Facilities Study Report

For

Physical Interconnection of

PJM Generation Interconnection Request Project ID AG2-660, AH1-044, AH1-150 & AH1-151

"Nelson-Electric Junction 345 kV"

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." Make sure this added in the FSR under introduction section

A. Transmission Owner Facilities Study Summary

1. PROJECT DESCRIPTION

The Project Developer (PD) has proposed a solar/storage upgrade to a planned/existing solar Generating Facility located in Lee County, Illinois with designated PJM Project ID's of AG2-660, AH1-044, AH1-150 & AH1-151.

This project is an increase to the developer's AF2-041/AF2-199/AF2-200 projects, and will share the same Point of Change in Ownership.

The AG2-660, AH1-044, AH1-150 & AH1-151 projects are a 600 MW uprate (380 MW Capacity uprate) to the previous project. The total installed facilities will have a capability of 1200 MW with 740 MW of this output being recognized by PJM as Capacity.

Project ID	MW Energy (MW)	Capacity Interconnection Rights (MW)
AG2-660	0	20
AH1-044	200	120
AH1-150	200	120
AH1-151	200	120
Total	**600**	**380**

2. POINT OF INTERCONNECTION (POI)

This project is an increase to the developer's AF2-041/AF2-199/AF2-200/AG2-660/AH1-044/ AH1-150 project(s), which will share the same Point of Interconnection into the TSS 934 Herman Rd. 345kV substation.

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

3. POINT OF CHANGE IN OWNERSHIP

The Point in Change of Ownership will be located at the first dead-end structure inside the TSS 934 Herman Rd. 345kV 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:

- Circuit breakers and associated equipment are located between the high side of the MPT(s) and the Point of Change in Ownership.
- 345kV L93401 circuit breaker.
    - GIC to incorporate new IPP owned CB into existing two terminal 345kV L93401 tie line relaying. Both entities to issue new tie line relay settings as needed.
    - Confirm the location of the Relays for the new 345kV breaker is in the same building as existing System 1 and System 2 Fibers for L93401.
    - New Gas Circuit breaker control for loss of SF6 gas condition should be as follows (see Engineering practice EP-5206-E):
        1. For an open circuit breaker, when SF6 gas drops to the critical level, the close circuit of breaker shall be opened, and the 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 should be opened, and motor operated disconnects on both sides of CB should be opened.
- Support steel structures and foundations will be designed to support associated electrical equipment.

In general, GIC to follow section 6.2 (Design F) of the latest version of ComEd Interconnection Guidelines for Generators at Transmission Level (Rev 2: Effective 12/16/2021).

1. New gas circuit breakers to auto trip and isolate for critical gas level.

2. New Tie Line terminal relay types to be the same as ComEd terminal relays. This includes relay firmware versions.
3. ComEd Protection and Control Engineering must review all Project Developer relay protection design drawings and relay settings.
4. Project 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.
5. Project 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.
6. Dual bus protection for secondary buses.
7. Dual TRFM protection and site protection must be compliant with NERC & PJM requirements.
8. Metering is required to be installed per ComEd & PJM standards.
9. SCADA interface to ComEd will be required.
10. Witness testing by ComEd or a DA will be required and must be pre-scheduled at least 90 days in advance.

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:

1. Connected CTs (where available)
2. PT secondary (where available)
3. DC control circuits
4. Auxiliary trip relays
5. Circuit breaker trip coils (where available)
6. Communication circuitry.

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.

- Two 345kV lines leaving TSS934 (including remote terminals: TSS155 and TSS111)

B. Transmission Owner Facilities Study Results

1. TRANSMISSION OWNER INTERCONNECTION FACILITIES:

N/A.

2. STAND ALONE NETWORK UPGRADES

N/A.

3. NETWORK UPGRADES

- Install one pair of serial fiber connections for each Project Developer RTU data exchange to be coordinated with ComEd SCADA Engineering:
    - Breaker statuses.
    - MW, MVAR, MWh and voltage values.

4. OTHER SCOPE OF WORK

N/A.

5. MILESTONE SCHEDULE FOR COMPLETION OF COMED WORK

Facilities outlined in this report are estimated to take 12 months to be constructed, 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	6
Construction	6	12

6. ASSUMPTIONS IN DEVELOPING SCOPE/COST/SCHEDULE

- This study is based on the PJM AG2-660, AH1-044, AH1-150 & AH1-151 Phase I Study Reports.
- 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.
- This cost estimates assume that work will be performed during normal weekdays and with no overtime.

- All upgrades to facilities included in this document will be required to meet latest ComEd standards.
- Costs are based on 2026 rates and do not reflect a potential increase in Labor or Material costs after 2026.
- Upgrades are subject to change based on detailed design development.
- It is assumed that ComEd facilities included in this document will not require a sound study or flood mitigation.
- The Project Developer has agreed to pay for the work necessary in preparing a cost estimate, impact study review, and review of relay requirements.
- This 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.
- ComEd cost estimate is valid for six (6) months after the Facilities Study release by PJM.
- Transmission line outages for construction have not been identified but generally are available from September to May. These outages are controlled by PJM.
- 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.

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 AG2-660, AH1-044, AH1-150 & AH1-151 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.

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

No additional easements, access rights, or temporary or permanent real property rights or acquisitions were identified as required for network upgrades to the ComEd system or for the project

to interconnect at this location within this study. However, as further needs are assessed in detailed engineering, design and/or construction activities, if it is determined that there is a need for easements, access rights, or temporary or permanent real property rights or acquisitions, the developer is fully responsible for the costs to acquire these required land rights. Also, as necessary, the schedule will be adjusted accordingly to account for the necessary time to obtain these required land rights. All easements, access rights, or temporary or permanent real property rights or acquisitions shall comply with all ComEd requirements as detailed in "ComEd Interconnection Guidelines" and "Guidelines on Land Requirements for Interconnection Substation" posted on the PJM website.

9. ENVIRONMENTAL AND PERMITING

- Project Developer will be responsible for 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.
- 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.
- Project Developer will be responsible for remediation costs for locations found to have environmental contamination 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.

SYSTEM ONE LINE DIAGRAM

