

Phase 2 Facilities Study Report
For
Physical Interconnection of
PJM Generation Interconnection Request
Project ID AF2-407
Madison County, Indiana

"Fall Creek 345 kV"

Revision 0: December 2024

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 AEP Indiana Michigan Transmission Company Inc. to be abbreviated in the remainder of this report as IMTCo.

A. Transmission Owner Facilities Study Summary

1. PROJECT DESCRIPTION

The Project Developer has proposed a Storage Generating Facility located in Madison County, Indiana with a designated PJM Project ID of AF2-407. The installed facilities for AF2-407 will have a total Maximum Facility Output (MFO) of 300 MW with 300 MW of this output being recognized by PJM as Capacity.

2. POINTS OF INTERCONNECTION AND CHANGE IN OWNERSHIP

The Generating Facility will interconnect with the American Electric Power (AEP) transmission system via a direct connection to the Fall Creek 345 kV Station.

The Point of Interconnection (POI) is the point where the risers connect the generation lead circuit to the Fall Creek 345 kV Station line termination point. The Point of Change in Ownership (PCO) will be located at the second structure in the 345 kV generation lead circuit outside of the Fall Creek 345 kV Station fence. IMTCo will own the spans and structures from the Fall Creek 345 kV Station to the second structure. IMTCo will own the second structure, including the jumpers. The Project Developer will own the other span connecting to the PCO structure from the collector station side, the remainder of the generation lead circuit, and associated remaining structures back to the AF2-407 generation collector station.

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

3. SCOPE OF PROJECT DEVELOPER FACILITIES

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

- Main Power Transformer(s) (MPT(s)).
- Circuit breakers and associated equipment located between the high side of the MPT(s) and the Point of Change in Ownership.
- Generation lead line conductors from the Generating Facility to the Point of Change in Ownership.
- Protective relays and associated equipment for the generation lead.
- Telecommunications Equipment including Supervisory Control and Data Acquisition (SCADA) to comply with the TO's Applicable Technical Requirements and Standards.

B. Transmission Owner Facilities Study Results

The following is a description of the Transmission Owner facilities required for physical interconnection of the proposed AF2-407 project to the AEP transmission system. These facilities shall be designed according to AEP standards. Once built, AEP will own, operate, and maintain these Facilities.

1. INTERCONNECTION SUBSTATION (EXISTING)

IMTCo will upgrade the existing Fall Creek 345 kV Station for interconnection of PJM queue project AF2-407 by extending the west bus to the south, completing the “M” breaker string, and installing two (2) new circuit breakers and associated equipment. **Major equipment upgrades are expected to include:**

- Extend the Fall Creek 345 kV Station west Bus #1 to the south.
- Extend the existing partial “M” circuit breaker string to the new west Bus #1 extension.
- Install two (2) new 345 kV 5000A 63 kA circuit breakers and associated control relaying.
- Install four (4) new breaker disconnect switches.
- Install associated and additional buswork, bus supports, jumpers, insulators, grounding, SCADA (Supervisory Control and Data Acquisition) connectivity, fiber-optic relaying connectivity & equipment, and foundations.
- Review and revise (as needed) the protective relay settings for the remainder of the Fall Creek 345 kV Station to account for the addition of the new circuit breakers and the propose AF2-407 generation source.
- Coordinate line protection settings with Duke Energy for the Fall Creek - Noblesville 345 kV Circuit due to the changes required at the Fall Creek Station to interconnect the proposed AF2-407 project.
- Coordinate line protection settings with AES Indiana for the Fall Creek - Sunnyside 345 kV Circuit due to the changes required at the Fall Creek Station to interconnect the proposed AF2-407 project.

