



Reliability Analysis Update

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Transmission Expansion Advisory Committee

February 8, 2022

First Review

Baseline Reliability Projects

Process Stage: First Review

Criteria: Light Load Generation Deliverability and N-1

Assumption Reference: 2026 RTEP assumption

Model Used for Analysis: 2026 RTEP Summer case

Proposal Window Exclusion: None

Problem Statement:

The Shawville 230/115/17.2 kV transformer #2A is overloaded for multiple contingencies.

Violations were posted as part of the 2021 Window 1: FG# N1-LLT20, N1-LLT21, GD-LL45, GD-LL46

Existing Facility Rating: 114SN/149SE, 147WN/178WE MVA

Proposed Facility Rating: 422SN/471SE, 530WN/544WE MVA

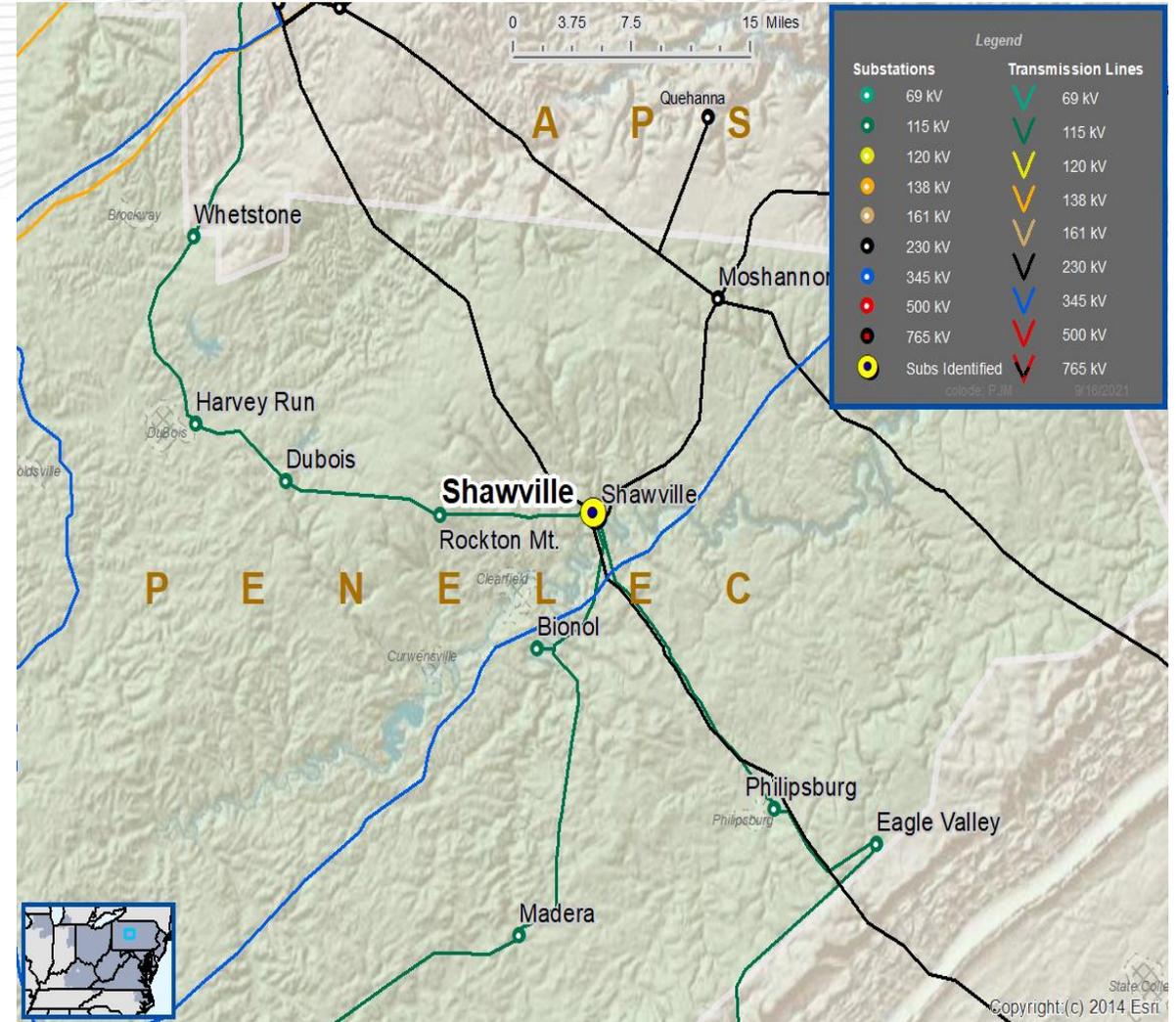
Proposed Solution:

Proposal ID 100 - Install a new 230/115 kV transformer and associated facilities. Replace the Plant's 2B 115-17.2 kV transformer with a larger 230/17.2 kV transformer

Estimated Cost: \$8.775 M

Alternatives: Proposal ID 306 - Replace the Shawville 2A 230/115-17.2 kV Transformer with a larger unit. (\$5.4 M)

Required In-Service: 6/1/2026



Second Review

Baseline Reliability Projects



PSEG Transmission Zone: Baseline

Process Stage: Second Review

Criteria: PSEG FERC Form 715

Assumption Reference: 2026 RTEP assumption

Model Used for Analysis: 2026 RTEP Summer case

Proposal Window Exclusion: None

Problem Statement:

The Lawrence 230/69 kV transformer # 220-4 has been identified for replacement based on equipment performance, condition assessment and system needs.

Violations were posted as part of the 2021 Window 3: FG# PSEG-01

Existing Facility Rating: 297SN/375SE, 344WN/464WE MVA

Proposed Facility Rating: 313SN/384SE, 369WN/454WE MVA

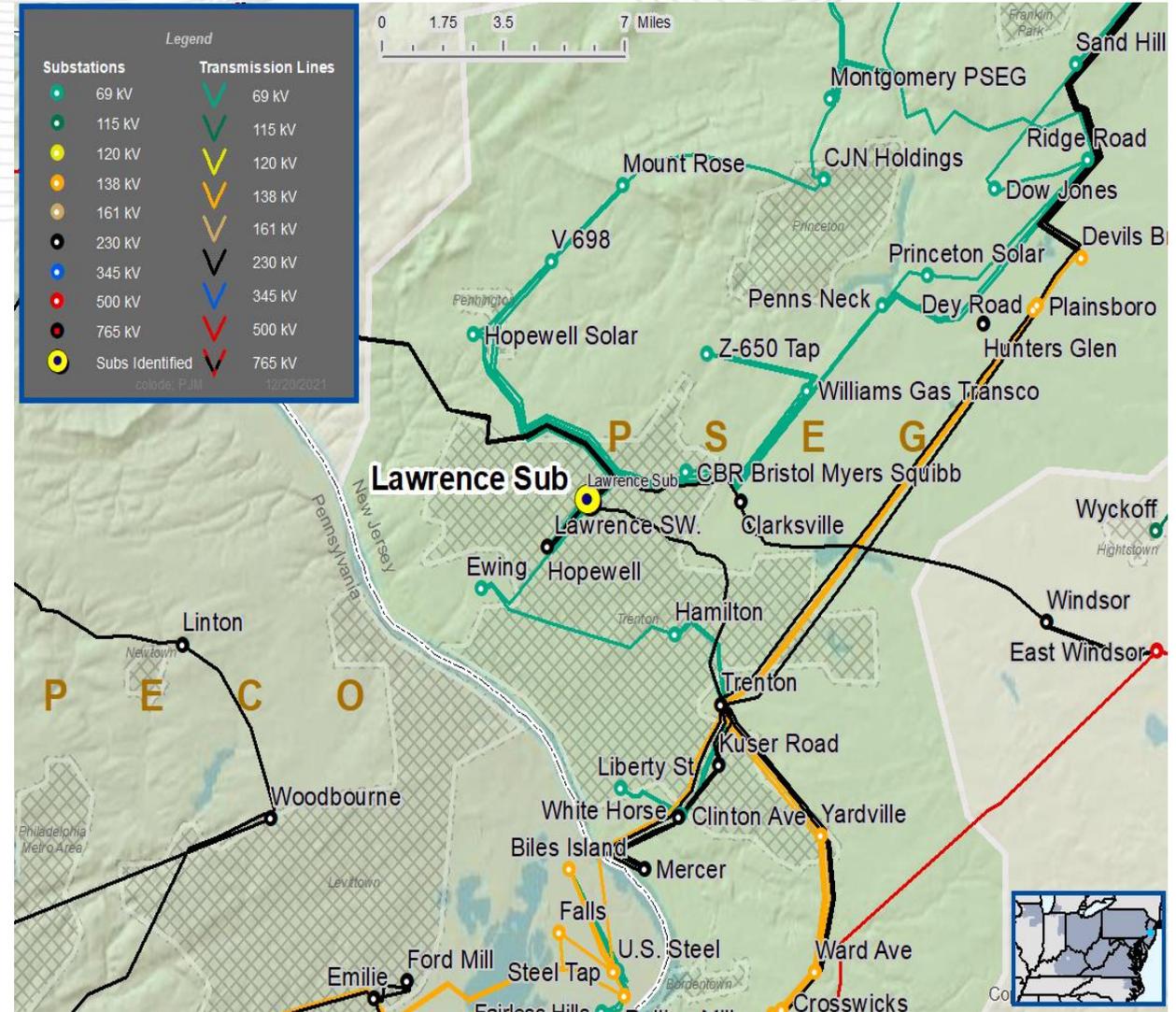
Recommended Solution:

Replace Lawrence Switching Station 230-69kV transformer 220-4 and its associated circuit switchers with a new larger capacity transformer with Load Tap Changer (LTC) and new dead tank circuit breaker. Install a new 230kV gas insulated breaker, associated disconnects, overhead bus, and other necessary equipment to complete the bay within the Lawrence 230kV Switchyard. (b3704)

Estimated Cost: \$13.36 M

Alternatives: N/A

Required In-Service: 6/1/2026



Process Stage: Second Review

Criteria: PSEG FERC Form 715

Assumption Reference: 2026 RTEP assumption

Model Used for Analysis: 2026 RTEP Summer case

Proposal Window Exclusion: None

Problem Statement:

The Athenia 230/138 kV transformer # 220-1 autotransformer has been identified for replacement based on equipment performance, condition assessment and system needs. . The 220-1 Auto-Transformer at Athenia has been heavily gassing for many years. The transformer has been de-gassed multiple times due to high levels of combustible gas in the main tank.

Violations were posted as part of the 2021 Window 3: FG# PSEG-02

Existing Facility Rating: 606SN/807SE, 717WN/954WE MVA

Proposed Facility Rating: 606SN/807SE, 717WN/954WE MVA

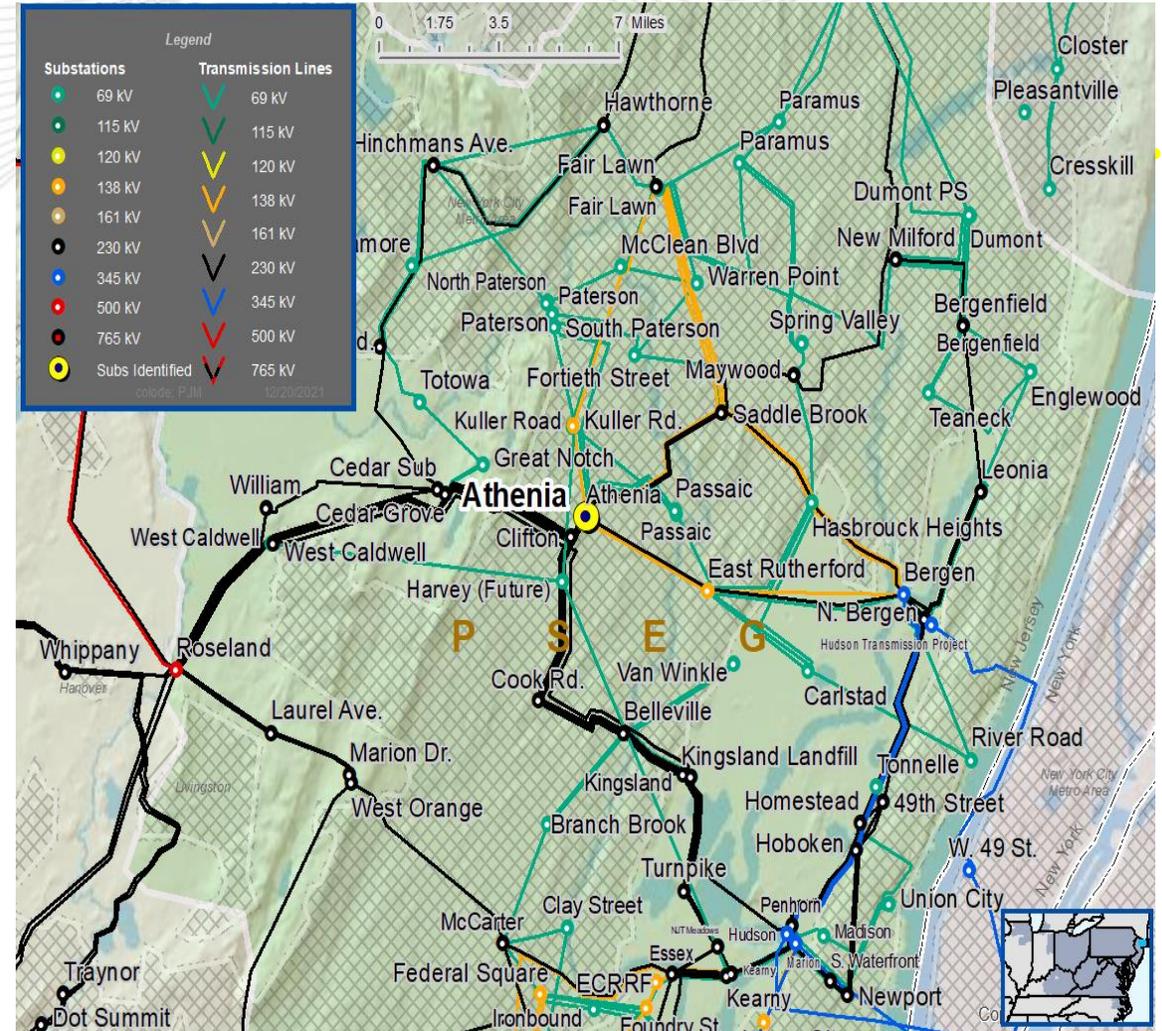
Recommended Solution :

Replace existing 230/138kV Athenia 220-1 transformer. (b3705)

Estimated Cost: \$13.04 M

Alternatives: N/A

Required In-Service: 6/1/2026





PSEG Transmission Zone: Baseline

Process Stage: Second Review

Criteria: PSEG FERC Form 715

Assumption Reference: 2026 RTEP assumption

Model Used for Analysis: 2026 RTEP Summer case

Proposal Window Exclusion: None

Problem Statement:

The Fair Lawn 230/138 kV #220-1 Auto-Transformer has been identified for replacement based on equipment performance, condition assessment and system needs. The transformer has been generating acetylene since 2015 along with other key combustible gasses.

Violations were posted as part of the 2021 Window 3: FG# PSEG-03

Existing Facility Rating: 596SN/808SE, 685WN/874WE MVA

Proposed Facility Rating: 470SN/674SE, 554WN/739WE MVA

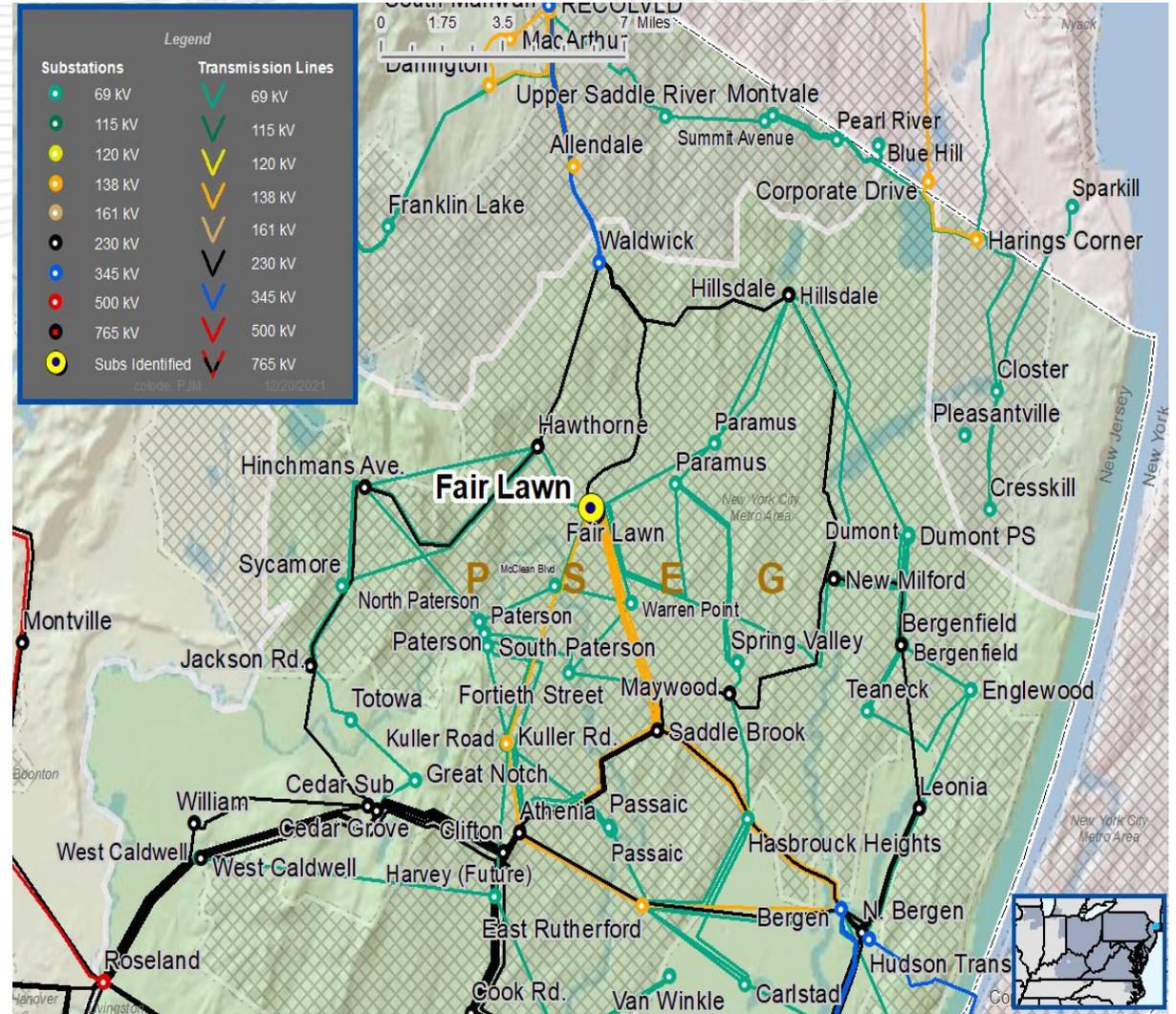
Recommended Solution:

Replace Fair Lawn 230-138kV transformer 220-1 with an existing O&M system spare at Burlington. (b3706)

Estimated Cost: \$4.454 M

Alternatives: N/A

Required In-Service: 6/1/2026





PJM RTEP 2021 Window 2

- Window opened on 11/03/2021
- Window closed on 01/12/2022
- For this Window, PJM seeks technical solutions, also called proposals, to resolve potential reliability criteria violations on facilities identified below in accordance with all applicable planning criteria (PJM, NERC, SERC, RFC, and Local Transmission Owner criteria).
- 10 total proposals submitted from 3 different entities
 - 4 Greenfield
 - 6 Upgrades
- Cost Estimates: Approximate range from \$4.2M to \$62M
- 2 Proposals identified with Cost Containment

Proposal ID #	Project Type	Project Description	Total Construction Cost M\$	Zone	kV Level	Analysis	Flowgate
176	UPGRADE	Reconductor 345kV E. Frankfort to Crete to St John transmission line	35.7	ComEd	345	Winter Gen Deliv	GD-W2-W5, GD-W2-W6
805	GREENFIELD	Cedar Run 345kV Transmission Project	16.7	ComEd	345	Winter Gen Deliv	GD-W2-W5, GD-W2-W6
253	UPGRADE	Rebuild 345 kV Lines 6607/6608 East Frankfort - Crete and 94507/97008 Crete - St. John	62.6	ComEd	345	Winter Gen Deliv	GD-W2-W5, GD-W2-W6, GD-W2-259, GD-W2-258
994	UPGRADE	Install Series Inductor on Line 94507 Crete - St. John	12	ComEd	345	Winter Gen Deliv	GD-W2-W5, GD-W2-W6, GD-W2-259, GD-W2-258
408	UPGRADE	Install 345 kV Bus Tie Circuit Breaker at Dresden Station	4.26	ComEd	345	Winter Gen Deliv	GD-W2-W211, GD-W2-W214, GD-W2-51
442	GREENFIELD	East Spring 345kV Transmission Project	10.4	ComEd	345	Winter Gen Deliv	GD-W2-W211, GD-W2-W214
977	UPGRADE	Rebuild 345 kV double circuit Lines 94507 and 97008 Crete - Indiana	17.1	ComEd	345	Winter Gen Deliv	GD-W2-W5, GD-W2-W6, GD-W2-259, GD-W2-258
727	UPGRADE	Swap 345kV transmission line at Green Acres and reconductor Crete to St John 345kV line	22.03	ComEd	345	Winter Gen Deliv	GD-W2-W5, GD-W2-W6
117	GREENFIELD	Series reactor along Crete-St John 345 kV line and reconductor Crete to St John 345kV line	27.08	ComEd	345	Winter Gen Deliv	GD-W2-W5, GD-W2-W6
335	GREENFIELD	Loop-in Bloom –Davis 345kV line at New NEET proposed Illinois Substation + Loop-in NEET owned Crete- St John 345 kV line at new NEET proposed State Line 345 kV sub	47.12	ComEd	345	Winter Gen Deliv	GD-W2-W5, GD-W2-W6

**PJM RTEP Solutions:
Harmony Village - Greys Point (Line #1021) and
Rappahannock - White Stone (Line #65) 115kV lines
overloads**



Dominion Transmission Zone: Baseline Harmony Village/White Stone Area

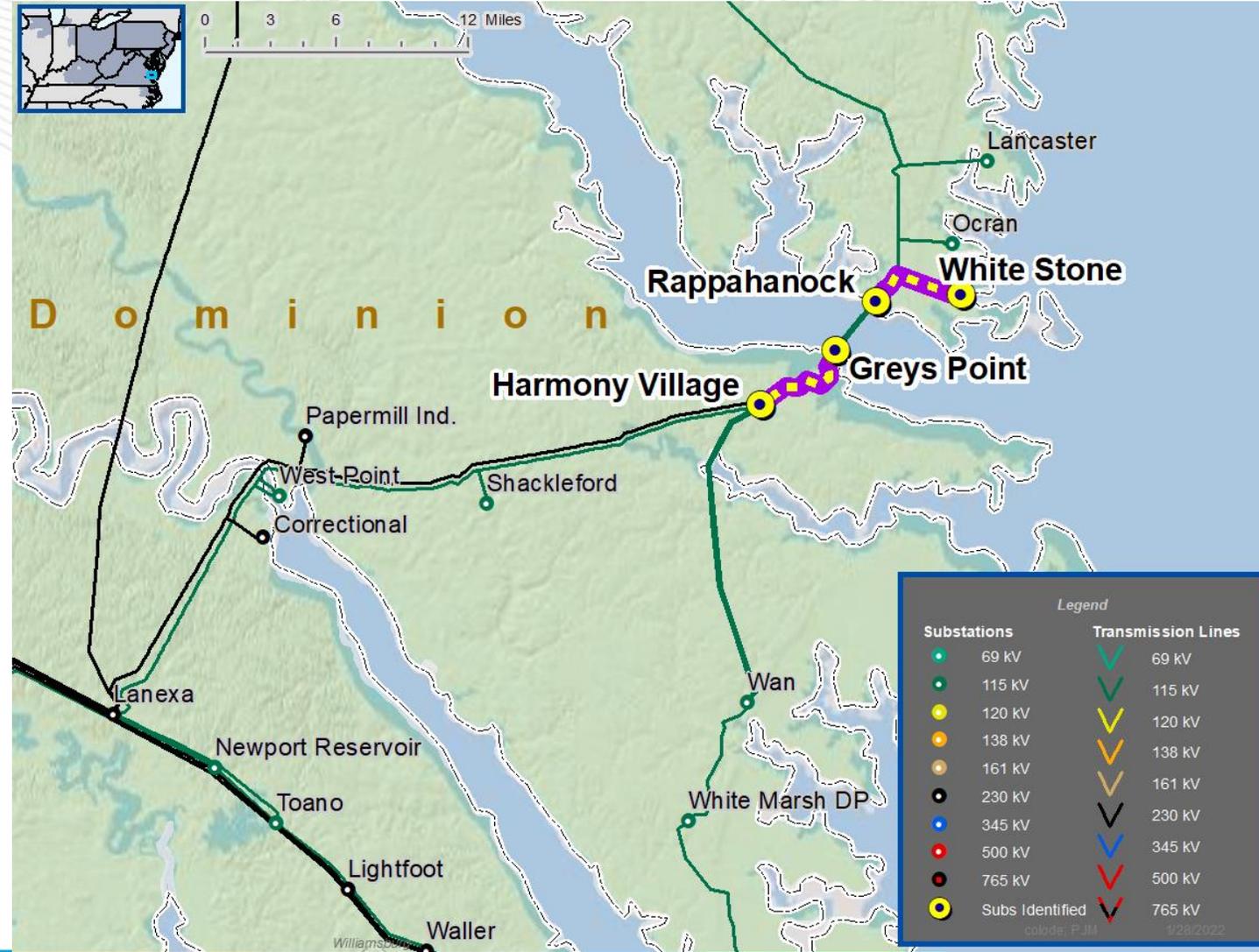
Process Stage: First Review

Criteria: Operational Performance

Proposal Window Exclusion: Immediate Need

Problem Statement:

- 115kV Line #1021 segment from Harmony Village to Greys Point and 115kV Line #65 segment from Rappahannock to White Stone are experiencing significant thermal overloads requiring Emergency Procedures during the current outage of 230kV Line #224 Lanexa to Northern Neck that is being rebuilt as an End-of-Life project (b3089). The outage is expected to continue through 2023.



Branch	SN/SE/WN/WE (MVA)
3GREYSPT – 3HARMONY 115kV	146/146/185/185
3RAPPAHNCK– 3WHIT STONE 115kV	146/146/185/185

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Dominion Transmission Zone: Baseline Harmony Village/White Stone Area

Proposed Solution:

- Reconductor approximately 0.57mi of 115kV Line #1021 from Harmony Village to Greys Point with 768 ACSS to achieve a summer emergency rating of 237MVA. The current conductor is 477 ACSR. **(b3707.1)**
- Reconductor approximately 0.97mi of 115 kV Line #65 from Rappahannock to White Stone with 768 ACSS to achieve a summer emergency rating of 237MVA. The current conductor is 477 ACSR. **(b3707.2)**

