Facilities Study Report

For

Physical Interconnection of

PJM Generation Interconnection Request

Project ID AF2-041, AF2-199, & AF2-200

NELSON-ELECTRIC JUNCTION 345 KV

Revision 1: December 2024

Revision 2: July 2025

Revision History

- Rev. 1 – Initial version
- Rev. 21 – Updated *Scope of Project Developer Interconnection Facilities* section and *Attachment #1 - Single Line Diagram* to show addition of fifth breaker on generator lead line

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.

A. Transmission Owner Facilities Study Summary

1. PROJECT DESCRIPTION

The Project Developer has proposed a Solar Generating Facility located in Lee County, Illinois with a designated PJM Project ID of AF2-041, AF2-199 and AF2-200. The installed facilities will have a total Maximum Facility Output (MFO) of 600 MW with 360 MW of this output being recognized by PJM as Capacity.

Project ID	MW Energy (MW)	Capacity Interconnection Rights (MW)
AF2-041	300	180
AF2-199	100	60
AF2-200	200	120
Total	**600**	**360**

2. POINT OF INTERCONNECTION (POI)

The Generating Facility will interconnect with the ComEd transmission system via a newly constructed 345kV breaker and a half substation, TSS 934 Herman Road, tapping the TSS 155 Nelson – TSS 111 Electric Junction 345kV line, L.15502, approximately 32.5 miles from TSS 155 Nelson and 40.6 miles from TSS 111 Electric Junction.

The construction of the new interconnection substation will result in the splitting of the existing TSS 55 Nelson – TSS111 Electric Junction 345kV, L.15502 into two lines on the transmission system. The new L.93407 will connect TSS 934 Herman Rd to TSS 111 Electric Junction and L.15502 will connect TSS 934 Herman Rd to TSS 155 Nelson.

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 934 Herman Rd 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:

- Two (2) 3-Phase Main Power Transformers (MPT #1 & 2)- 105/140/175 MVA (OA/FA/FA). 345kV Y- grounded, 34.5kV Y-grounded with a 13.8kV Delta tertiary. The Z% = 8.5% on a 105 MVA base with X/R=47.2 (High side to low side).
- One (1) 3-Phase Main Power Transformer MPT#3- 69/92/115 MVA (OA/FA/FA). 345kV Y-grounded, 34.5kV Y-grounded with a 13.8kV Delta tertiary. The Z% = 8.0% on a 89 MVA base with X/R=44.3 (High side to low side).
- One (1) 3-Phase Main Power Transformer MPT#4- 132/176/220 MVA (OA/FA/FA). 345kV Y-grounded, 34.5kV Y-grounded with a 13.8kV Delta tertiary. The Z% = 8.0% on a 132 MVA base with X/R=44.3 (High side to low side).
- Five (5) 345KV circuit breakers
- Five (5) 345kV disconnect switches
- One (1) 345kV generator lead line, 345kV L.93401, from the Project Developer Facility to the Point of Change in Ownership
- Relaying at Project Developer facility to send a Transfer Trip to TSS 934 Herman Rd for 345kV CB Breaker Failure. Ability to isolate 87L and DTT functions is required. Example scheme/settings can be provided by ComEd.
- Install three (3) 3000:1 CCVTs on 345kV side of each power transformers to be used for System 1 and System 2 relay protection.
- For new dead tank 345kV gas circuit breaker, install CB motor operated disconnects on both sides. All new 345kV current transformers are to be rated 3000 overall ratio with at least 1.5 RF for a minimum 3000A continuous thermal rating. New dead tank breakers to have 2 sets of 3000:5 overall ratio bushing CTs on each side. CTs to be multi-ratio with standard taps and C800 class. All new CBs will have CB monitoring and Breaker Failure scheme. 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 circuit breaker, when SF6 gas drops to the critical level, the close circuit of breaker shall be opened and line and both CB motor operated disconnects 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 both CB motor operated disconnects shall be opened.
- Project Developer to provide transformer test reports for 345-kV-34.5kV step up transformers. Test reports must include %Z impedance and load loss, including type of inverters used for ComEd short circuit modeling.
- 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.

