PJM Facilities Study Report

For

Network Upgrade N9145

Transition Cycle #1

June 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 N9145. The scope of this Network Upgrade includes the following:

- Upgrade 0.11 Miles of 115kV transmission line 65 from Garner DP to Moon Corner

B. Transmission Owner Facilities Study Results

1. Detailed Scope of work for Network Upgrade N9145:

The following is a detailed description of Transmission Owner Upgrades for Network Upgrade N9145. 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 Summary located in the Appendices, Attachment #1.

2. MILESTONE SCHEDULE FOR COMPLETION OF DOMINION WORK

Facilities outlined in this report are estimated to take 18 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	1	9
Permitting/Procurement	3	17
Construction	17	18

Due to outage congestion, Network Upgrades and/or internal Dominion projects have been identified as having possible outage conflicts with this network upgrade that may affect the estimated milestones listed above. Additional outage sequencing may be required that includes, but not limited to, the following projects:

Project 9922987 – Rebuild Line 65

- Coordinate with other projects on Line 65

3. ASSUMPTIONS IN DEVELOPING SCOPE/COST/SCHEDULE

- The preliminary construction schedule is dependent on outage availability.
- See Attachment 1 and 2– Preliminary Scoping Summary – Substation for additional assumptions
- See Attachment 3 – Preliminary Scoping Summary – Transmission line 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 – Substation Garner DP

Attachment #2: Preliminary Scoping Summary – Substation Moon Corner

Attachment #3: Preliminary Scoping Summary – Transmission

Attachment #1

Project Number: N9145 – Garner DP Substation

Project Description: Replace Line Lead for Line 65

SUBSTATION SCOPE OF WORK

Date: 06/20/2025

Revision Number: 0

Project Summary

Network upgrade N9145 provides for the uprate of Line 65 at Garner DP Substation in Richmond County, Virginia

Assumptions & Clarifications:

1. *The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary.*

Purchase and install substation material – Network Upgrade:

1. Conductors, connectors, and grounding materials as per engineering standards

Attachment #2

Project Number: N9145 – Moon Corner Station

Project Description: Replace Line Lead for Line 65

SUBSTATION SCOPE OF WORK

Date: 06/20/2025

Revision Number: 0

Project Summary

Network upgrade N9145 provides for the uprate of Line 65 at Moon Corner Station in Richmond County, Virginia.

Assumptions & Clarifications:

2. *The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary.*

Purchase and install substation material – Network Upgrade:

2. Conductors, connectors, and grounding materials as per engineering standards

Attachment #3

115 kV LINE #1078

Garner D.P – Moon Corner Substation

PROJECT N9145

PRELIMINARY SCOPING SUMMARY

This project serves to reconductor 115 kV line 1078 from Garner D.P to Moon Corner Substation for approximately 0.11 miles, which is located in Richmond County, VA. See **Figure 1** for the project location. The proposed work requires no additional land and will all be completed within the existing 100 ft right of way. The project will not install any new structures, and a Certificate of Public Convenience and Necessity (CPCN) filing is not expected.

The existing line consists mainly of galvanized steel and weathering steel single circuit H-frame structures built in 2024. The existing single (1) 477 ACSR (24/7) conductor will be replaced with single (1) 768.2 ACSS/TW/HS (20/7) “Maumee” conductor. The existing one (1) 3#6 Alumoweld shield wire and one (1) DNO-11410 OPGW will be replaced with two (2) DNO-11410 OPGW.

Project AG1-135 has scope overlap with project N9145. This scope assumes that project AG1-135 will occur prior to project N9145. Project AG1-135 will renumber line 65 to new line 1078 between Robley Sub and Moon Corner Sub.

Project N9136 has work impacting Garner D.P that could impact this project. It is assumed that project N9145 would move forward independently of project N9136.

Design Considerations:

EXISTING FACILITIES TO BE REMOVED:

1. Remove approximately 0.11 miles of single (1) 477 ACSR (24/7) “Flicker” conductor from existing backbone structure 1078/498 [1059/499] to existing backbone structure 1078/499A.

2. Remove approximately 0.11 miles of one (1) 3#6 Alumoweld shield wire from existing backbone structure 1078/498 [1059/499] to existing backbone structure 1078/499A.

3. Remove approximately 0.11 miles of one (1) DNO-11410 OPGW from existing backbone structure 1078/498 [1059/499] to existing backbone structure 1078/499A.

