PJM Facilities Study Report

For

Network Upgrade N9252

Transition Cycle #1

July 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 Virginia Electric and Power Company (VEPCO or Dominion).

A. Project Description

The System Impact Study for PJM Interconnection Transition Cycle #1 has identified the need for PJM Network Upgrade N9252. The scope of this Network Upgrade the following project:

- Upgrade 3.81 miles of Line 2021 between structures 2021/31 and 2021/62.

This Network Upgrade is part of a broader upgrade of 10.28 miles of Line 2021 between Elizabeth City and Shawboro. End of life project 993046 has rebuilt 6.47 miles of this line. The remaining 3.81 miles is scheduled to be completed in 2026.

B. Transmission Owner Facilities Study Results

1. Detailed Scope of work for Network Upgrade N9252:

The following is a detailed description of Transmission Owner Upgrades for Network Upgrade N9252. 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.

See Preliminary Scoping Summaries located in the Appendices, Attachment #1.

2. MILESTONE SCHEDULE FOR COMPLETION OF DOMINION WORK

Facilities outlined in this report are estimated to take 15 months to construct, from the time of full execution of the Generation Interconnection Agreement and completion of a construction kickoff call. This schedule may be impacted by the timeline for procurement and installation of long lead items and the ability to obtain outages to construct and test the proposed facilities.

Description	Start month	Finish month
Engineering	Complete	
Permitting/Procurement	Complete	
Construction	On-Going	15

3. ASSUMPTIONS IN DEVELOPING SCOPE/COST/SCHEDULE

- The 2021 line is currently being rebuilt under project 993046. 3.81 miles of the 10.28 miles remain. We are providing a pro rated cost for remaining scope compared to the original AFE approved estimate.
- The preliminary construction schedule is dependent on outage availability.
- See Attachment 1 –Project 993046 estimate scope for additional assumptions

4. LAND REQUIREMENTS

Dominion will be responsible for the following expectations in the area of Real Estate:

- Any additional land needed for Storm Water Management, Landscaping, and Wetlands/Wetlands Mitigation.
- Any other Land/Permitting requirements required by the Network Upgrade

5. ENVIRONMENTAL AND PERMITING

The Dominion will be responsible for the following expectations in the area of Environmental and Permitting:

- Assessment of environmental impacts related to the Network Upgrade including:
    - Environmental Impact Study requirements
    - Environmental Permitting
- A stormwater easement and/or specific stormwater design BMP's to allow access to and use of the facilities, including a maintenance agreement for said stormwater facilities.
- Conditional Use Permit for Substation
- Any additional land needed for Storm Water Management, Landscaping, and Wetlands/Wetlands Mitigation
- Any other Permitting requirements required by the Network Upgrade

C. APPENDICES

Attachment #1: Preliminary Scoping Summary – 993046 Shawboro – Elizabeth City
Attachment #2: Operating One Line 2021

Project #99-3046 – Rebuild Shawboro to Elizabeth City Line 2021: Shawboro to Elizabeth City

ESTIMATE SCOPE

This is an Estimate Scope for the rebuild of the Shawboro to Elizabeth City 230kV transmission line needed to support the area load in the northeastern part of North Carolina. The line will terminate in the Shawboro Substation (Currituck County) and Elizabeth City Substation (Pasquotank County). This project spans across 3 counties: Pasquotank, Camden, and Currituck counties, North Carolina. The rebuild will consist of DOM Pole suspension H-frames and engineered steel double-deadend H-frame and 3-pole structures. The line will utilize 2-768 ACSS/TW/HS "Maumee" conductor and two (2) DNO-11410 48-fiber OPGW for shielding. Backbones will not be replaced in the scope.

This Estimate Scope and following information encompass the requirements for the entire 10.28 mile upgrade to Line 2021. This Network Upgrade only covers the 3.81 miles of Line 2021 between structures 2021/31 and 2021/62.

The cost estimate is prorated to include only the 3.81 miles of Line 2021 that has not yet been completed.

