

Facilities Study Report

For

Physical Interconnection of

PJM Generation Interconnection Request

Project ID AH1-563

Aurora E.C. 138kV

Introduction

This Facilities Study has been prepared in accordance with the PJM Open Access Transmission Tariff, as well as the Application and Studies Agreement between the Project Developer and PJM Interconnection, LLC (PJM or Transmission Provider (TP)). The Transmission Owner (TO) is ComEd

This Facility Study was performed to satisfy the Phase 2 Facility Study requirement of the PJM Tariff. The Facility Study is intended to provide scope, cost and schedule estimates for the project as currently defined and approved for Phase 2 study. In the event project changes are made during DP2 that impact this report, updates will be provided as part of the Phase 3 report. Following execution of the project's final agreement, this report will not be updated to account for other changes made as part of the agreements modification clause and instead the scope change process will be followed.

A. Transmission Owner Facilities Study Summary

1. PROJECT DESCRIPTION

The Project Developer (PD) has proposed a battery storage uprate to an existing battery storage Generating Facility located in Illinois with a designated PJM Project ID of AH1-563.

This project is an increase to the planned AG1-513 project, and will share the same Point of Change in Ownership.

The AH1-563 project is a 150 MW uprate (150 MW Capacity uprate) to the previous project. The total installed facilities will have a capability of 1206 MW with 1124 MW of this output being recognized by PJM as Capacity.

2. POINT OF INTERCONNECTION (POI)

The Generating Facility will interconnect with the ComEd transmission system via a direct connection into the TSS 951 Aurora 138kV substation.

The proposed generation interconnection is shown on the single line diagram in Attachment #1.

3. POINT OF CHANGE IN OWNERSHIP

The Point of Change in Ownership will be located at the first dead-end structure inside the TSS 951 Aurora substation fence line.

4. SCOPE OF PROJECT DEVELOPER INTERCONNECTION FACILITIES

Project Developer will design, build, own, operate and maintain the Project Developer Interconnection Facilities on Project Developer's side of the Point of Change in Ownership (PCO). This includes, but is not limited to:

- One (1) 138kV circuit breaker
- One (1) 138kV disconnect switch
- Three (3) metering CTs and three (3) metering PTs, or a combination unit, meters, and associated equipment to meter the equipment installed in AH1-563
- One (1) 138kV line to connect to Generator lead line, L.95102, which connects to the Point of Interconnection (POI).
- Install one (1) pair of fiber jumper cables from the revenue metering unit to available fiber ports on the Aurora Energy Center Fiber Distribution Panel
- GIC developer to provide transformer test reports for 138kV-34kV step up transformers, for ComEd short circuit modeling. Test reports to include %Z Impedance and load loss.
- At Aurora Generations LLC, in general, GIC to follow section 6.1 (Design E) of the latest version of ComEd Interconnection Guidelines for Generators at Transmission Level (Rev 2: Effective 12/16/2021).
 - New gas circuit breakers to auto trip and isolate for critical gas level.
 - New Tie Line terminal relay types to be the same as ComEd terminal relays. This includes relay firmware versions.
 - ComEd Protection and Control Engineering must review all developer relay protection design drawings and relay settings.
 - Developer equipment impedance and/or test data must be provided to ComEd Protection and Control Engineering to model in a short circuit program. Examples include lines, transformers (include percent impedance and load loss), wind turbines, and inverters.
 - Developer to include over/under frequency and voltage protection at wind/solar farm collector bus. Suggested settings will be provided by ComEd. Under-frequency settings are to comply with MAIN Guide 1B.
 - Dual bus protection for 34.5kV bus.
 - Dual TRFM protection and site protection must be compliant with NERC & PJM requirements.
 - Metering is required to be installed per ComEd & PJM standards.
 - SCADA interface to ComEd will be required.
 - Witness testing by ComEd or a DA will be required and must be pre-scheduled at least 90 days in advance.
- New Gas Circuit breaker control for loss of SF6 gas condition should be as follows (see Engineering practice EP-5206-E):
 - For an open circuit breaker, when SF6 gas drops to the critical level, the close circuit of breaker shall be opened and motor operated disconnects on both sides of CB shall be opened.
 - For a closed SF6 gas circuit breaker, when SF6 gas drops to the critical level, the circuit breaker shall be opened and motor operated disconnects on both sides of CB shall be opened and the close of the circuit breaker shall be opened.

- For any new equipment connected to the BES (Bulk Electric System rated at 100kV or above) the associated primary/System 1 and secondary/System 2 protective schemes to have a minimum redundant:
 - Connected CTs (where available)
 - PT secondary (where available)
 - DC control circuits
 - Auxiliary trip relays
 - Circuit breaker trip coils (where available)
 - Communication circuitry.

