

## Interconnection Facilities Restudy Report

**#587**

1,050 Wind & Energy Storage  
Jerome, Lincoln & Minidoka Counties, ID

**July 10, 2025**

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## Table of Contents

Table of Contents .....	i
List of Tables .....	ii
List of Figures .....	ii
1. Study Overview .....	1
1.1 Introduction .....	1
1.2 Study Assumptions.....	1
1.3 No Transmission Service .....	2
2. Interconnection Facilities and Upgrades .....	3
2.1 Interconnection Customer’s Interconnection Facilities.....	3
2.2 Transmission Provider’s Interconnection Facilities .....	5
2.3 Substation Network Upgrades .....	6
2.4 System Network Upgrades .....	6
2.5 Distribution Upgrades .....	7
2.6 Estimated Costs.....	7
3. Contingent Facilities and Affected Systems.....	9
3.1 Generation Interconnection Queue.....	9
3.2 Contingent Facilities and Planned System Improvements .....	9
3.3 Affected Systems.....	9
4. Estimated Milestones .....	10
4.1 Milestones Overview .....	10
4.2 Estimated Milestones Detail .....	10
5. Interconnection Details.....	13
5.1 Generating Facility .....	13
5.2 Other Facilities Provided by Interconnection Customer .....	13
5.3 Operating Requirements.....	15
5.4 Reactive Power .....	16
5.5 Generation Interconnection Supervisory Data Requirements .....	16
Revision History .....	22

## List of Tables

<b>Table 1</b>	
Transmission Provider Interconnection Facilities.....	5
<b>Table 2</b>	
Substation Network Upgrades.....	6
<b>Table 3</b>	
Estimated cost of Interconnection Facilities and Network Upgrades. ....	8
<b>Table 4</b>	
Estimated Milestones .....	11
<b>Table 5</b>	
Transmission-interconnected wind Generation Interconnection Supervisory Data Table.....	18
<b>Table 6</b>	
BESS Generation Interconnection Supervisory Data Table. ....	20

## List of Figures

<b>Figure 1</b>	
Generic Point of Change of Ownership (POCO) configuration.....	4

# 1. Study Overview

## 1.1 Introduction

[REDACTED] (Interconnection Customer) has an executed Large Generator Interconnection Agreement (LGIA) with Idaho Power Company (IPC) for interconnection of the proposed 1,050 MW [REDACTED] #587 (Project) to IPC's Midpoint 345kV Station. The LGIA is for Energy Resource Interconnection Service (ERIS).

Following execution of the LGIA for the Project, Interconnection Customer requested Suspension of the Project in accordance with Article 5.16 of the LGIA. During the three (3)-year Project Suspension, IPC identified necessary changes to IPC's Midpoint 345kV Station. Upon Interconnection Customer lifting the Suspension on [REDACTED], IPC identified the Project requires an Interconnection Facilities Restudy (RFS) to be performed. This Interconnection Facilities Restudy Report (RFSR) identifies the work required to interconnect the Project the requested Midpoint 345kV Station Point of Interconnection (POI).

In accordance with Section 8.2 of IPC's Large Generator Interconnection Procedures (LGIP), this RFSR is specific to the Project and documents the basis for, and results of, the RFS for the Project. The RFSR provides a non-binding estimate of the cost of—and schedule for—equipment, engineering, procurement, and construction work required to connect the Project physically and electrically to the Transmission System. This report satisfies the RFS requirements of IPC's LGIP.

This RFSR 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 RFSR. Unless and until an LGIA amendment 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 RFSR. An LGIA amendment under IPC's Open Access Transmission Tariff (OATT) between Interconnection Customer and IPC for the Project will be prepared following finalization of this RFSR. The LGIA, as amended, will be a definitive agreement that contains terms and conditions that supersede this RFSR.

## 1.2 Study Assumptions

- For ERIS, Interconnection Customer's ability to inject its Large Generating Facility output beyond the Point of Interconnection (POI) will depend on the existing capacity of IPC's Transmission System at such time as a transmission service request is made that would accommodate such delivery. Transmission Service may require the construction of additional Network Upgrades.
- Senior- and equally queued Interconnection Requests that were considered in this study are listed in Section 3.1. If any of these Interconnection Requests are withdrawn, IPC reserves the right to restudy this Project, and the results and conclusions could significantly change.

