

# Subregional RTEP Committee - Mid-Atlantic FirstEnergy Supplemental Projects

# Needs

Stakeholders must submit any comments within 10 days of this meeting in order to provide time necessary to consider these comments prior to the next phase of the M-3 process



**Need Number:** JCPL-2023-055

**Process Stage:** Need Meeting 11/16/2023

**Project Driver:**

*Performance and Risk, Operational Flexibility and Efficiency*

**Specific Assumption Reference:**

System Performance Projects Global Factors

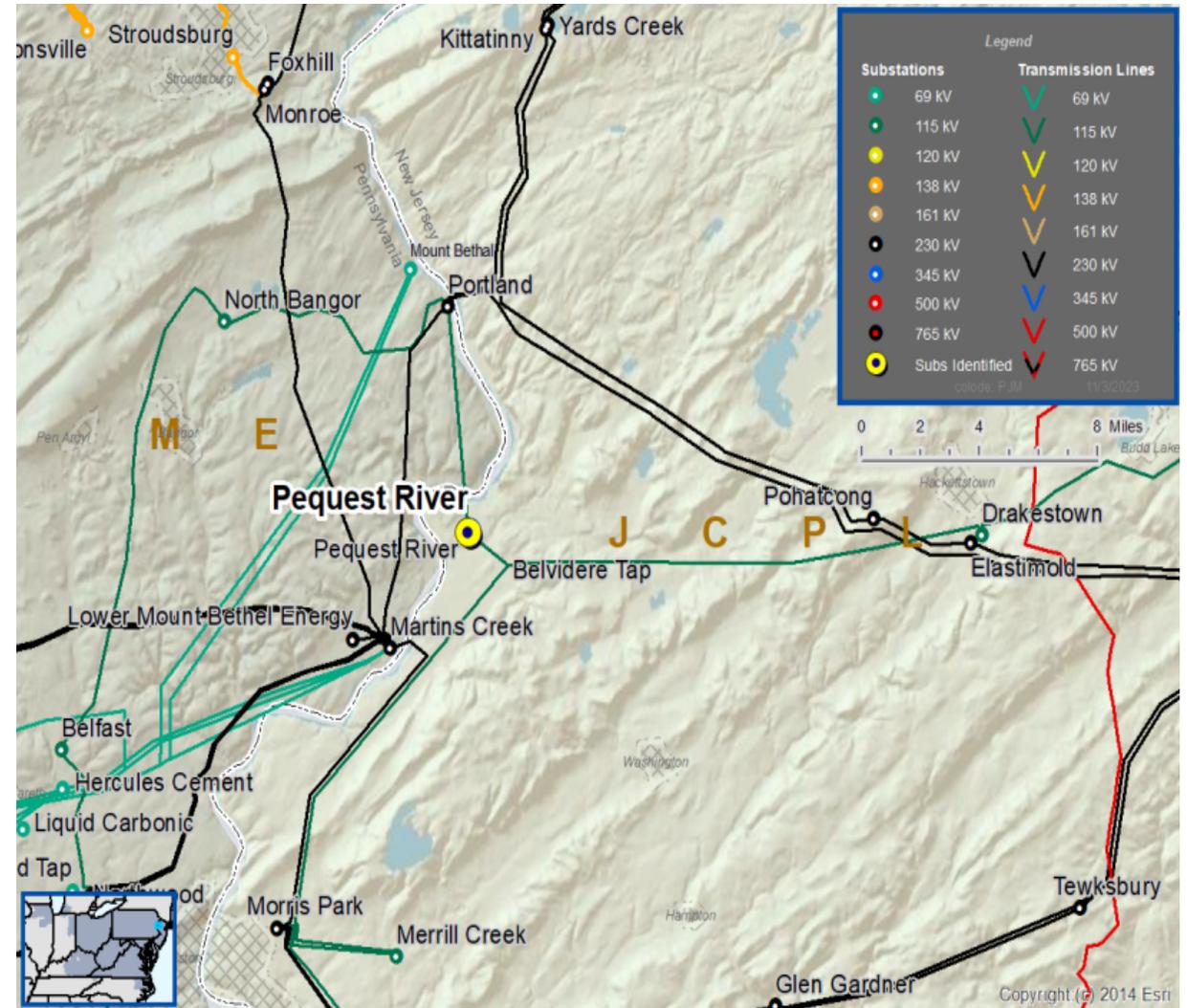
- System reliability and performance
- Reliability of Non-Bulk Electric System (Non-BES) Facilities

Add/Replace Transformers

Past System Reliability/Performance

**Problem Statement:**

- The 115-34.5 kV No. 2 Transformer at Pequest River Substation was manufactured approximately 50 years ago and is approaching end of life.
  - Most recent DGA results showed elevated ethane gas levels compared with IEEE Standards
- Existing TR Ratings:
  - 65/69 MVA (SN/SE)



