

**AEP Portion of
Facilities Study Report
For
Physical Interconnection of
PJM Generation Interconnection Request
Project ID AG1-126
"Marysville - Flatlick 765 kV"**

Revision 0: October 2024

Introduction

This Facilities Study has been prepared in accordance with the PJM Open Access Transmission Tariff Part VII, and if applicable, the Application and Studies Agreement between the Project Developer and PJM Interconnection, LLC (PJM or Transmission Provider (TP)). The Transmission Owner (TO) is AEP Ohio Transmission Company, Inc. to be abbreviated in the remainder of this report as OHTCo. OHTCo is an affiliate company of American Electric Power Service Corporation (AEP). All references to AEP include OHTCo unless otherwise specified.

A. Transmission Owner Facilities Study Summary

1. PROJECT DESCRIPTION

The Project Developer (PD) has proposed an uprate to a planned Solar Generating Facility located in Madison County, Ohio with a designated PJM Project ID of AG1-126. The AG1-126 project is a 400 MW Solar uprate (234.9 MW Capacity uprate) to the AG1-125 project. The AG1-126 project will connect to the American Electric Power (AEP) proposed AG1-125 765 kV Station. The total installed facilities will have a capability of 800 MW with 469.8 MW of this output being recognized by PJM as Capacity.

2. POINTS OF INTERCONNECTION AND CHANGE IN OWNERSHIP

The Point of Interconnection (POI) is the point where the risers connect the generator lead circuit to the new AG1-125 765 kV Switching Station line termination point. The AG1-126 project is an uprate to the Project Developer's AG1-125 project and will share the same Point of Change in Ownership (PCO).

3. AMENDMENTS TO THE IMPACT STUDY DATA OR IMPACT STUDY RESULTS

No amendments to the impact study data or impact study results are required by AEP.

4. PROJECT DEVELOPER SCHEDULE

The Project Developer's requested in-service date for the generation facility is January 17, 2028.

This report does not imply a Transmission Owner commitment to this date.

5. SCOPE OF PROJECT DEVELOPER INTERCONNECTION FACILITIES

The Project Developer will design, build, own, operate, and maintain the Project Developer Interconnection Facilities on the Project Developer's side of the Point of Change in Ownership (PCO). This includes, but is not limited to:

- One (1) Main Power Transformer(s) (MPT(s))
- One (1) Circuit breakers and associated equipment located between the high side of the MPT(s) and the Point of Change in Ownership
- Relay and protective equipment and Telecommunications Equipment including Supervisory Control and Data Acquisition (SCADA) to comply with the TO's Applicable Technical Requirements and Standards

- Installation of the submetering equipment listed in section B.3.
- Instrument transformers required to provide revenue quality metering and settlement between the AG1-126 project and any previous/originating projects interconnecting behind the same Point of Change in Ownership.
- Additional cable connections required between the below-proposed ethernet switch (to be installed at the AG1-126 project collector station) and the primary router (either installed or to be installed at the originating project collector station) for metering data transport.

B. Transmission Owner Facilities Study Results

The following is a description of the Transmission Owner facilities required for physical interconnection of the proposed AG1-126 project to the AEP transmission system. These facilities shall be designed according to AEP Applicable Technical Requirements and Standards. Once built, AEP will own, operate, and maintain these Facilities.

1. INTERCONNECTION SUBSTATION (AG1-125 NEW 765 kV SWITCHING STATION) (PJM Network Upgrade n8923)

- OHTCo will review and revise (as necessary) the protective relay settings at the new AG1-125 765 kV Switching Station to account for the additional generation.

2. TRANSMISSION LINE TIE-IN

No Transmission Line Tie-In work will be required for this project.

3. TRANSMISSION OWNER INTERCONNECTION FACILITIES:

- OHTCo will procure one (1) metering panel with two (2) primary meters and one (1) ethernet switch for installation in the AG1-126 Project Developer's collector station.
- OHTCo will procure one (1) connected grid router (CGR) for installation in the Project Developer's originating project collector station.

4. UPGRADE TO NEIGHBORING STATIONS

No Upgrades will be required at Neighboring AEP Stations.

5. INSTALLATION OF FIBER CABLE CIRCUITS

No new fiber circuits to facilitate communication with existing AEP equipment will be required for this interconnection.

6. COST ESTIMATE OF AEP FACILITIES FOR PHYSICAL INTERCONNECTION

The following tables summarize the total estimated costs according to FERC criteria. The estimated costs are in 2024 dollars. **This cost excludes Federal Income Tax Gross Up charges on Contributions in Aid of Construction (CIAC).** This tax may or may not be charged based on whether this project meets the eligibility requirements of IRS Notice 88-129. If at a future date it is determined that the Federal Income Tax Gross Up charges are required, the Transmission Owner shall be reimbursed by the Project Developer for such taxes. The estimated reimbursement amount is noted in the table below.

