



Reliability Analysis Update

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PJM Transmission Planning

Transmission Expansion Advisory Committee
June 4, 2024

- 2024 Window 1 Updates
- 2023 Window 2 Projects 2nd Read
- 2023 Window 2 Projects 1st Read



2024 RTEP Window 1 Updates

Baseline Reliability Projects



2024 Window 1 – Progress and Timeline Update

- Current schedule
 - Updated Preliminary model posted on May 28th, 2024
 - Requesting FERC Form 715 analysis results from transmission owners by June 21st, 2024
 - Targeting open 2024 RTEP proposal Window 1 in the mid of July



2024 7/8-Year RTEP Window Baseline Reliability Projects

- With the NJ SAA 2.0 Window on pause: The 2024 7/8 Year RTEP Analysis will focus on:
 - Using an 8-year RTEP case to inform:
 - Deliverability of full 7,500 MWs of SAA 1.0 capability (remaining 3,742 MW beyond the 2028-29 level) of generation from SAA 1.0 expected to be in service 2031-2032 (reliability)
 - Account for load growth (5 to 8 years gap) and longer-term impacts of deactivations
 - New 3,500 MW of generation requested with SAA 2.0 expected in service starting 2033 (public policy)
- Solutions will focus on meeting the 5-Year out reliability needs and consideration of 7/8 year out reliability needs (long lead primarily) for efficiency and cost effectiveness considerations.



2023 RTEP Window 2 Updates

Baseline Reliability Projects

2023 Window 2 opened on March 6 and closed on April 5

Window to address the following needs:

- | | | |
|--|--|--|
| <ul style="list-style-type: none">▪ AEP forecasted load growth in the Columbus, Ohio area. | <ul style="list-style-type: none">▪ Thermal issues in PSEG around Hinchmans area | <ul style="list-style-type: none">▪ 500kV line #588 Fentress -Yadkin End of Life (EOL) in Dominion |
|--|--|--|

- 2022 Window 3 selected solutions are included in the base cases.

PJM received 21 proposals from six entities
(15 Upgrades and 6 Greenfield)

Three non-incumbents:

AEP Footprint:
3 x proposing entities

PSEG Footprint:
2 x proposing entities

Dominion Footprint (EOL):
No competing proposals

Proposal costs range from \$0.449M to \$229.3M

Five proposals with cost containment

2023 RTEP Window 2 Second Review

Baseline Reliability Projects

Dominion Transmission Zone: Baseline 500kV Line #588 Rebuild (End of Life Criteria)

Process Stage: First Review

Criteria: Dominion's FERC 715 Planning Criteria (C.2.9 – End of Life Criteria)

Assumption Reference: FERC 715 Planning Criteria

Model Used for Analysis: 2023 Series 2028 RTEP cases

Problem Statement:

- Line #588 is approximately 13.66 miles of 500kV single circuit transmission line from Yadkin to Fentress. It was built on series 5 Corten towers that have been problematic for many years and fallen into a pattern where Dominion can expect to return for future maintenance if the line is not rebuilt by the requested target date. These structures were installed in 1975 and are approaching the end of service life.
- Third party assessment has determined that the towers have corroded to a point where they exhibit pre-mature thinning of structure members and pack-out at joints. If left unaddressed these issues could result in failure of structures and potentially the collapse of the line. (DOM-O1)

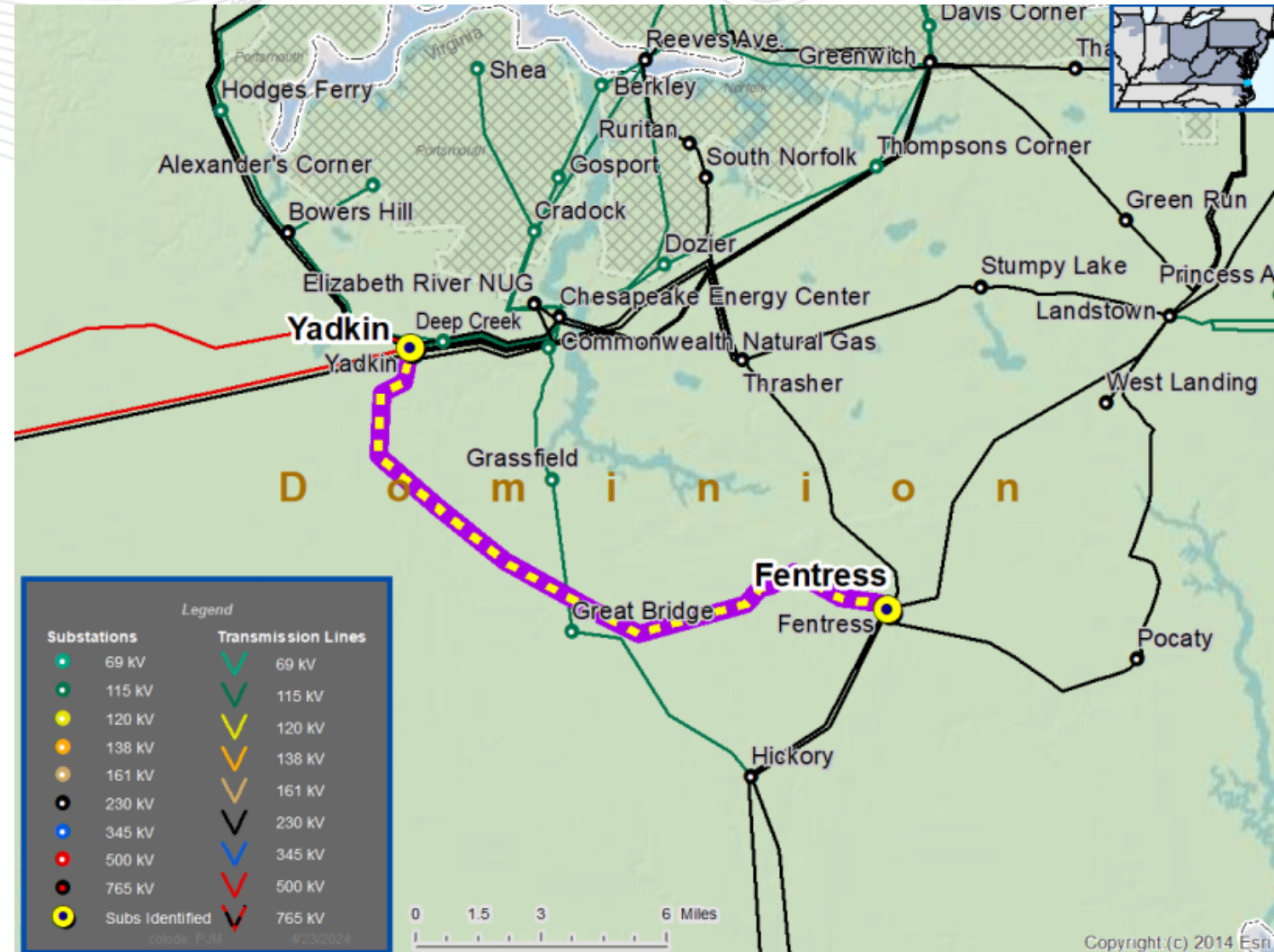
Existing Facility Rating: 3397/3426 MVA Summer (Normal/Emergency)

3984/4018 MVA Winter (Normal/Emergency)

Proposed Facility Rating: 4357/4357 MVA Summer (Normal/Emergency)

5155/5155 MVA Winter (Normal/Emergency)

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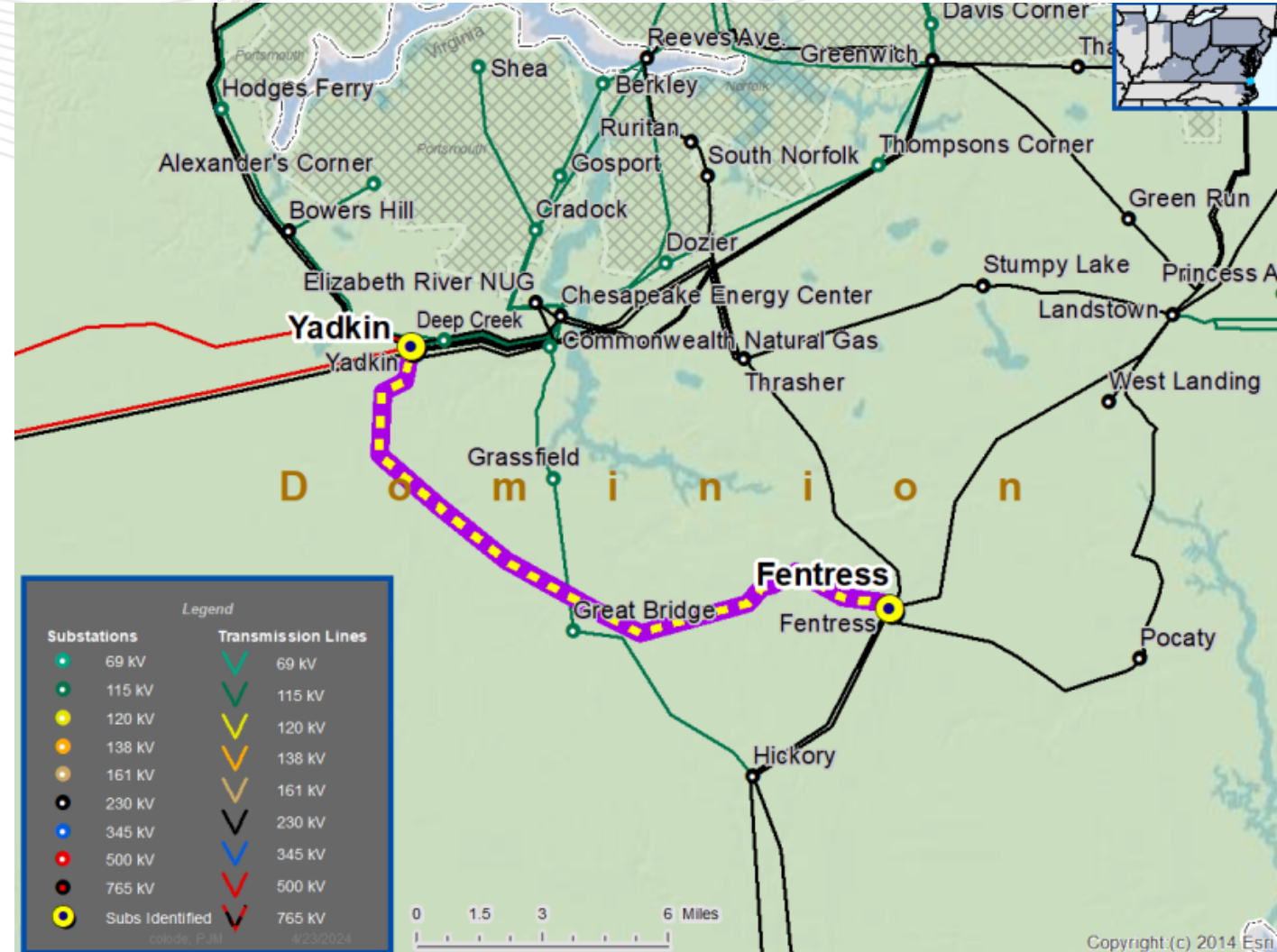
Dominion Transmission Zone: Baseline 500kV Line #588 Rebuild (End of Life Criteria)