EXISTING FACILITIES TO BE MODIFIED:

1. Replace three (3) single conductor suspension assemblies with three (3) conductor I-String suspension assemblies [Reference Drawing 31.500] and one (1) shield wire suspension assembly and one (1) OPGW suspension assembly with two (2) OPGW suspension assemblies [Reference Drawing 96.020] on the following one (1) structure:
    a. Structure 1078/499

2. Replace six (6) strain assemblies with six (6) 115kV single conductor strain assemblies [Reference Drawing 31.540], three (3) conductor jumper assemblies with three (3) conductor jumper loops [Reference Drawing 39.225], three (3) training insulators with three (3) training insulators [Reference Drawing 31.640], and two (2) shield wire strain assemblies and two (2) OPGW strain assembly with four (4) OPGW strain assemblies [Reference Drawing 96.060] on the following one (1) structure:
    a. Structure 1078/499B

3. Replace three (3) conductor strain assemblies with three (3) conductor crossing strain assemblies [Reference Drawing 31.340] and one (1) shield wire strain assembly and one (1) OPGW strain assembly with two (2) OPGW strain assemblies [Reference Drawing 96.061] on the following two (2) structures:
    a. Structure 1078/498 (1059/499) and 1078/499A

4. Replace three (3) conductor jumper loop assemblies with three (3) conductor jumper loop assemblies [Reference Drawing 39.225] on the existing one (1) self-supporting switch structure:
    a. Structure 1078/499C

5. In addition to the assemblies to be installed, three (3) floating dead-end assemblies [(2) of 31.540 and (1) of 39.225 per assembly] are included in the estimate for one (1) structure.
    a. The quantity of floating dead ends provided is based on conceptual scope note 1.

PERMANENT FACILITIES TO BE INSTALLED:

1. Install approximately 0.11 miles of 3-phase single (1) 768.2 ACSS/TW/HS (20/7) “Maumee” conductor from existing backbone structure 1078/498 [1059/499] to existing backbone structure 1078/499A.

2. Install approximately 0.11 miles of two (2) DNO-11410 OPGW from existing backbone structure 1078/498 [1059/499] to existing backbone structure 1078/499A.

a. This includes the installation of two (2) total splices as follows:
    i. One (1) fiber splices on existing structures 1078/499A and 1078/498 [1059/499]
        - Project N9145 will utilize the existing one (1) splice on structure 1078/499A and 1078/498 [1059/499] per project AG1-135.

CONCEPTUAL SCOPE NOTES:

1. No PLS-CADD modeling was done for this project. Instead, a design span was used to determine the difference in sags between the existing and proposed conductors at max sag conditions. The resulting change in max sags is approximately 0.87 feet. This change in sags is expected to be feasible to reconductor the line. To account for the increase in sag, this scope is also providing additional floating dead-end assemblies as an alternative method to mitigate potential clearance violations. For every 1' difference in MOT sag, 25% of the suspension structures will have floating dead-end assemblies provided for them.
    a. Design Span Length = 250 feet
    b. Existing Design Tension = 5,000 lbs NESC Heavy
    c. Proposed Design Tension = 5,000 lbs NESC Heavy

2. This project scope assumes that it is independent from other network upgrades included in Transition Cycle 1 – Phase 3. The following projects may impact the project scope if this assumption is incorrect.
    a. N7556 – Rebuild 115 kV Line 65 from Chilton Sub (AD2-074 Tap) to AG1-146 Tap
    b. N7698 – Rebuild 115 kV Line 65 from Chilton Sub (AD2-074 Tap) to Robley Sub (AG1-135 Tap)
    c. N8305 – Rebuild 115 kV Line 65 from Ocran Sub to Whitestone Sub
    d. N9136 – Rebuild 115 kV Line 1078 from Robley Sub (AG1-135) to Garner DP
    e. N9212 – Rebuild 115 kV Line 65 from Lancaster Sub to Ocran Sub
    f. N9218 – Rebuild 115 kV Line 65 from AG1-146 Tap to Lancaster Sub
3. Structures are designed based off the following NESC code parameters: NESC Heavy, 90 mph wind, ¾" Ice & 30 mph wind regardless of project location.

4. It is assumed for detailed engineering that a LiDAR survey will be required.

5. Any potential height restrictions were not accounted for in this design.

6. An existing right of way width of 100' is assumed based on the map viewer provided by Dominion. No additional right of way is required as the proposed reconductoring remains within the assumed 100' right of way.

7. A wetland delineation has not been completed as part of this conceptual package.

8. Wire reel lengths were not accounted for this line design. The assumed pull pad locations to avoid tension splices will be determined during detailed design.

9. It is assumed that two (2) DNO-11410 OPGW would be installed for project N9145 due to the other projects in Transition Cycle #1 – Phase 3 installing two (2) DNO-11410 OPGW throughout the existing line 65 corridor. If this assumption is incorrect, it would need to be re-analyzed in detailed engineering.

