Phase 2 Facilities Study Report

For

Physical Interconnection of

PJM Generation Interconnection Request

Project Identifier AF1-176

"Corey 138 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. Additional work will also be performed by Indiana Michigan Power Company to be abbreviated in the remainder of this report as IMPCo.

A. Transmission Owner Facilities Study Summary

1. PROJECT DESCRIPTION

The Project Developer has proposed a Solar/Storage Generating Facility located in St. Joseph County, Michigan. The installed facilities for AF1-176 will have a total Maximum Facility Output (MFO) of 300 MW with 155.684 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 Corey 138 kV Station.

The Point of Interconnection (POI) is the point where the risers connect the generation lead circuit to the Corey 138 kV Station line termination point. The Point of Change in Ownership (PCO) will be located at the first structure in the generation lead circuit outside of the Corey 138 kV Station fence. IMTCo will own the span from the Corey 138 kV Station to the first structure. IMTCo will own the structure, including the jumpers. The Project Developer will own the other span connecting to the Point in Change of Ownership structure from the collector station side, the remainder of the generation lead circuit, and associated remaining structures back to the AF1-176 generation collector station.

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

3. 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:

- 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.
- 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.

B. Transmission Owner Facilities Study Results

The following is a description of the Transmission Owner facilities required for physical interconnection of the proposed AF1-176 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)

To accommodate the interconnection of the proposed AF1-176 generation project to the Corey 138 kV Station, IMTCo will install a new circuit breaker and IMPCo will re-terminate the Corey – Hydramatic 138 kV Circuit to the newly created line exit position. IMTCo will then re-terminate the Corey - Kenzie Creek 138 kV Circuit into the line exit position created by re-terminating the Corey – Hydramatic 138 kV Circuit. The AF1-176 project will connect to the line exit position created by re-terminating the Corey - Kenzie Creek 138 kV Circuit. The above reconfiguration alleviates the need for line crossings as the generation lead circuit exits the Corey 138 kV Station.

IMTCo will upgrade the existing Corey 138 kV Station for interconnection of PJM queue project AF1-176 by completing the following scope:

- Installation of one (1) new 3000A 40 kA 138 kV circuit breaker with associated control relaying.
- Installation of one (1) three phase 3000 A circuit breaker disconnect switch.
- Installation of one (1) three phase CCVT and associated structures for the line exit to the Hydramatic 138 kV Station.
- Installation of one (1) H-frame dead end structure for the line exit to the Hydramatic 138 kV Station.
- Installation of associated and additional buswork, bus supports, jumpers, insulators, grounding, and foundations.

2. EXISTING TRANSMISSION LINE

To re-terminate the Hydramatic – Corey 138 kV Circuit, IMPCo will:

- Remove two (2) steel tangent structures, one (1) steel dead end structure, and associated conductor and shield wire along the existing Corey – Hydramatic 138 kV Circuit.
- Install one (1) new 90’ steel, single circuit, single pole, running corner direct embedded structure.
- Install one (1) new 90’ steel, single circuit, single pole dead end structure on a concrete foundation with an anchor bolt cage.
- Install two (2) spans of ACSR 1033.5 (Curlew) transmission line conductor with 7#8 Alumoweld shield wire.

To re-terminate the Kenzie Creek line IMTCo will:

- Remove one (1) steel dead end structure and associated conductor and shield wire along the Kenzie Creek – Corey 138 kV Circuit.

- Install one (1) new 100’ steel, single circuit, single pole dead end structure on a concrete foundation with an anchor bolt cage and two spans of ACSR 1033.5 (Curlew) transmission line conductor with 7#8 Alumoweld shield wire.

3. TRANSMISSION OWNER INTERCONNECTION FACILITIES:

The IMTCo Interconnection Facilities will include but are not limited to:

- Installation of a dual, direct fiber-based current differential relaying protection scheme for the generation lead circuit.
- Extension of two (2) underground 48 count all dielectric loose tube (ADLT) fiber optic cables from the Corey 138 kV station control house to fiber demarcation splice boxes to support direct fiber relaying between the Corey 138 kV and Project Developer's collector stations. The Project Developer will be responsible for the fiber extension from the splice boxes to the collector station.
- Installation of a standard revenue metering package, including three (3) single phase current transformers (CT), three (3) single phase voltage transformers (VT), associated structures and foundations, one (1) ethernet switch, and one (1) DICM-installed metering panel, for the generation lead circuit at the Corey 138 kV station.
- Review and revision (as necessary) of the protective relay settings for the remainder of the Corey 138 kV Station.