- This report is based on information available at the time of study. Interconnection Customer is responsible to check IPC's OASIS site and website regularly for Generation Interconnection and Transmission System updates:
  - OASIS (<https://www.oasis.oati.com/ipco/>)
  - Planning and Electrical Projects (<https://www.idahopower.com/energy-environment/energy/planning-and-electrical-projects/>)

### 1.3 No Transmission Service

This RFSR is a study of a request for ERIS as defined in Section 1 IPC's LGIP. This RFSR identifies the facilities necessary to interconnect the Project with IPC's Transmission System and be eligible to deliver the Project's output using the existing firm or non-firm capacity of the Transmission System on an "as available" basis. ERIS does not in and of itself convey any right to transmission service or to deliver electricity to any specific customer or Point of Delivery.

The battery energy storage system (BESS) component of this Project was not studied for grid-charging.

## 2. Interconnection Facilities and Upgrades

### 2.1 Interconnection Customer's Interconnection Facilities

#### *General Facility Description*

The proposed Project will consist of [REDACTED] wind and [REDACTED] battery energy storage (BESS) in Jerome, Lincoln, and Minidoka Counties, Idaho and interconnect at a single POI at IPC's Midpoint 345kV Station ([REDACTED]). The net Project output at the POI as studied is 1,050 MW.

Interconnection Customer's Interconnection Facilities are defined in Section 1 of IPC's LGIP as all facilities and equipment located between the Generating Facility and the Point of Change of Ownership (POCO), including any modification, addition, or upgrades to such facilities and equipment. Interconnection Customer is responsible for funding and constructing Interconnection Customer's Interconnection Facilities, including the gen-tie line and facilities to the POCO.

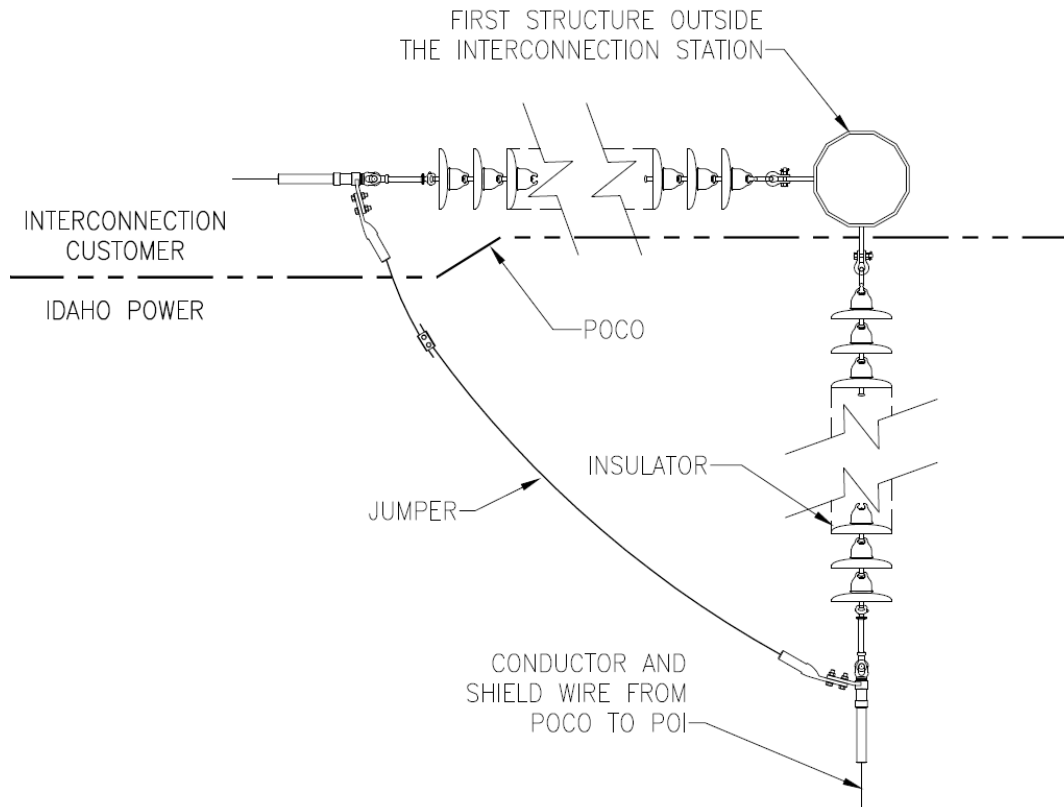
Interconnection Customer's Interconnection Facilities are located in IPC's [REDACTED] region in Lincoln County, ID, and are approximately [REDACTED] away from Transmission Provider's Interconnection Facilities (IPC's Interconnection Facilities). Interconnection Customer will install disconnect switches, collector system, transformers, controllers, appropriate grounding measures, and associated auxiliary equipment.