PJM Recommended Solution: Proposal 2023-W2-367:

- Rebuild approximately 13.51 miles of 500 kV line #588 from structure 588/184 inside Yadkin substation to structure 588/254 outside of Fentress substation. **(b3850.1)**
- Line #588 terminal equipment at Yadkin substation will be upgraded to a rating of 5000A. Since the new 500kV line will be using fiber, the wave trap will be removed and the line protection scheme will be updated. **(b3850.2)**
- At Fentress substation, since the new 500kV line will be using fiber, the wave trap will be removed and the line protection scheme will be updated. **(b3850.3)**

Estimated Cost: \$79.7 M

Required In-Service: 6/1/2028



2023 RTEP Window 2 First Review

Baseline Reliability Projects



AEP Transmission Zone: Baseline 2023 RTEP Window 2 Clusters 4 & 6

Process Stage: First Read

Criteria: Summer/Winter Generator Deliverability

Assumption Reference: 2023 RTEP assumptions

Model Used for Analysis: 2028 RTEP cases

Proposal Window Exclusion: None

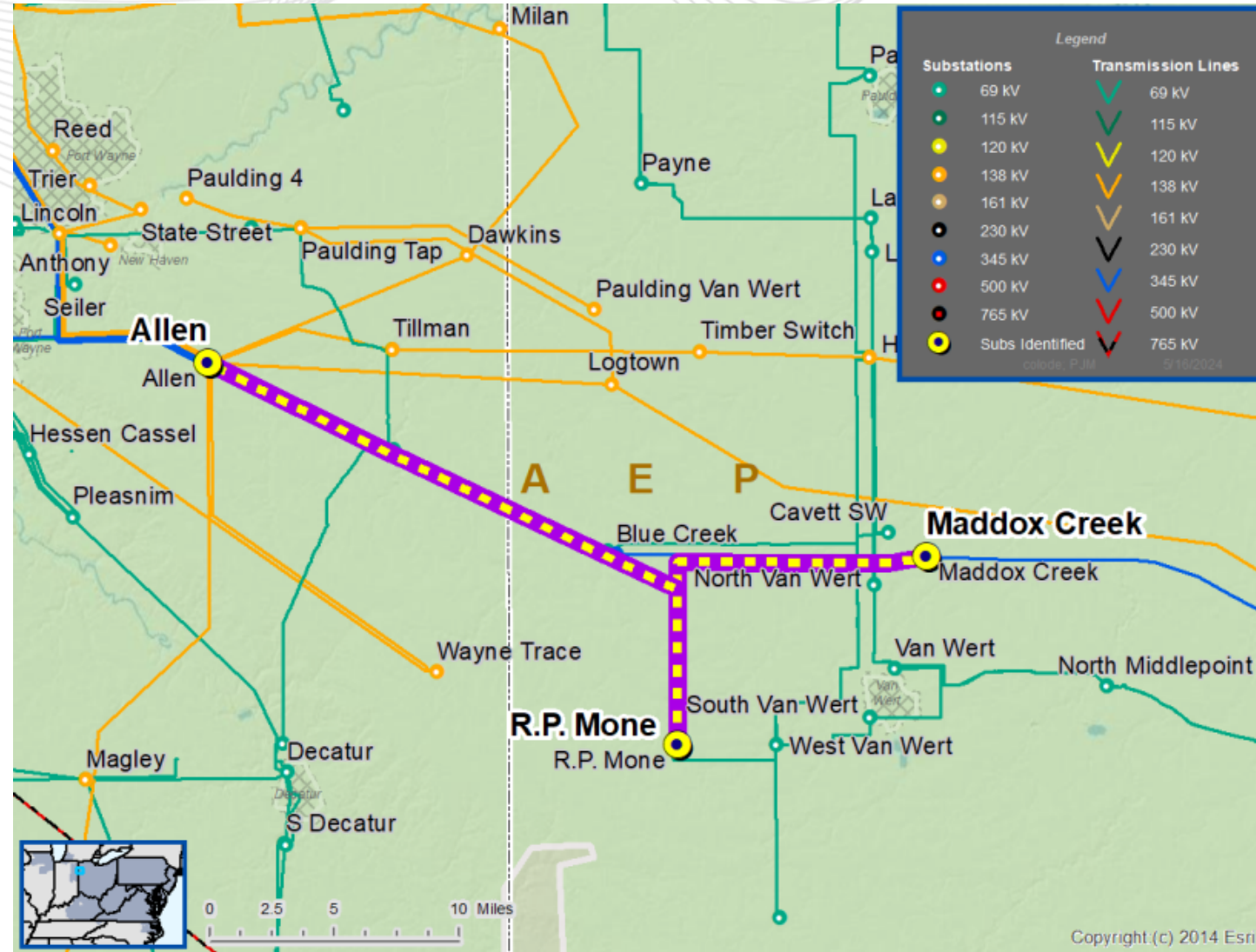
Problem Statement:

Cluster 4: 2023W2-GD-S170, 2023W2-GD-S142, 2023W2-GD-W213, 2023W2-GD-W58

In 2028 RTEP summer and winter cases, the R.P. Mone – Maddox Creek 345 kV line is overloaded in generator deliverability test for both N-1 and N-2 outages

Cluster 6: 2023W2-GD-W12

In 2028 RTEP winter cases, the Allen – R.P. Mone 345kV line is overloaded in generator deliverability test for a N-1 outage





AEP Transmission Zone: Baseline 2023 RTEP Window 2 Clusters 4 & 6

- As part of the 2023 RTEP Window #2, projects listed in the table below were proposed to address the violations in cluster 4, 6 or 4&6
- 7 total proposals submitted: all Upgrades from the same proposing entity - AEP

Proposal ID #	Cluster	Project Description	Total Cost (\$M)	Analysis Summary
561	Cluster 4	Reconductor the 9.4 mile 345 kV line between RP Mone and Maddox Creek stations.	16.719	Solves the target FGs, causes overload on Maddox -E. Lima 345kV line, increases the loading on Allen - RP Mone line
957	Cluster 4	Rebuild the 9.4 mile 345 kV line between RP Mone and Maddox Creek stations.	39.034	Solves the target FGs, causes overload on Maddox -E. Lima 345kV line, increases the loading on Allen - RP Mone line
683	Cluster 6	Mitigate three clearance issues on Allen - RP Mone 345 kV line to allow line to operate to conductor's designed rating.	0.450	Solves the target FG. Margin is not big though (93.4%)
169	Cluster 6	Reconductor approximately 18.6 miles of 345 kV line between Allen and RP Mone stations.	32.486	Solves the target FG, increases the loading on the RPMORE-Maddox, causes overload on the Maddox - E Lima 345KV line
819	Cluster 6	Rebuild approximately 18.6 miles of 345 kV line between Allen and RP Mone stations.	49.875	Solves the target FG, increases the loading on the RPMORE-Maddox, causes overload on the Maddox - E Lima 345KV line
11	4 & 6	Install 345 kV Phase Shifting Transformer at East Lima station on line towards Fostoria Central.	40.301	Solves the target FGs ,causes overload on E. Lima transformer #2, W. Fremont - Fremont AEP/ATSI 138KV tie
334	4 & 6	String the open positions of the 345 kV line between Maddox Creek and Sorenson stations to establish a new 345 kV circuit between the two stations (42.6 miles). Reconductor the existing conductors on the line. Perform station work at Maddox Creek, Sorenson, and East Lima stations.	134.397	Solves the target FGs



AEP Transmission Zone: Baseline 2023 RTEP Window 2 Clusters 4 & 6

R.P. Mone – Maddox Creek 345kV line (in AEP EOL list)

- 9.4 miles of Paper Expanded (PE) Conductor originally installed in 1955
- All but one of the existing structures on the line were originally installed in 1955

Allen – R.P. Mone 345kV line (in AEP EOL list)

- 24.6 miles of Paper Expanded (PE) Conductor originally installed in 1955 and 1968
- All but two of the existing structures on the line were originally installed in 1955 or 1968

Options	Proposal #169 (Allen – R.P. Mone reconductor) Proposal #561 (R.P. Mone – Maddox Creek reconductor) Portion of Proposal #334 (Station work at E. Lima & Maddox Creek)	Proposal #819 (Allen – R.P. Mone rebuild) Proposal #957 (R.P. Mone – Maddox Creek rebuild) Portion of Proposal #334 (Station work at E. Lima & Maddox Creek)	Proposal #334
Cost (\$M)	52.766	92.470	134.397
EOL factors	Partially addresses the EOL issues for both Allen - RP Mone and RP Mone - Maddox Creek 345kV circuits	Addresses the EOL issues for both Allen - RP Mone and RP Mone - Maddox Creek 345kV circuits	Partially addresses the EOL issues for both Allen - RP Mone and RP Mone - Maddox Creek 345kV circuits



AEP Transmission Zone: Baseline 2023 RTEP Window 2 Clusters 4 & 6

PJM Recommended Solution:

- Proposal #819: Rebuild Allen –R.P. Mone 345kV line (18.6 miles).
Estimated Cost: **\$49.875M**
- Proposal #957: Rebuild R.P. Mone – Maddox Creek 345kV line (9.4 miles). **Estimated Cost: \$39.034M**
- Portion of Proposal #334:
 - Replace breakers 'B1' and 'B' at Maddox Creek. **Estimated Cost: \$1.8M**
 - Replace two 345kV breakers 'M' and 'M2' at East Lima Station. **Estimated Cost: \$1.761M**

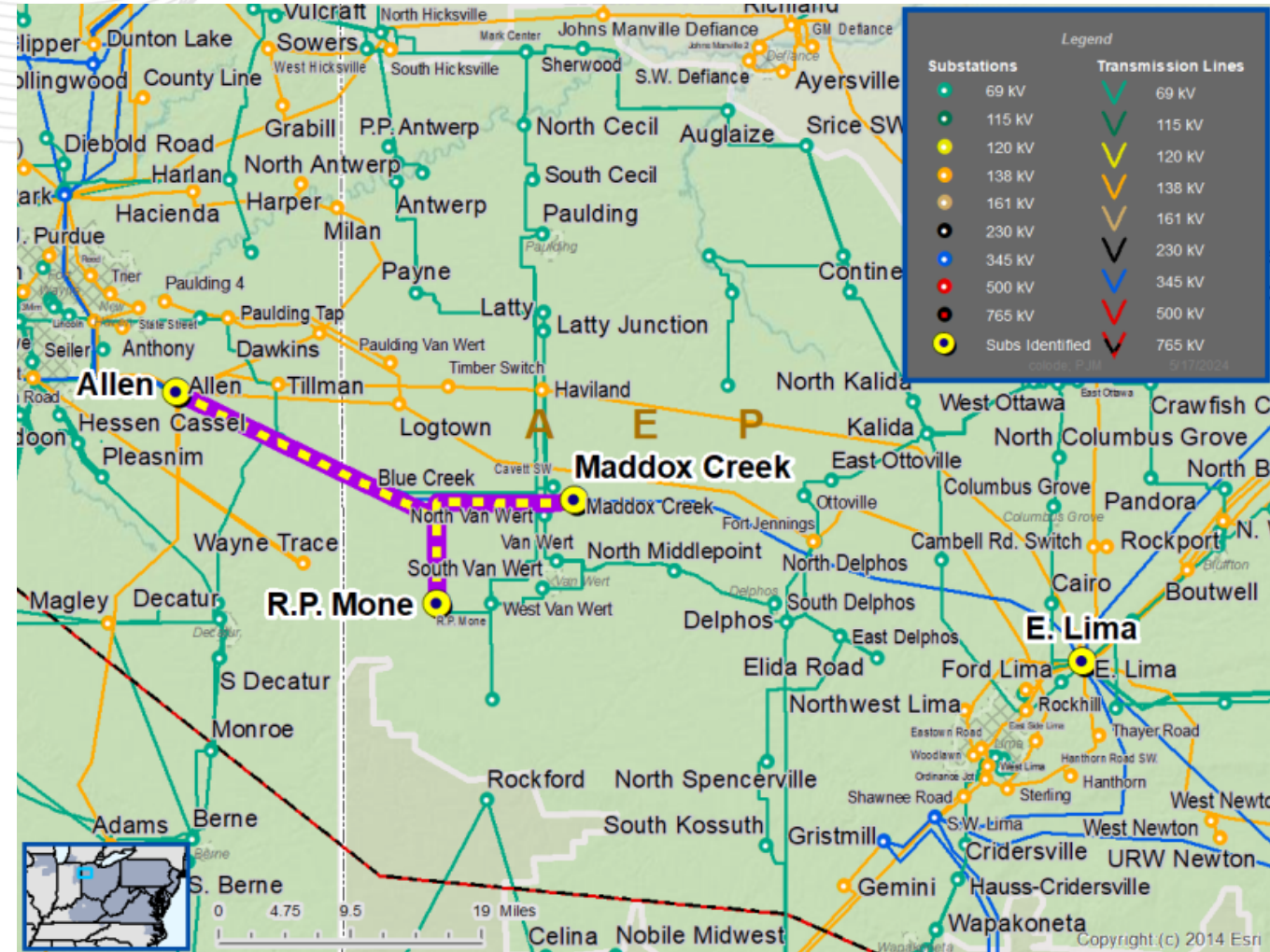
Total Estimated Cost: \$92.470 M

Required IS Date: 6/1/2027

Projected IS Date: 6/1/2027

Facility Ratings:

Branch	Existing Facility Ratings SN/SE/WN/WE (MVA)	Preliminary Facility Ratings SN/SE/WN/WE (MVA)
Allen – RP Mone 345kV	897/897/1138/1138	1677/1737/1737/1737
RP Mone – Maddox 345kV	897/1301/1138/1452	1676/1868/2022/2219
Maddox – E. Lima 345 kV	1188/1539/1506/1737	1916/2246/2425/2672





AEP Transmission Zone: Baseline 2023 RTEP Window 2 Clusters 2, 3 & 5

Process Stage: First Read

Criteria: Summer/Winter Generator Deliverability, N-1-1

Assumption Reference: 2023 RTEP assumptions

Model Used for Analysis: 2028 RTEP cases

Proposal Window Exclusion: None

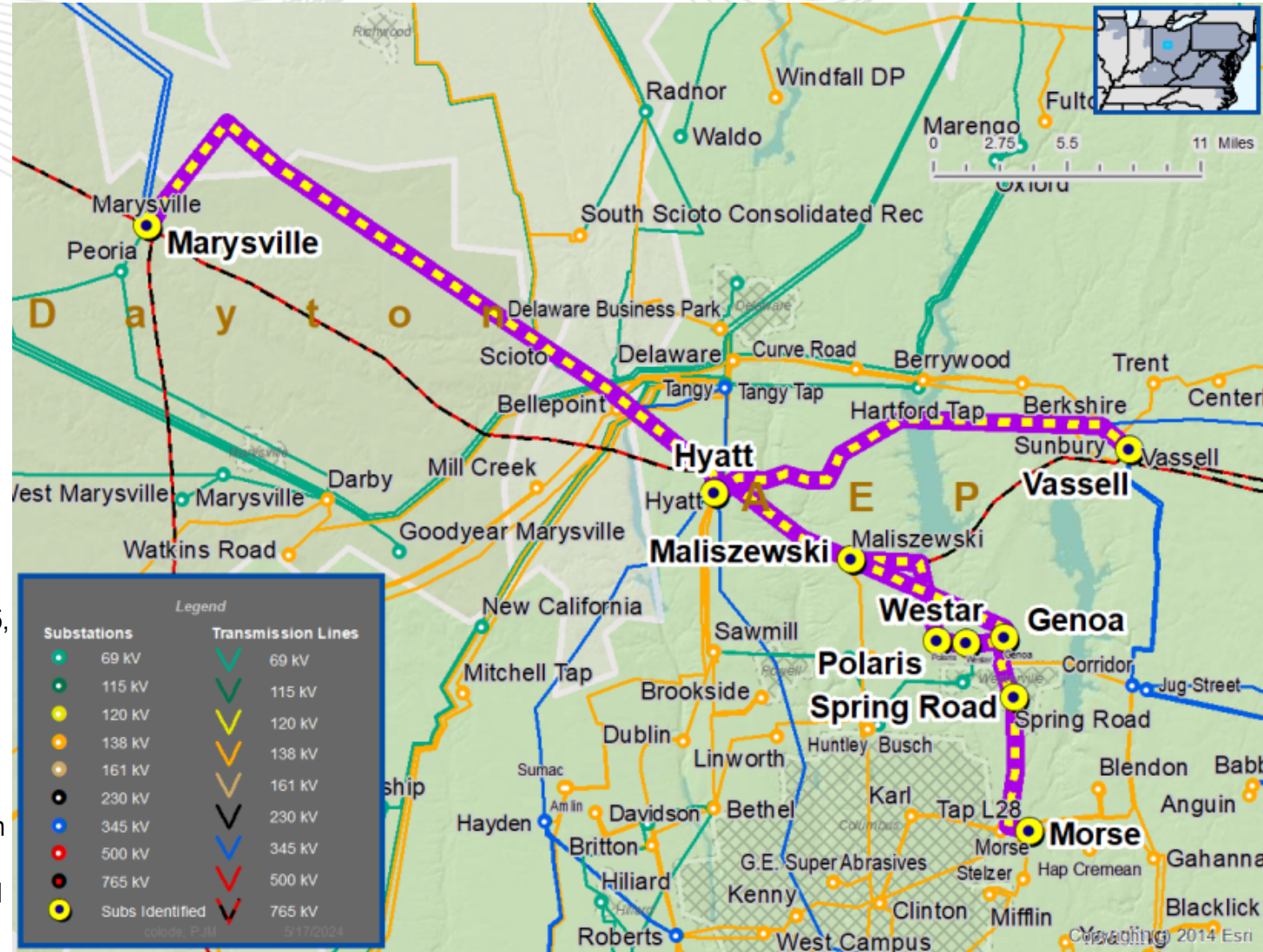
Problem Statement:

Cluster 3: 2023W2-GD-S186, 2023W2-GD-S141, 2023W2-N2-WT1, 2023W2-N2-ST4, 2023W2-N2-ST2, 2023W2-N1-ST15, 2023W2-N2-ST1, 2023W2-N2-ST30, 2023W2-N2-ST31, 2023W2-N2-WT4, 2023W2-N2-ST7, 2023W2-N2-ST28, 2023W2-N2-ST39, 2023W2-N2-ST37, 2023W2-N2-ST48, 2023W2-N2-ST46

In 2028 RTEP summer case, the **Genoa – Westar 138 kV** line is overloaded in generator deliverability test for N-2 outages; and in 2028 RTEP summer and winter cases, the Genoa – Westar 138 kV line is overloaded in N-1-1 test for multiple contingency pairs

Cluster 5: 2023W2-N2-ST6, 2023W2-N2-ST5, 2023W2-N1-ST14, 2023W2-GD-S165, 2023W2-N1-ST13, 2023W2-N2-ST3, 2023W2-GD-S135, 2023W2-N2-ST32, 2023W2-N2-ST43, 2023W2-N2-ST22, 2023W2-N2-ST44, 2023W2-N2-ST40, 2023W2-N2-WT5, 2023W2-N2-ST8, 2023W2-N2-WT3, 2023W2-N2-ST17, 2023W2-N2-ST49, 2023W2-N2-ST18, 2023W2-N2-ST13, 2023W2-N2-ST25, 2023W2-N2-ST47, 2023W2-N2-ST24

In 2028 RTEP summer case, the **Maliszewski – Polaris 138 kV** line is overloaded in generator deliverability test and basecase analysis test for N-2 outages; and in 2028 RTEP summer and winter cases, the Maliszewski – Polaris 138 kV line is overloaded in N-1-1 test for multiple contingency pairs





AEP Transmission Zone: Baseline 2023 RTEP Window 2 Clusters 2, 3 & 5

Problem Statement (Conti.):

Single floaters:

2023W2-N2-ST50, 2023W2-N2-ST9, 2023W2-N2-ST16, 2023W2-N2-ST34, 2023W2-N2-ST45

In 2028 RTEP summer case, the **Genoa – Spring Road 138 kV** line is overloaded in N-1-1 test for multiple contingency pairs.

2023W2-N2-ST11, 2023W2-N2-ST41, 2023W2-N2-WT8, 2023W2-N2-ST10, 2023W2-N2-WT7, 2023W2-N2-ST36, 2023W2-N2-ST12, 2023W2-N2-ST23, 2023W2-N2-ST14

In 2028 RTEP summer and winter cases, the **Polaris – Westar 138kV** line is overloaded in N-1-1 test for multiple contingency pairs.

Cluster 2: All of the above (cluster 3 & 5, and single floaters), plus

2023W2-N1-ST21, 2023W2-N1-ST20, 2023W2-N1-ST23, 2023W2-N1-ST22, 2023W2-N1-ST25, 2023W2-N1-ST24, 2023W2-N1-ST27, 2023W2-N1-ST26, 2023W2-N1-ST19, 2023W2-N2-ST33, 2023W2-N2-ST38, 2023W2-N2-ST35, 2023W2-GD-S170, 2023W2-N1-ST10, 2023W2-N1-ST12, 2023W2-N1-ST16, 2023W2-N1-ST18, 2023W2-N1-ST17, 2023W2-N1-ST1, 2023W2-N2-ST21, 2023W2-N1-ST3, 2023W2-N1-ST2, 2023W2-N2-ST20, 2023W2-N1-ST5, 2023W2-N1-WT1, 2023W2-N1-ST4, 2023W2-N1-ST7, 2023W2-N1-WT3, 2023W2-N1-ST6, 2023W2-N1-WT2, 2023W2-N2-ST29, 2023W2-N2-ST27, 2023W2-N2-ST26, 2023W2-GD-S4, 2023W2-GD-S3, 2023W2-N2-WT6, 2023W2-GD-W154, 2023W2-GD-W155, 2023W2-GD-W153, 2023W2-GD-W156, 2023W2-GD-S115, 2023W2-GD-S114, 2023W2-N2-ST42, 2023W2-GD-S6, 2023W2-GD-W162, 2023W2-GD-W165, 2023W2-GD-W163, 2023W2-GD-W164, 2023W2-GD-S122, 2023W2-GD-S121, 2023W2-GD-S123, 2023W2-GD-S126, 2023W2-GD-S125, 2023W2-GD-S116, 2023W2-GD-W59, 2023W2-GD-W58, 2023W2-N1-WT10, 2023W2-N1-WT13, 2023W2-N1-WT14, 2023W2-N1-WT11, 2023W2-N1-WT12, 2023W2-GD-W213, 2023W2-N2-WT2, 2023W2-GD-W214, 2023W2-N2-ST3, 2023W2-GD-W217, 2023W2-GD-W215, 2023W2-GD-W216, 2023W2-GD-S127, 2023W2-N1-ST9, 2023W2-N1-WT5, 2023W2-N1-ST8, 2023W2-N1-WT4, 2023W2-N1-WT7, 2023W2-N1-WT6, 2023W2-N1-WT9, 2023W2-N1-WT8, 2023W2-N2-ST11, 2023W2-N2-ST19, 2023W2-N2-ST15, 2023W2-GD-W19, 2023W2-GD-W25

In 2028 RTEP summer and winter cases, **Maliszewski transformer 765/138KV transformer and Maliszewski 138kV series reactor bypass** are overload in generator deliverability test and basecase analysis test for N-1 and N-2 outages.

In 2028 RTEP Summer case, the **Morse – Spring Road 138kV** line, the **Marysville – Hyatt 345kV** line, the **Hyatt – Vassell 345kV** line, the **Hyatt – Maliszewski #2 138kV** line, the **Genoa – Maliszewski 138kV #2** line are overloaded in N-1-1 test for multiple contingency pairs.



AEP Transmission Zone: Baseline 2023 RTEP Window 2 Clusters 2, 3 & 5

- As part of the 2023 RTEP Window #2, projects listed in the table below were proposed to address the violations in Cluster 2
- 3 total proposals submitted from 3 different entities
 - 2 Greenfields
 - 1 Upgrades
- Both greenfield proposals identified with cost containment

Proposal ID	Proposing Entity	Project Type	Project Description	Cost As Proposed (\$M)
117	AEP	UPGRADE	Connect and energize a second 765/345 kV bank at Vassell station. Replace 765 kV breaker D at Maliszewski station.	33.729
27	CNTLTM	GREENFIELD	1) new 765/345kV Barron substation, 2) A new double circuit 345kV transmission line from the new Barron Substation to the existing Hayden Substation, 3) Splitting the existing Conesville - Hyatt 345kV single circuit line and looping it into the existing Vassel substation, 4) Sag studies for the Genoa - Westar and Genoa - Spring Road 138kV transmission lines to increase their ratings, 5) Reconductoring the existing Maliszewski - Polaris and Polaris - Westar 138kV transmission lines.	203.830
343	TRANSRC	GREENFIELD	Jester greenfield 765/345kV station approximately 18.5 miles south of Marysville 765kV and 12 miles west of Hayden 345kV station; Reroute Hyatt – West Millersport 345kV line and loop into Corridor 345kV substation; Rebuild Kenny – Roberts 138kV circuit.	229.311



AEP Transmission Zone: Baseline 2023 RTEP Window 2 Clusters 2, 3 & 5

- As part of the 2023 RTEP Window #2, projects listed in the table below were proposed to address the violations in clusters 3, 5 and single floaters partially overlapped with Cluster 2
- 7 total proposals, all are upgrades from AEP
- None of the 7 proposals identified with cost containment

Cluster	Proposal ID	Project Description	Cost As Proposed (\$M)
3	596	Mitigate clearance issues on Westar - Genoa 138 kV line to allow line to operate to conductor's designed rating	2.815
3	729	Rebuild the approximately 2 mile 138 kV line between Westar and Genoa stations..	8.789
5	188	Reconductor the 2.8 mile 138 kV line between Maliszewski and Polaris stations.	7.231
5	340	Rebuild the 2.8 mile 138 kV line between Maliszewski and Polaris stations.	8.884
-	426	Mitigate clearance issues on Genoa - Spring Rd SW 138 kV line. Replace a station riser at Genoa station.	3.461
-	92	Rebuild the majority of the 3.7 mile 138 kV line between Polaris and Westar stations. Replace station equipment at Polaris station.	12.196



AEP Transmission Zone: Baseline 2023 RTEP Window 2 Clusters 2, 3 & 5

Proposal ID	Reliability Evaluation Results	Cost As Proposed (\$M)	Cost Adjustment *(\$M)	Total Cost (\$M)
117	Solves all the target issues with good margin. No new reliability violations identified.	33.729	0	33.729
27	Solves all the target issues with good margin. Causes overload on the Kenny – Roberts 138KV circuit. The following components are not needed and can be removed. 4) Sag studies for the Genoa - Westar and Genoa - Spring Road 138kV transmission lines to increase their ratings, 5) Reconductoring the existing Maliszewski - Polaris and Polaris - Westar 138kV transmission lines.	203.830	+49.860 -6.644	247.046
343	Solves all the target issues with good margin. No new reliability violations identified.	229.311	0	229.311

* Cost adjustment associated with scope additions or removals



AEP Transmission Zone: Baseline 2023 RTEP Window 2 Clusters 2, 3 & 5

Proposal ID	Cost Estimate Risks	Cost Containment Risks	Schedule Risk	Constructability Risks	Use of Existing ROW & Brownfield	Outage Coordination Risks
343	Low	Medium	Medium-High	Medium-High	High	Medium
27	Low	Low	Medium-High	Medium-High	High	Medium
117	Low	High	Low	Low	Low	Low



AEP Transmission Zone: Baseline 2023 RTEP Window 2 Clusters 2, 3 & 5

PJM Recommended Solution: Proposal #117

Connect and energize a second 765/345 kV bank at Vassell station.

Estimated Cost: \$30.829M

Replace 765 kV breaker D at Maliszewski station.

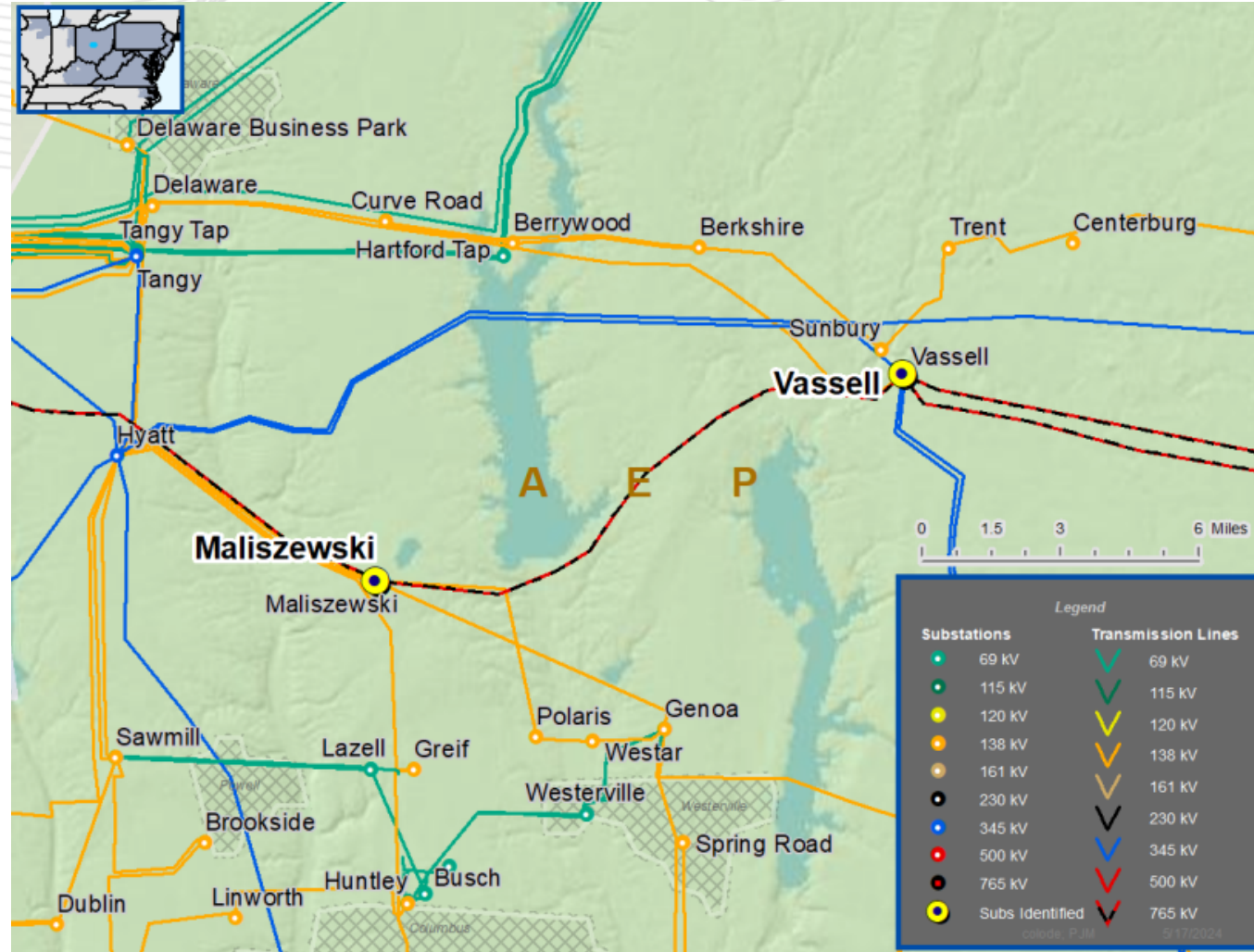
Estimated Cost: \$2.900M

Total Estimated Cost: \$33.729 M

Required IS Date: 6/1/2027

Projected IS Date: 6/1/2027

Facility Ratings:



Branch	Existing Facility Ratings SN/SE/WN/WE (MVA)	Preliminary Facility Ratings SN/SE/WN/WE (MVA)
Vassell 765/345 Transformer #2	-	2855/2897/2897/2897
Maliszewski – Marysville 765KV	4047/4142/4484/4961	4047/4571/4484/4961



PSEG Cluster 1 Proposals Evaluation Progress

Process Stage: First Review

Criteria: Summer N-1-1 Thermal violation

Assumption Reference: 2028 RTEP assumption

Model Used for Analysis: 2028 RTEP cases

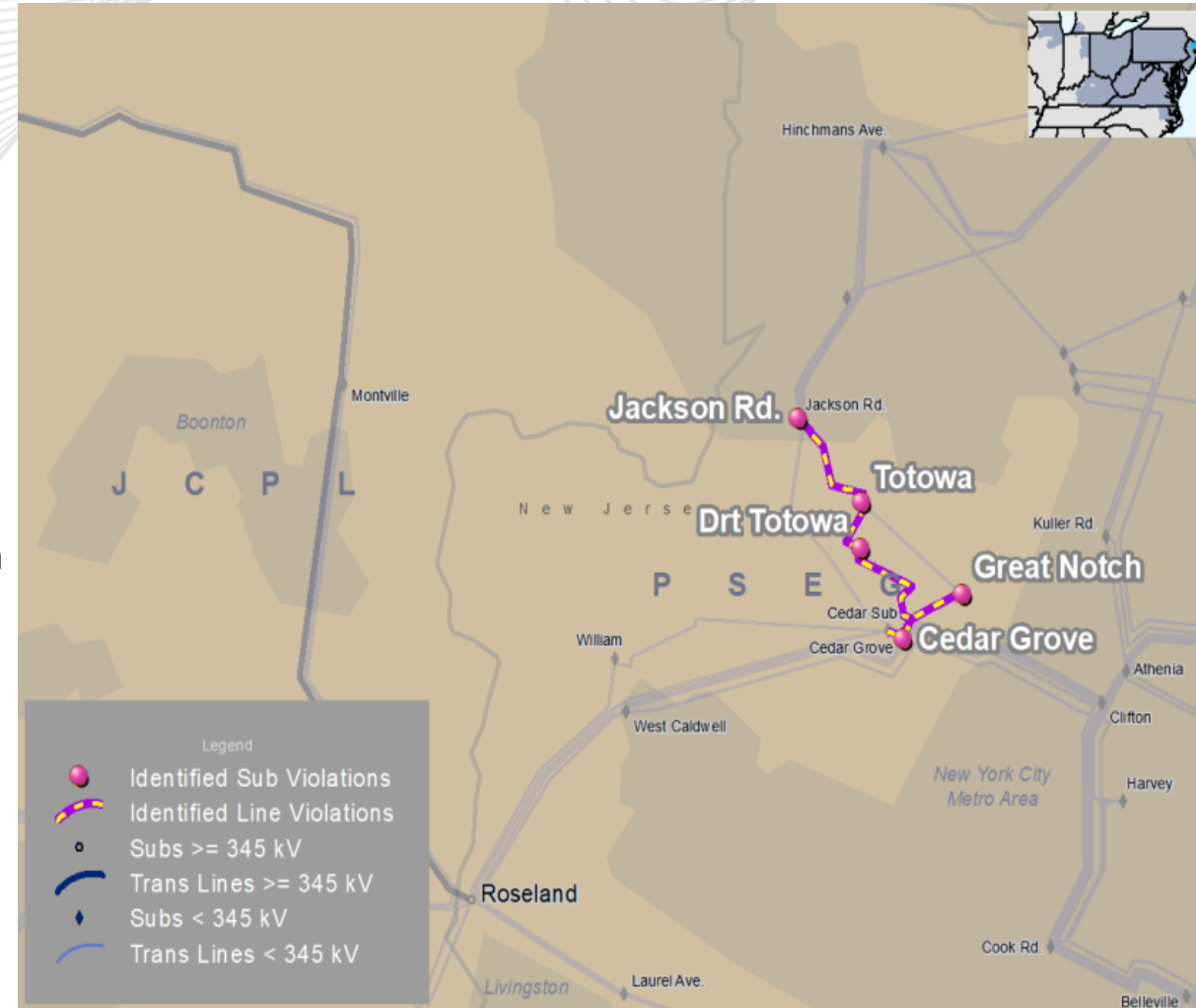
Proposal Window Exclusion: No

Problem Statement:

- PSEG N-1-1 thermal violation in the Northern New Jersey (Cedar Grove and Jackson area). Four 69 kV lines overloaded for several N-1-1 contingency combinations.

Violations were posted as part of the 2023 Window 2:

2023W2-PSEG-T1	2023W2-PSEG-T6	2023W2-PSEG-T11
2023W2-PSEG-T2	2023W2-PSEG-T7	2023W2-PSEG-T12
2023W2-PSEG-T3	2023W2-PSEG-T8	2023W2-PSEG-T13
2023W2-PSEG-T4	2023W2-PSEG-T9	2023W2-PSEG-T14
2023W2-PSEG-T5	2023W2-PSEG-T10	2023W2-PSEG-T15





PSEG Cluster 1 Proposals Evaluation Progress

2023 Window 2 Cluster 1 Proposals

- Four projects proposed by Two Entities
 - 1 – 69 kV new line, partial overhead and partial underground
 - 2 – 230 kV new underground lines
 - 1 – 345 kV new underground construction and 230 kV operation

Proposal ID	Proposing Entity	Project Description	Estimated Cost (M)
2023-W2-998	PSEG	New 69 kV from Cedar Grove - Jackson Rd (3.73mi OH, 1.2mi - UG) and new 69kV from I-633 top to Jackson Rd (0.8mi OH, 1.2mi - UG)	60.6
2023-W2-496	PSEG	4 miles New 230kV XLPE Circuit using (230kV rated 3500kcmil cable) from Jackson Road 230kV Station to Cedar Grove 230kV Station	78.9
2023-W2-627	PSEG	4 miles New 230kV XLPE Circuit using (345kV rated 5000kcmil cable) from Jackson Road 230kV Station to Cedar Grove 230kV Station	84.6
2023-W2-716	PPL Translink	Build a 7.6 mile 230kV underground circuit using (345kV rated 5000kcmil cable) from the JCPL Montville Substation to the PSEG Jackson Rd Substation.	211.1

Proposal ID 998:

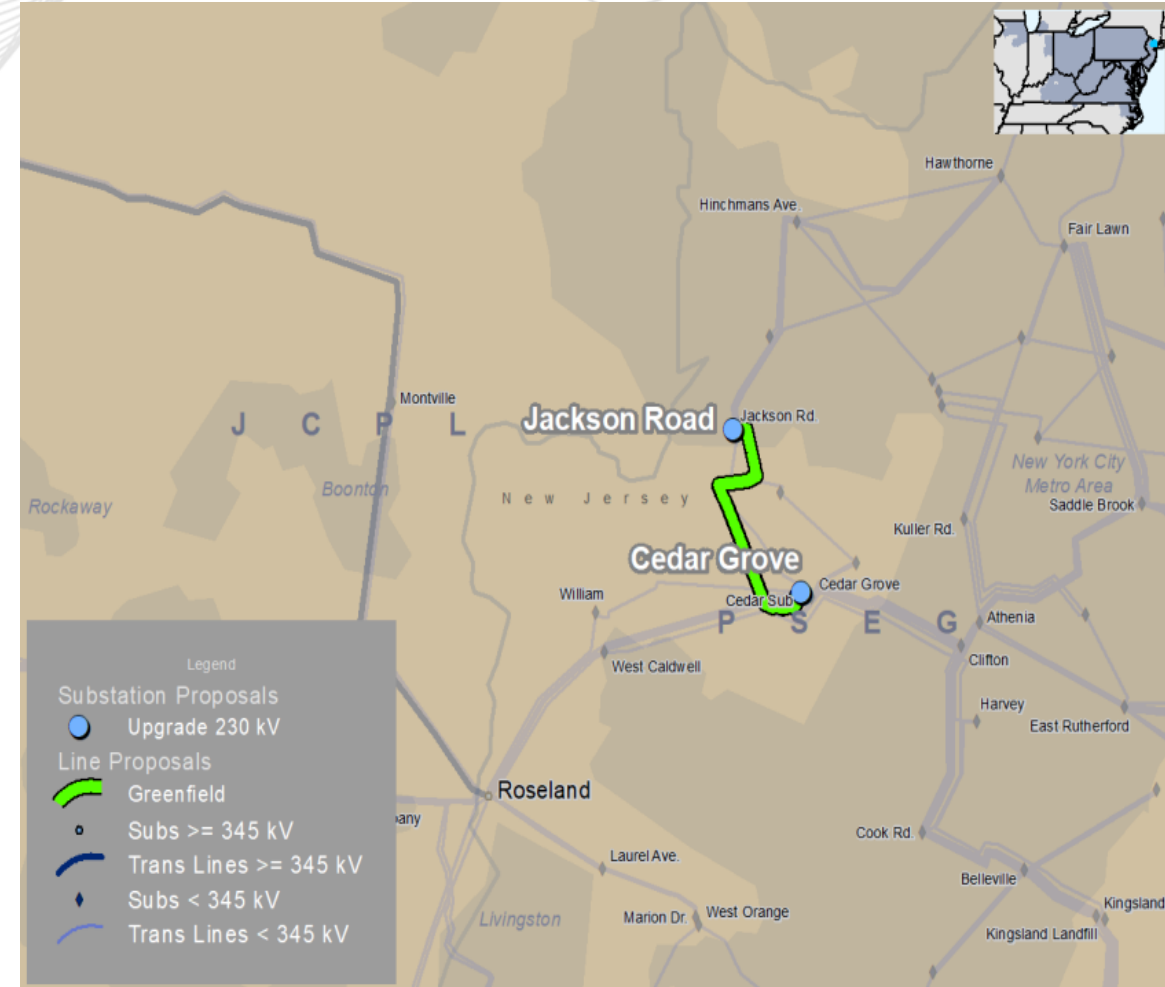
- Build new direct 69kV connection from Jackson Road to Cedar Grove (approximately 4.5 mi). This circuit will have both underground and overhead portions
- Replace (3) 72.5kV 40kA breakers with (3) 72.5 kV 63kA breakers. For the new 69kV line between Cedar Grove and Jackson Road. Replace the existing overhead termination structure with an underground termination structure. Replace line relay for the new 69kV line and the new extension
- For the new 69kV line between Cedar Grove and Jackson Road, installing a new UG termination structure. Replace line relay for the new 69kV line and the new extension
- Reroute a Portion of the existing N-664 underground and Tap into the existing I-633 creating a 3-ended circuit
- Reroute approximately 0.5 miles of the existing E-759 69kV line near the intersection of Vreeland Ave and Riverview Drive underground back to Jackson Road

Proposed Facility Rating: 95SN/131SE, 128WN/155WE MVA

Estimated Cost: \$60.6 M

Required In-Service: 6/1/2028

Projected In-Service: 6/1/2028





PSEG Cluster 1 Proposals Evaluation Progress

Proposal 2023-W2-496

Proposal ID 496:

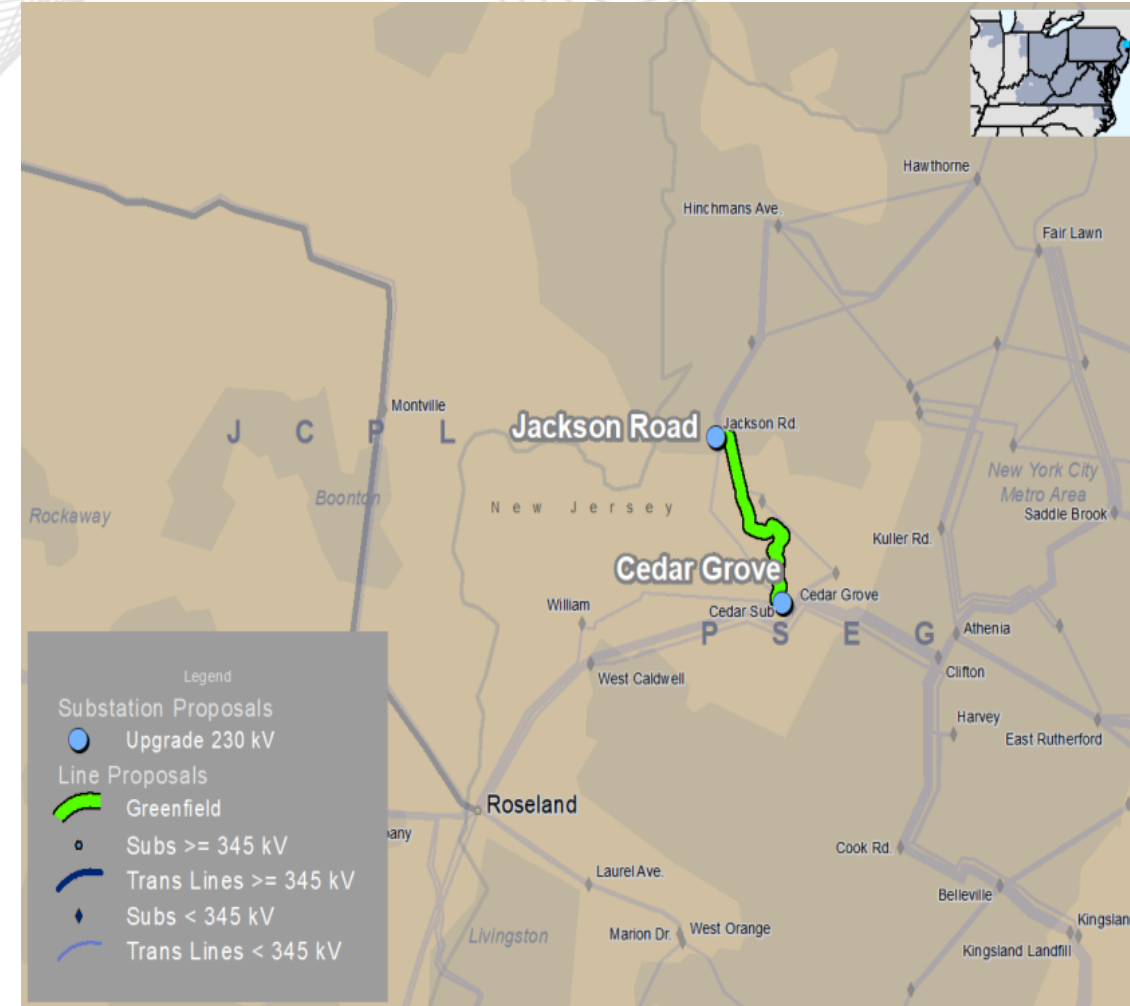
- Build 4 miles New 230kV XLPE Circuit using (230kV rated 3500kcmil cable) from Jackson Road 230kV Station to Cedar Grove 230kV Station
- Expand a new 230kV bay at the existing Cedar Grove with one line position by adding two 230kV circuit breaker and associated disconnect switches
- Replace the existing HPFF termination structure with a new XLPE termination structure to connect to spare GIS bay position circuit breaker and associated disconnect switches

Proposed Facility Rating: 457SN/677SE, 492WN/700WE MVA

Estimated Cost: \$78.9 M

Required In-Service: 6/1/2028

Projected In-Service: 6/1/2028





PSEG Cluster 1 Proposals Evaluation Progress

Proposal 2023-W2-627

Proposal ID 627:

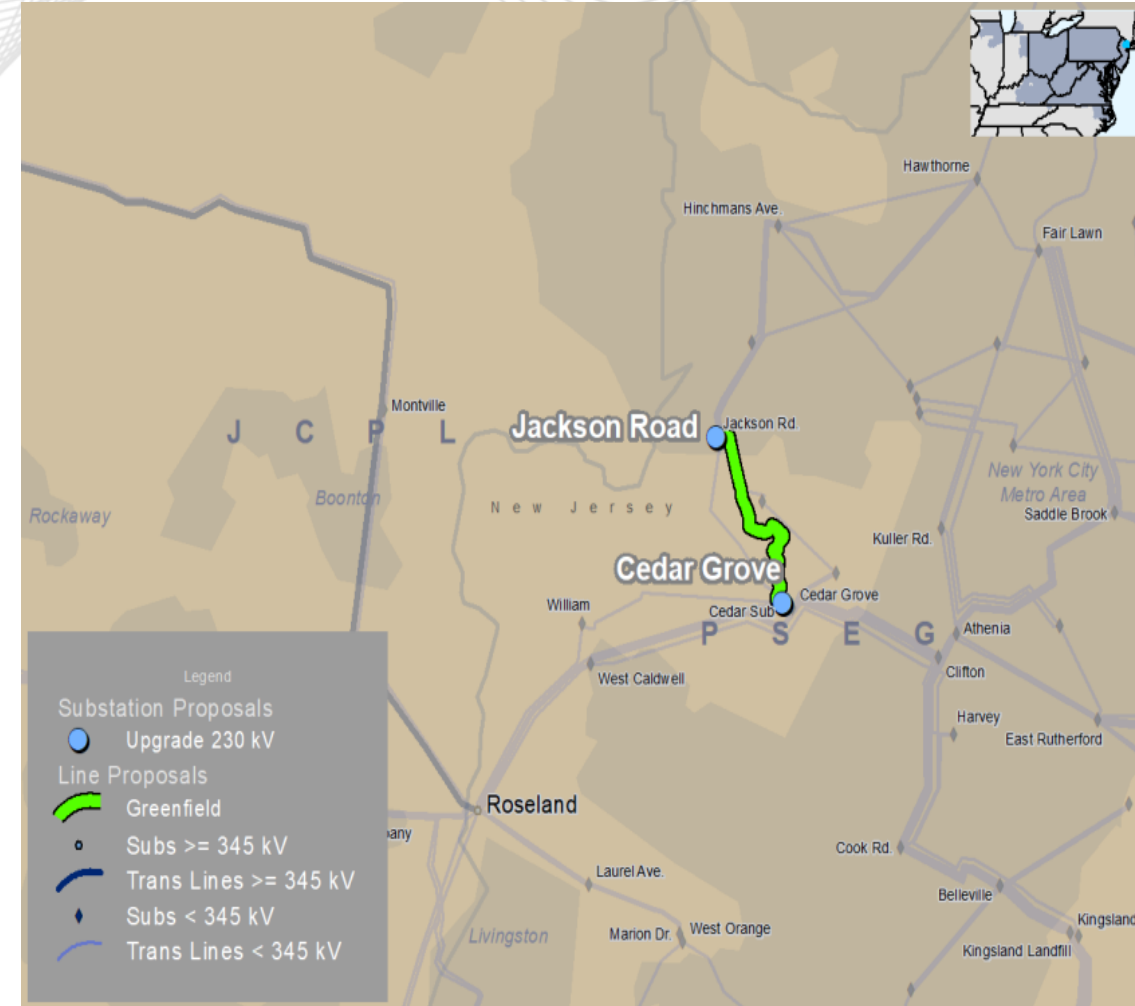
- Build 4 miles New 230kV XLPE Circuit using (345kV rated 5000kcmil cable) from Jackson Road 230kV Station to Cedar Grove 230kV Station
- Expand a new 230kV bay at the existing Cedar Grove Station with one line position by adding two 230kV circuit breakers and associated disconnect switches
- Replace the existing HPFF termination structure with a new XLPE termination structure to connect to spare GIS bay position

Proposed Facility Rating: 512SN/796SE, 552WN/821WE MVA

Estimated Cost: \$84.6 M

Required In-Service: 6/1/2028

Projected In-Service: 6/1/2028





PSEG Cluster 1 Proposals Evaluation Progress

Proposal 2023-W2-716

Proposal ID 716:

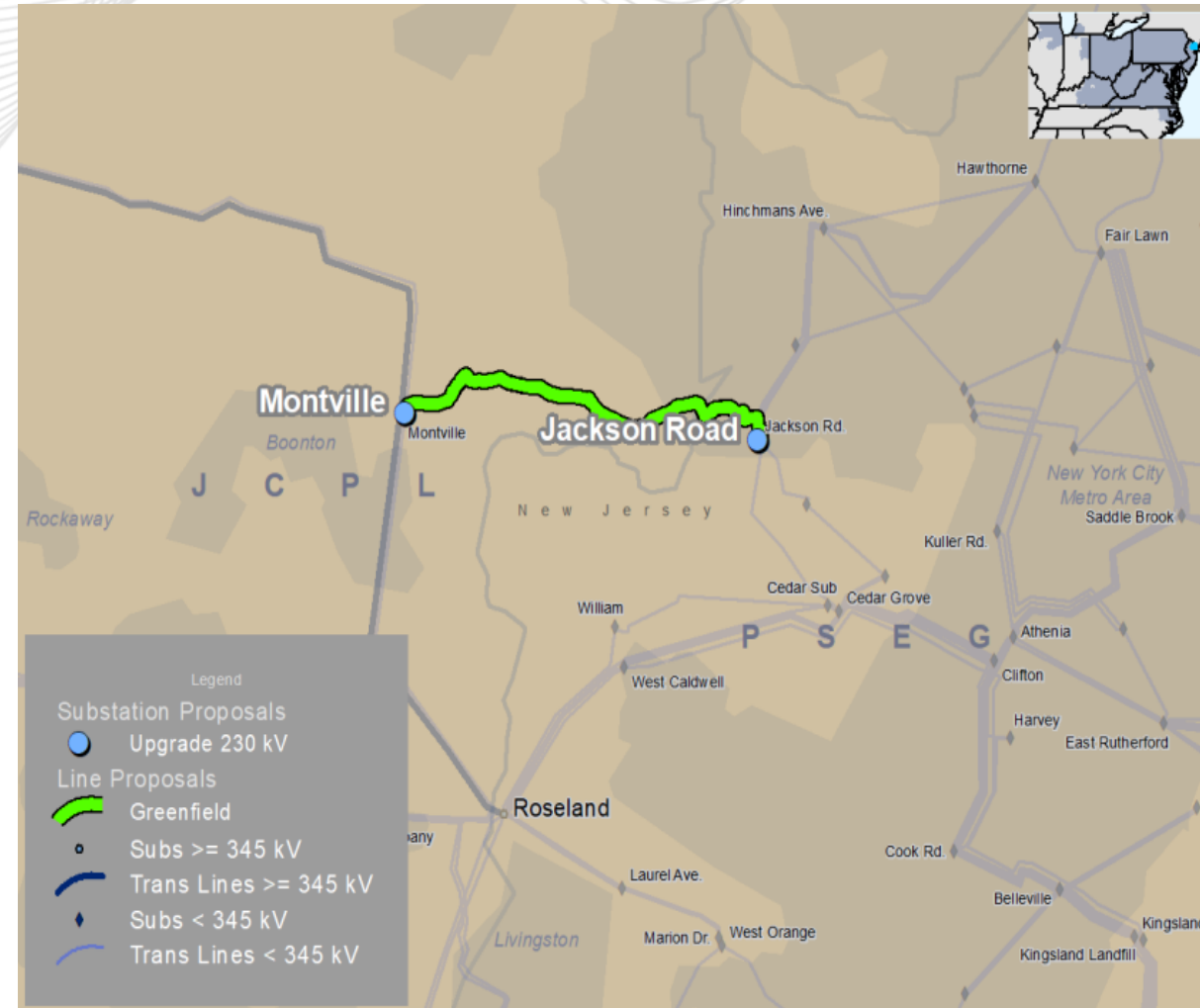
- Build a 7.6 mile 230 kV underground circuit using (345kV rated 5000kcmil cable) from the JCPL Montville Substation to the PSEG Jackson Rd Substation
- Expand the Montville 230 kV to a breaker and a half configuration by adding one new bay on the west side of the yard to terminate the new line
- At Jackson Rd, terminate the new line in the open bay position next to transformer 40

Proposed Facility Rating: 624SN/830SE, 659WN/850WE MVA

Estimated Cost: \$211.1 M

Required In-Service: 6/1/2028

Projected In-Service: 6/1/2028





PSEG Cluster 1 Proposals Evaluation Progress

2023 Window 2 Cluster 1 Proposals study

PJM evaluated all four Proposals:

- Performed the DNH analysis to ensure the proposals solve the identified violations and don't cause a harm to the system
- Evaluated the proposals for their performance in future load growth

Proposals Performance Comparison:

Proposal ID	2023-W2-998	2023-W2-496	2023-W2-627	2023-W2-716
Address all Cluster 1 Violations	Y	Y	Y	Y
Provides Margin for Future Needs	N	Y	Y	N
Future Expandability	N	N	Y	Y



PSEG Cluster 1 Proposals Evaluation Progress

Proposal ID	Proposing Entity	Project Type	Project Description	Cost As Proposed (\$M)
998	PSEG	UPGRADE	New 69 kV from Cedar Grove - Jackson Rd (3.73mi OH, 1.2mi - UG) and new 69kV from I-633 top to Jackson Rd (0.8mi OH, 1.2mi - UG)	60.6
496	PSEG	GREENFIELD	4 miles New 230kV XLPE Circuit using (230kV rated 3500kcmil cable) from Jackson Road 230kV Station to Cedar Grove 230kV Station	78.9
627	PSEG	GREENFIELD	4 miles New 230kV XLPE Circuit using (345kV rated 5000kcmil cable) from Jackson Road 230kV Station to Cedar Grove 230kV Station	84.6
716	PPL Translink	GREENFIELD	Build a 7.6 mile 230 underground circuit using (345kV rated 5000kcmil cable) from the JCPL Montville Substation to the PSEG Jackson Rd Substation	211.1

Proposal ID	Cost Estimate Risks	Cost Containment Risks	Schedule Risk	Constructability Risks	Use of Existing ROW & Brownfield	Outage Coordination Risks
998	Low	High	Medium	Medium	Medium-High	Low
496	Low	Low	Medium-High	Medium	Medium-High	Low
627	Low	Low	Medium-High	Medium	Medium-High	Low
716	Low	Medium-High	High	High	High	Low

Process Stage: First Review

Criteria: Summer N-1-1 Thermal violation

Problem Statement:

- PSEG N-1-1 thermal violation in the Northern New Jersey (Cedar Grove and Jackson area). Four 69 kV lines overloaded for several N-1-1 contingency combinations.