2. TRANSMISSION LINE TIE-IN

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

3. TRANSMISSION OWNER INTERCONNECTION FACILITIES:

The IMTCo Interconnection Facilities for the proposed AF2-407 project are expected to include the following:

- Install two (2) new 90 ft. custom steel single pole, single circuit dead end structures on concrete foundations with anchor bolt cages.
- Install two (2) spans of ACSR (Aluminum Conductor Steel Reinforced) 2-bundled 954 54/7 (Cardinal) transmission line conductor with 48-count fiber OPGW (Optical Ground Wire) shield wire for the generation lead circuit exiting from the Fall Creek 345 kV Station.
- Install dual direct fiber current differential relays for the protection scheme for the proposed AF2-407 generation lead.

- Install a 345 kV revenue metering package, including one (1) control house-installed metering panel with Primary and Backup meters, three (3) 1-phase current transformers (CTs), three (3) 1-phase Capacitor Coupled Voltage Transformers (CCVTs), and associated structures, foundations, grounding, and telecommunications connectivity at the Fall Creek 345 kV Station for the proposed AF2-407 generation lead circuit.
- Extend two (2) fiber-optic cables via underground and transmission-supported ADSS (All Dielectric Self Supporting) with ADSS entrances via diverse paths from the Fall Creek 345 kV Station control house to fiber demarcation splice boxes. The fiber-optic cable runs will support direct fiber relaying between the Fall Creek 345 kV Station and the Project Developer's collector station. The Project Developer will be responsible for the fiber extension from the splice boxes to the collector station.

4. UPGRADE TO NEIGHBORING STATIONS

No Upgrades will be required at Neighboring AEP Stations.

5. INSTALLATION OF FIBER-OPTIC CABLE CIRCUITS

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

6. MILESTONE SCHEDULES FOR COMPLETION OF AEP WORK

6.1 STANDARD OPTION:

<u>Activity</u>	<u>Number of Days (See Notes)</u>
Project Engagement*	1
Engineering Start	70
Material Ordering	112
Construction (Grading & Below Grade)	457
Construction (Above Grade)	547
Outage Requests Made By	400
Outage (Structure Foundations)**	832
Outage (Cut-in & Testing)**	882
Ready For Back Feed (ITO In-Service Date)	912

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

****Scheduled Outages are contingent upon outage availability. Longer duration outages are not available during peak load periods.**

The above schedule is based on typical AEP construction timelines, long lead material availability, and common outage constraints. The facilities outlined in this report, as constructed by AEP, are estimated to take 30 months to complete. Given this construction timeline, timeline for the phase 3 study, and a typical period for agreement processing, AEP can support a backfeed date of February 2, 2028, subject to change during the tariff defined Final Agreement Negotiation Phase. The Project Developer is expected to have the interconnection facilities constructed and ready to accept backfeed by the business day prior to the final negotiated backfeed date.

7. 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.

7.1 SCOPE ASSUMPTIONS:

- Equipment specifications (Breaker ratings, conductor size, etc.) are a result of the desktop functional scoping process observed while conducting this facilities study. These specifications

are subject to change based on the results of the detailed scoping efforts that will take place post-interconnection or engineering and procurement agreements.

- 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 provide any required additional easements for all facilities and structures.
- The Project Developer will have their construction and required checkout completed prior to the start of the interconnection to the Fall Creek 345 kV Station and any required testing outages.

7.2 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 AF2-407 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.

7.3 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.

8. METERING REQUIREMENTS

All metering needed for this interconnection project must meet the metering requirements stated in Appendix 2, section 8 of the AF2-407 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" document, found at:

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

The primary and backup metering 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 existing project's PCO that differs in either fuel type or corporate entity from the original existing project will require the installation of additional submetering for both the original existing project and the uprate project for the purpose of settlement. Submetering will require additional space within the original 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 cables connecting the submeters, and any other additional hardware for the required submetering will be procured, installed, owned, and maintained by the Project Developer.