- In general, Project Developer relaying, etc. to follow per section 6.1 (Design F) of latest version of ComEd Interconnection Guidelines (For Generators at Transmission Level) Rev 2: Effective 12/16/21, with the following project specific notes:
    - 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 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. 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, which will most likely require a 3rd party TelCo or wireless connection (to be determined by UCOMM during detailed Engineering phase)
    - Witness testing by ComEd or a Distribution Automation will be required and must be pre-scheduled at least 90 days in advance.
    - Project Developer to provide final lead length of 345kV L.93401, electrical characteristics, construction configuration, size of conductors, and impedance characteristics.
    - Project Developer shall provide shunt reactive compensation as required by the PJM Interconnection studies.
- Power output from the Project Developer site shall be in accordance with the power quality standards contained in the IEEE Standard 519. The generating units and all associated equipment at the Project Developer site shall not introduce any distortion of ComEd's waveform or telephone or carrier interference that is inconsistent or conflicts with such standard.
- Relay and protective equipment, telecommunications equipment, and Supervisory Control and Data Acquisition (SCADA) to comply with the ComEd's Applicable Technical Requirements and Standards. 345KV L.93401 will require two Single Mode Fiber paths from TSS 934 Herman Rd to the developer substation control building (Steward Creek Solar), approximately .96 miles. One fiber path will be dedicated for System 1 Relay/schemes, and the other will be dedicated for System 2 Relays/schemes. These Fiber paths will need to be physically diverse from each other, and each should contain a minimum of 48 Single Mode Fibers. Both of these Fiber cables will be owned and maintained by the Project Developer, and the demarcation of ownership will be in an FDP within the TSS 934 Herman Rd control building.

  For 345kV line L93401, install System 1 87L-1/SEL-411L-1 and a System 2 87L-2/SEL-411L-

1 current differential scheme. Utilize full 3000:5 CT ratio for both systems of line relaying. Two separate Single Mode Fiber paths will be required between TSS934 Herman and the AF2-041 substation building. One fiber path will be dedicated for System 1 Relay/schemes, and the other will be dedicated for System 2 Relays/schemes. These Fiber paths will need to be physically diverse from each other, and each should contain a minimum of 48 Single Mode Fibers. Both of these Fiber cables will be owned and maintained by the Project Developer, and the demarcation of ownership will be in an FDP within the TSS934 Herman control building. In addition, install load rejection logic such that transfer trip is initiated on both System 1 and System 2 relaying to Project Developer site if both BT 1-3 and BT2-3 at TSS934 are opened (referred to GDD 4003 for load rejection design).

- 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 AF2-041, AF2-199, and AF2-200 projects 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:

The ComEd Interconnection Facilities will include, but not be limited to, the following:

- A 345kV 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.
- One (1) Motor Operated Disconnect (MOD) switch. Disconnect switch shall have a minimum nameplate capability of 3282/3534/4224/5046 A (1961/2112/2524/3015 MVA) SN/SLTE/SSTE/SLD continuous.
- Three (3) metering CTs, three metering PTs, or a combination unit, meters, and associated equipment to meter L.93401.
    - Install equipment necessary to provide bi-directional revenue metering (kWH, kVARH) and real time data (kW, kVAR, and circuit breaker status and 345kV voltage) for 345kV L.93401, on the ComEd side of the POI per ComEd applicable standards.
- Three (3) surge arrestors

- Foundations and structures

2. STAND ALONE NETWORK UPGRADES

TSS 934 Herman Rd Interconnection Substation

A new breaker and a half substation, TSS 934 Herman Rd 345kV, will be constructed along the planned L.15502 345kV transmission line to interconnect the project with the ComEd transmission system.