Interconnection Customer's [REDACTED] main step-up transformers are [REDACTED] [REDACTED] transformer(s). The Project single line does not indicate the winding configuration on the [REDACTED] transformers. IPC requires a configuration that provides a ground return path for line protection/transmission relaying (e.g., wye-grounded connection on the high side and delta included in the transformer).

Interconnection Customer will build facilities to the POCO, including a transmission line with a minimum 24-count optical ground wire (OPGW) from Interconnection Customer's Interconnection Facilities to IPC's Interconnection Facilities. Interconnection Customer is responsible to mirror IPC's System Protection relays to include dual SEL-411L installation for protection of the interconnection intertie.

#### *Point of Change of Ownership*

The POCO for the Project will be at the first structure outside IPC's Midpoint 345kV Station (POI Station). The structure at the POCO will be part of Interconnection Customer's Interconnection Facilities. The jumper will be part of IPC's Interconnection Facilities. The following drawing provides generic information and standard requirements for the POCO.



**Figure 1**

Generic Point of Change of Ownership (POCO) configuration.

Note the following related to the POCO:

- The first structure outside the POI Station shall be designed as follows:
  - 90-degree max line angle
  - Steel
  - IPC phase spacing
- Interconnection Customer's OPGW shall terminate at an Interconnection Customer-provided splice box on the structure.
- Interconnection Customer shall inform IPC of the conductor size.
- IPC and Interconnection Customer shall coordinate phase configuration (e.g., 321, 213, etc.).
- Insulator parts shown in the diagram are for representation only; actual parts used will be dependent on final design.

## 2.2 Transmission Provider's Interconnection Facilities

Transmission Provider's Interconnection Facilities (IPC's Interconnection Facilities) are defined in Section 1 of IPC's LGIP as all facilities and equipment owned, controlled, or operated by IPC from the POCO to the POI, including any modifications, additions, or upgrades to such facilities or equipment. In accordance with Section 4.2.1 of IPC's LGIP, costs for IPC's Interconnection Facilities are directly assigned to Interconnection Customer and are not reimbursable.

### *Point of Interconnection*

The Project's POI will be at Interconnection Customer's requested POI of IPC's Midpoint 345kV Station. The preliminary configuration for the POI is on IPC's side of air-break switch [REDACTED]. A drawing detailing the configuration is attached as Exhibit 1. This configuration will be finalized during construction, and the final configuration will be captured in an LGIA amendment, if necessary.

### *Metering*

All metering for the Project will be installed, configured, and maintained in accordance with IPC's publicly posted [Facility Interconnection Requirements for Transmission Systems](#), as may be updated from time to time.

### *IPC's Interconnection Facilities*

To allow interconnection of the Project, IPC will install the following facilities up to the POCO:

- [REDACTED] ION 8650A meter
- [REDACTED] dead-end structures
- [REDACTED] air-break switch
- [REDACTED] current transformers (CT)
- Required foundations, bus, bus supports, and fiber communication equipment
- The last span of the Project's gen-tie line, including insulators, conductor, and associated hardware

IPC will install equipment to collect and transmit Phasor Measurement Unit (PMU) data to IPC. The communication circuits required for this data transmission are described in Section 5.2 of this RFSR. The data can be made available to Interconnection Customer on request.

**Table 1**

Transmission Provider Interconnection Facilities

Facility Description	Unloaded Cost Estimate
Interconnection Facilities	\$1,538,132



## 2.3 Substation Network Upgrades

Substation Network Upgrades are defined in Section 1 of IPC's LGIP as Network Upgrades that are required at the substation located at the POI; this includes all switching stations. This section includes both Substation Stand Alone Network Upgrades (SANU) and Substation Network Upgrades, the actual costs of which are reimbursable.

