PJM Facilities Study Report

for

Network Upgrade N9116

"Homer City - Shelocta 230 kV Line Upgrade"

Revision 1: August 2025

Introduction

This Facilities Study has been prepared in accordance with the PJM Open Access Transmission Tariff and PJM Manuals. The Transmission Owner (TO) is Mid-Atlantic Interstate Transmission, LLC (MAIT).

A. Project Description

The System Impact Study for PJM Interconnection Cycle TC-1 has identified the need for PJM Network Upgrade N9116. The scope of this Network Upgrade includes the following:

- Rebuild the Homer City – Shelocta 230 kV Line, approximately 11 miles, with double bunded 795 kcmil 26/7 ACSS conductor
- Terminate new conductor at Homer City substation.
- Terminate new conductor at Shelocta substation.

Upon completion of the Network Upgrade above, the expected final ratings will be:

Unit	Normal	LTE	STE	LD
MVA	858	1037	1037	1095

B. Transmission Owner Facilities Study Results

1. Detailed Scope of work for Network Upgrade [N9116]:

The following is a detailed description of Transmission Owner Upgrades for Network Upgrade N9116. These facilities shall be designed according to the Transmission Owner's Applicable Technical Requirements and Standards. Once built the Transmission Owner will own, operate, and maintain these facilities.

1.1 Homer City – Shelocta 230 kV Substation

Rebuild the Homer City – Shelocta 230 kV Line, approximately 11 miles.

- Existing Conditions
    - The existing line is constructed mostly on single circuit wood H-frame multipole structures, along with (5) 3-pole steel deadends and (2) lattice towers.
    - The steel pole deadends and lattice towers are to remain.
    - Per TAMI, the existing conductor is 636 kcmil 24/7 ACSR shielded by (2) 3/8" - 7 strand EHS Steel.
    - GIS View this line is not in the database. By following the known adjacent lines, we can assume 3 distribution crossings. A groundline inspection is necessary to determine any distribution crossings or under-build. This estimate assumes distribution coordination is required.
- Installations
    - (10) engineered steel, mono-pole, dead-end structures on concrete foundations.
    - (3) engineered steel, mono-pole, angle structures on concrete foundations.
    - (64) engineered steel, mono-pole, tangent structures on concrete foundations.
    - 11.0 miles of double bundled 795 kcmil 26/7 ACSS, shielded by (1) 3#6 Alumoweld
- Removals

- (10) wood, multi-pole, deadend structures.
- (3) wood, 3-pole, angle structures.
- (64) wood, multi-pole, tangent structures.
- 11.0 miles of (3) 636 kcmil 24/7 ACSR shielded by (2) 3/8" - 7 strand EHS Steel shield wire.

- Siting/Licensing
  - It is assumed a Full Application will be required.
- Scope of Work Assumptions
  - It is assumed the outage requirements for construction on the line can be met.
  - It is assumed that a Ground Survey will be required.
  - It is assumed that only a Ground Survey (instead of LiDAR) is required for the As Built Survey.
  - It is assumed an Aerial LiDAR survey will be required.
  - It is assumed that the existing right-of-way can be used.
  - FAA: Restricted flight zone identified southwest of Homer City Station.
  - The proposed rebuild crosses the Norfolk Southern Railroad.
  - The proposed rebuild crosses the Buffalo & Pittsburgh Railroad.
  - The proposed rebuild crosses (3) major roads and (13) other roadways.
  - The proposed rebuild crosses (6) minor waterways.
  - The proposed rebuild crosses (19) registered wetland areas per TAMI and the FWS Wetland Directory in Google Earth.
  - The proposed rebuild crosses over (3) distribution lines per GIS View.
  - It is assumed the Homer City and Shelocta Substations will need to remain energized during construction. Temporary construction may be required.
  - Exact structure locations are not yet determined. This rebuild is assumed to be a structure for structure rebuild. An engineering analysis will be required.
  - Assumed an additional 20 foot to all existing structure heights due to the transition from H-frames to mono-poles where the phase distances are significantly different. This was to ensure adequate ground clearance per NESC standards.
  - Assumed steel construction for this 230kV rebuild. All structures assumed to be engineered steel on concrete foundations.
  - Existing steel and lattice structures are to remain. Only existing wood structures are to be replaced.
  - It is assumed that the existing structures (to remain) are in adequate condition and can handle the new loading. An engineering analysis during project development will be required.
  - Assumed new insulators are required on the existing (to remain) steel and lattice structures due to a change in conductor size.
  - Assumed line route will need groundline inspection prior to project to ensure justification.