**Need Number:** JCPL-2023-056, JCPL-2023-066

**Process Stage:** Need Meeting 11/16/2023

**Project Driver(s):**

*Equipment Material Condition, Performance and Risk*

**Specific Assumption Reference(s)**

Line Condition Rebuild/Replacement

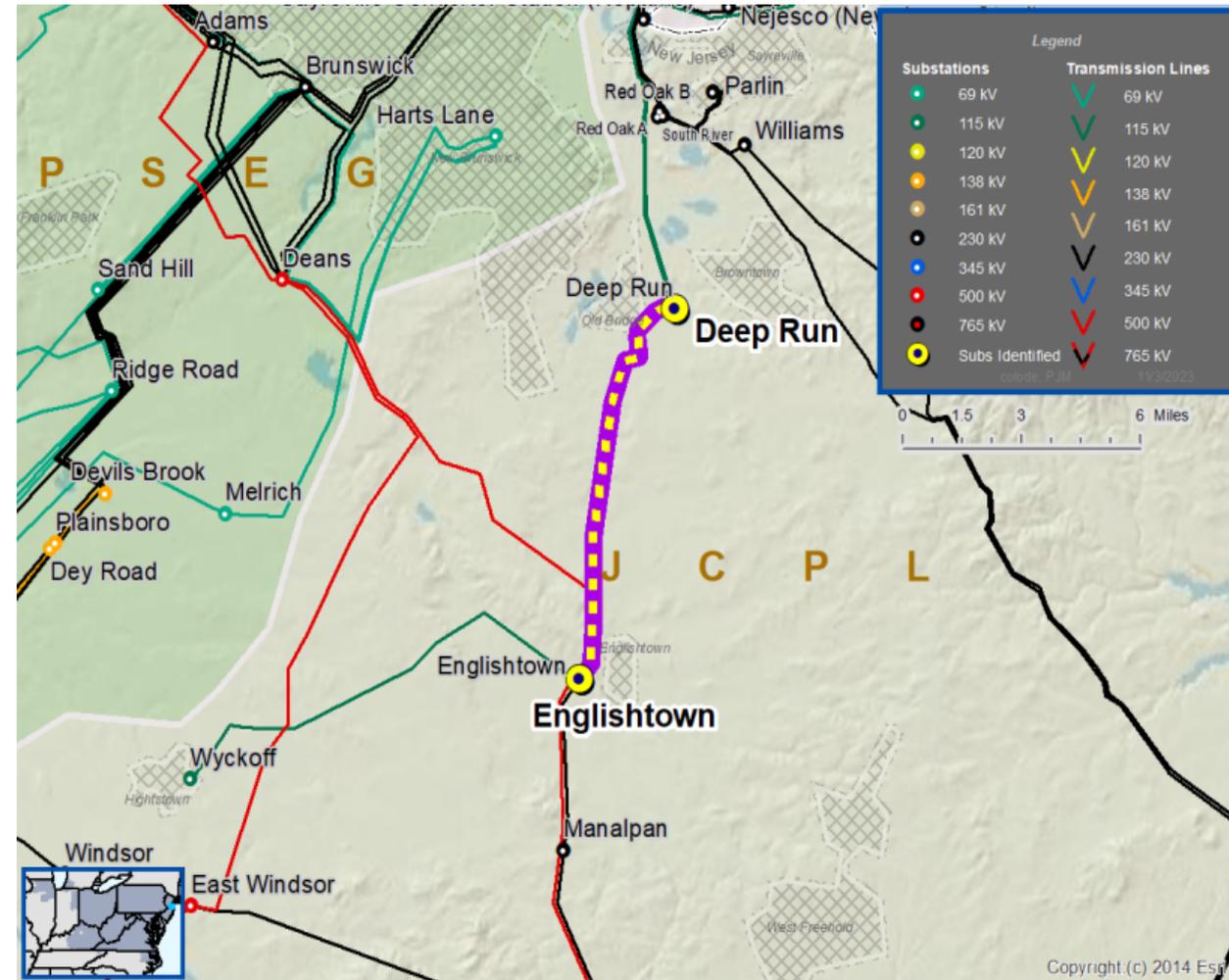
- Age/condition of wood pole transmission line structures
- Age/condition of transmission line conductors

System Performance Projects

- Substation/line equipment limits

**Problem Statement**

- Both Deep Run – Englishtown 115 kV DRE1 and DRE2 lines have structures with an average age of 55+ years. Upon visual inspection, 88-91% fail inspection due to rot/decay and woodpecker damage.
- Line sections are exhibiting deterioration and increasing maintenance needs.
- Transmission line ratings are limited by terminal equipment.



