting	G2, G4, G5: 0.04 p.u.; G1, G3, G6: Not Available	PSE Report# PSE289 for BGS
4. Joint Voltage Control Equipment	Feature Not Available	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1-G6: 0.9 p.u. - 1.05 p.u.	
B) Manual	Indeterminable	
6. ULTC capability	T1-T5: No ULTC	
C.5 Excitation Equipment		
1. Time for Vt to change from rated to 0.95% following a large step change	G1, G3, G4 = 1.03 sec; G2 = 2.0 sec; G5 and G6 are not available	PSE Report# PSE289 for BGS Powertech Report # 9634-97-REP2
2. Negative field voltage capability	G1, G3 = -3.9 p.u at 122 Vbase; G2, G4, G5 = -12.6 p.u. at 140 Vbase; G6 not available	PSE Report# PSE289 for BGS Powertech Report # 9634-97-REP2

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Description	Burrard GS	Reference For Additional Information
3. PSS	G1 - G6	
C.6 Voltage Regulator when generator in Synchronous Condenser Mode or Minimum MW Mode		
A) Maximum Voltage	G1-G5: 1.05 p.u.	
B) Minimum Voltage	G1-G5: 0.9 p.u.	
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	Field Current limiters on all units act to to limit If to 2050A; Terminal Voltage limits max voltage to 18.15kV (1.1 p.u.)	PSE Report# PSE289 for BGS Powertech Report # 9634-97-REP2
2. UELs (Reactive Ampere Limiting)	For UEL curves/graph, see reference	PSE Report# PSE289 for BGS Powertech Report # 9634-97-REP2
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	81G U/F relay: Alarm at 58.4Hz, 30 sec time-delayed U/F tripping at 57.5 Hz, instantaneous tripping at 56 Hz	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	59G sustained O/V protection: 109% of rated voltage with inverse time characteristics; instantaneous at 130%	PI Sheets
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for BGS; also see Protection Information on SIS	

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Description	Burrard GS	Reference For Additional Information
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	RFJ 513	Communication Block Diagram
Control Center	SCC, LMC	Communication Block Diagram
Control Points	Point Assignment	416Z7-R05-A48 Sh.1 to 10
Point Assignment	416Z7-R05-A48 Sh.1 to 10	
Communication Block Diagram	416Z7-R06-B0 Sh 1 to Sh 15	
E.1.2 Automatic Generation Control System (AGC)	No	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	No	"http://w3.bl/pcontrol/Subsites/Planning/pdf/RASSummary.pdf"
E.1.4 Telemetry	Point Assignment	416Z7-R05-A48 Sh.1 to 10
E.1.5 Alarm Points	Point Assignment	416Z7-R05-A48 Sh.1 to 10
E.1.6 Equipment Status	Point Assignment	416Z7-R05-A48 Sh.1 to 10
E.1.7 Battery/Charger System		Telecontrol Manual Unit 22 Section 1
System	48V DC System	416Z7-R18 D65
Reference	Feature Not Available	Metering equipment is present but there is no revenue metering "system"
E.1.8 Revenue Metering System		
E.2 Telecommunications Media		
Telecommunications Media	Digital Radio	

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Description	Prince Rupert GS	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	13CB1, 13CB2	LOO 3P05-41A;922-E58-01
B.3 Blackstart		
Blackstart Capability	Yes, RPG is a Gas Turbine generating station	LOO 3P05-41A
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	13CB1, 2 = 3000A	One Line Diagram
B) Disconnect Switches	60D11, 12 = 800A	One Line Diagram
2. Circuit breaker fault current rating	13CB1, 2 = 20kA	One Line Diagram
C.3 Generator Max Power Output		
Nameplate	G1, G2: 27.1 MVA, 0.85 p.f., 13.8KV rated voltage	Powertech Report # 12045-21-00 RPG-1
MPO (plant)	46.1 MW	Powertech Report # 12045-21-00 RPG-1
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	C.R.C.
2. Unit/Plant MVar or terminal voltage adjustment by BC1C	Full	Local Operating Order 3P05-41A
3. Line-Drop-Compensation (LDC) equipment and setting	Feature Not Equipped	
4. Joint Voltage Control Equipment	Feature Not Equipped	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1, G2: 0.95 p.u. - 1.05 p.u	Powertech Report # 12045-21-00 RPG-1
B) Manual	Indeterminable	
6. ULTC capability	T11, T12: No ULTC	
C.5 Excitation Equipment		
1. Time for Vf to change from rated to 0.95% following a large step change	G1-G2: 1.1 sec	
2. Negative field voltage capability	-4.0 p.u. at 60.6 Vbase	Powertech Report # 12045-21-00 RPG-1
3. PSS	Feature Not Equipped	
C.6 Voltage Regulator when generator in Synchronous Condenser Mode or Minimum MW Mode		

