Facilities Study Report

For

Physical Interconnection of

PJM Generation Interconnection Request

Project ID AG2-166

“Newville-Nottingham Tap 1 69kV”

Business Use

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 PPL Electric Utilities Corporation (PPL EU or PPL).

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 solar Generating Facility located in Plainfield, Cumberland County, Pennsylvania with a designated PJM Project ID of AG2-166. The installed facilities will have a total Maximum Facility Output (MFO) of 10 MW with 0 MW of this output being recognized by PJM as Capacity.

2. POINT OF INTERCONNECTION (POI)

The Generating Facility will interconnect with the PPL EU transmission system via a newly constructed line tap, tapping the Newville Tap 69kV #1 line, approximately 14.5 miles from Cumberland substation and 24.5 miles from Juniata 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 where the Project Developer generator lead line conductor and insulator assembly attaches to the PPL EU termination structure, which is typically the first structure after the PPL EU motor operated switch structure.

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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 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
- For projects where PPL EU fiber is not available: PD must procure a 3rd party communication circuit for direct trip transfer relaying from the PD substation to the remote end substations.

B. Transmission Owner Facilities Study Results

The following is a description of the planned Transmission Owner facilities for the physical interconnection of the proposed AG2-166 project to PPL EU transmission system. These facilities shall be designed according to PPL EU Applicable Technical Requirements and Standards. Once built, PPL EU will own, operate, and maintain these Facilities.

1. TRANSMISSION OWNER INTERCONNECTION FACILITIES:

PPL EU will tap the existing Newville Tap 69kV #1 line near GPS coordinates 40.1883°, -77.3108° and extend the tap towards the Project Developer substation by completing the following:

- Install a single circuit, direct-embed, steel, structure with a SCADA controlled MOLBAB after the line tap stricture.
- Install a new single circuit, custom foundation, custom steel pole, full terminal deadend structure (PCO). The PCO structure must be outside of the Project Developer's Substation fenced area.
- Install 556 24/7 ACSR 3-phase conductors from the tap structure to the PCO.

2. STAND ALONE NETWORK UPGRADES

None.

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3. NETWORK UPGRADES

Transmission Line Tie-in for new interconnection:

PPL EU will complete Newville Tap 69kV #1 line modifications to tie in the new Transmission Owner Interconnection Facilities (TOIF). This includes:

- Install a new steel monopole tap structure, to tap the existing transmission line (Point of Interconnection). Installation of this tap structure and associated conductor span from the TOIF, will require an outage of the PPL EU transmission line and is NOT eligible for Option to Build.
- Replace/modify the existing structures on either side of the new tap structure.

Upgrades to Neighboring Facilities:

Cumberland Substation:

- Complete remote end relay work for Direct Transfer Trip.
- Model IC in CAPE and conduct a wide area short-circuit study two busses away from the IC facilities. Identify affected relays and revise settings as needed.
- Conduct a review of the IC relay settings and engineering package (submitted by IC to PPL EU).

Juniata Substation:

- Complete remote end relay work for Direct Transfer Trip
- Model IC in CAPE and conduct a wide area short-circuit study two busses away from the IC facilities. Identify affected relays and revise settings as needed.
- Conduct a review of the IC relay settings and engineering package (submitted by IC to PPL EU).

4. OTHER SCOPE OF WORK

Installation of fiber cable circuits:

- No fiber circuits are currently available for this project. The PD must procure a 3rd party communication circuit for Direct Transfer Trip relaying from the PD substation to the remote end substations.

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Should the Project Developer elect to proceed with Option to Build for Transmission Owner Interconnection Facilities, oversight costs will apply to account for design review, approvals, coordination, and general oversight/administrative work.

5. MILESTONE SCHEDULE FOR COMPLETION OF [TO] 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 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	18
Permitting	18	21
Construction	21	24

6. ASSUMPTIONS IN DEVELOPING SCOPE/COST/SCHEDULE

The following assumptions were made in preparing this Phase 2 Study:

- There will be no major environmental, geotechnical, real estate, or permitting issues.
- There is no cost to PPL EU for easements and real estate acquisition.
- The PD will obtain all permits and approvals necessary for PPL EU owned Transmission Owner Interconnection Facilities.
- The PD will perform all site preparation for the Transmission Owner Interconnection Facilities.
- The IC will construct a permanent access road required for PPL EU's MOLBAB (Motor Operated Load Break Air Break) Switch to PPL EU standards and specifications.
- Suitable line/equipment outages can be scheduled as required. Failure to meet a scheduled facility outage may result in project delays.
- In the event of operational, governmental, and/or environmental regulatory delays, the use of additional resources, such as overtime, premiums for expedited material, and/or contractor labor, may enable PPL EU to decrease the estimated construction period. However, no guarantees can be made.
- The GIA must be fully executed by the PD, PJM, and PPL EU, and the construction implementation meeting kick-off meeting must be held before PPL EU design and construction

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activities may commence.

- Cost estimates are based on conditions when the study is performed and are subject to change based on many factors, including but not limited to, union labor rates and commodity pricing.
- Prerequisite PJM network upgrade project b3774 is anticipated to be in service by May 1st, 2027 per current construction schedule. This project must be in service prior to the interconnection of AG2-166, and any delay in construction for this network upgrade may necessitate delays in construction for AG2-166.

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 AG2-166 GIA, and in PJM Manuals M01 and M14D. The details of applicable revenue metering requirements are given in the 'PPL EU Transmission Facility Interconnection Requirements' document posted on PJM website.