### *Substation Stand Alone Network Upgrades*

SANUs are defined in Section 1 of IPC's LGIP as Network Upgrades that Interconnection Customer may construct without affecting day-to-day operations of the Transmission System during their construction.

No Substation SANUs were identified for this Project.

### *Substation Network Upgrades*

The following Substation Network Upgrades are required for this Project:

- Construct a [REDACTED] line terminal at the Midpoint Station:
  - [REDACTED] power circuit breaker
  - [REDACTED] air-break switch
  - [REDACTED] capacitance coupled voltage transformers (CCVT)
  - Line bay and associated relaying, PLC communications, and control equipment installed in the station yard and building

**Table 2**

Substation Network Upgrades

Facility Description	Unloaded Cost Estimate
POI Station	\$2,178,954

## 2.4 System Network Upgrades

System Network Upgrades are defined in Section 1 of IPC's LGIP as Network Upgrades that are required beyond the substation located at the POI. This section includes both System SANU and System Network Upgrades, the actual costs of which are reimbursable.

### *System Stand Alone Network Upgrades*

SANUs are defined in Section 1 of IPC's LGIP as Network Upgrades that Interconnection Customer may construct without affecting day-to-day operations of the Transmission System during their construction.

No System SANUs were identified for this Project.

### **System Network Upgrades**

No System Network Upgrades were identified for this Project.

## **2.5 Distribution Upgrades**

Distribution Upgrades are defined in Section 1 of IPC's LGIP as additions, modification, and upgrades to IPC's Distribution System at or beyond the POI to facilitate interconnection of the Generating Facility. In accordance with Article 11.3 of IPC's LGIA, costs for Distribution Upgrades are directly assigned to Interconnection Customer and are not reimbursable.

Note that the identified Distribution Upgrades do not include distribution facilities to support local service to Interconnection Customer's Interconnection Facilities, Generating Facility, auxiliary load, etc. See the Local Service portion of Section 5.2 of this RFSR for additional information on local service requirements.

No Distribution Upgrades were identified for this Project.

## **2.6 Estimated Costs**

The following good faith estimates are provided in 2025 US dollars and are based on a number of assumptions and conditions. IPC does not warrant or guarantee the estimated costs in the table below, which are estimates only and are subject to change. Interconnection Customer will be responsible for all actual costs incurred in connection with the work performed by IPC and its agents, under the terms and subject to the conditions included in any LGIA executed by IPC and Interconnection Customer. Costs for work being performed by Interconnection Customer and/or Affected Systems are not included.

**Table 3**

Estimated cost of Interconnection Facilities and Network Upgrades.

Description	Ownership	Cost Estimate
<b>IPC Interconnection Facilities:</b>		
<b>Facilities between the POCO and POI as described in Section 2.2</b>	IPC	\$1,538,132
Contingency 20%		\$307,626
Overheads 3%		\$55,373
<b>Total</b>		<b>\$1,901,131</b>
<b>Substation Network Upgrades:</b>		
<b>Upgrades to POI Station as described in Section 2.3</b>	IPC	\$2,178,954
Contingency 20%		\$435,791
Overheads 3%		\$78,442
<b>Total</b>		<b>\$2,693,187</b>
	<b>GRAND TOTAL</b>	<b>\$4,594,318</b>

## 3. Contingent Facilities and Affected Systems

### 3.1 Generation Interconnection Queue

Interconnection Customer has applied to interconnect the Project to IPC's transmission system for an injection of 1,050 at a single POI at 345kV at IPC's Midpoint Station.

If a senior-queued Interconnection Request that is responsible for constructing Network Upgrades should withdraw from the queue or otherwise be terminated, junior-queued Interconnection Requests in the electrically relevant area may be restudied and assigned additional Network Upgrades identified as necessary to facilitate their interconnection.

As of the date of this report, Interconnection Request #551 is the only senior-queued Interconnection Request to the Project. The recommended upgrades for this senior-queued Interconnection Request were assumed to be completed prior to the interconnection of the Project. Costs related to Network Upgrades could be passed on to the Project should changes be made to this senior-queued Interconnection Request.

