

Facilities Study Report

For

Physical Interconnection of

PJM Generation Interconnection Request

Project ID AF2-225

McLean 345kV

August 2025

Introduction

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

Revision History:

Version	Date	Description of Changes
1.0	December 2024	Initial Issue
2.0	August 2025	Administrative updates

A. Transmission Owner Facilities Study Summary

1. PROJECT DESCRIPTION

The Project Developer (PD) has proposed a solar Generating Facility located in, McLean County, IL with a designated PJM Project ID of AF2-225. The installed facilities will have a total Maximum Facility Output (MFO) of 150 MW with 63 MW of this output being recognized by PJM as Capacity.

2. POINT OF INTERCONNECTION (POI)

The Generating Facility will interconnect with the Commonwealth Edison transmission system via a direct connection into the TSS 92 McLean 345kV substation.

This project will share interconnection facilities and the Point of Change in Ownership with Z2-087 and AE2-223. The combined output of the Generating Facilities at the Point of Interconnection is 500MW.

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 TSS 92 McLean 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:

- 4.1. The PD is responsible for construction of additional 150MW of solar generation. The PD is also responsible for two (2) 345kV circuit breakers and one (1) generator step-up transformer (GSU), and associated disconnects.
- 4.2. At AF2-225 Bright Stalk Solar Park, in general, Project Developer relaying, etc. to follow section 6.1 (Design F) of latest version of ComEd interconnections guidelines (for Generators at Transmission Level) Rev2 Effective date 12/16/21, with the following project specific notes (where applicable):
 - Install Revenue Metering Equipment at the output terminal of AE2-225 generation facility including revenue meter and CT/PT.

- Install fiber optic cable link to provide comm link to transmit revenue meter data to the ComEd SCADA system.
 - New 345kV gas circuit breakers to auto trip and isolate for critical gas level
 - New 345kV 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 Project Developer relay protection design drawings and relay settings.
 - Project Developer equipment impedance and/or test data must be provided to ComEd Protection and Control Engineering to model in a short circuit program.
 - Project Developer to include over/under frequency and voltage protection at 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 Designated Authority will be required and must be pre-scheduled at least 90 days in advance.
- 4.3. Project Developer to provide transformer test reports for 345kV - 34.5kV step up transformers, for ComEd short circuit modeling. Test reports must include %Z impedance and load loss.
- 4.4. 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
- 4.5 The PD will be responsible to purchase real estate or obtain the necessary right-of-way easement to install the 345kV transmission line to TSS 92 McLean substation.
- 4.6 New Gas Circuit breaker control for loss of SF6 gas condition should be as follows (see Engineering practice EP-5206E and relay specifications):
- For an open SF6 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.
- 4.7 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 the fault current for an existing BES bus. Settings changes may be required per the outcome of this coordination study.

4.8 The PD is to provide two, physically diverse, Single Mode Fiber paths between TSS 92 McLean Interconnection Substation and Bright Stalk Solar Park.

4.9 The PD will be responsible to request and bear the cost of any outages required on existing transmission or distribution lines that may be required for the transport of any large equipment, i.e. turbines, rotors, turbine structures, etc.

4.10 The PD is responsible for the upgrade of relay protection at Bright Stalk Wind. At the PD station the protection design must be revised to account for the new topology and relay settings are to be modified as needed.

B. Transmission Owner Facilities Study Results

1. PROJECT DESCRIPTION

Not Applicable

2. STAND ALONE NETWORK UPGRADES

Not Applicable

3. NETWORK UPGRADES

The Network Upgrades will include, but not be limited to, the following.

Relay Upgrades

- 1) At TSS 92 McLean, modify the existing L.94805 411L/311L settings as needed.

4. OTHER SCOPE OF WORK

Design, procurement and construction to upgrade the Point of Interconnection metering CT/PTs within ComEd's TSS 92 McLean. Existing CT/PT's will need to be replaced to accommodate the new generation.

Metering to be provided for revenue and AMI purposes.