- Two (2) 345kV transmission line dead-end structures with testing to check proper phase and identification is correct.
- Six (6) 345kV station class surge arrestors.
- Three (3) 345kV IPO circuit breakers with a minimum nameplate capability 3282/3534/4224/5046 A (1961/2112/2524/3015MVA) SN/SLTE/SSTE/SLD continuous, and interrupting capability of 63kA 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 termination 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).
- Eight (8) 345kV motor operated breaker disconnect switches: one (1) on each side of the 345kV circuit breakers and one (1) for each 345kV transmission line (L.15502, L.93407). These disconnect switches shall have the same minimum thermal capability as the circuit breakers above.
- Nine (9) 345kV CCVT's, 3000:1, without carrier accessories used for System 1 and System 2 relay protection (3 CCVT's for each 345kV Bus).
- Foundations and structures for all new equipment.
- A 345kV control building to ComEd specifications to accommodate System 1 and System 2 batteries, battery chargers, AC/DC panels, protective relaying, communication, SCADA, metering equipment, etc. 125 VDC battery system, DC distribution panels, System 1 and System 2 relay panels, marshalling cabinet, aux AC power panels, building HVAC system, fire/security system, and battery monitoring. Building shall be masonry or precast.
- All 345kV circuit breakers are required to have a SEL-2411 relay pre-installed inside of the breaker control cabinet for monitoring. Multimode fiber from the yard to the control building is required.
- The substation relaying will employ IEC 61850 "Generation 2" design using GOOSE tripping (all ComEd schemes) but no Sample Values schemes. During detailed engineering, consult Relay Engineer for latest standards, and reference prior project work.
- Install new ICON node (RR South Ring) for L15502 and L93407 System 2 relaying to provide nx64 channels.
- For all new outdoor 345kV GCBs, for SCADA controls and 50BF/79/25 functions, use SEL-451 relays for S1 and SEL-401 or a SEL-451 for S2. Hardwire Bus pots to SEL-451 for synch closing and to SEL401/451 for Bus pot monitoring. Both relays will be in a relay cabinet to be located near the breaker with MB connection between relays and wired to trip and close the CB, reference prior project work. The relays can also be located inside the control building

depending on the station layout.

- SF6 critical will automatically trip the CB and open MODs on either side of the CB.
- Install a control cabinet in the yard located adjacent to the line MODs. Cabinet to contain SEL-2411 relay for Remote Trip, Close, “89a”, “89af”, “89b”, & “89bf’ statuses to be sent to SCADA. Include local FDP in the cabinet with redundant single mode fibers.
- Fiber, All Network devices to be installed with provisions for the future devices.
    - Only Station Bus Fiber to be used.
    - All Station Bus fiber will be run in Panduit covered fiber through and will be OM3 50mm MM Fiber, 12 count jumper.
    - Jumpers will be spliced in a Main FDP Cabinet. One Main FDP for each A & B Network. Main FDP will have LC Connected jumpers to the SDN Switches.
    - Remote end of OM3 fiber jumpers will be spliced into a Corning DIN Rail Mount FDP.
    - Local LC Connectors will be used to go between the Local A or Local B FDP to the S1 and S2 5A & 5B ports respectively.

SCADA network will be based on 61850 design.

- Install BSC/IT UCOMM router and firewall
- One SCADA cabinet:
    - Three SEL-3555 RTACs for RTU, SysLog/SEL protocol concentrator, and Synchrophaser data concentrator.
    - Two SEL-3555 as redundant HMI, with each tied to its own mouse, keyboard, and monitor on the operator desk. The DPAC RTAC will have a large wall mounted monitor in an area where people can gather.
    - One SEL-2730M Ethernet switch as SCADA Master Switch.
    - One Omicron RBX1 Station Scout
    - One SEL-3350 RTAC for Project Developer data. Install one pair of serial fiber connections for each Project Developer RTU data exchange.
    - SEL-2440 DPACs for all local alarms include failure contacts for RTAC’s & Switches
    - 43 Cut out switch mapped to a DPAC.
    - TCE access ports to set up on-site.

- Two Station Bus network cabinets (A and B):
    - One master SEL-2741 switch
    - Install SEL2741 as needed to accommodate all protective relaying
    - One SEL-2440 DPAC
    - Install Network A & Network B PTP Clocks. SEL2488 PTP Clocks.
    - One SEL-3350 Blueframe Flow Controller
    - One Ruggedcom RST2228 Ethernet Switch
    - One Ruggedcom RSG910C Switch with two 1000BASE-SX SFPs

- Connect metering group-provided revenue meter to station IP architecture.
- Install normal and emergency sources to provide three -phase 208/120 VAC auxiliary power

through local service request process. The normal and emergency sources shall be supplied from diverse 12kV or 34kV sources and approved by local utilities planning group.