GI #570 is not included in the list of senior-queued Interconnection Requests because [REDACTED] #587 was submitted as an alternative interconnection option to GI #570, not as an additional project interconnecting to IPC's Transmission System. Both GI #570 and [REDACTED] #587 cannot proceed to construction.

### 3.2 Contingent Facilities and Planned System Improvements

Contingent Facilities are defined in Section 1 of IPC's LGIP as those unbuilt Interconnection Facilities and Network Upgrades upon which the Interconnection Request's costs, timing, and study findings are dependent, and if delayed or not built, could cause a need for restudies of the Interconnection Request or a reassessment of the Interconnection Facilities and/or Network Upgrades and/or costs and timing.

No Contingent Facilities or planned system improvements were identified for this Project.

### 3.3 Affected Systems

Affected System is defined in Section 1 of IPC's LGIP as an electric system other than IPC's Transmission System that may be affected by the proposed interconnection.

IPC has not identified an Affected System for this Project. If an Affected System is later identified, IPC will notify both Interconnection Customer and Affected System, and an Affected System study may be required.

## 4. Estimated Milestones

### 4.1 Milestones Overview

The milestone dates in this section 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 Commercial Operation Date (COD). 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 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 COD 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. For these and other reasons, IPC does not warrant or guarantee the estimated milestone dates, which are estimates only.

### 4.2 Estimated Milestones Detail

Interconnection Customer has requested a COD of June 1, 2028. IPC has developed the milestone dates in good faith considering many factors, including the requested COD, known long-lead times, and the schedule of other in-progress projects. The estimated milestone schedule captured in the following table does not align with the requested COD.

These milestones will begin, and the milestone 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 in the ultimate LGIA 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 the ultimate LGIA by the specified date(s) may result in the loss of milestone dates and construction schedules set forth below.

**Table 4**  
Estimated Milestones

Estimated Date	Responsible Party	Milestone
March 23, 2022	Interconnection Customer	<b>Completed</b> LGIA Execution
	Interconnection Customer	<b>Completed</b> <ul style="list-style-type: none"> <li>• LGIA Suspended</li> <li>• Demonstration of Site Control status provided</li> </ul>
	Interconnection Customer	<b>Completed</b> Provide Certificate of Insurance
	Interconnection Customer	<b>Completed</b> LGIA Unsuspended
15 Business Days following receipt of executable LGIA amendment	Interconnection Customer	<b>LGIA Amendment Execution</b>
15 Business Days following LGIA Amendment Execution	Interconnection Customer	<b>Project Initiation<sup>1</sup></b> IPC receives the following: <ul style="list-style-type: none"> <li>• Demonstration of continued Site Control (updated status)</li> <li>• Construction funding or arrangements acceptable to IPC are made with IPC's Credit Department</li> <li>• Reasonable evidence to show one or more of the development milestones as per LGIP Section 11.3 has been achieved</li> <li>• Notice to Proceed for design, procurement, and construction</li> </ul>
Immediately following Project Initiation	IPC	Initial design activities to support procurement of long lead materials initiated
5 weeks following Project Initiation	IPC	Initial design activities complete and Long Lead Material ordered
6 months following Project Initiation	IPC	Engineering and Design initiated
24 months following Project Initiation	IPC	Engineering and Design complete
43 months following Project Initiation <sup>2</sup>	IPC	Long Lead Material procured/received
10 months prior to COD	Interconnection Customer	Provide updated EMT models to complete modeling in accordance with IPC's OATT Attachment O
8 months prior to Commissioning of IPC's Interconnection Facilities	IPC	Network modeling submission Failure to submit by given lead time will result in Project delay

<sup>1</sup> Both GI #570 and GI #587 cannot proceed to construction.

<sup>2</sup> Construction will not begin until long-lead items are received.