CONCEPTUAL ESTIMATE NOTES:

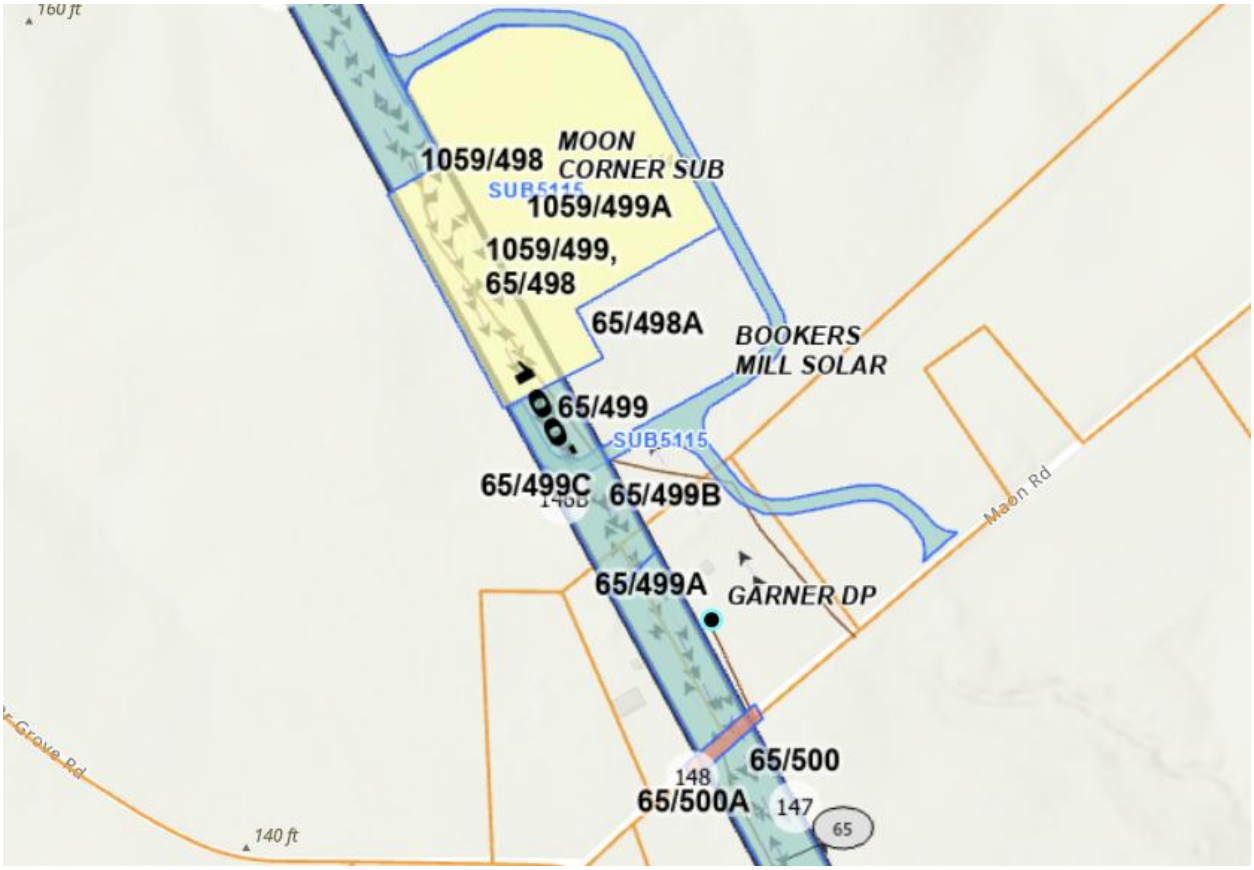
1. The conceptual estimate assumes that a laydown yard is required for this project.

2. Prior to detailed engineering, a full land rights review would be required. A desktop review was completed to estimate the project cost.

3. Access estimate cost inputs include the following assumptions:
    a. Work pad totals based on provided SOW and assumptions from kmz file. Assume 15 mats for tangents and 30 mats for angles at each work pad for reconductor work and 50 mats per pull pad.
    b. DDE structures assumed based off of wire reel lengths - based off of pull pad locations.
    c. Pull pad locations based on location of major road/water crossings and line mileage.
    d. Assuming that existing stone in Substations will be used for access per SOW and that access is existing or will be built by others before the start of construction. Assumes that the substations will be constructed with access roads built to and from Substations and work from inside the substations for Backbone installation.
    e. Assumes no delays due to permitting or real estate issues after work begins. Assume no schedule compressions from SOC/PJM.
    f. Assumes all clearing and forestry costs have been captured by others. No access costs for forestry activities included in this pricing.
    g. Stream crossing based on estimates from aerial imagery.
    h. Assumes that all existing roads may be dressed with stone that can remain at the end of the project. Assumes existing two track roads in many locations will be impermeable. No costs for stone road removal are included.

4. Due to the time allotted to create an estimate, stakeholders were not consulted for their respective costs. Stakeholder costs were derived as follows:
    a. Telecommunications costs were based on a cost per mile based off comparable projects in the TC#1 Phase 3 Cycle. Project N8305, which is rebuilding Line 65 from Ocran Sub to Whitestone Sub, was used to develop the Telecommunications cost per mile due to similar project scope and location.

Figure 1 – Project Location



Required Material Summary

Item	Qty
12,000-Ft 768.2 ACSS/TW "Maumee" Conductor Reels	1