...Continued from previous page

Need Number	Transmission Line / Substation Locations	Existing Circuit Rating (SN / SE)	Existing Conductor Rating (SN / SE)	Length of Line (miles)	Identified Structures (end of life / total)
JCPL-2023-066	Deep Run – Englishtown 115kV DRE1	176 / 223	232 / 282	7.6	73 / 80 (91% Failure Rate)
JCPL-2023-056	Deep Run – Englishtown 115kV DRE2	166 / 210	232 / 282	7.6	71 / 80 (88% Failure Rate)

**Need Number:** JCPL-2023-057

**Process Stage:** Need Meeting 11/16/2023

**Project Driver:**

*Performance and Risk, Operational Flexibility and Efficiency*

**Specific Assumption Reference:**

System Performance Projects Global Factors

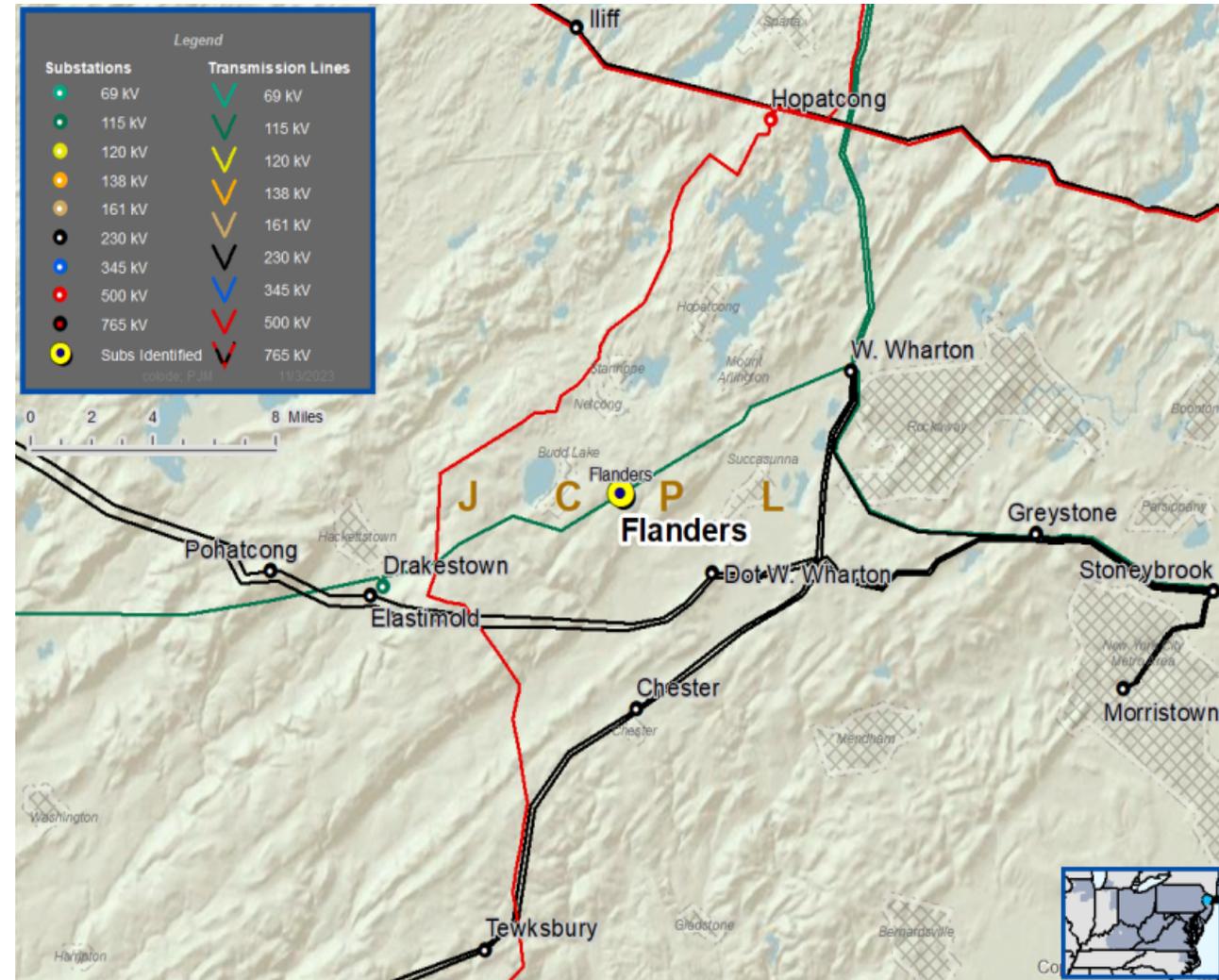
- System reliability and performance
- Reliability of Non-Bulk Electric System (Non-BES) Facilities

Add/Replace Transformers

Past System Reliability/Performance

**Problem Statement:**

- The 115-34.5 kV No. 2 Transformer at Flanders Substation was manufactured approximately 70 years ago and is approaching end of life.
- High levels of moisture continue to develop in the transformer.
  - Moisture can reduce oil dielectric strength increasing risk of flashover and arcing.
- Existing TR Ratings:
  - 61 / 66 MVA (SN/SE)