Estimated Date	Responsible Party	Milestone
180 Calendar Days prior to Initial Synchronization	Interconnection Customer	Provide a completed copy of the Large Generating Facility data requirements contained in Appendix 1 of the LGIP per LGIA Article 24.3
180 Calendar Days prior to Initial Synchronization	Interconnection Customer	Provide initial specifications for Interconnection Customer's Interconnection Facilities per LGIA Article 5.10.1
90 Calendar Days prior to Initial Synchronization	Interconnection Customer	Provide final specifications for Interconnection Customer's Interconnection Facilities per LGIA Article 5.10.1
3 months prior to Initial Synchronization	Interconnection Customer	Provide notification of local Balancing Authority per LGIA Article 9.2
53 months following Project Initiation	IPC	Construction of IPC's Interconnection Facilities and Network Upgrades Complete
1 month following completion of all previous construction milestones	IPC	Commissioning of IPC's Interconnection Facilities and Network Upgrades Complete Back feed power is available
Any time after Commissioning Complete <b>Note:</b> Switching request must be made a minimum of 5 days prior to In-Service Date	Interconnection Customer	<b>In-Service Date</b> Switch at the POI can be closed to obtain back feed power
TBD	Interconnection Customer	<b>Initial Synchronization Date</b> Interconnection Customer Trial Operation begins; test energy can be generated only if the IC has arranged for the delivery of such energy
30 Calendar Days prior to COD	Interconnection Customer	Notify IPC of COD
Prior to COD	Interconnection Customer	Pass Generating Facility Functional Testing
Prior to COD	Interconnection Customer	Provide as-built or as-tested performance data that differs from the initial Large Generating Facility data requirements contained in Appendix 1 of the LGIP per LGIA Article 24.4
TBD	Interconnection Customer	<b>COD</b>
Within 30 Calendar Days following COD	Interconnection Customer	Submit completed Appendix E of the LGIA confirming completion of Trial Operation and COD
120 Calendar Days following COD	Interconnection Customer	Provide as-built drawings, information, and documents for Interconnection Customer's Interconnection Facilities per LGIA Article 5.10.3

## 5. Interconnection Details

### 5.1 Generating Facility

The Generating Facility is defined in Section 1 of IPC's LGIP as Interconnection Customer's device(s) for the production and/or storage for later injection of electricity identified in the Interconnection Request but shall not include Interconnection Customer's Interconnection Facilities.

Interconnection Customer's system will be constructed as follows:

1. The wind system will comprise of [REDACTED] wind turbines dispersed among [REDACTED] collector stations.
2. The BESS inverter system will comprise of [REDACTED] BESS inverter systems, each to be located on the [REDACTED] bus of the [REDACTED] collector stations [REDACTED] transformers.
3. A plant controller will be used to control the inverter system and to implement smart inverter functionality for operating the Project within a voltage range specified by IPC at the POI.

The above-referenced inverters, or equivalent inverters that have the same specifications and functionality as stated above, must be utilized. Additional study and/or equipment may be necessary if a different inverter is utilized that has different specifications and functionality than that which was studied.

### *Operating Assumptions for Battery Energy Storage System*

Interconnection Customer did not request to charge the BESS portion of the Project from the grid; therefore, the no charging study was performed. Interconnection Customer will be required to demonstrate operating procedures and control measures that prevent the BESS from grid charging. Additionally, IPC shall enable an additional relay setting at the POI to trip the Project if grid-charging is detected.

### 5.2 Other Facilities Provided by Interconnection Customer

#### *Telecommunications*

Interconnection Customer is not responsible for any third-party communication circuits for IPC's Interconnection Facilities. Any additional telecommunication requirements, including OPGW on the gen-tie line, will be the sole responsibility of Interconnection Customer.

#### *Ground Fault Equipment*

Interconnection Customer will install transformer configurations that will provide a ground source to the transmission system.



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

Interconnection Customer will install equipment to receive/transmit signals from IPC Load Serving Operations for Generation Output Limit Control (GOLC)—see Section 5.5 of this RFSR. IPC’s recommended method of communication for GOLC is via fiber between the Interconnection Facilities and the Project.

## ***Local Service***

Interconnection Customer is required to take local service from the local service provider as a retail customer. Interconnection Customer is responsible to arrange for local service to Interconnection Customer’s Interconnection Facilities and/or Generating Facility.

If receiving local service from IPC, Interconnection Customer shall coordinate such requirements with IPC so that local service can be provided in accordance with the provisions contained within the applicable service schedule. The service schedule and functional settlement will be determined during construction of the Project.