- Add substation lightning protection system.
- For any new equipment connected to the Bulk Electric System, rated at 100kV or above, ComEd requires the associated System 1 and System 2 protective schemes to have a minimum redundancy; connected CTs, PTs, DC control circuits, auxiliary trip relays, circuit breaker trip coils, and communication circuitry.
- Dedicated site drainage pond shall be provided for the new TSS 934 Herman Rd substation in addition to the substation footprint and to be exclusively used by ComEd.
- Drainage pond property and storm water piping system shall be conveyed to ComEd.
- The Project Developer will be responsible for the cost of security system design and installation. Substation security level and requirements shall be assigned/determined by Exelon Security Operations. All fencing and security design shall be coordinated with and approved by Exelon Security team
- All relaying is to be in accordance with PJM Protection Standards.
- All new or upgraded facilities are to be in accordance with the PJM Transmission 7 Substation Design Subcommittee Technical Requirements.
- It is the responsibility of the Project Developer to obtain any permitting required for this project. See environmental section for details.
- Bus, insulators, supports, and equipment leads shall follow ComEd standards.
- Witness testing by ComEd is required.

3. NETWORK UPGRADES

- Transmission Line Tie-in for new interconnection substation:

The Nelson-Electric Junction 345kV line will be cut and looped into the new interconnection substation. The new conductor type will be 2-1033.5 kcmil “Curlew” ACSS/TW and the new shield wire type will be 7#6 Alumoweld. Approximately 0.215 circuit miles of conductor and shield wire will be installed to facilitate the cut-in.

The following structure replacements and installations are required for the cut-in to TSS 934 Herman Rd:

Structure Number	Line Number	Existing Structure Type	Comments
338	15502	LSV+0	Install new single-circuit horizontal configuration deadend steel pole
338D	15502	N/A	Install new single-circuit horizontal configuration deadend steel pole

Structure Number	Line Number	Existing Structure Type	Comments
338E, 338F	93407	N/A	Install new single-circuit horizontal configuration deadend steel pole

- Build new Fiber path (estimated ~ 4 miles) from TSS 934 Herman Road to existing Fiber to TSS 155 Nelson. Use this fiber path for L.15502 System 1 relays and L.93407 System 2 relays (Fiber MUX). Single Mode Fiber, minimum count of 48, path between TSS 934 and TSS 155 shall be physically diverse from path to TSS 111 and will be owned and maintained by ComEd.
- Build new Fiber path (estimated ~ 4 miles) from TSS 934 to existing Fiber to TSS 111 Electric Junction. Use this fiber path for L93407 System 1 relays and L.15502 System 2 relays (Fiber MUX). Single Mode Fiber, minimum count of 48, path between TSS 934 and TSS 111 shall be physically diverse from path to TSS 155 and will be to be owned and maintained by ComEd.
- TSS 111 Electric Junction
    - Relabel 345kV L15502 to L93407 (physical labels and station prints).
    - Review and reset 345kV L93407 (old L15502) relay settings.
    - Replace System 1 & 2 87L-1/SEL-411L-1 1550 nm 87L port (for long 60+ mile line) with standard 1300 nm 87L port for current differential scheme via direct fiber and fiber MUX.
    - Relay and communications equipment to change remote terminal to TSS 934 Herman Rd instead of TSS 155 Nelson.
    - Update fiber connections to run to TSS 934 Herman.
    - Retire existing JungleMux schemes and install new ICON MUX equipment for L93407 System 2 relaying to provide nx64 channels.
    - Install one (1) SEL-3350 RTAC for new relays with one (1) Master RST-2228 switch and two (2) Aux RST-2228 switches.
    - Add serial communication from RTAC
- TSS 155 Nelson
    - For 345kV line L.15502 replace System 1 & 2 87L-1/SEL-411L-1 (with 1500 nm 87 L port (for long 60+ mile line) with standard 1300 nm 87L port, for current differential scheme via direct fiber and Fiber MUX.
    - Relay and communications equipment to change remote terminal to TSS 934 Herman Rd instead of TSS 111 Electric Junction. SEL-411L-1 firmware shall match new remote terminal.
    - Retire existing JungleMux schemes and install new ICON MUX equipment for L15502 System 2 relaying to provide nx64 channels.
    - Update fiber connections to run to new TSS 934 Herman.