9. LAND REQUIREMENTS FOR INTERCONNECTION SUBSTATION

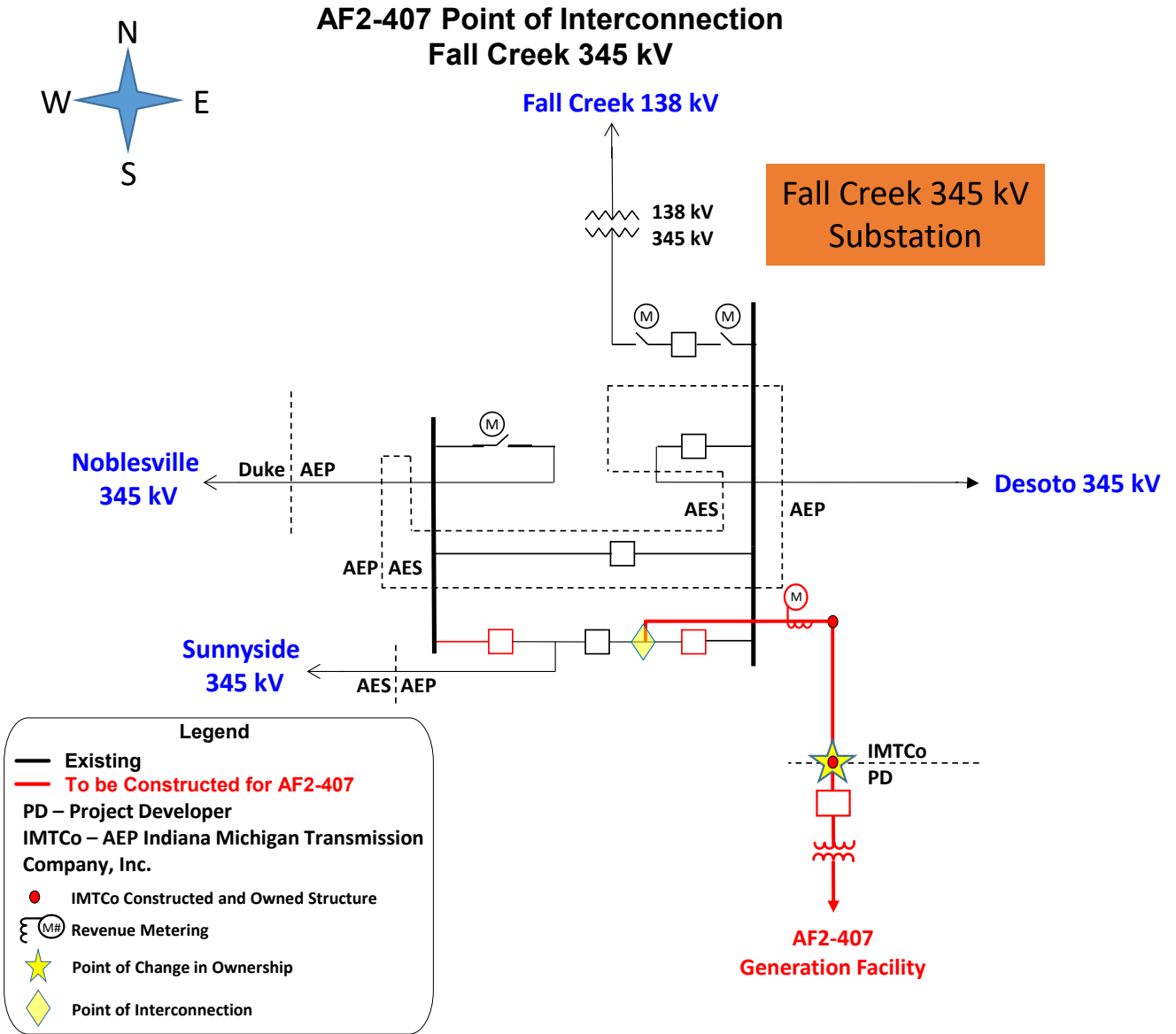
Land requirements for the Interconnection Substation needed for this interconnection project must meet the requirements found at: <https://www.aep.com/requiredpostings/AEPTransmissionStudies> posted on the AEP website.

10. 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" document, 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



Attachment #2: POI Map

