PJM Facilities Study Report

For

Network Upgrade N9645

Cycle AG1 – 450 & AF2 – 358

Revision 0: August 2025

Introduction

This Facilities Study has been prepared in accordance with the PJM Open Access Transmission Tariff. The Transmission Owner (TO) is Delmarva Power & Light (DPL).

A. Project Description

The System Impact Study for PJM Interconnection Cycle AG1-450 & AF2-358 has identified the need for PJM Network Upgrade N9645. The scope of this Network Upgrade includes the following:

- Upgrade the existing 69kV AF2-358/AG1-450 interconnection three-position ring bus substation by adding one (1) 69kV 10 MVAR capacitor bank in a fourth ring bus position. The new capacitor bank will be switched using a circuit switcher.

B. Transmission Owner Facilities Study Results

1. Detailed Scope of work for Network Upgrade N9645:

The following is a detailed description of Transmission Owner Upgrades for Network Upgrade N9645. 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.

The following major items are to be installed:

- One (1) 69kV 10 MVAR Single Stage Capacitor Bank on a Slab Foundation
- Three (3) 69kV Lightning Arresters on a Steel Support Structure and Drilled Pier Foundation
- One (1) 34kV Resistive Potential Device (for Capacitor Neutral Bus Voltage Sensing) Installed on the Capacitor Bank's Structural Frame
- One (1) 72.5kV Circuit Switcher on a Drilled Pier Foundation
- One (1) 72.5kV SF6 Circuit Breaker (2000A, 40kA) on a Slab Foundation
- Two (2) 72.5kV Group Operated Disconnect Switches with Manual Operators (2000A) Mounted to Existing Steel Switch Support Structures in the Ring Bus
- One (1) 72.5kV Group Operated Disconnect Switch with Manual Operator (1200A) Mounted to a New Steel Switch Support Structure on Drilled Pier Foundations
- Three (3) 72.5kV CVTs on a Steel Support Structure and Drilled Pier Foundation
- Two (2) 69kV Steel Bus Support Structures with Drilled Pier Foundations
- One (1) 70-Foot Steel Lightning Mast on a Drilled Pier Foundation near the Capacitor Bank

- 477 KCMIL AAC Taps for Lightning Arresters and 69kV CVT's
- 4" SPS AL Rigid Bus
- 954 KCMIL ACSR Bus for the Capacitor Bank and Circuit Switcher
- One (1) Standard 20" Relay Panel for Front-Line Protection and Back-Up Protection for the Capacitor Bank and Circuit Switcher using SEL Relays
- One (1) Standard 10" Relay Panel for Control and Stuck Breaker Protection of the New 72.5kV SF6 Circuit Breaker using an SEL Relay
- PVC Conduits from Cable Trench to New 72.5kV SF6 Circuit Breaker, New 69kV CVTs, New 72.5kV Circuit Switcher, and New Resistive Potential Device for the Capacitor Bank
- Control Cables (and Auxiliary Power Cables) as needed from the Control Enclosure to the New 72.5kV SF6 Circuit Breaker, New 69kV CVTs, New 72.5kV Circuit Switcher, and New Resistive Potential Device for the Capacitor Bank
- Grounding Conductor and Fittings to Ground all New Yard Structures and Equipment to the Station Ground Grid as Required

2. MILESTONE SCHEDULE FOR COMPLETION OF DELMARVA POWER & LIGHT WORK

Facilities outlined in this report are estimated to take 18 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
Detailed Design	1	10
Permitting (If Needed)	6	10
Construction	11	18

3. ASSUMPTIONS IN DEVELOPING SCOPE/COST/SCHEDULE

- Since the interconnection substation has been designed as an ultimate six-position ring bus, it is assumed that the fourth position for the capacitor bank can be installed by removing the span of rigid bus at the new breaker's location and replacing bus support insulators with breaker disconnect switches on each side of the new breaker. It is assumed that the bus support insulators are installed on switch support structures such that the structures do not

need to be replaced to add the switches.

- It is assumed that the interconnection substation's yard does not need to be expanded to accommodate the capacitor bank and related equipment.
- No new cable trench is required.
- The interconnection substation's ground grid is adequate and does not need to be upgraded; no grounding calculation is required.
- The auxiliary AC and DC systems are adequate to accommodate the additional equipment, and the control enclosure and termination cabinets have sufficient space for the new relay and control panels and wiring.
- One new lightning mast has been included for conservatism, but a shielding study should be done to determine if it is needed or could be omitted.

4. LAND REQUIREMENTS

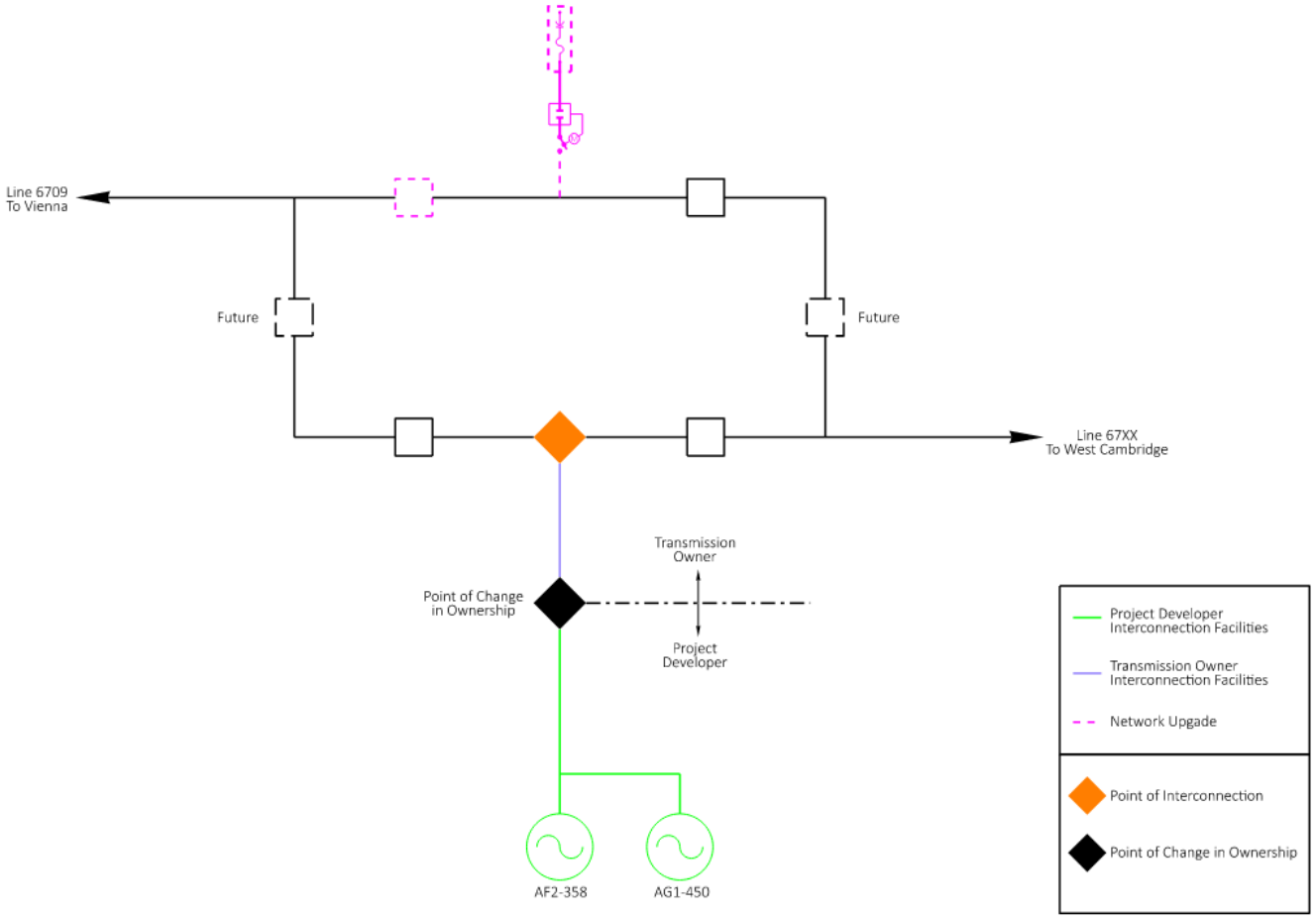
- No new land is required for this network upgrade. It has been assumed that the new capacitor bank and related equipment can be installed in the existing interconnection substation yard.

5. ENVIRONMENTAL AND PERMITING

- If the disturbed area is greater than 5000 square feet, storm water management and erosion/sediment control permitting would be required, but based on the scope, it is likely the disturbed area would remain less than 5000 square feet. As such, it is expected that the permitting for this network upgrade project would be minimal.

C. Appendices

ATTACHMENT #1: SINGLE-LINE DIAGRAM FOR NETWORK UPGRADE N9645


Line 6709
To Vienna
Future
Future
Line 67XX
To West Cambridge
Transmission
Owner
Point of Change
in Ownership
Project
Developer
AF2-358
AG1-450
Project Developer
Interconnection Facilities
Transmission Owner
Interconnection Facilities
Network Upgade
Point of Interconnection
Point of Change in Ownership