- Install one (1) SEL-3350 RTAC for new relays with one (1) Master RST-2228 switch and two (2) Aux RST-2228 switches.
- Add serial communication from RTAC.

- TSS 120 Lombard
  - Review and update relay settings for 345kV L11124.
- Sta 6 Byron
  - Install new ICON node to complete RR South Ring and support System 2 Relay channels for L15502 and L93407.
- TSS 144 Wayne
  - Install new ICON node to complete RR South Ring and support System 2 Relay channels for L15502 and L93407.
- TSS 937 Lee County
  - Install new ICON node to complete RR South Ring and support System 2 Relay channels for L15502 and L93407.
- TSS 113 Waterman
  - Install new ICON node to complete RR South Ring and support System 2 Relay channels for L15502 and L93407.

4. OTHER SCOPE OF WORK

- This section is not applicable.

5. MILESTONE SCHEDULE FOR COMPLETION OF [TO] WORK

Facilities outlined in this report are estimated to take 60 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	21
Permitting	21	50
Construction	50	60

6. ASSUMPTIONS IN DEVELOPING SCOPE/COST/SCHEDULE

- Additional sites that require new SEL ICON nodes could be added depending on the progress of AF1-280 (TSS 953 Renner Road), AG1-434 (TSS 967 Lee Road), and AF2-392 (TSS 911

Hoyle Road).

- Assumes completion of TSS 953 RENNER RD PJM New Service Request Project AF1-280. INSTALL 200 MW SOLAR FARM ON 345KV L15501.
- Step up transformers are in the same location/yard and share a ground grid.
- Metering equipment will be sized to account for the combined power of AF2-041, AF2-199, and AF2-200.
- ComEd estimate does not include costs of design and construction of AF2-041, AF2-199, and AF2-200 Steward Creek Solar substation, and transmission as described in Project Developer scope of work. ComEd estimated schedule is based on GIA contract being executed by all parties.
- ComEd estimate assumes that TSS 934 Herman Rd is low impact site (low security requirements). Chain linked fencing, non-motorized gate and no cameras.
- 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 2024 rates and do not reflect a potential increase in Labor or Material costs.
- Foundation design assumes typical soil conditions at locations and will be subject to change after soil boring tests.
- 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.
- It is assumed no underground conflicts exist in the area of the new substation. Survey of the property will be acquired. Project Developer will be responsible for the cost of this survey.
- All upgrades to facilities included in this document will be required to meet latest ComEd standards.
- ComEd cost estimate is valid for six (6) months after Facilities Study release by PJM.
- Upgrades are subject to change based on detailed design development.
- TSS 934 Herman Rd shall be designed for a 100 yr bfe + 3ft at minimum. A flood study should be done early on to determine if any flood mitigations are needed such as elevating foundations.
- 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.
- 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.

- This study assumes that any additional right-of-way and/or easement work required will be at the expense of the Project Developer.
- This study assumes the Project Developer will remove any trees and mitigate any wetlands present in the property that would restrict the cut-in to new TSS 934.
- Project Developer to upload as-built drawings to ComEd drawing system (Meridian).
- 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.
- This document assumes that Project Developer has designed, built, tested, and conveyed to ComEd the new TSS 934 substation (per all most recent applicable ComEd specs, standards and engineering practices) and transmission line tie-in up to the existing ComEd right of way to allow for the 345kV line energization and back feed. Design, engineering and construction shall be by ComEd-approved contractors of choice.
- It is assumed that all associated network upgrades, as listed in the System Impact study, are complete prior to this New Service Request Project being placed in service.
- 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.

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 AF2-041, AF2-199, and AF2-200 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 on the ComEd side of the Point of Change in Ownership will be installed, 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

Guidelines Applicable to New Interconnection Substation:

- For a 345kV substation bisecting one transmission line, the site should be at least 784' x 513' excluding the drainage pond. The site should be expandable to 784' x 914' without any restriction.
- 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, drainage pond 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.

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

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 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.

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

Attachment #1: Single line Diagram for the Physical Interconnection

Attachment #1