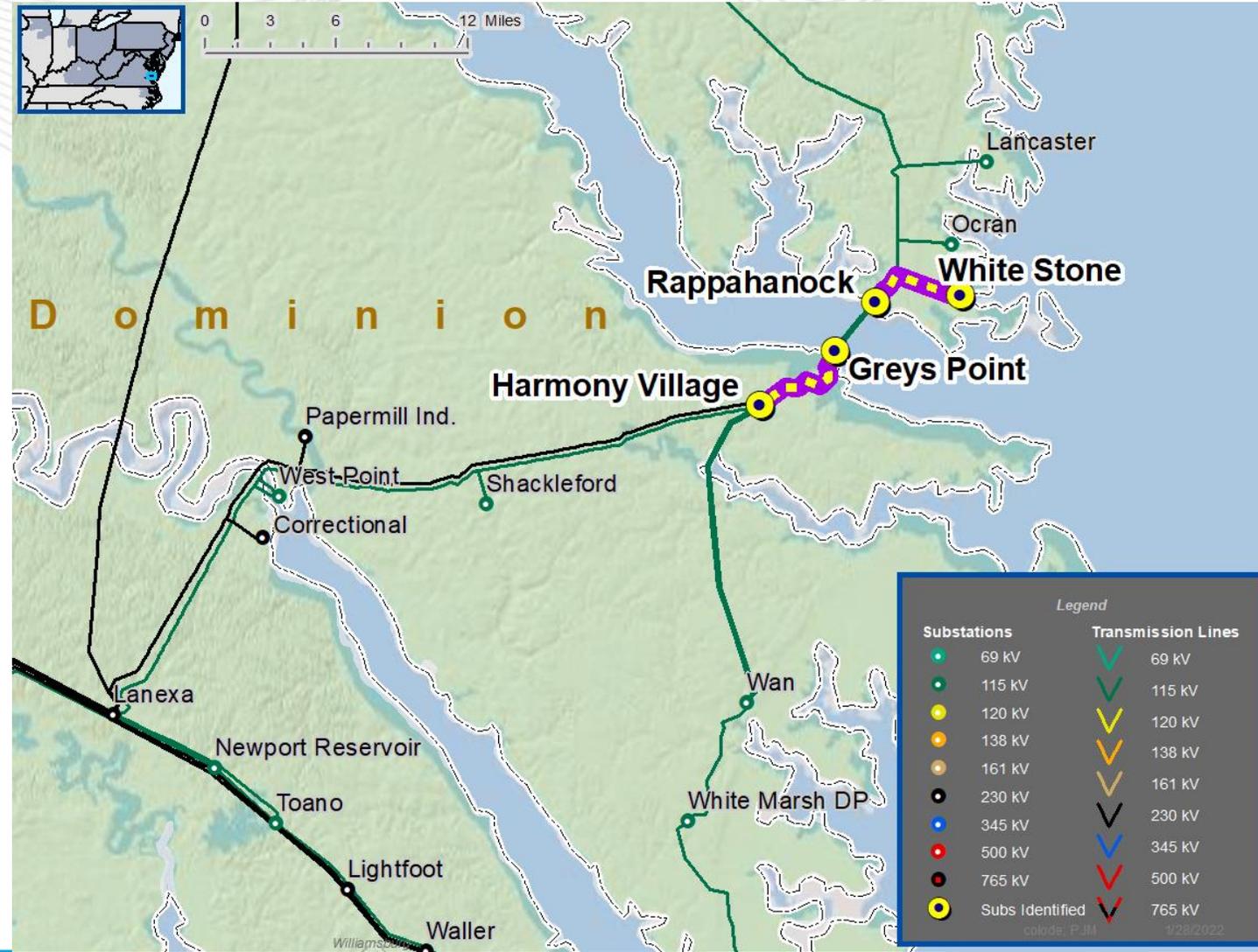
Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
3GREYSPT – 3HARMONY 115kV	237/237/279/279
3RAPPAHNCK– 3WHIT STONE 115kV	237/237/279/279

Total Estimated Cost: \$ 3.0M

Projected In-Service: 5/31/2022

Project Status: Conceptual / Planning



- PJM System Planning will present the Operational Performance baseline upgrade for the two 115kV line segments of Harmony Village – Greys Point and Rappahannock to White Stone as follows.
 - February 8 – Transmission Expansion Advisory Committee (TEAC)
 - February 16 – PJM Board Approval
 - May 31 – Projected In-Service date



2022 RTEP

- Currently working through case building
 - Currently expect case delivery to begin initial analysis on February 18
- PJM requested the Confidential Candidate EOL Needs List from Transmission Owners on February 18
- Targeting April timeframe for initial preliminary Summer Peak analysis posting on the competitive planning page

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Reliability Analysis Update



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Version No.	Date	Description
1	2/2/2022	<ul style="list-style-type: none">• Original slides posted

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