B. Transmission Owner Facilities Study Results

The following is a description of the planned Transmission Owner facilities for the physical interconnection of the proposed AH1-563 project to ComEd transmission system. These facilities shall be designed according to ComEd Applicable Technical Requirements and Standards. Once built, ComEd will own, operate, and maintain these Facilities.

1. TRANSMISSION OWNER INTERCONNECTION FACILITIES:

A 138kV dead-end structure and foundation outside the fence of the Interconnection Substation, to terminate the Project Developer's generator lead line.

Line conductor from the dead-end structure to the bus position in the switchyard of the interconnection substation.

2. STAND ALONE NETWORK UPGRADES

NA

3. NETWORK UPGRADES

Expanding existing ComEd substation:

TSS 951 Aurora Upgrade

The existing substation, TSS 951 Aurora 138kV, will be upgraded to interconnect the project with the ComEd transmission system.

- Three (3) metering CTs and three (3) metering PTs, or a combination unit, meters, and associated equipment on the ComEd-side of the POI.
- Install SEL-3350 RTAC.
 - Install one pair of serial fiber connections for each developer RTU data exchange to be coordinated with ComEd SCADA Engineering:
 - Breaker statuses
 - MW, MVAR, MWh and voltage values
 - Install one pair of serial fiber connection for the ComEd-owned revenue metering unit

- All changes to topology, including generation, must be modeled during the Phase 1 study for PRC-027 compliance. A protection system coordination study is required for new BES buses or when there is a 15% (or greater) change in fault current for an existing BES bus. Setting changes may be required per the outcome of this coordination study. At a minimum, review and reset the existing relay terminals shown below (as needed).
 - TSS144 and TSS951 138kV L14403
 - TSS111 and TSS951 138kV L11103

Upgrades to neighboring facilities:

TSS 144 Wayne

- Review and reset the existing relay terminals shown below (as needed) for 138kV L14403

TSS 111 Electric Junction

- Review and reset the existing relay terminals shown below (as needed) for 138kV 11103

Installation of fiber cable circuits

AH1-563 assumes the existing 24-count, Single Mode, fiber cable between TSS 951 Aurora and the Aurora Energy Center has sufficient spare fiber ports to service the SCADA connection between the ComEd-owned revenue meter located at Aurora Energy Center and the new SCADA SEL-3350 RTU RTAC installed in AH1-563.

4. OTHER SCOPE OF WORK

This section is not applicable.

5. MILESTONE SCHEDULE FOR COMPLETION OF ComEd WORK

Facilities outlined in this report are estimated to take 30 months to construct, from the time the Generation Interconnection Agreement is fully executed. This schedule is may be impacted by the timeline for procurement and installation of long lead items, the ability to obtain outages to construct and test the proposed facilities.

Description	Start month	Finish month
Detailed Design	1	12
Construction	12	30

6. ASSUMPTIONS IN DEVELOPING SCOPE/COST/SCHEDULE

- This cost estimates assume that work will be performed during normal weekdays and with no overtime. Transmission line outages for construction have not been identified, but generally are available from September to May. These outages are controlled by PJM.
- Costs are based on 2026 rates and do not reflect a potential increase in Labor or Material costs after 2026.
- ComEd cost estimate is valid for six (6) months after Facilities Study release by PJM.
- The Project Developer will be responsible to request and bear the cost for relocation of existing transmission or distribution lines (including structures and other facilities) that may be required for transmission line crossings, the transport of any large equipment, such as turbines, rotors, turbine structures, cranes, etc. Formal submittal of this request to ComEd's TSO for ultimate review by PJM can be made 7 months prior to back feed request date.
- There will be no foundations installed during this project.
- All upgrades to facilities included in this document will be required to meet latest ComEd standards.
- Upgrades are subject to change based on detailed design development.
- ComEd will complete pre-design and post construction survey for the transmission and substation upgrades, as required. This includes, but is not limited to, the LIDAR survey and video imaging for transmission lines. Costs associated with this are at the expense of the Project Developer. Pre-design survey must be completed prior to detailed engineering.
- This study assumes that there will be no additional right-of-way and/or easement work required.
- This Facilities Study is time dependent. If the project is not into construction within one year of the issuance, the study will be void and the project re-studied, requiring the completion of a new Facilities Study.
- It is assumed that all associated network upgrades, as listed in the Phase 1 study, are complete prior to this New Service Request Project being placed in service.
- AG1-513 Battery Storage to be completed before starting the AH1-563 Aurora Battery Storage.

7. REVENUE METERING REQUIREMENTS

All revenue metering needed for this interconnection project must meet the metering requirements stated in Appendix 2, section 8 of the AH1-563 GIA, and in PJM Manuals M01 and M14D. The details of applicable revenue metering requirements are given in the 'ComEd Interconnection Guidelines' posted on PJM website.

The revenue metering will be installed on the ComEd side of the Point of Change in Ownership, owned and maintained by ComEd.

- REVENUE METERING FOR PJM AND COMED

- The revenue meter measures the wholesale energy output (Hourly compensated net MWH and Hourly compensated net MVARH) of the Generating Facility.
- The metering equipment, including revenue meter and CT/PT shall be installed, at Project Developer's expense, at the interconnection substation on ComEd side of the Point of Change in Ownership.
- ComEd shall own, operate, maintain, inspect, and test all the metering equipment as set forth in 'Testing of Metering Equipment' section of the PJM Tariff, at the Project Developer's expense.
- **REAL-TIME METERING FOR PJM**
 - The Project Developer shall install, own, operate, maintain, inspect, and test real-time metering equipment to measure and transmit directly to PJM the real time MW, MVAR, voltage and status of electrical equipment such as circuit breakers and Motor Operated Disconnect switches, in conformance with the requirements listed in PJM Manuals M-01 and M-14D, at the Project Developer's expense.
- **RETAIL METERING FOR COMED**
 - The AMI Meter measures the energy consumption by the Project Developer at transmission level and hence shall be designed to measure low MW flow.
 - The metering equipment including AMI Meter and CT/PT shall be installed at the interconnection substation on ComEd side of the POI, at the Project Developer's expense.
 - ComEd shall own, operate, maintain, inspect, and test all the metering equipment as set forth in the 'ComEd Interconnection Guidelines'.
- **BATTERY CHARGE METER FOR COMED**
 - FERC Order 841 designates inflow to charge battery storage facility as wholesale power. To separately measure the power inflow to charge the battery and bill it at wholesale rate, the Project Developer needs to install the following equipment.
 - Battery Charge Meter including Current Transformer/Potential Transformer (CT/PT) at the output terminal of the battery storage facility to measure power inflow from transmission system to charge the battery storage facility.
 - Fiber cable to provide communication link to transmit Battery Charge Meter data to the ComEd SCADA system.

8. LAND REQUIREMENTS FOR INTERCONNECTION SUBSTATION

Land requirements for the Interconnection Substation needed for this interconnection project must meet the requirements in the 'ComEd Interconnection Guidelines' posted on PJM website.

Upon completion of the construction and installation of the interconnection substation, the tie-line, access road, stormwater detention facility and related improvements and facilities, and the satisfactory completion of testing of the interconnection substation acceptable to ComEd, the Project Developer shall transfer all the Property Rights and Permits to ComEd, at no cost or expense to ComEd, pursuant to documentation that is acceptable to ComEd, including (without limitation) the Property Transfer Documents in fee simple.

All real property conveyed in fee to ComEd must be remediated to and all real property to which real property rights are transferred to ComEd (as determined in ComEd's discretion) must be remediated to IEPA's Tiered Approach to Corrective Action Objectives (TACO) Tier 1 residential remediation standards.

Pursuant to PJM's site control requirements, the Project Developer is responsible for the acquisition of any land rights required for construction of a new substation. As such, the estimated total cost and schedule contemplated by this Facilities Study Report does not include the estimated cost and time necessary for the acquisition of any such land rights.

9. APPLICABLE TECHNICAL REQUIREMENTS AND STANDARDS

- ComEd Interconnection Guidelines (For Generators at Transmission Level), Rev. 2, Dated 12/16/2021
- ComEd Guidelines on Land Requirements for Interconnection Substations, Rev. 2, Dated January 2026

10. ENVIRONMENTAL AND PERMITTING

- ComEd will be responsible to obtain all environmental approvals and permitting required. This includes any endangered species studies and monitoring, as required. Costs associated with this permitting are at the expense of the Project Developer.
- The Project Developer will be responsible for site restoration required for substation and transmission upgrades. This includes, but is not limited to road restoration/improvements, wetland restoration, and farm field restoration/crop damage. Costs associated with this are at the expense of the Project Developer.
- The Project Developer will be responsible for the cost to purchase real estate or obtain the necessary right-of-way easement for all upgrades associated with this project. These associated upgrades are not included in the costs listed in this study.
- The Project Developer will be responsible for remediation costs for locations found to have environmental contaminations and remediation. This may require contaminated soil disposal as well as lead paint removal for existing structure work.
- It is assumed that all necessary permits will be obtained in a timely manner to allow engineering and construction to proceed according to the Milestone Schedule.
- It is assumed that conveyance of property and rights will be obtained to support the PJM Transmission Outage Schedule.
- It is assumed that the required Environmental Study will yield no impediments to the development of the site.
- ComEd will complete geotechnical soil borings, resistivity study, and analysis for substation and transmission upgrades. Costs associated with this are at the expense of the Project Developer.

C. APPENDICES

Attachment #1: Single line Diagram for the Physical Interconnection

