



# Generator Interconnection Facility Study Report

for the

**[REDACTED] Project #620**

for

**[REDACTED]**

in

**Elmore County, Idaho**

**8/11/2022**

# FACILITY STUDY REPORT (FSR)

[REDACTED]

**Project #620**

**8/11/2022**

## 1. General Facility Description

[REDACTED] (“Interconnection Customer”) has stated that the proposed project will consist of a 20 MW [REDACTED] in Elmore County, Idaho and utilize [REDACTED] the 230 kV bus at Idaho Power Company (IPC)’s Bennett Mountain 230 kV Switchyard. The total injection of the power plant with the addition of the expansion in GI #620 was studied at 175 MW during the Summer and 205 MW during the Winter (maximum project output).

Contact Information for Interconnection Customer is as follows:

[REDACTED]

A Standard Large Generator Interconnection Agreement (the “LGIA”) under IPC’s Open Access Transmission Tariff (OATT) between Interconnection Customer and IPC – Delivery (Transmission Provider) for the [REDACTED] 20 MW Project, specifically Generator Interconnection Project #620 (“Project”), will be prepared for this project. The LGIA will be a definitive agreement that contains terms and conditions that supersedes this FSR.

### 1.1 Interconnection Point

The Interconnection Facilities are located in IPC’s Central region in Township 3S, Range 7E and Section 19. The Point of Interconnection (“POI”) for the Project will be [REDACTED] at IPC’s Bennett Mountain 230kV Switchyard.

### 1.2 Point of Change of Ownership

The Point of Change of Ownership for the Project is assumed to be the same as the Point of Interconnection.

### 1.3 Interconnection Customer’s Interconnection and Generation Facilities

The Interconnection Customer’s Interconnection Facilities are located immediately south of and adjacent to IPC’s Interconnection Facilities. The Interconnection Customer is increasing the generating capacity of its existing simple cycle generating facility.

### 1.4 Other Facilities Provided by Interconnection Customer

#### 1.4.1 Telecommunications

The Interconnection Customer is not responsible for any third-party communication circuits for the IPC Interconnection Facilities. Any additional telecommunication requirements will be the sole responsibility of the Interconnection Customer.

#### **1.4.2 Ground Fault Equipment**

The existing transformers at Bennett Mountain Switchyard should provide an adequate ground source for transmission line protection/relaying.

#### **1.4.3 Generator Output Limit Control**

The Interconnection Customer has existing equipment to receive signals from IPC Grid Operations for Generation Output Limit Control (“GOLC”) - see Section 3 Operating Requirements and Appendix A. IPC’s recommended method of communication for GOLC is via fiber between the Interconnection Customer’s Facilities and IPC’s Facilities.

#### **1.4.4 Local Service**

The Interconnection Customer is responsible to arrange for local service to their site, as necessary.

#### **1.4.5 Property**

No changes or additions to existing IPC property are required.

#### **1.4.6 Site Work**

No site work is required.

#### **1.4.7 Monitoring Information**

If the Interconnection Customer requires the ability to monitor information related to the IPC breaker/relay (i.e. Mirrored Bits) in the interconnection station, they are required to supply their own communications circuit to the interface area of the interconnection yard. The fiber communication circuit used for GOLC is acceptable.

#### **1.4.8 Generator Technical Information & Drawings**

Interconnection Customer shall provide draft design prints during FSR development containing technical information, like impedances, and equipment brand and models. After construction, the Interconnection Customer shall submit to IPC all the as-built information, including prints with the latest approved technical information and commissioning test results.

### **1.5 Transmission Provider’s Interconnection Facilities**

Transmission Provider’s Interconnection Facilities are referred to hereafter as “IPC’s Interconnection Facilities.” No changes or modifications required to existing IPC Interconnection Facilities at IPC’s Bennett Mountain 230 kV Switchyard.

## **2. Estimated Milestones**

These milestones will begin, and the construction schedule referenced below will only be valid, upon receipt of funding from Interconnection Customer or its authorized third party no later than the date set forth below for such payment. IPC will not commit any resources toward project construction that have not been funded by Interconnection Customer. Additionally, failure by Interconnection Customer to make the required payments as set forth in this Study by the date(s) specified below may result in the



loss of milestone dates and construction schedules set forth below. In the event that the Interconnection Customer is unable to meet dates as outlined below, Interconnection Customer may request an extension of the Operation Date of up to three (3) years. Interconnection Customer’s request will be evaluated by IPC to ensure Interconnection Customer’s request does not negatively impact other projects in IPC’s Generator Interconnection Queue. Such extension will be allowed only if IPC determines, in its sole discretion, that the extension will not negatively impact other projects in IPC’s Generator Interconnection Queue. Estimated milestones, which will be updated and revised for inclusion in the LGIA in light of subsequent developments and conditions, are as follows:

<b>Estimated Date</b>	<b>Responsible Party</b>	<b>Estimated Milestones</b>
[DATE]	<i>Interconnection Customer</i>	<i>Executed Large Generator Interconnection Agreement</i>
4 months prior to IPC Commissioning	<i>IPC</i>	<i>Changes to existing generation output, with no changes to metering, must be modeled and submitted to the Western Energy Imbalance Market a minimum of 4 months prior to coming online, failure to submit by given lead time will result in project delay.</i>
TBD	<i>Interconnection Customer</i>	<i>Interconnection Customer testing begins</i>
TBD	<i>IPC</i>	<i>Notification from IPC’s Energy Contracting Coordinator confirming Operation Date (pending all requirements are met) of Firm Network Resource Output</i>

IPC does not warrant or guarantee the foregoing estimated milestone dates, which are estimates only. These milestone dates assume, among other things, that materials can be timely procured, labor resources are available, and that outages to the existing transmission system are available to be scheduled. Additionally, there are several matters, such as permitting issues and the performance of subcontractors that are outside the control of IPC that could delay the estimated Operation Date. For purposes of example only, federal, state, or local permitting, land division approval, identification of Interconnection Facilities location, access to proposed Interconnection Facilities location for survey and geotechnical investigation, coordination of design and construction with the Interconnection Customer, failure of IPC’s vendors to timely perform services or deliver goods, and delays in payment from Interconnection Customer, may result in delays of any estimated milestone and the Operation Date of the project. To the extent any of the foregoing are outside of the reasonable control of IPC, they shall be deemed Force Majeure events.

### **3. Operating Requirements**

The Project is required to comply with the applicable Voltage and Current Distortion Limits found in IEEE Standard 519-2014 *IEEE Recommended Practices and requirements for harmonic Control in Electrical Power Systems* or any subsequent standards as they may be updated from time to time.

**Low Voltage Ride Through:** The Project must be capable of riding through faults on adjacent sections of the power system without tripping due to low voltage. The interconnection projects must meet or exceed the Low Voltage Ride-Through requirements as set forth in NERC Standard PRC-024.

**Frequency Response Requirements:** Generator must be capable of providing Fast Frequency Response for both positive and negative frequency deviations from 60Hz ( +/- 0.036 Hz) for Bulk Electric System disturbances. The required frequency response will be linear for a deviation of 0 to +/- 0.1 Hz, a response of 0% to 3% of generator capacity, with a maximum required response of 3% of generator's full capacity for as long as the generator is able to provide support or the frequency deviation is reduced to within stated limits, whichever occurs first. Provided that Generator meets the above Fast Frequency Response requirements, Company shall not curtail Interconnection Customer when such curtailments are caused by a need to comply with applicable Frequency Responsive reliability standards.

**Momentary Cessation Requirements:** Momentary cessation should not be used within the voltage and frequency ride-through curves specified in PRC-024. Use of momentary cessation is not considered "ride through" within the "No Trip" zone curves of PRC-024. The use of momentary cessation should be eliminated to the extent possible consistent with NERC's *Reliability Guideline for BPS-Connected Inverter-Based Resource Performance*

Interconnection Customer will be able to modify power plant facilities on the Interconnection Customer side of the Point of Interconnection with no impact upon the operation of the transmission or distribution system whenever the generation facilities are electrically isolated from the system via the 231H switch and a terminal clearance is issued by IPC's Grid Operator.

#### 4. Reactive Power

It is the Project's responsibility to provide reactive power capability to have a power factor operating range of at least 0.95 leading (absorbing) to at least 0.95 lagging (supplying) at the high side of the generator substation over the range of real power output (up to maximum output of the project).

The Project must have equipment capable of receiving an analog setpoint, via DNP 3.0, from IPC for Voltage Control. IPC will issue an operating voltage schedule for the Project at the time the LGIA is executed. For more detail see Appendix A.

#### 5. Upgrades

##### 5.1 Distribution Upgrades

No distribution upgrades required

##### 5.2 Network Upgrades to Substations

No substation network upgrades required

##### 5.3 Network Upgrades to the Transmission System

No transmission network upgrades required

#### 6. Estimated Costs

The total estimated cost for the project is ■.

There is no modification required to existing Interconnection Facilities and no identified distribution upgrades or substation and transmission network upgrades.

### **Note Regarding Transmission Service:**

This FSR is a study of a request for Network Resource Interconnection Service. This FSR identifies the facilities necessary to provide such service. Network Resource Interconnection Service in and of itself does not convey any right to transmission service or to deliver electricity to any specific customer or Point of Delivery.

### **Note Regarding LGIA:**

This FSR is a study and preliminary evaluation only and does not constitute, or form the basis of, a definitive agreement related to the matters described in this FSR. Unless and until a LGIA is executed by IPC and Interconnection Customer, no party will have any legal rights or obligations, express or implied, related to the subject matter of this FSR.

# Appendix A

## Generation Interconnection Control Requirements

### A.1 Generator Output Limit Control (GOLC)

**A.1.1** IPC requires Interconnected Power Producers to accept GOLC signals from IPC's energy management system ("EMS").

**A.1.2** The GOLC signals will consist of four points shared between the IPC EMS (via the IPC RTU) and the Interconnection Customer's Generator Controller ("SGC"). The IPC RTU will be the master and the SGC will be the slave.

**A.1.2.1** GOLC Setpoint: An analog output that contains the MW value the Interconnection Customer should curtail to, should a GOLC request be made via the GOLC On/Off discrete output Control point.