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

Installation of revenue grade Bi-directional Metering Equipment will be required in the vicinity of he Point of Interconnection to measure kWh and kVARh. All metering equipment must meet applicable PPL EU tariff requirements as well as being compliant with all applicable requirements of the PJM agreements. The equipment must provide bidirectional revenue metering (kWh and kVARh) and real-time data (kW, kVAR, circuit breaker status, and generator bus voltages) for the PD's generating resource. The metering equipment should be housed in a control cabinet or similar enclosure and must be accessible to PPL EU metering personnel.

8. LAND REQUIREMENTS FOR INTERCONNECTION SUBSTATION

Land requirements for the Interconnection Substation needed for this interconnection project must meet the requirements in the 'PPL EU Transmission Facility Interconnection Requirements' and 'Right of Way, Real Estate, Siting, and Permitting Requirements' documents posted on PJM website.

9. APPLICABLE TECHNICAL REQUIREMENTS AND STANDARDS

Applicable Technical Requirements and Standard: The Transmission Facility Interconnection Requirements Rev. 1 dated April 5th, 2023 shall apply. The Right of Way, Real Estate, Siting, and Permitting Requirements for Transmission Interconnection Projects Rev. 1 dated March 1st, 2022 shall apply.

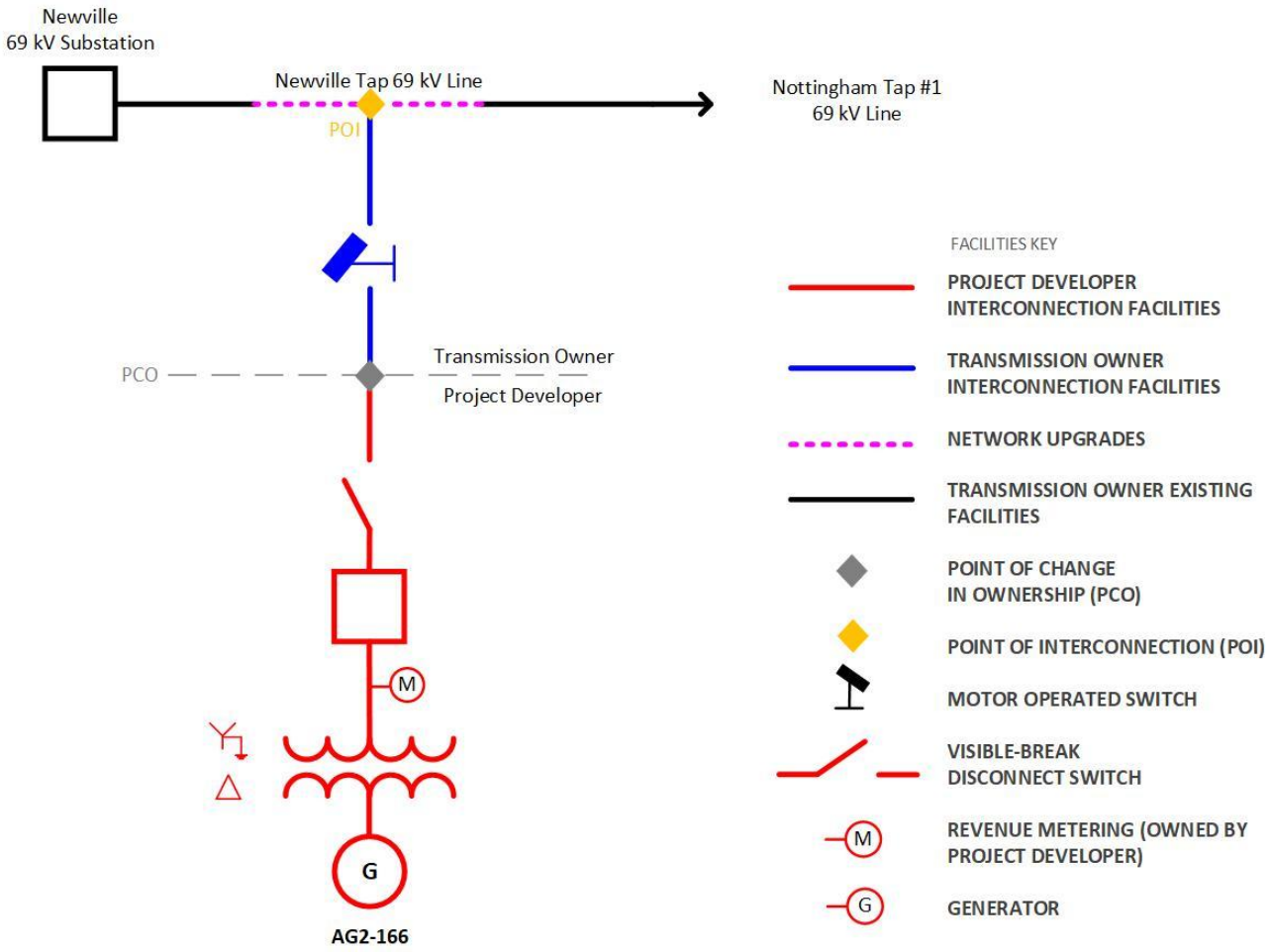
10. ENVIRONMENTAL AND PERMITING

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The details of applicable environmental and permitting requirements are given in the 'Right of Way, Real Estate, Siting, and Permitting Requirements for Transmission Interconnection Projects' document posted on PJM website.

C. APPENDICES

Attachment #1: Single line Diagram for the Physical Interconnection



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