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Description	Prince Rupert G2	Reference For Additional Information
A) Maximum Voltage	G1, G2: 1.05 p.u.	Powertech Report # 12045-21-00 RPG-1
B) Minimum Voltage	G1, G2: 0.95 p.u.	Powertech Report # 12045-21-00 RPG-1
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	OEL's operate in 30 seconds for 8 amps of pilot exciter current. However, pilot exciter output current is only 4.2 amps for full reactive capability	Powertech Report # 12045-21-00 RPG-1
2. UELs (Reactive Ampere Limiting)	For UEL curve(s), see reference	Powertech Report # 12045-21-00 RPG-1
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	81O U/F relay picks up at 55 Hz with inverse time characteristics for shutdown	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	59G sustained O/V protection at 113% of rated voltage with inverse time characteristics	PI Sheets
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station P&C Setting Sheets for RPG	
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	S215, T102	Communication Block Diagram
Control Center	NCC	Communication Block Diagram
Control Points	Point Assignment	922-H04-A7
Point Assignment	922-H04-A7	

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Description	Prince Rupert GS	Reference For Additional Information
Communication Block Diagram	922-R08-D0, 905-R08-D0 Sh.1 to 3	
E.1.2 Automatic Generation Control System (AGC)	No	Point Assignment, Local Operating Order
E.1.3 Remedial Action Schemes (RAS)	No	"http://w3hq/pcontrol/Subsites/Planning/pdf/RAS-Summary.pdf"
E.1.4 Telemetry	Point Assignment	922-H04-A7
E.1.5 Alarm Points	Point Assignment	922-H04-A7
E.1.6 Equipment Status	Point Assignment	922-H04-A7
E.1.7 Battery/Charger System		Telecontrol Manual Unit 22 Section 1
System	48V DC System	905-R15-B28
E.1.8 Revenue Metering System	Feature Not Equipped	Metering equipment is present but there is no revenue metering "system"
E.2 Telecommunications Media		
Telecommunications Media	Power Line Carrier	

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Description	Stave Falls G5	Reference For Additional Information
B.2 Synchronization		
Circuit Breaker (s) used	4C811, 12 and 13	One Line Diagram: 422-E06-D101 LOO: 3P05-85A
B.3 Blackstart		
Blackstart Capability	No	
C.2 Switchgear Ratings		
1. Continuous		
A) Circuit Breakers	60CB10, 20 = 1200A	One Line Diagram: 422-E06-D101
B) Disconnect Switches	1301, D2 = 2000A; 6001, D2 & 60DC810, 20 = 1200A	One Line Diagram: 422-E06-D101
2. Circuit breaker fault current rating	60CB10, 20 = 31.5kA	One Line Diagram: 422-E06-D101
C.3 Generator Max Power Output		
Nameplate	G1-G2: 50 MVA, 0.9 p.f., 13.8kV rated voltage	
MPO (plant)	91 MW	Comptroller of Water Rights
C.4 Generator Reactive Capability		
1. Capability Curves	See Reference	G.R.D
2. Unit/Plant MVar or terminal voltage adjustment by BCTC	Full	Local Operating Order: 3P05-85A
3. Line-Drop-Compensation (LDC) equipment and setting	Feature Not Equipped	
4. Joint Voltage Control Equipment	Feature Not Equipped	
5. Generator Voltage Regulator minimum and Maximum Voltage Setpoint		
A) Automatic	G1, G2: 0.8 p.u. - 1.1 p.u.	
B) Manual	Indeterminable	
6. ULTC capability	T1, T2: No ULTC	
C.5 Excitation Equipment		
1. Time for Vt to change from rated to 0.95% following a large step change	G1-G2: 0.03 sec	
2. Negative field voltage capability	-4.3 p.u. at 58 Vbase	
3. PSS	G1, G2	