Proposed/Preferred Solution:

Proposal ID 627:

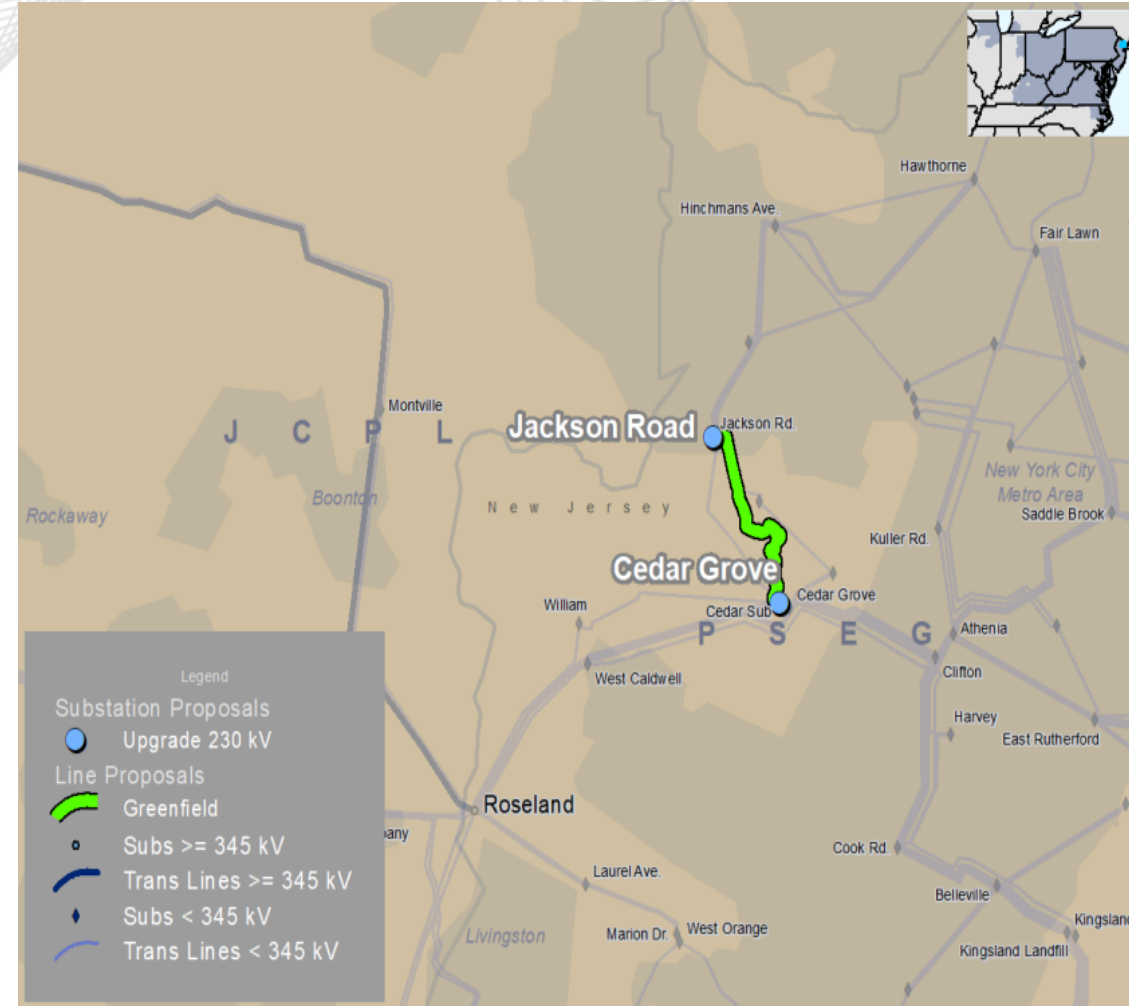
- Build 4 miles New 230kV XLPE Circuit using (345kV rated 5000kcmil cable) from Jackson Road 230kV Station to Cedar Grove 230kV Station
- Expand a new 230kV bay at the existing Cedar Grove Station with one line position by adding two 230kV circuit breakers and associated disconnect switches
- Replace the existing HPFF termination structure with a new XLPE termination structure to connect to spare GIS bay position

Proposed Facility Rating: 512SN/796SE, 552WN/821WE MVA

Estimated Cost: \$84.6 M

Required In-Service: 6/1/2028

Projected In-Service: 6/1/2028

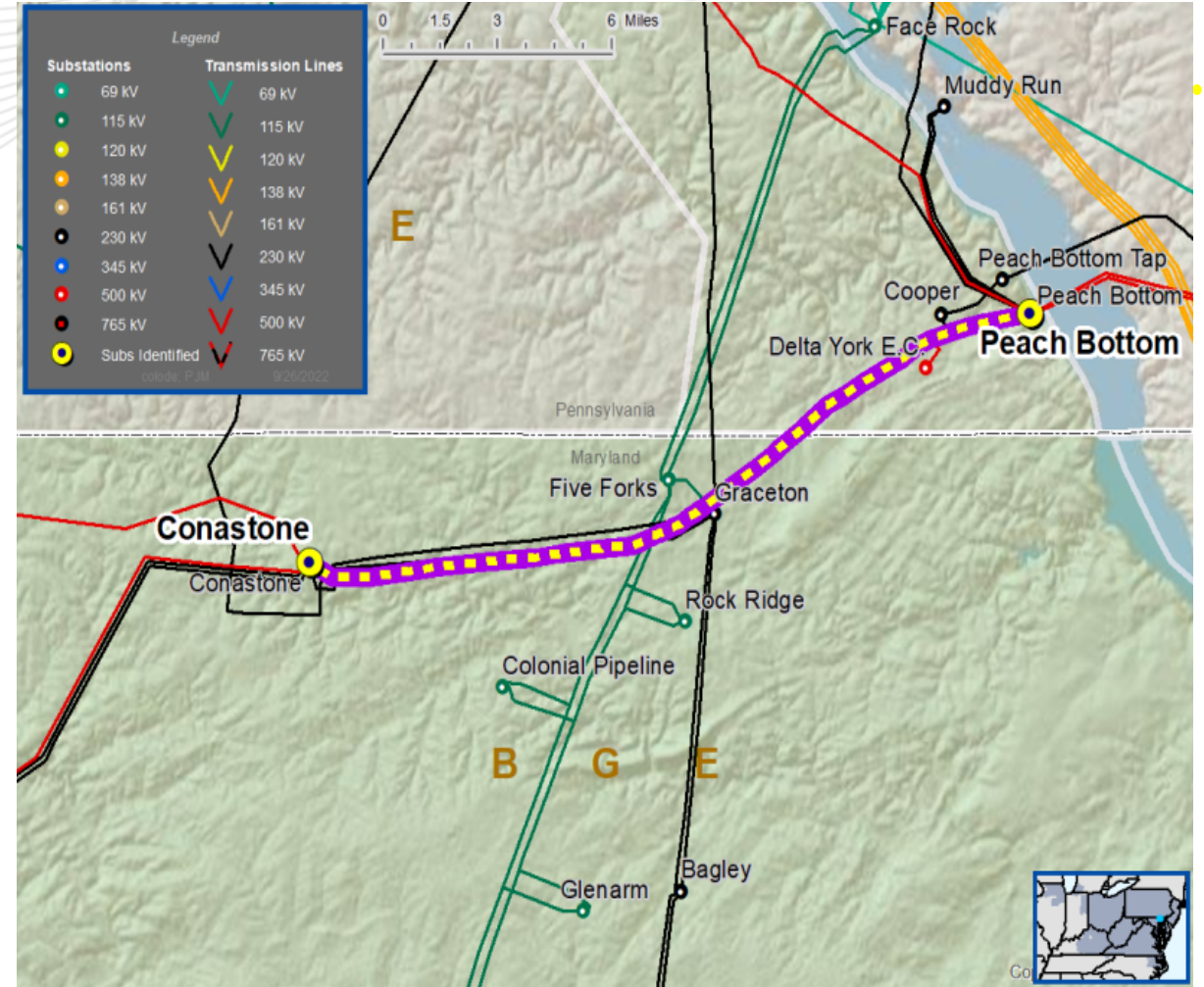


Baseline Upgrade Cancellations

Baseline upgrades B3728.1 and B3728.2 were identified to address violations in RTEP 2022. The violations were part of the 2022 Window 1

These upgrades overlap with the upgrades identified in the 2022 Window 3 and will be canceled

Upgrade ID	Description	Transmission Owner
b3728.1	Upgrade two Breaker bushings on the 500 kV Line 5012 (Conastone-Peach Bottom) at Conastone substation.	BGE
b3728.2	Replace 4 meters and bus work inside Peach Bottom substation on the 500 kV Line 5012 (Conastone-Peach Bottom).	PECO



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Reliability Analysis Update



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Version No.	Date	Description
1	5/30/2024	<ul style="list-style-type: none">• Original slides posted
2	5/31/2024	<ul style="list-style-type: none">• Slides #16 and #17, updated the costs
3	6/3/2024	<ul style="list-style-type: none">• Added slide #33

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