**Need Number:** JCPL-2023-058

**Process State:** Need Meeting 11/16/2023

**Project Driver:**

*Customer Service*

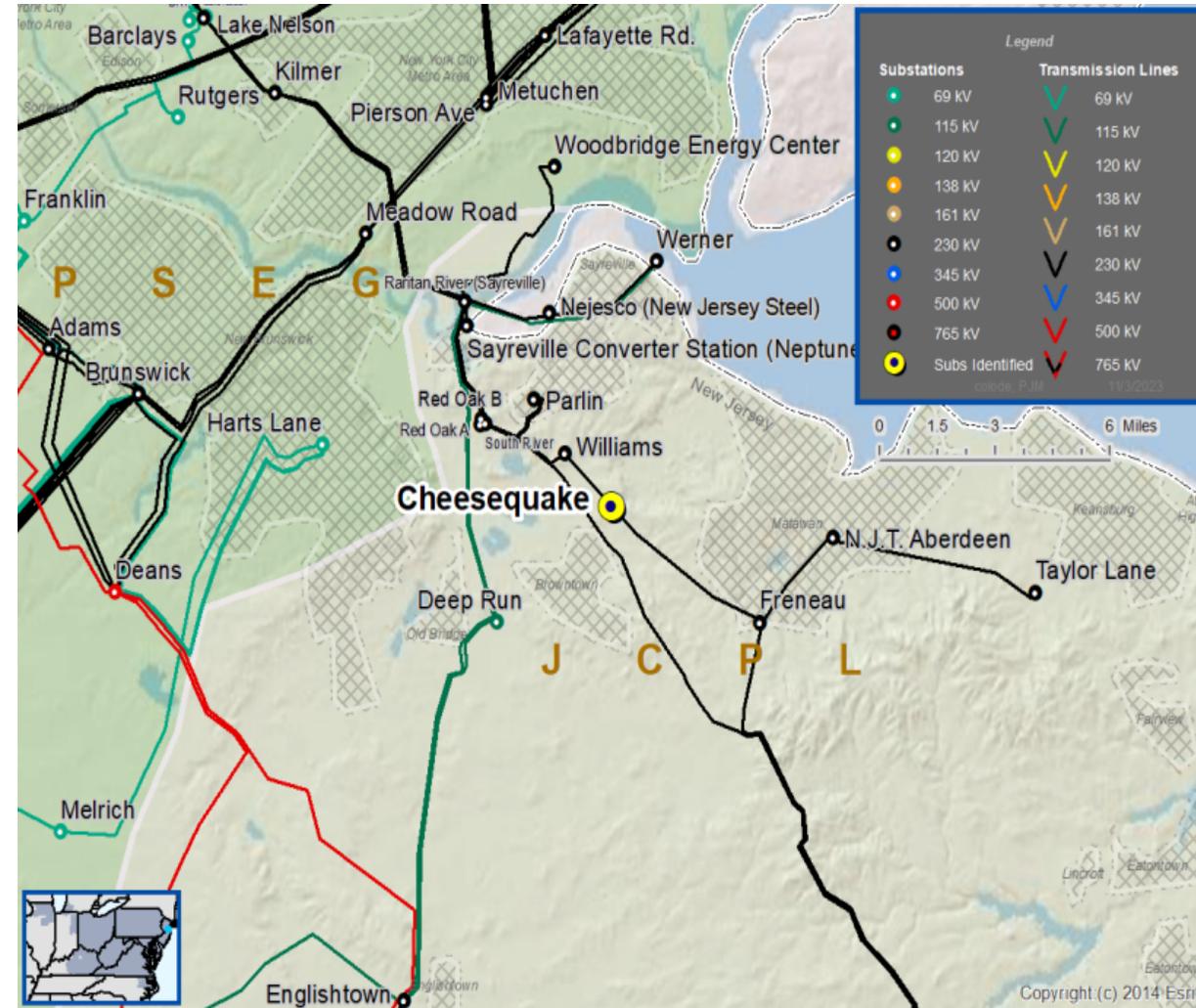
**Specific Assumption Reference:**

New customer connection requests will be evaluated per FirstEnergy’s “Requirements for Transmission Connected Facilities” document and “Transmission Planning Criteria” document.

**Problem Statement:**

New Customer Connection - A customer requested 34.5 kV service for load of approximately 14 MVA; location is near Cheesequake Substation.