6.1 COST ESTIMATE FOR TRANSMISSION OWNER-BUILD OPTION

Work Description	Type of Upgrade	Direct		Indirect		Total	Tax
		Labor	Material	Labor	Material		
Transmission Owner Interconnection Facilities	TOIF	\$106,608	\$51,442	\$23,199	\$12,553	\$193,802	\$0
New Interconnection Substation	Stand Alone Network Upgrade	\$0	\$0	\$0	\$0	\$0	\$0
Expansion of existing substation (OHTCo)	Network upgrade n8923.0	\$36,901	\$7,080	\$14,081	\$2,702	\$60,764	\$0
Interconnection Substation tie-in	Network upgrade	\$0	\$0	\$0	\$0	\$0	\$0
Remote relay at Station x	Network upgrade	\$0	\$0	\$0	\$0	\$0	\$0
Remote relay at Station y	Network upgrade	\$0	\$0	\$0	\$0	\$0	\$0
Fiber Installation in Existing ROW	Network upgrade	\$0	\$0	\$0	\$0	\$0	\$0
Fiber Installation in New ROW	Stand Alone Network upgrade	\$0	\$0	\$0	\$0	\$0	\$0
Final Tie in for Fiber installation in New ROW	Network upgrade	\$0	\$0	\$0	\$0	\$0	\$0
Total Project Costs		\$143,509	\$58,522	\$37,280	\$15,255	\$254,566	\$0

7. MILESTONE SCHEDULES FOR COMPLETION OF AEP WORK

7.1 STANDARD OPTION:

<u>Activity</u>	<u>Number of Days (See Notes)</u>
Project Engagement*	1
Engineering Start	45
Material Ordering	N/A
Construction (Grading & Below Grade)	N/A
Construction (Above Grade)	N/A
Outage Requests Made By	N/A
Outage (Structure Foundations)	N/A
Outage (Cut-in & Testing)	N/A
Ready For Back Feed (ITO In-Service Date)	105

***Day 1 will be determined at the PJM construction project kick off meeting.**

The above schedule is based on typical AEP labor timelines. The facilities outlined in this report, as constructed by AEP, are estimated to take 3 months to complete. Given this timeline, the projected backfeed date for the proposed AG1-125 project, and a typical period for agreement processing, AEP can support a backfeed date of October 15, 2027, subject to change during the tariff defined Final Agreement Negotiation Phase.

8. ASSUMPTIONS IN DEVELOPING SCOPE/COST/SCHEDULE

Note - Any materials purchased, or design decisions made by the Project Developer (relative to any facilities to be owned by AEP) prior to coordination with and approval by the executing AEP team (pursuant to an Engineering and Procurement or Generation Interconnection Agreement) are at the developer's risk and may not meet the specifications required for interconnection with the AEP transmission system.

8.1 SCOPE ASSUMPTIONS:

- Protection and Control (P&C) coordination with the Project Developer will be needed throughout the project. The Project Developer will be required to install an AEP-compatible line relaying protection panel at the collector substation using AEP standards to ensure relay coordination and adequate line protection. The AEP design team will ensure that the firmware at the collector station terminal matches the approved firmware at the AEP terminal. Failure to accept the cost of a matching line relay protection panel may change scoping.
- Scopes provided are based on a table-top process without the benefit of the results of site-specific engineering studies (e.g., soil borings, environmental survey, ground grid, etc.), unless otherwise provided by the Project Developer.
- The Project Developer will have their construction and required checkout complete prior to the energization of the AG1-126 uprate to the AG1-125 project and any required testing outages.
- **The additional submetering scope provided assumes that a single submeter will be sufficient to provide settlement data for an individual queued project. Additional submeters may be required depending on the Project Developer's final collector configuration.**
- **The additional submetering scope is intended to provide reliable data for settlement between the uprate and any originating projects and may not be necessary should the Project Developer decide to forego the installation, if allowed (see Section 9.).**
- **If in the future the uprate or originating project changes in such a way that requires settlement between the two entities, submetering will be required and may cause additional outages and expenses at that time.**

8.2 SCHEDULE ASSUMPTIONS:

- All transmission outages are subject to PJM and AEP Operations outage scheduling requirements.
- Significant scope of work changes will impact the schedule.
- The above schedule reflects only the work required to interconnect the AG1-126 project. The schedules regarding network upgrades associated with this project, if any, are detailed in the documentation related to the specific network upgrade.
- Slippage by the Project Developer in executing the Generation Interconnection Agreement (GIA) does not equate to a "day for day" slippage in the scheduled back feed and in service dates. Depending on the time of year, planned outages, neighboring projects and maintenance of the grid, outage availability has the potential to shift by weeks or months depending on conditions at the time of the fully executed agreement.

8.3 ESTIMATE ASSUMPTIONS:

- Estimates provided are based on a table-top process without the benefit of the results of site-specific engineering studies (e.g., soil borings, environmental survey, ground grid, etc.), unless otherwise provided by the Project Developer.

9. METERING REQUIREMENTS

All metering needed for this interconnection project must meet the metering requirements stated in Appendix 2, section 8 of the AG1-126 GIA, and in PJM Manuals M01 and M14D. The details of applicable metering requirements are provided in the "Connection Requirements for the AEP Transmission System" (Rev. 5, dated December 31, 2023) document, found at:

<https://www.aep.com/requiredpostings/AEPTransmissionStudies>

The primary and backup metering for the combined AG1-126/AG1-125 project will be installed on the Transmission Owner side of the Point of Change in Ownership and will be owned and maintained by the Transmission Owner.