- Ancillary Scope of Work
    - Project Management
        - Provide project management, coordination, administration, scheduling, material management and project development if required.
    - Forestry
        - Tree and grub clearing will be required. Priority tree rights are to be expanded.
    - Real Estate
        - It is assumed that all work will take place within the existing ROW.
        - A “rights and restrictions” review by Real Estate will be required.
        - Georeferenced ROW extents will be required to be provided to engineering.
        - Real estate estimate have been included for:
            - Internal support including railroad permitting, document review, project planning meetings, subcontractor oversight and assistance with transfer of assets if required.
            - External support for rights & restrictions reviews, easement digitization and other GIS support, general project support, acquisition, construction support and damage settlements/releases.
            - Cost of purchasing new land rights and associated fees such as recording costs or permits (estimated--actual cost will depend on current market values, land type, location and negotiations and can vary greatly along the route).
            - We have not included acquisition labor or cost of potential priority tree rights unless specified as needed in the scope and assumptions.
            - Direct damage payments not included in estimate.
            - Any assumed ROW width used in this estimate for the calculation of easement area is based on the widest ROW needed for the voltage and does not account for structure configuration or span lengths. Widths needed can vary upon final design.
            - Access roads (direct cost); assumption of 7 off-ROW road.
            - Laydown yard; assumption of 3 yards (per SMIF) for duration of construction (per interview).
            - Modified easements; assuming 6.
            - Agent per diem.
            - Encroachment mitigation/payment.
            - Assuming 10% of New ROW will be accounted for centerline modifications which may arise due to the rebuild. 16.67 acres will need to be acquired.
            - Recording fees=10% of total easement/acquisition cost; fees do not include taxes that may be required by specific counties via a "Real Estate Transfer Tax Statement of Value.

- Environmental
  - Several wetland areas along the rebuild line route have been identified and all
  - applicable permits are required.
  - An environmental review will be required to identify any additional
  - construction constraints or additional permitting requirements.
- Information Technology
  - None
- Access Road
  - Access roads will be required along the entire line route and the terrain is hilly.
- Distribution Scope
  - Per GIS View this line is not in the database. By following the known adjacent lines, we can assume 3 distribution crossings. A groundline inspection is necessary to determine any distribution crossings or under-build. This estimate assumes distribution coordination is required.

1.2 Homer City Substation

Terminate new conductor on the Shelocta terminal and replace overhead conductor.

- Below Grade Scope of Work
  - (1) lot conduit for in-sub fiber run.
- Above Grade Scope of Work
  - Terminate new conductor on the Shelocta terminal and replace overhead conductor.
- Relay & Controls
  - Review and revise relay settings as required by line reconductoring.
- Scope of Work Assumptions
  - It is assumed that the existing takeoff structures can accommodate the new loading from the new line conductor.
- Ancillary Scope of Work
  - Project Management
    - Project management will be required for this asset.
  - Information Technology
    - Estimated (1) in-sub fiber run to represent ADSS tail extension from Homer City Substation control house to last T-Line structure for OPGW build.
  - Testing & Commissioning

        - Testing and commissioning services as required for new equipment.

1.3 Shelocta Substation

Terminate new conductor on the Homer City terminal.