Upgrade ComEd SCADA system to integrate revenue meter installed at the output terminal of generation facility for AF2-225 and to communicate wholesale energy output (Hourly compensated net MWH and Hourly compensated net MVARH).

5. MILESTONE SCHEDULE FOR COMPLETION OF [TO] WORK

Facilities outlined in this report are estimated to take 36 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	6
Permitting	6	12
Construction	24	36

6. ASSUMPTIONS IN DEVELOPING SCOPE/COST/SCHEDULE

- 6.1 This study is based on the System Impact Study Report for PJM Generation Interconnection New Service Request Project AF2-225 McLean 345kV. The steady-state voltage study for stability analysis will be performed by PJM during the Facility Phase. The PJM study could identify upgrades to the ComEd system that would become part of this project's scope of work. It is assumed that all associated network upgrades, as listed in the above System Impact study, are complete prior to this New Service Request Project being placed in service.
- 6.2 The schedule is based on GIA contract being executed by all parties and the deposit received.
- 6.3 ComEd cost estimates assume that work will be performed during normal weekdays and with no overtime.
- 6.4 Transmission line outages for the tap construction have not been identified, but generally are available in spring (March to May) and fall (September to November). These outages are controlled by PJM.
- 6.5 The PD will be responsible to request and bearing the cost for relocation of existing transmission or distribution lines (including structures) that may be required for transmission line crossings, the transport of any large equipment, such as cranes, etc. The backfeed date identified in earlier sections is not yet approved. Formal submittal of this request to ComEd's TSO for ultimate review by PJM can be made 7 months prior to the back feed request date.
- 6.6 All upgrades to facilities included in this document will be required to meet the latest ComEd standards.
- 6.7 Upgrades are subject to change based on detailed design development
- 6.8 Costs are based on 2024 rates and do not reflect a potential increase in Labor or Material costs.
- 6.9 Project Developer to upload as-built drawings to ComEd drawing system (Meridian).
- 6.10 Single fiber routing has not been included in this study.
- 6.11 ComEd cost estimate is valid for six (6) months after Facilities Study release by PJM.
- 6.12 This study assumes that there will be no additional right-of-way and/or easement work required.
- 6.13 This Facilities Study is time-dependent. If the project is not into construction within one year of the issuance, the FS will be void and the project re-studied, requiring the completion of a new FS.

- 6.14 Both (1) all real property conveyed in fee to ComEd must be remediated to and (2) 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.
- 6.15 This facilities study report (FSR) assumes that generator output and plant auxiliary power consumption can both be metered with revenue accuracy as described. The final revenue metering configuration and equipment will be confirmed, and may be revised, during detailed engineering following execution of the Generator Interconnection Agreement (GIA).

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 AF2-225 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.

7.1 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 PD's expense, at the interconnection substation on ComEd side of the Point of Interconnection.

ComEd shall own, operate, maintain, inspect, and test all the metering equipment as set forth in 'Testing of Metering Equipment' section of this Interconnection Service Agreement, at the PD's expense.

7.2 REAL-TIME METERING FOR PJM:

The PD 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 Disconnects, in conformance with the requirements listed in PJM Manuals M-01 and M-14D.

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 "Land requirements for Interconnection Substations".

9. ENVIRONMENTAL AND PERMITTING

No environmental concerns and/or permitting requirements were identified as needed by this study. However, should detailed engineering and design and/or construction activities identify the need for an environmental study and/or permit requirements, the developer is fully responsible for the costs related to any environmental study, any actions to address the identified environmental impacts and the permits. Also, the schedule will be adjusted accordingly to account for the

necessary time to perform the environmental study, address the identified environmental impacts and to obtain the permits, if applicable. All environmental studies, actions to address environmental impacts and permit actions shall comply with all ComEd requirements as detailed in "ComEd Environmental Requirements for Third Party Developers", and with all local, city, county, state, and federal requirements.

C. APPENDICES

- 1) Attachment #1: One Line Diagram

Attachment #1:



