Facilities Study Report

For

Physical Interconnection of

PJM Generation Interconnection Request

Project ID AF2-120

Garner-Northern Neck 115 kV

July 2025 Rev 1

Introduction

This Facilities Study has been prepared in accordance with the PJM Open Access Transmission Tariff Part VII, and, if applicable, the Application and Studies Agreement between the Project Developer and PJM Interconnection, LLC (PJM or Transmission Provider (TP)). The Transmission Owner (TO) is Virginia Electric and Power Company (VEPCO or Dominion).

A. Transmission Owner Facilities Study Summary

1. PROJECT DESCRIPTION

The Project Developer (PD) has proposed a Solar Generating Facility located in Richmond, VA with a designated PJM Project ID of AF2-120. The installed facilities will have a total Maximum Facility Output (MFO) of 62 MW with 37.2 MW of this output being recognized by PJM as Capacity.

2. POINT OF INTERCONNECTION (POI)

AF2-120 is a project sharing a Common Use Upgrade that will interconnect with the Dominion transmission system via a direct connection into AE1-155 (Moon Corner 115 kV) switching station by adding (1) additional breaker. Station AE1-155 (Moon Corner 115 kV) will serve as the interconnection location for AF2-120 & AG1-536.

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

3. POINT OF CHANGE IN OWNERSHIP

The Point of Change in Ownership will be the 115kV disconnect switch 4-hole pad on the transmission line structure outside the AF2-120 & AG1-536 station fence.

4. SCOPE OF PROJECT DEVELOPER INTERCONNECTION FACILITIES

Project Developer will design, build, own, operate and maintain the Project Developer Interconnection Facilities on Project Developer's side of the Point of Change in Ownership (PCO). This includes, but is not limited to:

- Circuit breakers and associated equipment located between the high side of the MPT(s) or GSU(s) and the Point of Change in Ownership.
- Generator lead line from the Generating Facility to the Point of Change in Ownership.
- Relay and protective equipment, telecommunications equipment, and 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 planned Transmission Owner facilities for the physical interconnection of the proposed AF2-120 & AG1- 536 projects to the Dominion transmission system.

These facilities shall be designed according to Dominion Applicable Technical Requirements and Standards. Once built, Dominion will own, operate, and maintain these Facilities.

1. TRANSMISSION OWNER INTERCONNECTION FACILITIES:

The Transmission Owner Interconnection Facilities will include, but not be limited to, the following:

This project serves to install two (2) new 115 kV backbone structures at the existing Moon Corner Substation. One backbone shall be installed inside the substation and the second one shall be installed outside of the substation allowing the Project Developer for the AF2-120 & AG1-536 projects to connect into existing Moon Corner Substation. New backbone structures will connect the developer's transmission line to the Moon Corner Substation. The developer's transmission line will be referred to as Line 1XXX.

Line conductor from the backbone structure to the bus position in the switchyard of the interconnection substation. Conductor and shield wire to be used will be 768.2 ACSS/TW/HS "Maumee" and DNO-11410 OPGW respectively. Existing static poles will be re-used and the shielding on the substation will be re-arranged to adequately shield the existing substation equipment.

Purchase and install substation material – Transmission Owner Interconnection Facilities:

1. Three (3), 115kV, metering accuracy CCVT
2. Three (3), 115kV, 500:5 metering accuracy CT
3. Conductor, connectors, conduits, control cables, foundations, steel structures and grounding material as per engineering standards

Purchase and install relay material – Transmission Owner Interconnection Facilities:

1. One (1), 1340 – 24" dual SEL-411L CD/Fiber line panel
2. One (1), 1425 – dual SEL-735 transmission and generator interconnect metering – (Install SEL-735 relays into existing panel)
3. One (1), 4524 – revenue metering CT make-up box
4. One (1), 4506 – CCVT potential make-up box with metering (P4)
5. One (1), 1323 –SEL-487E/735 PMU and PQ monitoring – Install SEL-487E-4 relays into existing panel

Modification to Existing Facilities – Transmission Owner Interconnection Facilities:

1. Transfer two (2) spans of existing 7#7 Alumoweld shield wire as follows:
    a. Approximately 123 feet from existing backbone structures 1059/499 (65/498) to new developer's backbone 1XXX/1.
    b. Approximately 185 feet from existing backbone structure 1059/499 (65/498) to new developer's backbone structure 1XXX/1.

Permanent Facilities to be Installed – Transmission Owner Interconnection Facilities:

1. Install two (2) 115kV SC engineered steel backbone structures on foundations as follows:

a. Structures 1XXX/1 and 1XXX/2

2. Install approximately 181 feet of 3-phase 768.2 ACSS/TW/HS conductor from new backbone structure 1XXX/1 to new backbone structure 1XXX/2.
3. Install approximately 181 feet of two (2) DNO-11410 OPGW from new backbone structure 1XXX/1 to new backbone structure 1XXX/2.
4. Install one (1) 115kV mounted switch on new developer's backbone structure 1XXX/2.

2. STAND ALONE NETWORK UPGRADES

Dominion's Technical Requirements for Generation Interconnect Substation (EP_REF_2200-23-00) prevents this project from having the option to build for the Stand Alone Network Upgrades.

3. NETWORK UPGRADES

The Network Upgrades will include, but not be limited to, the following:

Expanding existing TO substation:

Moon Corner 115 kV Upgrade (NXXXX)

Moon Corner 115 kV substation will be expanded/upgraded to interconnect projects AF2-120 and AG1-536 with the Dominion transmission system by adding one new breaker.

The objective of this project is to add one new line position and one new 115kV breaker installed at Moon Corner Substation to support the new storage and solar farm built by Project Developer. The existing 115kV three-breaker ring will be modified to a four-breaker ring bus to support the new generation interconnect. The fourth position will be for the 115kV feed for the Project's Collector Station for the new storage and solar farm.

Substation design and relay protection are based on Dominion's Facility Interconnection Requirements, NERC Compliance Procedure FAC-001 (version 23), that is posted on PJM's website. This standard meets or exceeds the PJM Transmission and Substation Design Subcommittee Technical Requirements and the PJM Protection Standards (PJM Manual 7).

The scope of work includes the following:

Purchase and Install - Network Physical Facilities:

1. One (1), 115kV, 3000A, 40kAIC, SF-6 circuit breaker
2. Two (2), 115kV, 2000A, 3-phase center break gang operated switch
3. Three (3), 90kV, 74kV MCOV surge arrester
4. One (1), 24' x 10' control enclosure expansion
5. Station stone as required
6. Station lighting as required
7. Steel structures as required including switch stands, bus supports, and CCVT supports
8. Foundations as required including control house, equipment, and bus support stands
9. Conductors, connectors, conduits, control cables, and grounding materials as per engineering standards

Purchase and Install - Network Relay Protection Equipment:

1. One (1), 1510 – 24” dual SEL-351-7 transmission breaker with reclosing panel
2. One (1), 4510 – SEL-2411 breaker annunciator
3. One (1), 4526_A – circuit breaker fiber optic make-up box

4. OTHER SCOPE OF WORK

The Project Developer will supply and own metering equipment that will provide instantaneous net MW and MVar per unit values in accordance with PJM Manuals M-01 and M-14D, and Sections 8.1 through 8.5 of Appendix 2 to the GIA.

5. MILESTONE SCHEDULE FOR COMPLETION OF TO WORK

Facilities outlined in this report are estimated to take 43 months to construct, from the time the Generator 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
Detailed Design	1	8
Permitting	3	39
Construction	39	43

6. ASSUMPTIONS IN DEVELOPING SCOPE/COST/SCHEDULE

General Assumptions:

1. The estimated procurement lead time for breakers is based on current Dominion pre-ordered breaker production slots. These production slots will be assigned after the agreement is executed.
2. The preliminary construction schedule is dependent on outage availability.
3. We do not anticipate an expansion of the existing switchyard.
4. The POCO structure will be located at the first span outside the switchyard.

Conceptual Design Notes:

1. Currently, the scope and estimate assume Dominion standard spread footer foundations. Once the soil information is available and it is prudent to change the design to “helical pile foundations” the Dominion team should be informed to adjust the project estimate at the

earliest possible opportunity.

2. Crossing insulators will be required on the ahead span of new backbone structure 1XXX/1 and on the back span of new backbone structure 1XXX/2.
3. Existing 7#7 Alumoweld shield wire between existing static poles 1059/499A and 65/498A will remain.
4. Shield and conductor assemblies on the ahead span of new backbone structure 1XXX/2 are assumed to be included in the developer scope.
5. No updated survey data of the transmission line is available at this time; however, survey data will be requested for detailed design.
6. Fiber splices shall be installed on new backbone structures 1XXX/1 and 1XXX/2 in case the developer needs it for protection and communication purposes.
7. It is assumed that new backbone structures will be installed within DEV property. Any real estate needed as part of the project AF2-120 or AG1-536 will be acquired by the developer.
8. A short line outage on Line 65 and Line 1059 will be required for the shielding scope of work. Additionally, a sequenced outage will be required to perform the substation work.
9. Network Upgrade n9267 is included in the Transition Cycle #1 cluster and involves constructing a new 115kV line from Northern Neck to Moon Corner substation. The new line position will include the installation of 2 breakers identified as “F” and “G” in the Appendices, Attachment #1B. Breaker “B” is representative of the interconnection for AF2-120 and AG1-536. Although separate projects, construction efforts and outages may need to be coordinated between the projects.

7. REVENUE METERING REQUIREMENTS

All revenue metering needed for this interconnection project must meet the metering requirements stated in Appendix 2, section 8 of the AF2-120 GIA, and in PJM Manuals M01 and M14D. The details of applicable revenue metering requirements are given in section 4.1.6 Metering and Telecommunications of Dominion’s Facility Interconnection Connection Requirement NERC Standard FAC-001 posted on PJM website.

The revenue metering will be installed on the Transmission Owner side of the Point of Change in Ownership will be installed, owned and maintained by Transmission Owner.

a. Hourly compensated MWh received from the Generating Facility to the TO;
b. Hourly compensated MVARh received from the Generating Facility to the TO;
c. Hourly compensated MWh delivered from the TO to the Generating Facility; and
d. Hourly compensated MVARh delivered from the TO to the Generating Facility.

The Project Developer will access revenue meter via wireless transceivers or fiber cabling to meter with RS-485 or Ethernet communication port for dial-up reads. Project Developer must provide revenue and real time data to PJM from Project Developer Market Operations Center per “PJM Telemetry Data Exchange Summary” document available at PJM.com.

8. LAND REQUIREMENTS FOR INTERCONNECTION SUBSTATION

Land requirements for the Interconnection Substation needed for this interconnection project must meet the requirements in Dominion's Facility Interconnection Requirements, NERC Compliance Procedure FAC-001 (version 23), that is posted on PJM's website.

The Project Developer would be responsible for the following expectations in the area of Real Estate.

- The land required for Dominion's substation and project specific areas around must be deeded over title-in-fee.
- Any additional land needed for Storm Water Management, Landscaping, and Wetlands/Wetlands Mitigation.
- Dominion Real Estate and Counsel will provide standard real estate checklist word document. Process needs to start at least 6 months prior to closing date.
- Required subdivision plat and associated documentation to be reviewed prior to subdividing parcel with the county.
- Suitable Access Road from Substation to a Virginia/North Carolina State Maintained Roadway.
- Dominion will require access road, transmission line and utilities easement to the Substation.
- Any other Land/Permitting requirements required by the Substation.

9. ENVIRONMENTAL AND PERMITING

The Project Developer would be responsible for the following expectations in the area of Environmental and Permitting.