Requested in-service date is 06/01/2025



**Need Number:** JCPL-2023-059

**Process State:** Need Meeting 11/16/2023

**Project Driver:**

*Customer Service*

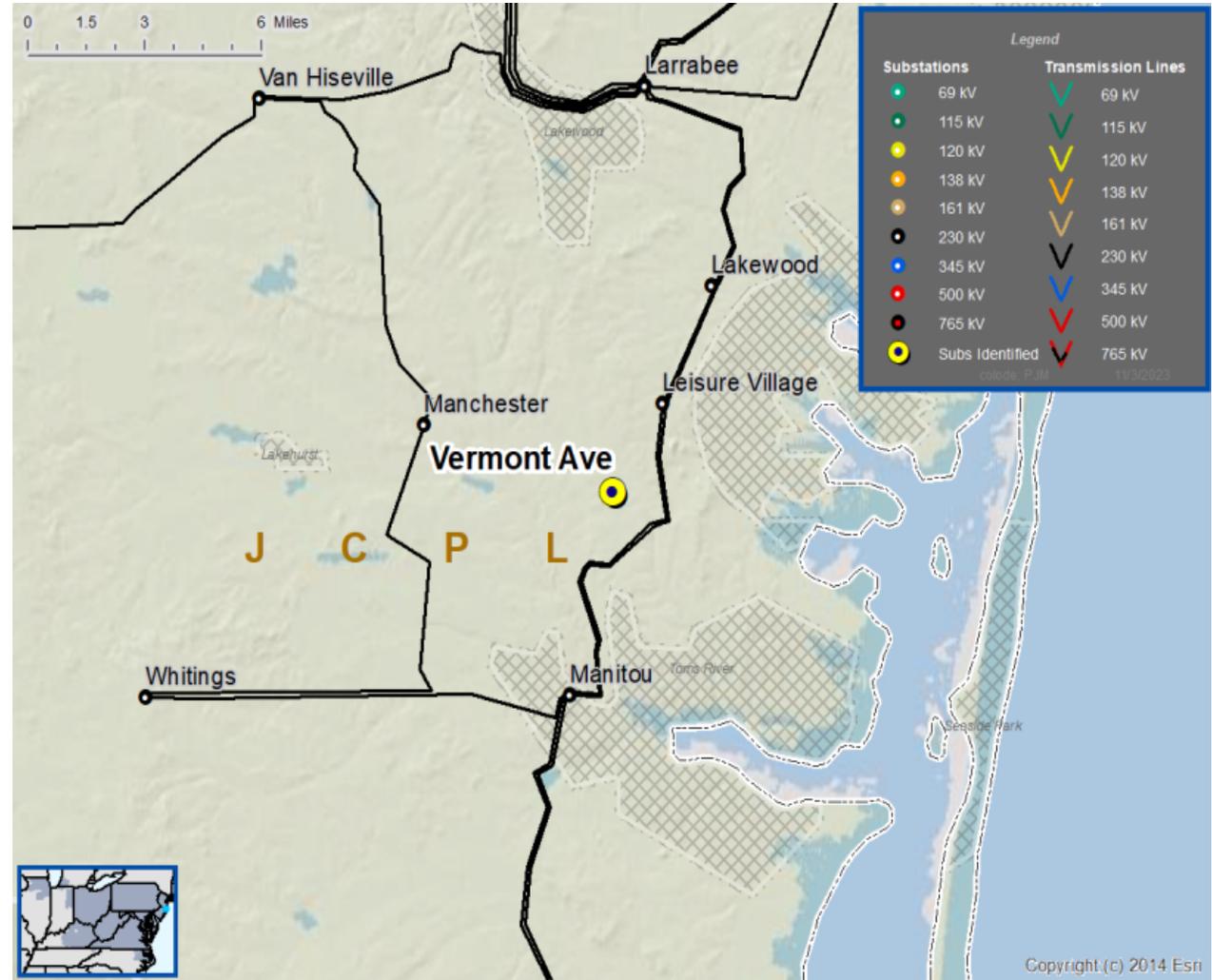
**Specific Assumption Reference:**

New customer connection requests will be evaluated per FirstEnergy’s “Requirements for Transmission Connected Facilities” document and “Transmission Planning Criteria” document.

**Problem Statement:**

New Customer Connection - A customer requested 34.5 kV service for load of approximately 10 MVA; location is near Vermont Ave Substation.

Requested in-service date is 05/01/2025



# Solutions

Stakeholders must submit any comments within 10 days of this meeting in order to provide time necessary to consider these comments prior to the next phase of the M-3 process

