Facilities Study Report

For

Physical Interconnection of

PJM Generation Interconnection Request
Project ID AG2-236

"Potter-Harlan 69 kV"

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 American Transmission Systems, Inc. (ATSI), a FirstEnergy company.

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 has proposed an uprate to an existing Solar Generating Facility located in Lawrence County, Pennsylvania. The AG2-236 project is a 20 MW (2.0 MW Capacity) uprate to the previous project (AG1-054), for a total Maximum Facility Output (MFO) of 60 MW with 27.2 MW of this output recognized by PJM as Capacity.

2. POINT OF INTERCONNECTION (POI)

The Generating Facility will interconnect with the ATSI transmission system at the existing Potter-Harlan Substation as an uprate to AG1-054.

3. POINT OF CHANGE IN OWNERSHIP (PCO)

The PCO will remain the same as AG1-054, located at the last Project Developer-owned structure outside the existing Potter-Harlan substation fence line

4. SCOPE OF PROJECT DEVELOPER FACILITIES

Project Developer will design, build, own, operate and maintain the Project Developer Interconnection Facilities on Project Developer's side of the PCO. These facilities may have been constructed as part of AG1-054. This includes, but is not limited to:

- Circuit breakers and associated equipment located between the high side of the GSU and the PCO.
- Generator lead line from the Generating Facility to the PCO.
- Relay and protective equipment, and Supervisory Control and Data Acquisition (SCADA) and telecommunications equipment to comply with the TO's Applicable Technical Requirements and Standards.

B. Transmission Owner Facilities Study Results

The following is a description of Transmission Owner facilities for physical interconnection of the proposed AG2-236 project to ATSI transmission system. These facilities shall be designed according to FirstEnergy Applicable Technical Requirements and Standards. Once built, ATSI will own, operate, and maintain these Facilities.

1. TRANSMISSION OWNER INTERCONNECTION FACILITIES (TOIF)

1.1 AG1-054 Generator Substation

Energize and integrate generator interconnection facilities to the transmission system.

- Relay and Controls Scope of Work
    - Integrate interconnection facilities protection and controls to the transmission system.
- Ancillary Scope of Work
    - Project Management
        - Provide project management, coordination, administration, scheduling, material management and project development if required.
    - Revenue Metering
        - Provide support for updates to existing revenue metering.
    - Testing and Commissioning
        - Test and commission all power assets.

2. STAND ALONE NETWORK UPGRADES

None

3. NETWORK UPGRADES

3.1 Cedar Street Substation

Review and revise relay settings

- Below Grade Scope of Work:

- None
- Above Grade Scope of Work:
  - None
- Relay & Control Scope of Work
  - Review and update relay settings
  - Scope of Work Assumptions:
  - Using existing relays.
  - Ancillary Scope of Work
  - Project Management
    - Provide project management, coordination, administration, scheduling, material management and project development if required.
  - Information Technology
    - None
  - Testing and Commissioning
    - To test and commission all power assets.

3.2 Campbell Substation

Review and revise relay settings

- Below Grade Scope of Work:
  - None
- Above Grade Scope of Work:
  - None
- Relay & Control Scope of Work
  - Review and update relay settings
- Scope of Work Assumptions:
  - Using existing relays
- Ancillary Scope of Work
  - Project Management
    - Provide project management, coordination, administration, scheduling, material management and project development if required.
  - Information Technology
    - None
  - Testing and Commissioning

- To test and commission all power assets.

3.3 Volant (AG1-054 Interconnection) Substation

Review and revise relay settings

- Below Grade Scope of Work:
  - None
- Above Grade Scope of Work:
  - None
- Relay & Control Scope of Work
  - Review and update relay settings
- Scope of Work Assumptions:
  - TBD
- Ancillary Scope of Work
  - Project Management
    - Provide project management, coordination, administration, scheduling, material management and project development if required.
  - Information Technology
    - None
  - Testing and Commissioning
    - To test and commission all power assets.

4. Other Scope of Work

Provide support for updates to the existing Project Developer-Owned revenue metering

5. MILESTONE SCHEDULE FOR COMPLETION OF ATSI WORK

Facilities outlined in this report are estimated to take 9 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
Preliminary Engineering	1	2

Detailed Engineering	3	8
Siting, Permitting & Real Estate	-	-
Equipment Delivery	-	-
Construction	8	9
Testing and Commissioning	9	9

6. ASSUMPTIONS IN DEVELOPING SCOPE/COST/SCHEDULE

6.1 Scope Assumptions:

- Project Developer is responsible for making all arrangements for electric distribution service (if required) for its generation station. No costs or schedule are included herein.