- Assessment of environmental impacts related to the Interconnection Facility and/or Network Upgrades including:

  Environmental Impact Study requirements

  Environmental Permitting

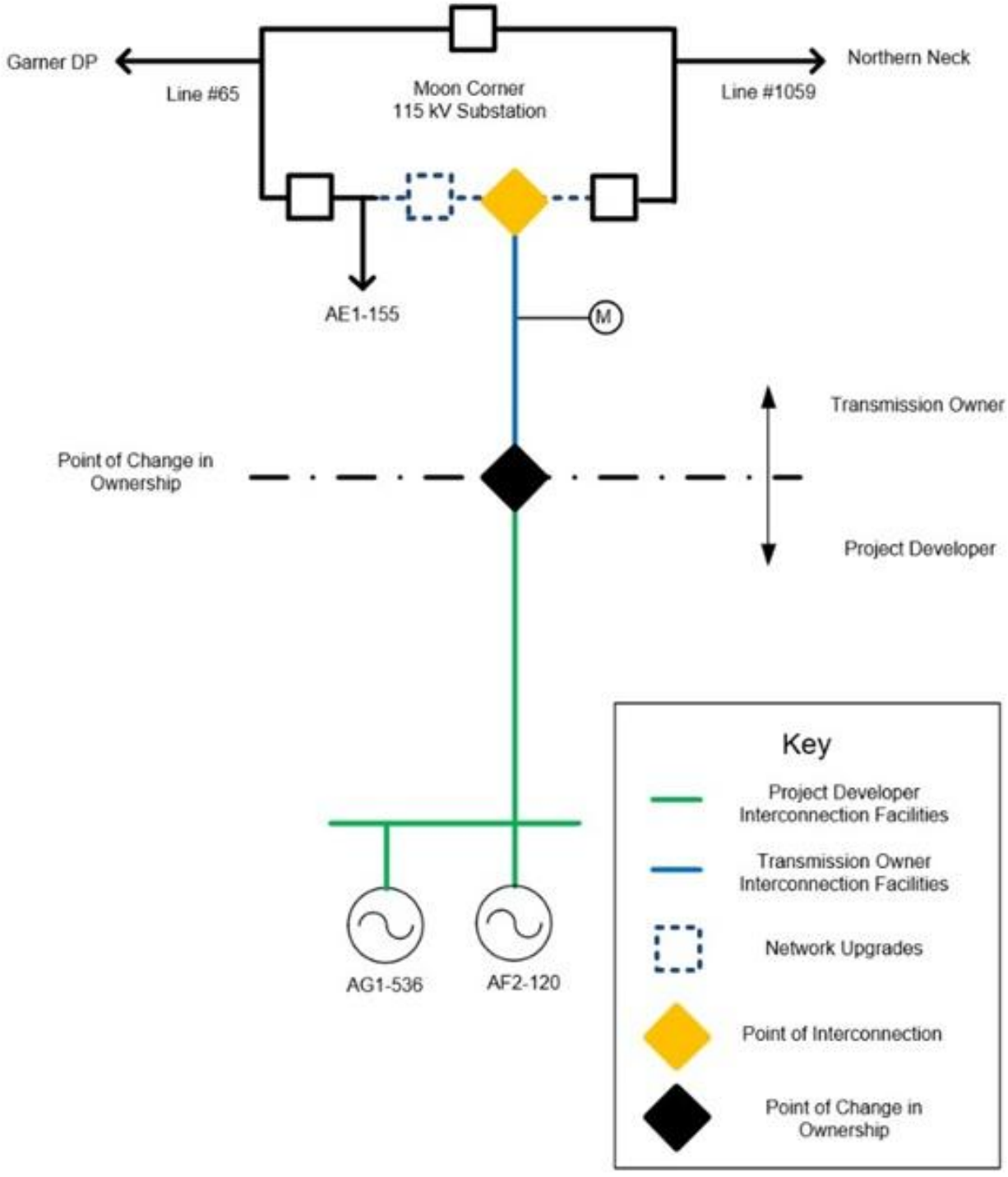
- Dominion will require a stormwater easement for substation specific stormwater design BMP's to allow access to and use of the facilities.

  A maintenance agreement should be in place in perpetuity for said stormwater facilities.

