Facilities Study Report

For

Physical Interconnection of

PJM Generation Interconnection Request

Project ID AG1-374

“Blue Mound 345 kV”

Revision 2: December 2024

Introduction

This Facilities Study has been prepared in accordance with the PJM Open Access Transmission Tariff Part VII. The Transmission Owner (TO) is ComEd.

A. Transmission Owner Facilities Study Summary

1. PROJECT DESCRIPTION

The Project Developer has proposed a solar Generating Facility located in, McLean County, Illinois with a designated PJM Project ID of AG1-374. The installed facilities will have a total Maximum Facility Output (MFO) of 300 MW with 180 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 178 Blue Mound 345 kV substation.

The proposed generation interconnection is shown on the planning sketch 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 345 kV interconnection 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:

- Main Power Transformer(s) (MPT), Generation step-up (GSU) transformer(s) or final transformation, as applicable.
- Circuit breakers and associated equipment located between the high side of the MPT(s) or GSU(s) and the Point of Change in Ownership.
- Generator lead line from the Generating Facility to the Point of Change in Ownership
- Relay and protective equipment, telecommunications equipment, and Supervisory Control and Data Acquisition (SCADA) to comply with the TO's Applicable Technical Requirements and Standards.
- Two physically diverse 48 count single mode fiber to run the length of new 345kV L98903. Fibers will be owned and maintained by the project developer, and the demarcation of ownership will be in an FDP within TSS 178 Blue Mound control building.

B. Transmission Owner Facilities Study Results

The following is a description of the planned Transmission Owner facilities for the physical interconnection of the proposed AG1-374 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 345 kV dead-end structure and foundation within 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.
- A 345 kV line motor operated disconnect (MOD), and a set of revenue-metering.
- Two physically diverse 48 count single mode fiber to run the length of new 345kV L98903. Fibers will be owned and maintained by the project developer, and the demarcation of ownership will be in an FDP within TSS 178 Blue Mound control building.
- New 345kV L98903 will be routed into the new interconnection substation. Project Developer to provide limiting Transmission Facility ratings for their portion of 345KV L98903, in accordance with NERC FAC-008, FERC Order 881 and PJM Operational requirements for normal and emergency ratings from -55F to 130F in 5F increments.

2. STAND ALONE NETWORK UPGRADES

This section is not applicable.

3. NETWORK UPGRADES

The L9515 345 kV line will be cut and rerouted to a different area of TSS 178 Blue Mound.

- ComEd will be performing the design, procurement, and construction of the new structures required to reroute L9515.
- The new conductor type will be 2-1277.2 kcmil ACAR (54/7) Bundled. The new shield wire will be 7#6 Alumoweld.
- Approximately 0.17 new circuit miles of conductor and shield wire will be installed.
- The following structure replacements and installations are required for the 345kV L9515 cutover work.

Structure #	Existing Structure Type	Comments

298D	LS1204	Remove Structure
NEW 298D, NEW 298E	N/A	Install new single-circuit 90-degree heavy angle dead end steel pole structures, similar to EM10496.3

TSS 178 Blue Mound Upgrade

- The existing substation, TSS 178 Blue Mound 345 kV, will be expanded south approx. 50 feet and upgraded to interconnect the project with the ComEd transmission system.
- Install new 345 kV 2.0-cycle IPO circuit breaker with a minimum nameplate capability of 3282/3534/4224/5046 A (1961/2112/2524/3015 MVA) SN/SLTE/SSTE/SLD continuous, and interrupting capability of 63 kA at -40°F. Circuit Breaker to be equipped with a motor operated disconnect switch (MOD) on both sides of the breaker. All equipment associated with the breaker terminations should meet or exceed the thermal capability of the breaker including CB disconnects, leads, CTs, metering, relays, etc. Nameplates to reflect actual maximum capability of equipment (NOT minimum requirements specified). This new circuit breaker will be BT 1-4 CB and create a new line position.
- Install 345 kV motor operated disconnect (MOD) having a minimum thermal capability of 3282/3534/4224/5046 A (1961/2112/2524/3015 MVA) SN/SE/SLD for 345 kV L98903.
- Upgrade 2-1113 KCMIL ACSR jumpers with 2-1590 ACSR.
- Install SEL-451 for breaker failure relaying for new BT1-4.
- Upgrade BT1-2 and 4-3 breaker failure relaying to SEL-451.
- Install one SEL-351A per BT to perform second reclose mode.
- Install SEL-411L/311L scheme for the protection of new 345 kV L98903.
- Install 3-phase 3000:1 CCVTs for the new bus.
- Install SEL-3350 RTAC.
- Install RST-2228 additional Aux Switch B to create dual switch architecture for new IP relays.
- Install additional SEL-3350 RTAC for Project Developer data. Install one pair of serial fiber connections for each data exchange/Project Developer RTU.
- Connect ComEd-owned revenue meter to IP architecture.

TSS 95 Chestnut

- Relay settings review and necessary modifications

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 24 months to construct, from the time the Generation Interconnection Agreement is fully executed. This schedule 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	10
Permitting	10	11
Construction	12	24

6. ASSUMPTIONS IN DEVELOPING SCOPE/COST/SCHEDULE

- 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.
- Costs are based on 2024 rates and do not reflect a potential increase in Labor or Material costs after 2024.
- ComEd cost estimate is valid for six (6) months after Facilities Study release by PJM.
- Foundation design assumes typical soil conditions at locations and will be subject to change after soil boring tests.
- 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 any additional right-of-way and/or easement work required will be at the Project Developer's expense.

- 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 Facility Study.
- It is assumed that all associated network upgrades, as listed in the Phase 1 study, are complete prior to this queue being placed in service.

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 AG1-374 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'.

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.

- The site should be expanded 50’ x 457’ to the South.
- The site should be accessible from at least two sides to bring in future transmission lines. This means that there should be no river, another transmission line, hills, forest, or wetland on at least two sides of the site.
- There should be no legal agreements or other impediment to interconnect additional generator lead lines to this site from other generators in the future.
- The site should not encroach into ComEd transmission or distribution corridors.
- If the Project Developer owns the land surrounding the substation site, the Project Developer must provide open easement to ComEd to bring in future transmission lines into the substation.
- The Project Developer is responsible to build an access road meeting ComEd requirements to the substation site from the nearest public road.
- The Project Developer is responsible to acquire land to install tie-lines integrating the substation with the ComEd transmission system.
- The Project Developer is responsible to acquire land for the stormwater detention facility meeting all applicable ComEd Environmental requirements and all applicable municipal, county, and state requirements for stormwater management.

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.

9. ENVIRONMENTAL AND PERMITING

- 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 D
- eveloper 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

Attachment #2: Substation General Arrangement

Attachment #3: L9515 P&P