Any additional generation proposed behind an originating project's PCO that differs in either fuel type or corporate entity from the originating project will require the installation of additional submetering for both the originating project and the uprate for the purpose of settlement. Submetering will require additional space within the originating project's facilities. The meters, routers, Ethernet to fiber converters, and telecom switch will be procured and owned by AEP. The revenue quality instrument transformers, fiber-optic cable connecting the submeters, and any other additional hardware for the required submetering will be procured, installed, owned, and maintained by the Project Developer.

10. LAND REQUIREMENTS FOR INTERCONNECTION SUBSTATION

Land requirements for the Interconnection Substation needed for this interconnection project must meet the requirements set forth in "Standards and Expectations for Siting, Real Estate, Right-of-Way, and Environmental Permitting for Transmission Interconnection Projects," Version 3 dated October 31, 2022 at <https://www.aep.com/requiredpostings/AEPTransmissionStudies> posted on AEP website.

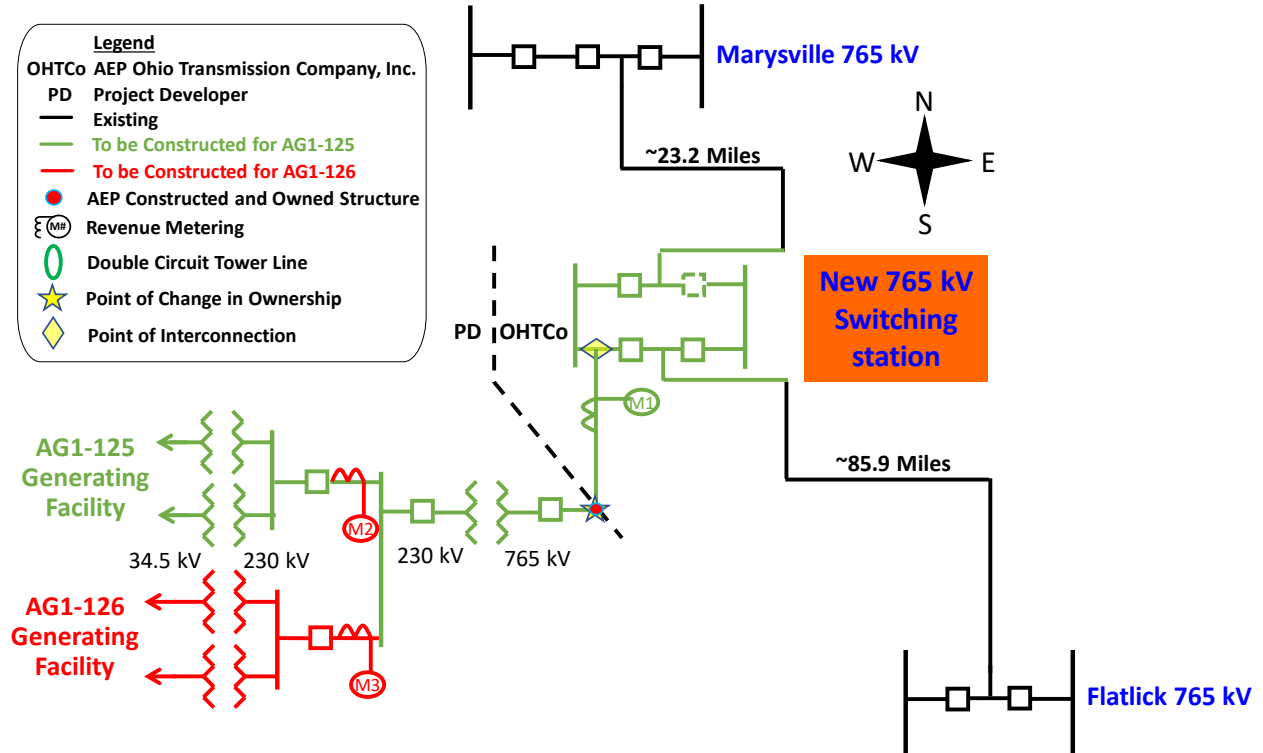
11. ENVIRONMENTAL AND PERMITTING

The Project Developer is expected to obtain, at its cost, all necessary permits and provisions for the facilities to be constructed for this interconnection. AEP requires that the standards provided in the "Standards and Expectations for Siting, Real Estate, Right-Of-Way, and Environmental Permitting for Transmission Interconnection Projects", Version 3 dated October 31, 2022 found at: <https://www.aep.com/requiredpostings/AEPTransmissionStudies> be adhered to for all facilities interconnecting with the AEP transmission system.

C APPENDICES

Attachment #1: Single line Diagram for the Physical Interconnection

AG1-126 Point of Interconnection Marysville – Flatlick 765 kV Circuit (Remote Stations Not Completely Shown)



Attachment #2: POI Map