EXISTING FACILITIES TO BE REMOVED:

1. Remove approximately 10.28 miles of 3-phase 2-545.6 ACAR (15/7) conductor from structure 2021/1A – 2021/92.
2. Remove approximately 10.28 miles of two (2) 3#6 ALWD shield wire from structure 2021/1A – 2021/92
3. Remove two (2) sets of 3-phase risers in the following locations:
    a. Elizabeth City Substation and Shawboro Substation.
4. Remove eight (4) existing Line 2021 steel H-frame structures as follows:
    a. Structures 1, 16, 30, 41
5. Remove four (4) existing Line 2021 steel 3-pole structures as follows:
    a. Structures 6-8, 64
6. Remove thirteen (13) existing Line 2021 wood 3-pole structures as follows:
    a. Structures 3, 11, 14, 15, 19, 28, 29, 31, 33, 37, 52, 62, 90
7. Remove fifty-four (54) existing Line 2021 wood H-frame structures as follows:
    a. Structures 5, 11A, 12, 13, 17, 18, 20-25, 32, 36, 38-40, 42-51, 53, 54, 56-61,

71-89

PERMANENT FACILITIES TO BE INSTALLED:

1. Install thirteen (13) engineered steel 3-pole double deadend structures on foundations **(Reference Drawing 12.156)** as follows:
    a. Structures 3, 6-8, 14-15, 19, 31, 33, 37, 52, 64, 90
2. Install one (1) engineered steel 3-pole double-deadend crossing structure on foundations **(Reference Drawing 12.157)** as follows:
    a. Structure 62
3. Install three (3) engineered steel H-frame double-deadend structures on foundations **(Reference Drawing 12.165)** as follows:
    a. Structures 11, 25, 28
4. Install two (2) weathering steel H-frame double-deadend crossing direct-embeded DOM pole structures with extra-long pipe piles **(Reference Drawing 12.166)** as follows:
    a. Structures 1, 29
5. Install fifty-five (55) weathering steel H-frame suspension direct-embeded DOM pole structures with extra-long pipe piles **(Reference Drawing 12.555)** as follows:
    a. Structures 5, 11A, 12-13, 16-18, 20-24, 32, 36, 38-51, 53-54, 56-61, 71-89
6. Install one (1) direct embed DOM pole H-frame suspension crossing structures **(Reference Drawing 12.556)** as follows:
    a. Structure 30
7. Install approximately 10.28 miles of 3-phase 2-768 ACSS/TW/HS “Maumee” conductor from structure 2021/1A – 2021/92.
8. Install approximately 10.14 miles of (2) DNO-11410 OPGW from structures 2021/1A – 2021/26 and 2021/27-2021/92.
9. Install approximately 0.14 miles of (2) DNO-9809 OPGW from structures 2021/26 – 2021/27.
10. Install two (2) sets of 3-phase risers at Elizabeth City Substation and Shawboro Substation.
11. Install a total of twelve (12) splice boxes. Two (2) at each location as follows
    a. Structures 1A and 92
    b. Structures 26 and 27
    c. Three (3) additional locations between 27 and 92 (assuming 15,000-foot

fiber reel lengths)

EXISITNG FACILITIES TO BE TRANSFERRED OF MODIFIED:

1. Replace existing shield and conductor strain assemblies on the following existing structures:
    a. Three (3) crossing conductor strain assemblies and two (2) OPGW strain assemblies on the following two (2) Line #2021 structures: 1A and 92.
    b. Three (3) conductor suspension assemblies and two (2) OPGW suspension assemblies and arm assemblies on the following ten (10) structures: 2, 4, 34, 35, 55, 66 - 70.
    c. Three (3) crossing conductor suspension assemblies and two (2) OPGW suspension assemblies and arm assemblies on the following eight (8) Line #2021 structures: 9, 10, 26-27, 63, 63A, 65, 91.
2. Install two (2) fiber splice boxes per location on the following existing Line #2021 structures: 1A, 26, 27, and 92 (This amount is included in the total number of splice boxes in previous section).

Project Notes and Assumptions

Conceptual design applied NESC Heavy Loading and 120 mph wind to the line for NESC code cases. The line is actually within the NESC Medium loading area with the majority of the line within the 110-mph wind zone.

1. Regional airports are located within the vicinity of Line 2021. FAA filing may be required. It is assumed that there will be no restrictions on structure heights along the line.
2. Bird deterrents may be necessary on structures 7, 15-27, and 62-71. These areas include seventeen (17) suspension structures requiring oversized bells and bird deterrents on the suspension arms.
3. Switches 202115 and 202118 in the Shawboro Substation will be replaced as apart of the substation scope.
4. Line 2021 crosses Pasquotank River between structures 26 and 27, in this span the line transitions to vertical framing and supports an adjacent distribution line. The current distribution line crossing has an underground neutral wire beneath the river.
5. Approximately one-third of the structures for Line #2021 has been replaced within the last twenty (20) years with steel structures. Wherever possible, these structures were not replaced.
6. Poor soil conditions present within right of way. Need for foundations necessary for majority if not all structures.

7. For structures 2021/26 and 2021/27 conductor tension stay within design load limits for 230kV Double Circuit N-1 Tower.

Attachement #2

Operating One Line Diagram Elezabeth City – Shawboro Line 2021 dated 5/21/2025