- Below Grade Scope of Work
    - (1) lot conduit for in-sub fiber run.
- Above Grade Scope of Work
    - Terminate new conductor on the Homer City terminal.
- Relay & Controls
    - Review and revise relay settings as required by line reconductoring.
- Scope of Work Assumptions
    - It is assumed that the existing takeoff structures can accommodate the new loading from the new line conductor.
- Ancillary Scope of Work
    - Project Management
        - Project management will be required for this asset.
    - Information Technology
        - Estimated (1) in-sub fiber run to represent ADSS tail extension from Homer City Substation control house to last T-Line structure for OPGW build.
    - Testing & Commissioning
        - Testing and commissioning services as required for new equipment.

2. MILESTONE SCHEDULE FOR COMPLETION OF MAIT WORK

Facilities outlined in this report are estimated to take 31 months to construct, from the time the Generation Interconnection Agreement is fully executed. This schedule is based on the ability to obtain outages to construct and test the proposed facilities.

Description	Start Month	Finish Month
Preliminary Engineering	1	2
Siting, Permits & Real Estate	3	19
Detailed Engineering	3	19
Equipment Delivery	21	21
Construction	22	31
Testing & Commissioning	31	31

3. ASSUMPTIONS IN DEVELOPING SCOPE/COST/SCHEDULE

3.1 Scope Assumptions:

- N/A

3.2 Cost Estimate Assumptions:

- The cost estimates provided in this report were developed as of February 18, 2025, 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 applicable Interconnection Agreement for the related project, FirstEnergy reserves the right to re-evaluate and provide a more accurate cost estimate during the implementation phase of the project.

3.3 Schedule Assumptions:

- FirstEnergy'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 FirstEnergy or the Transmission Provider.

4. LAND REQUIREMENTS

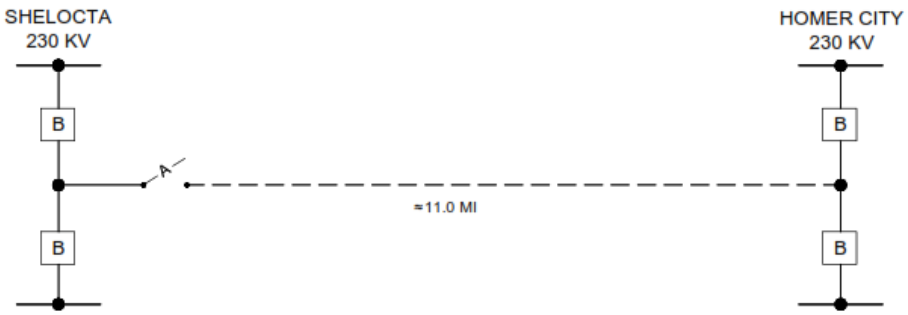
Not Applicable.

5. ENVIRONMENTAL AND PERMITING

- Environmental Scope:
    - Several wetland areas along the rebuild line route have been identified and all
    - applicable permits are required.
    - An environmental review will be required to identify any additional
    - construction constraints or additional permitting requirements.
- Environmental Assumptions:
    - Road Bonds are required.
    - Environmental Filming Documentation of Existing roads are required
    - Environmental Access and Road Crossing Permit Fees is required.
    - Environmental Development of Permit Binder is required.
    - Environmental Cultural Resource Consultation is required.
    - Environmental Wetland Permits are required.
    - Environmental Construction walk-down is required

C. APPENDICES

ATTACHMENT #1: SINGLE LINE DIAGRAM



FirstEnergy Energy Delivery Technical Services		TITLE REBUILD THE HOMER CITY - SHELOCTA 230 KV LINE (11 MILES)			
BY: K E F	DATE: 3/6/2025	AGREEMENT	n9116	DOC. ID	REV. 0
APP: -	ISSUE:				

ATTACHMENT #2: PROTECTION REQUIREMENTS

Not Applicable.