**A.1.2.1.1** An Analog Input feedback point must be updated (to reflect the GOLC setpoint value) by the SGC upon the SGC's receipt of the GOLC setpoint change, with no intentional delay.

**A.1.2.2** GOLC On/Off: A discrete output (DO) control point with pulsing Trip/Close controls. Following a "GOLC On" control (DNP Control Code "Close/Pulse On"), the SGC will run power output back to the MW value specified in the GOLC Setpoint. Following a "GOLC Off" control (DNP Control Code "Trip/Pulse On"), the Interconnection Customer is free to run to maximum possible output.

**A.1.2.2.1** A Discrete Input (DI) feedback point must be updated (to reflect the last GOLC DO Control Code received) by the SGC upon the SGC's receipt of the GOLC DO control, with no intentional delay. The feedback DI should latch to an OFF state following the receipt of a "GOLC OFF" control and it should latch to an ON state following the receipt of an "GOLC ON" control.

**A.1.3** If a GOLC control is issued, it is expected to see MW reductions start within 1 minute and plant output to be below the GOLC Setpoint value within 10 minutes.

### A.2 Voltage Control

**A.2.1** IPC requires Transmission-Interconnected Power Producers to accept voltage control signals from IPC's EMS when they are connected to IPC's transmission system.

**A.2.2** The voltage control will consist of one setpoint and one feedback point shared between the IPC EMS and the SGC.

**A.2.3** The setpoint will contain the desired target voltage for plant operation. This setpoint will have a valid control range between 0.95 and 1.05 per unit ("p.u.") of nominal system voltage.

**A.2.4** The control will always be active, there is no digital supervisory point like the Curtail On/Off control above.

**A.2.4.1** When a setpoint change is issued an Analog Input feedback point must be updated (to reflect the voltage control setpoint value) by the SGC upon the SGC's receipt of the voltage control setpoint change, with no intentional delay.

**A.2.4.2** When a setpoint change is received by the SGC, the voltage control system should react with no intentional delay.

**A.2.4.3** The voltage control system should operate at the voltage indicated by the setpoint with an accuracy of +/- 0.5% of the nominal system voltage.



**A.2.5** The Interconnection Customer should supervise this control by setting up "reasonability limits", i.e. configure a reasonable range of values for this control to be valid. As an example, they will accept anything in the valid control range (between 0.95 and 1.05 p.u.) but reject values outside this range. If they were fed an erroneous value outside the valid range, their control system would default to the last known, good value.

### A.3 Generation Interconnection Data Points Requirements

<b>Digital Inputs to IPC (DNP Obj. 01, Var. 2)</b>			
Index	Description	State (0/1)	Comments:
0	GOLC Off/On (Control Feedback)	Off/On	Feedback provided by Interconnection Customer
1	FREQUENCY RESPONSE OFF/ON (Control Feedback)	Off/On	Feedback provided by Interconnection Customer
2	52A Interconnection Customer Main Breaker (if present)	Open/Closed	Sourced at substation
3	52A Interconnection Customer Capacitor Breaker (if present)	Open/Closed	Sourced at substation

<b>Digital Outputs to Interconnection Customer (DNP Obj. 12, Var. 1)</b>		
Index	Description	Comments:
0	GOLC Off/On	Control issued by IPC
1	Frequency Response Off/On	Control issued by IPC

<b>Analog Inputs to IPC (DNP Obj. 30, Var. 2)</b>							
Index	Description	Raw High	Raw Low	EU High	EU Low	EU Units	Comments:
0	GOLC Setpoint Value Received (Feedback)	32767	32768	TBD	TBD	MW	Provided by Interconnection Customer
1	Voltage Control Setpoint Value Rec'd (Feedback)	32767	32768	TBD	TBD	kV	Provided by Interconnection Customer
2	Maximum Park Generating Capacity	32767	32768	TBD	TBD	MW	Provided by Interconnection Customer
3	Ambient Temperature	32767	32768	327.67	-327.68	DEG C	Provided by Interconnection Customer
4	Wind Direction	32767	32768	327.67	-327.68	Deg from North	Provided by Interconnection Customer
5	Wind Speed	32767	32768	327.67	-327.68	M/S	Provided by Interconnection Customer
6	Relative Humidity	32767	-	TBD	TBD	%	Provided by



			32768				Interconnection Customer
7	SPARE						
8	SPARE						
9	SPARE						
10	SPARE						
11	SPARE						
12	SPARE						
13	SPARE						
14	SPARE						
15	SPARE						
16	SPARE						
17	SPARE						

<b>Analog Outputs to Interconnection Customer (DNP Obj. 41, Var. 2)</b>							
Index	Description	Raw High	Raw Low	EU High	EU Low	EU Units	Comments:
0	GOLC Setpoint	32767	-32768	TBD	TBD	MW	Control issued by IPC
1	Voltage Control Setpoint	32767	-32768	TBD	TBD	kV	Control issued by IPC
2	SPARE						
3	SPARE						
4	SPARE						
5	SPARE						
6	SPARE						
7	SPARE						
8	SPARE						
9	SPARE						