## ***Property***

IPC does not anticipate the need for additional land to be acquired for this Project. IPC’s Interconnection Facilities will be owned and maintained by IPC.

Interconnection Customer may be required to obtain transmission easements and/or transmission line crossing agreements from IPC depending on the designed path of Interconnection Customer’s [REDACTED] gen-tie line.

## ***Site Work***

No site work was identified beyond that required for Network Upgrades on property already owned by IPC.

## ***Monitoring Information***

If Interconnection Customer requires the ability to monitor information related to the IPC breaker/relay (i.e., Mirrored Bits) in the POI Station, Interconnection Customer is required to supply its own communications circuit to the POCO. The fiber communication circuit used for GOLC is acceptable.

## ***Meteorological Data***

To integrate the wind energy into IPC’s system, Interconnection Customer will provide weather data to IPC from the Project site or from a location within two miles of the Project site. This data must consist of the following near real-time weather parameters that will be collected via each meteorological observation tower at ten (10) meters and eighty (80) meters above ground:

1. Wind Speed (miles/seconds)
2. Wind Direction

3. Air Temperature (degrees Centigrade)
4. Relative Humidity
5. Barometric Pressure

This data shall be provided to IPC hourly via commonly accepted electronic web service standards or similar communication method. Specific meteorological data must also be provided to IPC via the telemetry circuit as identified in Section 5.5 of this RFSR. Interconnection Customer will provide relevant historical meteorological data to IPC. Additionally, Interconnection Customer shall submit to IPC the physical and technical specifications for all meteorological measurement devices, geographic locations, and technical specifications of all turbines. The associated cost for obtaining this data is Interconnection Customer's responsibility and is therefore not included in the Facility Study estimate.

### **Generator Technical Information and Drawings**

During Project design development, Interconnection Customer shall provide draft design prints containing technical information, including but not limited to impedances and equipment brand and models. After construction, Interconnection Customer shall submit to IPC all the as-built information, including prints with the latest approved technical information and commissioning test results in accordance with the timing requirements outlined in the LGIA.

## **5.3 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. Interconnection projects must meet or exceed the low voltage ride-through requirements as set forth in NERC Reliability Standard PRC-024 and PRC-029, when effective.

### **Frequency Response Requirements**

The Project must be capable of providing Primary Frequency Response for both positive and negative frequency deviations from 60Hz (+/- 0.036 Hz) with a droop of up to 5% for Bulk Electric System disturbances. Provided the Project meets the above Primary Frequency Response requirements, IPC shall not curtail the Project when such curtailments are caused by a need to comply with applicable Frequency Response reliability standards.

### **Momentary Cessation Requirements**

Momentary cessation should not be used within the voltage and frequency ride-through curves specified in PRC-024 and PRC-029, when effective. Use of momentary cessation is not considered ride through within the No Trip zone curves of PRC-024 or mandatory and continuous operation regions of PRC-029. 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 Interconnection Customer side of the POCO only if 1) there is no impact on the operation of the transmission or distribution system, 2) the generation facilities are electrically isolated from the system via the [REDACTED] switch, and 3) a terminal clearance is issued by IPC's Load Serving Operator.

## **5.4 Reactive Power**

The Project will be required to provide reactive power versus real power capability measured at the high side of the main power transformer that complies with IEEE 2800-2022 *IEEE Standard for Interconnection and Interoperability of Inverter-Based Resources (IBRs) Interconnecting with Associated Transmission Electric Power Systems*, or any subsequent standards as they may be updated from time to time.

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 prior to the Project's In-Service Date. For more detail, see Section 5.5 of this RFSR.

## **5.5 Generation Interconnection Supervisory Data Requirements**

### **Interconnection Communications**

All supervisory data points described in this Section 5.5 of the RFSR are to be communicated between Interconnection Customer and IPC via serial DNP 3.0 protocol. The physical transport will be fiber cables.

Interconnection Customer is responsible for this fiber connection from their PLC or other controls equipment to the POCO.

### **Generator Output Limit Control**

The Project will be subject to reductions directed by IPC Load Serving Operations during transmission system contingencies and other reliability events. When these conditions occur, the Project will be subject to Generator Output Limit Control (GOLC) and will have equipment capable of receiving an analog setpoint via DNP 3.0 from IPC for GOLC. GOLC will be accomplished with a setpoint and discrete output control from IPC to the Project indicating maximum output allowed.