IMTCo will reuse an existing steel dead end structure (#450) for the generation lead circuit to the proposed AF1-176 collector station. (see scope assumption #6 in section 8.1)

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.

7. MILESTONE SCHEDULES FOR COMPLETION OF AEP WORK

7.1 STANDARD OPTION:

Activity	Number of Days (See Notes)
Project Engagement*	1
Engineering Start	70
Material Ordering	112
Construction (Grading & Below Grade)	569
Construction (Above Grade)	629
Outage Requests Made By	344
Outage (Structure Foundations)**	709
Outage (Cut-in & Testing)**	760
Ready For Back Feed (ITO In-Service Date)	790

***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 26 months to complete. Given this construction timeline, timeframe for the phase 3 study, 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. 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.

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:

- 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 Corey 138 kV Station and any required testing outages.
- **To retain the existing dead-end structure the project developer must construct a tangent structure that ensures the angle of the first span of conductor they own is 90 degrees relative to the AEP-owned span exiting the station.**

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 AF1-176 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 AF1-176 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 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

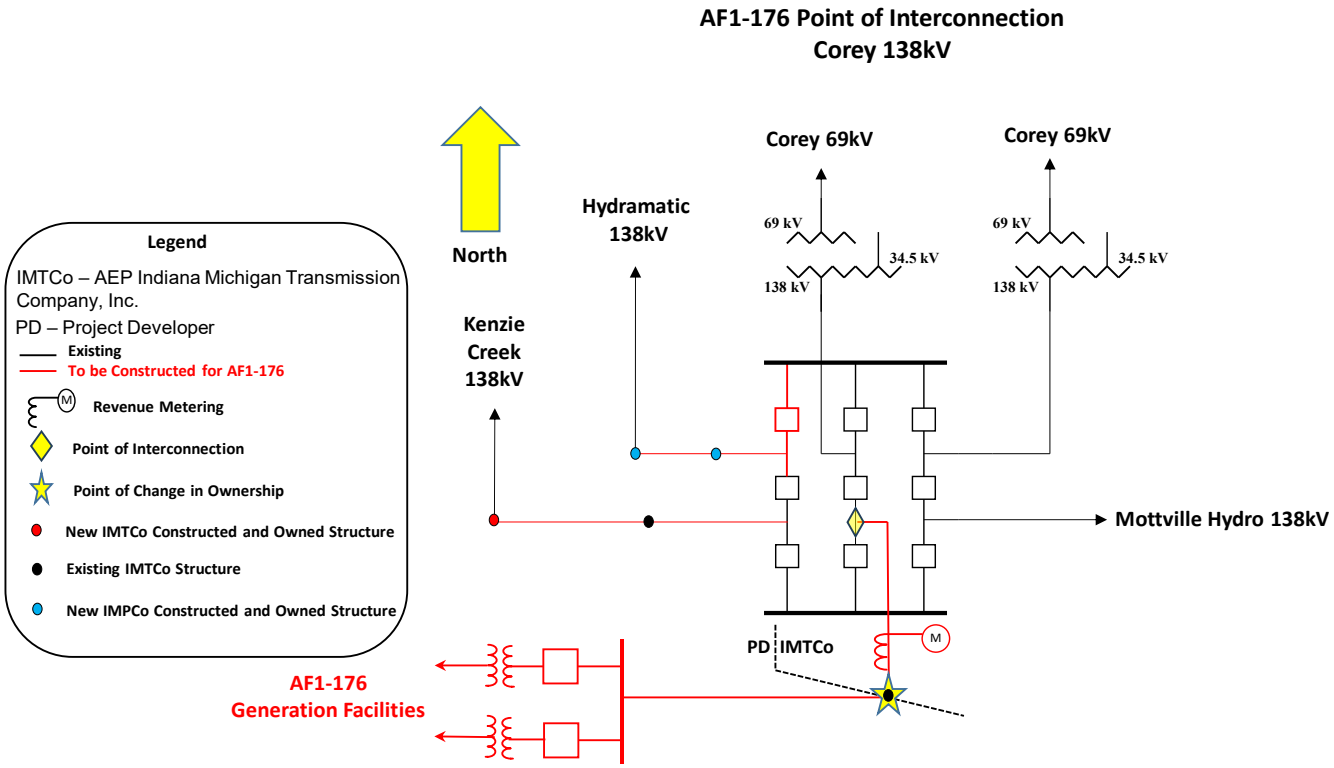
Land requirements for the Interconnection Substation needed for this interconnection project must meet the requirements in the https://www.aep.com/requiredpostings/AEPTransmissionStudies posted on AEP website.

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", 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