**Need Number:** JCPL-2019-026

**Process Stage:** Solution Meeting – 11/16/2023

**Previously Presented:** Need Meeting – 03/25/2019

**Project Driver(s):**

*Equipment Material Condition, Performance and Risk*

**Specific Assumption Reference(s)**

Line Condition Rebuild/Replacement

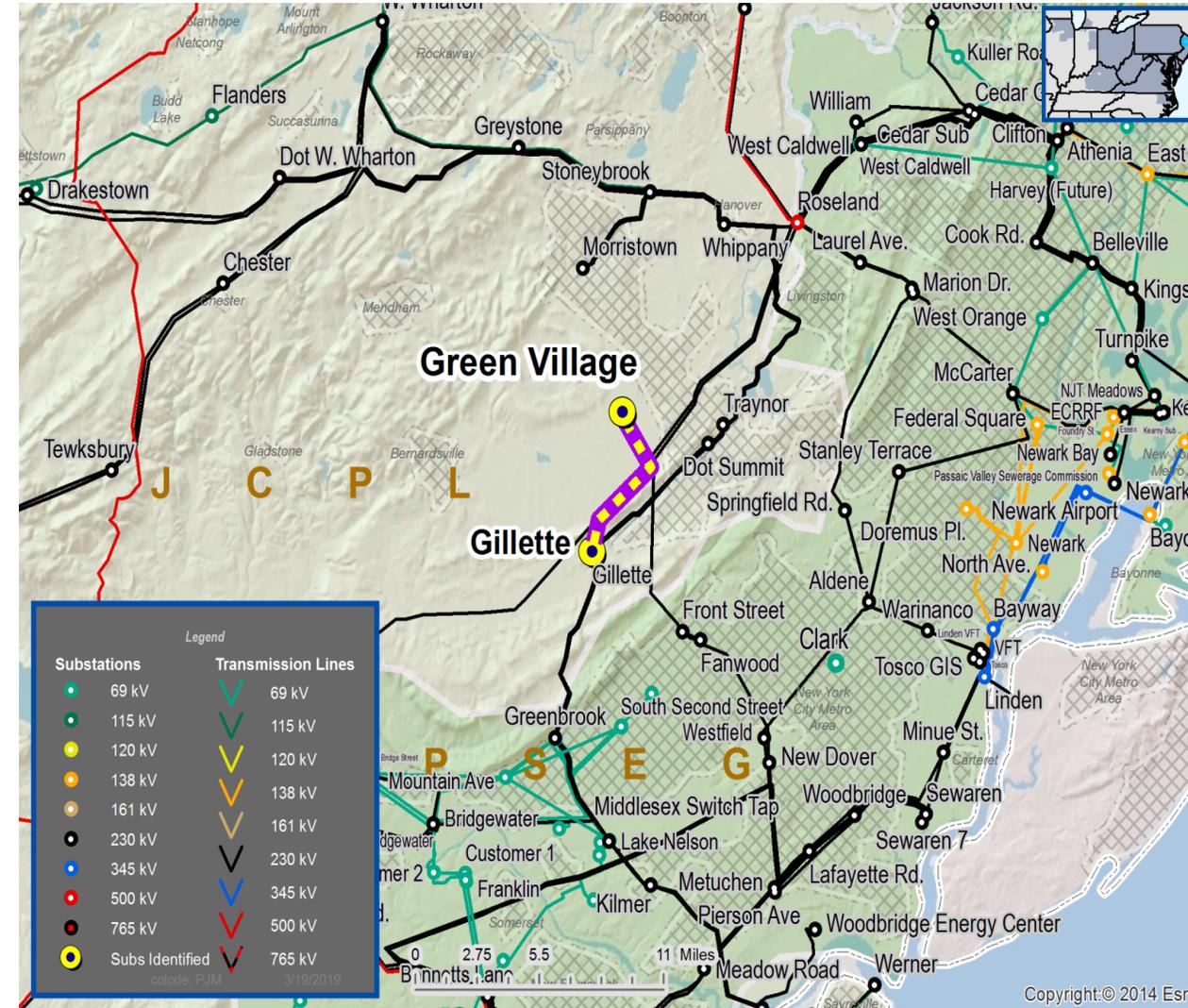
- Age/condition of wood pole transmission line structures
- Age/condition of steel tower or steel pole transmission line structures
- Age/condition of transmission line conductors

**System Performance Projects**

- Substation/line equipment limits

**Problem Statement**

- Line sections are exhibiting deterioration, increasing maintenance needs. Transmission line is approaching end of life
- Transmission line ratings are limited by terminal equipment.



...Continued from previous page

Need Number	Transmission Line / Substation Locations	Existing Circuit Rating (SN / SE)	Existing Conductor Rating (SN / SE)	Length of Line (miles)	Identified Structures (end of life / total)	Failure reasons
JCPL-2019-026	Gillette – Green Village 34.5 kV E5 Line Gillette – Green Village 34.5 kV J114 Line	41 / 50 44 / 53	41 / 50 44 / 53	5.7	132 / 134 (99% Failure Rate)	Age, bad/cut/missing grounds, rot/decay, woodpecker holes, etc.



# JCPL Transmission Zone M-3 Process Gillette – Green Village 34.5 kV lines

**Need Numbers:** JCPL-2019-026

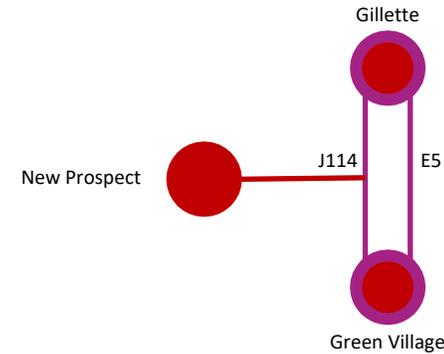
**Process Stage:** Solution Meeting 11/16/2023

**Proposed Solution:**

- Rebuild the Gillette-Green Village 34.5kV E5 and J114 circuit (shared structures). Replace approximately 134 damaged poles. Install 5.7 miles of new conductor.
  - Gillette Substation: Replace line relaying, limiting substation conductor
  - Green Village Substation: Replace line relaying, line side disconnect switch

**Transmission Line Ratings:**

- Gillette-Green Village E5 34.5 kV Line
  - Before Proposed Solution: 41 / 50 MVA (SN / SE)
  - After Proposed Solution: 55 / 67 MVA (SN / SE)
  
- Gillette-Green Village J114 34.5 kV Line
  - Before Proposed Solution: 44 / 53 MVA (SN / SE)
  - After Proposed Solution: 55 / 67 MVA (SN / SE)



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

**Alternatives Considered:**

- Maintain existing condition with increased risk to the reliability of the 34.5 kV network and replace equipment on failure.