IPC requires interconnected Projects to accept GOLC signals from IPC's energy management system (EMS) when they are connected to IPC's transmission system.

The GOLC signals will consist of four points shared between the IPC EMS (via the IPC RTU) and Interconnection Customer Generator Controller (SGC). The IPC RTU will be the master, and the SGC will be the slave.

- **GOLC Setpoint:** An analog output that contains the MW value Interconnection Customer should curtail to, should a GOLC request be made via the GOLC On/Off discrete output Control point.
- **GOLC Setpoint Feedback:** 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.
- **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), Interconnection Customer is free to run to maximum output.
- **GOLC On/Off Feedback:** 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.

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 ten (10) minutes.

## Voltage Control

IPC requires interconnected Projects to accept voltage control signals from IPC's EMS when they are connected to IPC's transmission system.

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

- **Voltage Control Setpoint:** An analog output that contains the voltage Interconnection Customer should target 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.
- **Voltage Control Setpoint Feedback:** An analog input feedback point must be updated to reflect the Voltage Control Setpoint by the SGC upon the SGC's receipt of the voltage setpoint change with no intentional delay.

The control will always be active; there is no digital supervisory point like the GOLC On/Off control above.

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

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.

### Auxiliary Data Points

Additional status points relating to local weather, equipment, and other supervisory information are required in accordance with the following Generation Interconnection Supervisory Data Table. This table includes a comprehensive list of data points to be sent and received via the fiber connection described in the Interconnection Communications portion of this Generation Interconnection Supervisory Data Requirements section of the RFSR.

**Table 5**

Transmission-interconnected wind Generation Interconnection Supervisory Data Table.

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

Digital Outputs to Interconnection Customer (DNP Obj. 12, Var. 1)		
Index	Description	Comments:
0	GOLC Off/On	Control issued by IPC
1	EMS COMM Off/On	Control issued by IPC

Analog Inputs to IPC (DNP Obj. 30, Var. 2)							
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

Analog Inputs to IPC (DNP Obj. 30, Var. 2)							
Index	Description	Raw High	Raw Low	EU High	EU Low	EU Units	Comments:
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	-32768	TBD	TBD	%	Provided by Interconnection Customer
7	SPARE						
8	SPARE						
9	Number of Turbines in High Speed Cutout	32767	-32768	32767	-32768	Units	Provided by Interconnection Customer
10	SPARE						
11	SPARE						
12	SPARE						
13	SPARE						
14	SPARE						
15	SPARE						
16	SPARE						
17	SPARE						

Analog Outputs to Interconnection Customer (DNP Obj. 41, Var. 2)							
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						

Analog Outputs to Interconnection Customer (DNP Obj. 41, Var. 2)							
Index	Description	Raw High	Raw Low	EU High	EU Low	EU Units	Comments:
5	SPARE						
6	SPARE						
7	SPARE						
8	SPARE						
9	SPARE						

**Table 6**

BESS Generation Interconnection Supervisory Data Table.

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

Digital Outputs to Interconnection Customer (DNP Obj. 12, Var. 1)		
Index	Description	Comments:
0	GOLC Off/On	Control issued by IPC
1	EMS COMM Off/On	Control issued by IPC

Analog Inputs to IPC (DNP Obj. 30, Var. 2)							
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	SPARE						

Analog Inputs to IPC (DNP Obj. 30, Var. 2)							
Index	Description	Raw High	Raw Low	EU High	EU Low	EU Units	Comments:
4	SPARE						
5	SPARE						
6	SPARE						
7	SPARE						
8	SPARE						
9	SPARE						
10	SPARE						
11	SPARE						
12	SPARE						
13	SPARE						
14	SPARE						
15	SPARE						
16	SPARE						
17	SPARE						

Analog Outputs to Interconnection Customer (DNP Obj. 41, Var. 2)							
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						



# Revision History

Date	Author	Revisions
05/30/2025	Laura nelson	Interconnection Facilities Restudy Report version 1.0 issued.
7/10/2025	Laura Nelson	Minor updates to section 3.1 and Table 4 based on Interconnection Customer comments. Version 1.1.