6.2 Cost Estimate Assumptions:

- The cost estimates provided for this project were developed as of February 11, 2026, based upon current market conditions. Hence, they are subject to significant changes in the event that project implementation is delayed. Notwithstanding the cost estimates from this report being used in the Generator Interconnection Agreement for the related project, ATSI reserves the right to re-evaluate and provide a more accurate cost estimate during the implementation phase of the project. In accordance with section 217 of the Open Access Transmission Tariff, the Project Developer will be responsible for 100 percent of the actual costs of the facilities required to accommodate its Interconnection Request.
- ATSI reserves the right to charge the Project Developer operation and maintenance expenses to maintain the Project Developer attachment facilities, including metering facilities, owned by ATSI. These costs will be specified in the Generator Interconnection Agreement.

6.3 Schedule Assumptions:

- This schedule assumes that all issues covered by the "Environmental, Real Estate and Permitting Issues" section of this document are resolved. Construction cannot begin until after all applicable permits and/or easements have been obtained.
- ATSI's ability to support this schedule also depends on the feasibility of taking the required outages to support construction. Outages that are determined to negatively impact system reliability or cause congestion may be delayed or denied, at any time, even if they are submitted on time based on the Outage Submittal Rules in section 4.2.1 of PJM Manual 03. This includes, but is not limited to, outages requested between the months of June and September, as well as January and March, which typically get denied due to summer and winter peak conditions. Therefore, the construction schedule will be adjusted as needed to accommodate any outage restrictions that have been identified by ATSI or the Transmission Provider.

7. REVENUE METERING REQUIREMENTS

Revenue metering equipment is owned, operated, and maintained by the Project Developer.

Transmission Owner's Revenue Metering Requirements may be found in the FirstEnergy Corporation Requirements for Transmission Connected Facilities document which can be found on the PJM website at:

https://pjm.com/planning/design-engineering/to-tech-standards/private-firstenergy

These requirements are in addition to any metering required by PJM.

Transmission Owner will obtain real-time, site-specific, generation data from PJM, via the required communication link from Project Developer to PJM. Transmission Owner will work with PJM and Project Developer to ensure the generation data provided to PJM meets Transmission Owner's requirements.