**Estimated Project Cost:** \$ 24.2 M

**Projected In-Service:** 02/23/2024

**Project Status:** Construction

**Model:** 2023 RTEP model for 2028 Summer (50/50)

**Need Number:** JCPL-2023-006

**Process Stage:** Solution Meeting 11/16/2023

**Previously Presented:** Need Meeting 5/18/2023

**Project Driver:**

*Performance and Risk, Operational Flexibility and Efficiency*

**Specific Assumption Reference:**

System Performance Projects Global Factors

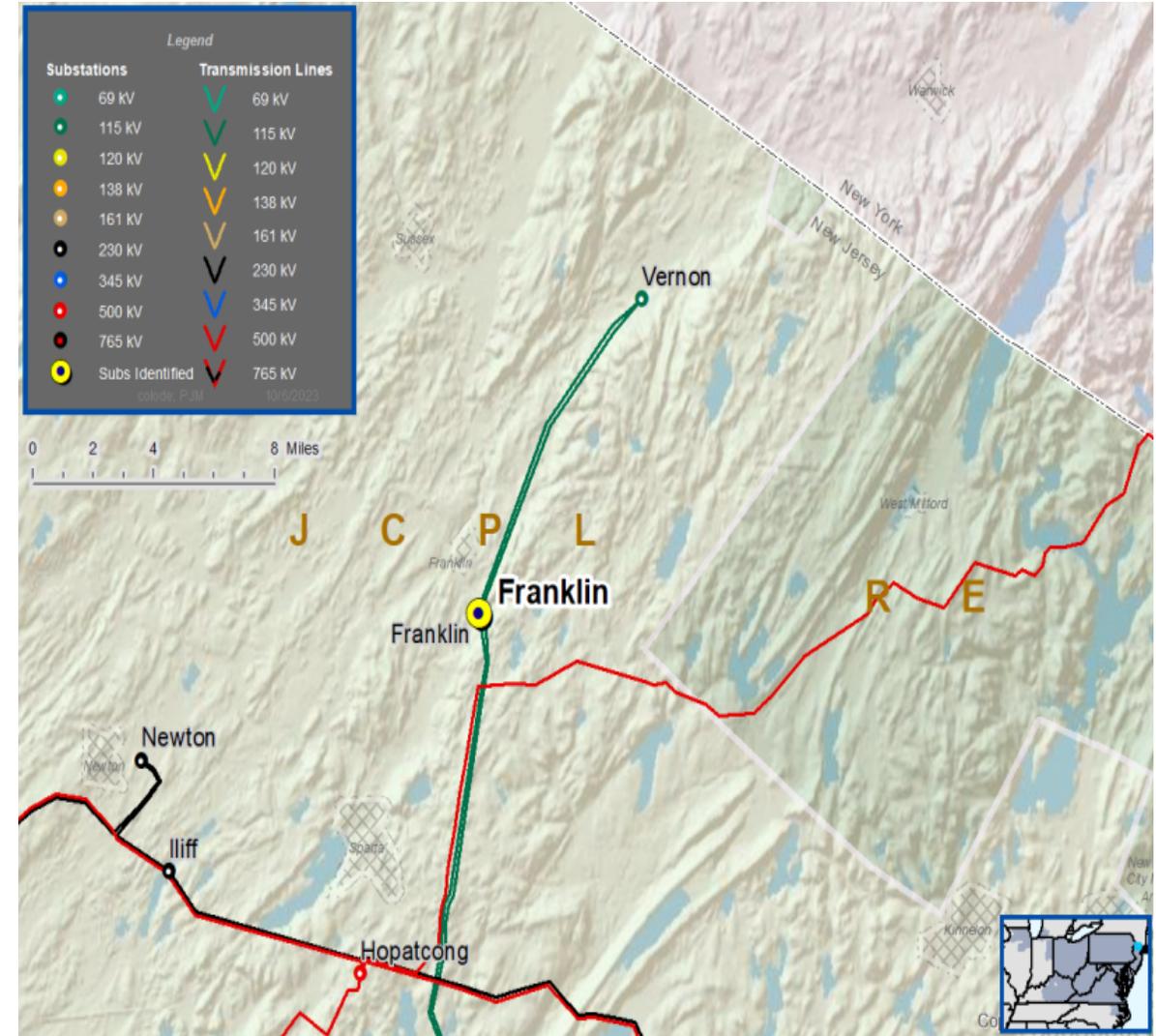
- System reliability and performance
- Reliability of Non-Bulk Electric System (Non-BES) Facilities

Add/Replace Transformers

Past System Reliability/Performance

**Problem Statement:**

- The 115 – 34.5 kV No. 2 Transformer at Franklin Substation was installed 70 years ago and is approaching end of life.
- Ethane and Hydrogen gases have been exhibited as elevated compared to IEEE standards.
- Existing TR Ratings:
  - 61 / 66 MVA (SN / SLTE)