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Description	Stave Falls GS	Reference For Additional Information
C.6 Voltage Regulator when generator in Synchronous Condenser Mode or Minimum MW Mode		
A) Maximum Voltage	G1, G2: 1.1 p.u.	
B) Minimum Voltage	G1, G2: 0.8 p.u.	
C.7 Excitation System Limiters		
1. OELs (Terminal Voltage/Field Current)	Terminal Voltage limiter acts to limit the maximum terminal voltage to 1.1 p.u.	
2. UELs (Reactive Ampere Limiting)	For UEL curve(s), see reference	C.R.O.
C.8 Off-Nominal Frequency Operation		
1. O/F and U/F capability (Unit)		
2. O/F and U/F settings (Unit)	81G O/F relay: 65 Hz for more that 50 sec; 12M motor overspeed protection at 150%	PI Sheets
C.9 Off-Nominal Voltage Operation		
1. O/V and U/V capability (Unit)		
2. O/V and U/V settings (Unit)	59G sustained O/V protection at 120% of rated voltage with inverse time characteristics, and instantaneous protection at 140%	PI Sheets
D.1 General Protective Relay Requirements		
1. Relay Information	See Generating Station PAC Setting Sheets for SPE	
E.1 Operations Control and Telecommunications Facilities		
E.1.1 Remote Control Facility and Control Center		
Remote Control Facility	RTU 121 / RTU 122	Communication Block Diagram
Control Center	LMC / SCC	Communication Block Diagram

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ATTACHMENT 3
Planned Modifications

For the purposes of Section 2.4, an Interconnection Request is not required for the following proposed Modifications:

Planned Generator Upgrades

as of 1 February 2005

Planned Unit Upgrades:

Plant unit	MVA	MW	Incremental MW
GMS G1	321	305	44
GMS G2	321	305	44
GMS G3	321	305	44
GMS G4	321	305	44
GMS G6	321	305	30
GMS G7	321	305	30
GMS G8	321	305	30
ASH G1	35	33	6

Note: Unit ratings are approximate

Attachment 4

Procedures for Interconnection of Modifications to Generating Plants

1. Preamble

This Attachment contains the procedures that BC Hydro, as an Interconnection Customer, will use when an Interconnection Request is submitted pursuant to Section 2.4 of this Tariff Supplement 79.

2. Interconnection Procedures

(a) Sections 1 through 4, 6 through 10, and 12 of the Standard Generator Interconnection Procedures ("SGIP") apply to processing an Interconnection Request submitted by BC Hydro pursuant to Section 2.4 of Tariff Supplement 79, with the exception that no deposits are required to be submitted as referred to in the SGIP.

(b) Section 11 of the SGIP applies to an Interconnection Request submitted by BC Hydro pursuant to Section 2.4 of this Tariff Supplement 79, except that all references in the SGIP to "Standard Generator Interconnection Agreement" and "SGIA" will be replaced with "Terms and Conditions for Modifications" or "TCM" in accordance with following Section 3.

3. Terms and Conditions for Modifications

In accordance with Section 11 of the SGIP, as modified above, Transmission Provider will tender a TCM to BC Hydro, as the Interconnection Customer, in the attached form as provided in Schedule A.

Schedule A

TERMS AND CONDITIONS FOR MODIFICATIONS

WHEREAS:

A. Pursuant to Section 2.4 of Tariff Supplement 79, if BC Hydro, as an Interconnection Customer, proposes a Modification which will change the Point of Interconnection or increase the generating capacity of a Generating Plant or which may reasonably be expected to affect the stability or reliability of the Transmission System, an Interconnection Request will be submitted in relation to the Modification;

B. It has been determined that an Interconnection Request is required for <*> Generating Facility, and an Interconnection Request for the proposed Modification has been submitted to the Transmission Provider; and

C. The following terms and conditions will apply with respect to the Modification and these terms and conditions will be deemed to be the Standard Generator Interconnection Agreement ("SGIA") for this Interconnection Request.

Article 1. Definitions

1.1 "**BC Hydro's Interconnection Facilities**" means all facilities and equipment that are located between the Generating Facility and the Point of Interconnection, including any modification, addition, or upgrades to such facilities and equipment necessary to physically and electrically interconnect the Generating Facility to the Transmission System. BC Hydro's Interconnection Facilities are sole use facilities.

1.2 **"Combined Study Agreement"** means the Combined Study Agreement dated <*> in respect of the Generating Facility.

1.3 **"Commercial Operation"** means the status of a Generating Facility that has completed Trial Operation, and for which BC Hydro, as the Interconnection Customer, has issued a Declaration of Compatibility-Generator (Operating) or such other document(s) of similar effect as may be substituted therefore, and for which BC Hydro, as the Interconnection Customer, has completed a Commissioning Notice to Operate.

1.4 **"Commercial Operation Date"** of a unit means the date on which the Generating Facility commences Commercial Operation as confirmed by BC Hydro, as the Interconnection Customer, pursuant to Appendix D to these Terms and Conditions.

1.5 **"Commissioning Interconnection Service"** means the service provided by the Transmission Provider associated with interconnecting the Generating Facility to the Transmission System and enabling it to receive electric energy and capacity from the Generating Facility at the Point of Interconnection for Trial Operation of the Generating Facility prior to Commercial Operation, pursuant to the terms of these Terms and Conditions and, if applicable, the Tariff.

1.6 "**Generating Facility**" means the Modification to the Generating Plant, , as described in the Interconnection Feasibility Study, the Interconnection Facilities Study and Appendix C, but does not include BC Hydro's Interconnection Facilities.

1.7 **"Interconnection Facilities Study"** means the Interconnection Facilities Study dated <*> in respect of the Generating Facility.

1.8 **"Interconnection Request"** means the request, in the form of Appendix 1 to the Standard Generator Interconnection Procedures in respect of the Generating Facility.

1.9 **"Modification"** means a modification, addition, repair, replacement or change in operation of or to all or a portion of the BC Hydro Generation System.

1.10 **"Network Resource"** has the meaning provided in the Tariff.

1.11 **Network Upgrades"** mean the additions, modifications, and upgrades to the Transmission System required at or beyond the Point of Interconnection to accommodate the interconnection of the Generating Facility to the Transmission System.

1.12 "**Point of Interconnection**" means the point where the Generating Plant that is the subject of the Modification connects to the Transmission System as set out in Appendix 1 to Tariff Supplement 79.

Article 2. Effective Date and Term

2.1 **Effective Date**. These Terms and Conditions will be deemed effective upon being confirmed in writing by BC Hydro, as the Interconnection Customer, subject to acceptance by the Commission (if applicable) or if filed unexecuted, upon the date

specified by the Commission. Transmission Provider will promptly file these Terms and Conditions in accordance with Article 3.1, if required.

2.2 **Term and Termination.** These Terms and Conditions will apply until the Commercial Operation Date, provided that these Terms and Conditions may be terminated by BC Hydro, as the Interconnection Customer, after giving the Transmission Provider ninety (90) calendar days advance written notice. If the Generating Facility fails to achieve Commercial Operation within three (3) years of the target date for Commercial Operation set out in Appendix B these Terms and Conditions will be terminated by the Transmission Provider, unless an extension of time is approved by the Commission.

Article 3. Regulatory Filings

3.1 **Filing.** Transmission Provider will file these Terms and Conditions (and any amendments hereto) with the appropriate Governmental Authority, if required.

Article 4. Scope Of Service

4.1 Commissioning Interconnection Service.

4.1.1 **The Product.** Transmission Provider must conduct the necessary studies and construct the Network Upgrades needed to integrate the Generating Facility in the same manner as all Network Resources. Transmission Provider will construct the facilities identified as Network Upgrades in Appendix A to this Agreement.

4.1.2 **Transmission Delivery Service Implications.** Commissioning Interconnection Service allows the Generating Facility to be studied as a Network Resource on the assumption that the Generating Facility will be designated under the Tariff as a Network Resource on the Transmission System, up to the Generating Facility's full output, on the same basis as existing Network Resources interconnected to the Transmission System, and that such a designation will occur. Commissioning Interconnection Service does not convey a reservation of transmission service.

To the extent BC Hydro, as an Interconnection Customer, does designate the Generating Facility as a Network Resource, it must do so pursuant to the Tariff.

Once BC Hydro, as the Interconnection Customer, satisfies the requirements for obtaining Commissioning Interconnection Service, any future transmission service request for delivery from the Generating Facility within the Transmission System of any amount of capacity and/or energy, up to the amount initially studied, will not require that any additional studies be performed or that any further upgrades associated with such Generating Facility be undertaken, regardless of whether or not such Generating Facility is ever designated by BC Hydro, as the Interconnection Customer, as a Network Resource. However, the reduction or elimination of congestion or redispatch costs may require additional studies and the construction of additional upgrades.

To the extent BC Hydro, as an Interconnection Customer, enters into an arrangement for long term transmission service for deliveries from the Generating Facility outside the Transmission System, such request may require additional studies and upgrades in order for Transmission Provider to grant such request.

4.2 Provision of Service. Transmission Provider will provide Commissioning Interconnection Service for the Generating Facility at the Point of Interconnection.

4.3 Performance Standards. BC Hydro will perform all of its obligations under this Agreement in accordance with applicable laws and regulations, Applicable Reliability Standards, and Good Utility Practice.

4.4 No Transmission Service. These Terms and Conditions do not constitute a request for, nor the provision of, any transmission service under the Tariff, and does not convey any right to deliver electricity to any specific customer or Point of Delivery.

4.5 Purpose of BC Hydro's Interconnection Facilities. Except as may be required by applicable laws and regulations, or as otherwise determined by BC Hydro, BC Hydro's Interconnection Facilities shall be constructed for the sole purpose of interconnecting the Generating Facility to the Transmission System and shall be used for no other purpose.

Article 5. Interconnection Facilities Engineering, Procurements and Construction

5.1 Construction Timing. The In-Service Date, Initial Synchronization Date and target Commercial Operation Date will be set forth in Appendix B, Milestones.

5.2 Equipment Procurement. Transmission Provider will commence design of Network Upgrades and procure necessary equipment as soon as practicable after

completion of the Interconnection Facilities Study pursuant to the Combined Study Agreement.

5.3 Construction Commencement. Transmission Provider will commence construction of Network Upgrades as soon as practicable after the following additional conditions are satisfied:

5.3.1 Approval of the appropriate Governmental Authority has been obtained for any facilities requiring regulatory approval; and

5.3.2 Necessary real property rights and rights-of-way have been obtained, to the extent required for the construction of a discrete aspect of Network Upgrades.

5.4 Limited Operation. If Network Upgrades are not reasonably expected to be completed prior to the Commercial Operation Date of the Generating Facility, Transmission Provider may perform operating studies on a timely basis to determine the extent to which the Generating Facility and BC Hydro's Interconnection Facilities may operate prior to the completion of Network Upgrades consistent with applicable laws and regulations, Applicable Reliability Standards, Good Utility Practice, and these Terms and Conditions. BC Hydro may operate the Generating Facility and BC Hydro's Interconnection Facilities in accordance with the results of such studies.

5.5 BC Hydro's Interconnection Facilities ("BCHIF"). BC Hydro will, at its expense, design, procure, construct, own and install the BCHIF, as set forth in Appendix A, Interconnection Facilities and Network Upgrades. The BCHIF will be designed and constructed in accordance with Good Utility Practice, to ensure that the BCHIF are compatible with the technical specifications (including the Technical Interconnection Requirements), operational control, and safety requirements of BC Hydro.

5.6 Suspension. BC Hydro, as the Interconnection Customer, reserves the right, upon written notice to the Transmission Provider, to suspend at any time all work by the Transmission Provider associated with the construction and installation of Network Upgrades required under these Terms and Conditions with the condition that the Transmission System will be left in a safe and reliable condition in accordance with Good Utility Practice and BC Hydro's safety and reliability criteria. In the event that BC Hydro, as the Interconnection Customer, suspends work by the Transmission Provider required under these Terms and Conditions pursuant to this Article 5.6, and has not requested the Transmission Provider to recommence the work required under these Terms and Conditions on or before the expiration of

three (3) years following commencement of such suspension, these Terms and Conditions will be deemed terminated. The three-year period will begin on the date the suspension is requested, or the date of the written notice to the Transmission Provider, if no effective date is specified.

Article 6. Start-Up and Synchronization

6.1 Start-Up and Synchronization. BC Hydro, as the Interconnection Customer, is responsible for the proper synchronization of the Generating Facility to the Transmission System.

6.2 Commercial Operation. BC Hydro will amend, no later than the Commercial Operation Date, Attachments 1 and 2 to Tariff Supplement 79 to reflect the updated information required for these Attachments.

These Terms and Conditions are confirmed by BC Hydro, as the Interconnection Customer.

_____

Project Manager

_____

Date

List of Appendices:

ACCEPTED: JAN 17 2011

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Appendix A Interconnection Facilities and Network Upgrades

Appendix B Milestones

Appendix C Interconnection Details

Appendix D Commercial Operation Date.

Appendix A

Interconnection Facilities and Network Upgrades

1. BC Hydro's Interconnection Facilities:

   (a) [insert BC Hydro's Interconnection Facilities]:

2. Network Upgrades:

   (a) [insert Stand Alone Network Upgrades]:

   (b) [insert Other Network Upgrades]:

Appendix B

Milestones

Appendix C

Interconnection Details

Appendix D

Commercial Operation Date

[Date]

Attention:

Re: _____ Generating Facility

On **[Date]** BC Hydro has completed Trial Operation of Unit No. ___. This letter confirms that BC Hydro commenced Commercial Operation of Unit No. ___ at the Generating Facility, effective as of **[Date plus one day]**.

[Signature]

[BC Hydro Representative]