8. LAND REQUIREMENTS FOR INTERCONNECTION SUBSTATION

Not Applicable

6. APPLICABLE TECHNICAL REQUIREMENTS AND STANDARDS

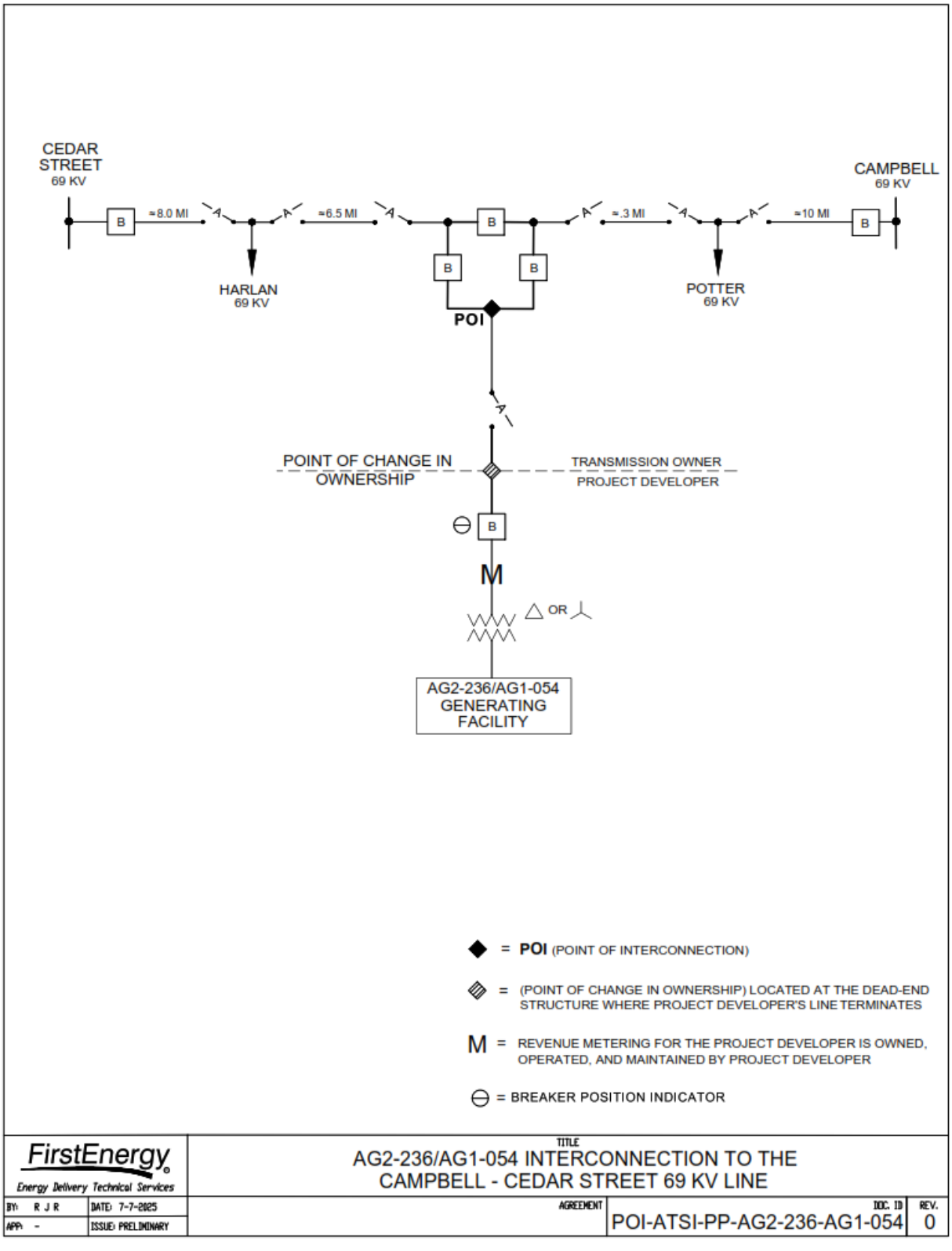
The Requirements for Transmission Connected Facilities, Revision 6, dated December 19, 2024, shall apply.

6. ENVIRONMENTAL AND PERMITING

Not Applicable

C. APPENDICES

ATTACHMENT #1: SINGLE LINE DIAGRAM FOR THE PHYSICAL INTERCONNECTION



ATTACHMENT #2: PROTECTION REQUIREMENTS

Short Circuit Analysis

Short Circuit Values
The preliminary 69kV fault values at the AG2-236 interconnection location (Volant 69kV) are:

Three phase = 6.4kA
Single line to ground = 4.3kA
Z1= (4.2 + j 11.9)%
Z0= (10.5 + j 29.2)%

These values are provided for bolted, symmetrical faults under anticipated normal system conditions and are provided on a 71.07kV, 100MVA base. Future increases in fault currents are possible and it is the Project Developer's responsibility to upgrade their equipment and/or protective equipment coordination when necessary.

Protection Requirements

AG2-236 is a proposed uprate to the generation to be installed as part of the AG1-054 project. It is understood that no changes are being made to the utility-side of the Project Developer's interconnecting transformers.

The Project Developer will need to provide information on the inverters and show that they meet the requirements of UL 1741 certification for anti-islanding protection. Any necessary intertie functions will be incorporated into the line relaying at the generator terminal of the interconnecting line. The Project Developer will not supply fault current to the FE system.

Scope and cost estimates supplied assume that that the AG2-236 facility will meet the requirements as stated above, but documentation must be supplied to FirstEnergy to verify inverters meet these standards.

The Project Developer will be required to comply with all FE Generation Protection Requirements for Generation Project Developers. The Generation Protection Requirements may be found within the "FirstEnergy Requirements for Transmission Connected Facilities" document located at the following links:

www.firstenergycorp.com/feconnect

www.pjm.com/planning/design-engineering/to-tech-standards.aspx

FE System Modifications

System modifications may be required to make settings changes and/or replace existing relays at FirstEnergy remote substation. Generator relaying will be required to coordinate with upstream transmission system protection.

Settings Changes
Settings changes are possible at, but not limited to, the following stations:

- Volant
- Cedar Street

- Campbell