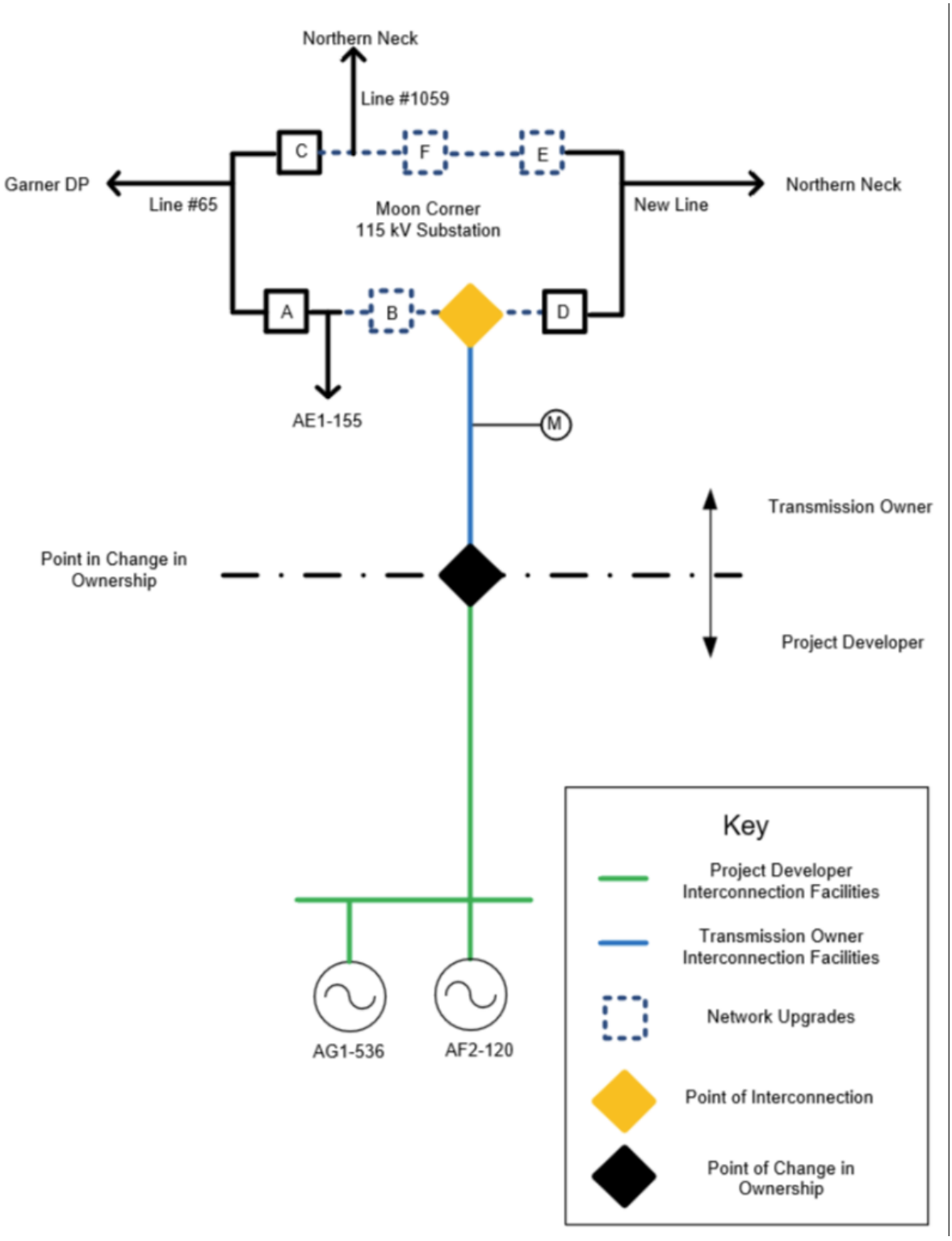
- Conditional Use Permit for Substation
- Any additional land needed for Storm Water Management, Landscaping, and Wetlands/Wetlands Mitigation
- Any other Permitting requirements required by the Substation

C. APPENDICES

Attachment #1A: Single line Diagram for the Physical Interconnection



Attachment #1B: Single line Diagram for the Physical Interconnection and Network Upgrade n9267



Attachment #2: Substation General Arrangement