**Need Number:** JCPL-2023-042

**Process Stage:** Solution Meeting 11/16/2023

**Previously Presented:** Need Meeting 10/19/2023

**Project Driver:**

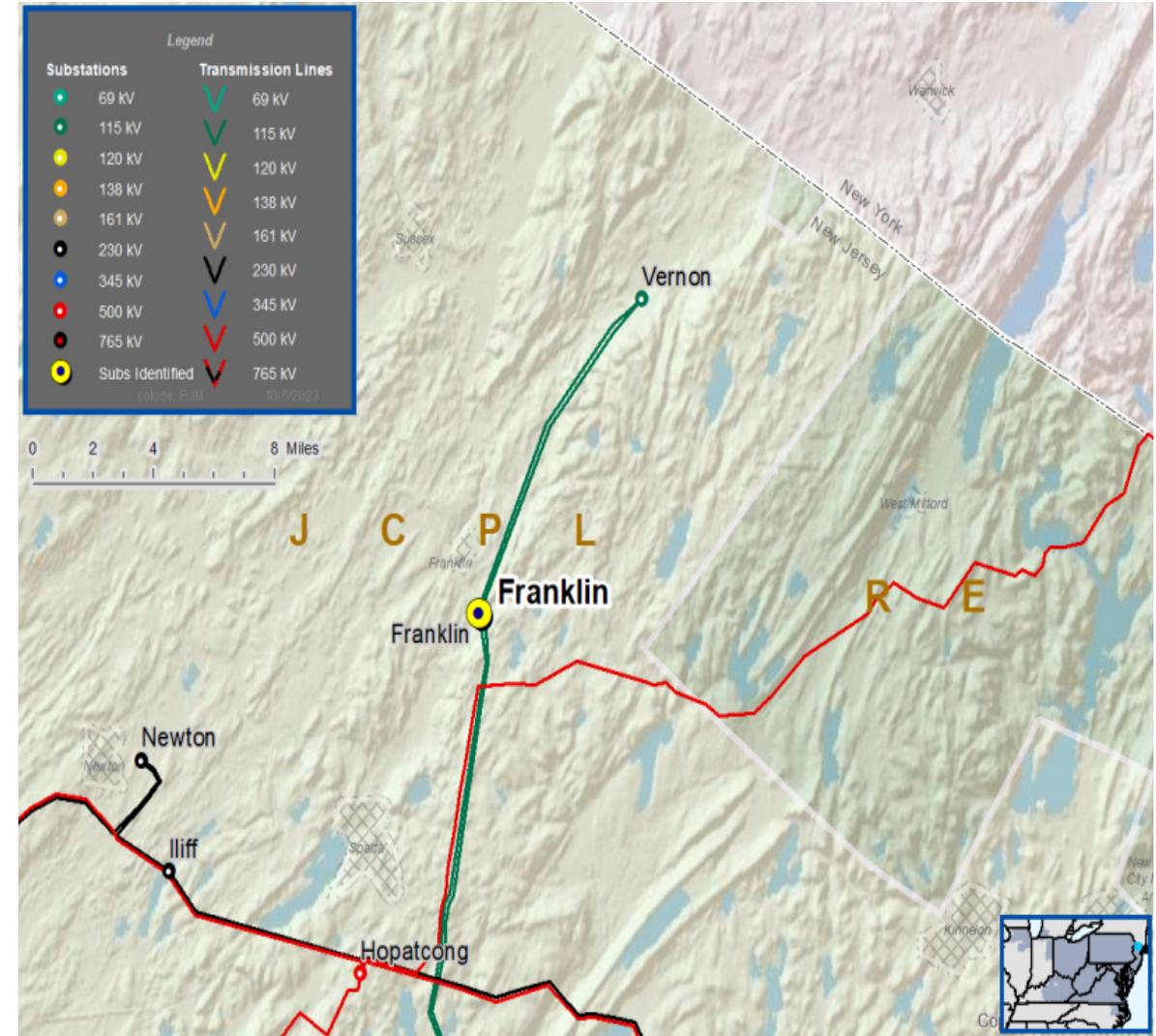
*Performance and Risk, Operational Flexibility and Efficiency*

**Specific Assumption Reference:**

- Load at risk in planning and operational scenarios
- Add/Expand Bus Configuration

**Problem Statement:**

- Franklin Substation is configured as a straight bus with two 115 kV sources. Each 115 kV source is a tap connection on the Vernon – West Wharton 115 kV lines
  - Franklin Substation serves approximately 67 MW of load and 4,464 customers.
  - Both existing Vernon – West Wharton 115 kV Lines are 16.7 miles long. A fault anywhere on either line will cause an outage at Franklin and Vernon substations.



**Need Number:** JCPL-2023-006, JCPL-2023-042

**Process Stage:** Solution Meeting 11/16/2023

**Proposed Solution:**

- At Franklin Substation:
  - Construct an 11 breaker 115 kV breaker-and-a-half substation
  - Cut the existing Vernon – West Wharton 115 kV D931 & J932 Lines and terminate them at Franklin Substation. This will create the following 115 kV Lines:
    - Franklin – West Wharton No. 1 115 kV
    - Franklin – West Wharton No. 2 115 kV
    - Franklin – Vernon No. 1 115 kV
    - Franklin – Vernon No. 2 115 kV
  - Install a new 90 MVA 115-34.5 kV transformer
  - Replace the existing 115-34.5 kV No. 2 transformer with a 90 MVA unit.
- Replace relaying at Franklin, Vernon, and West Wharton Substations

**Alternatives Considered:**

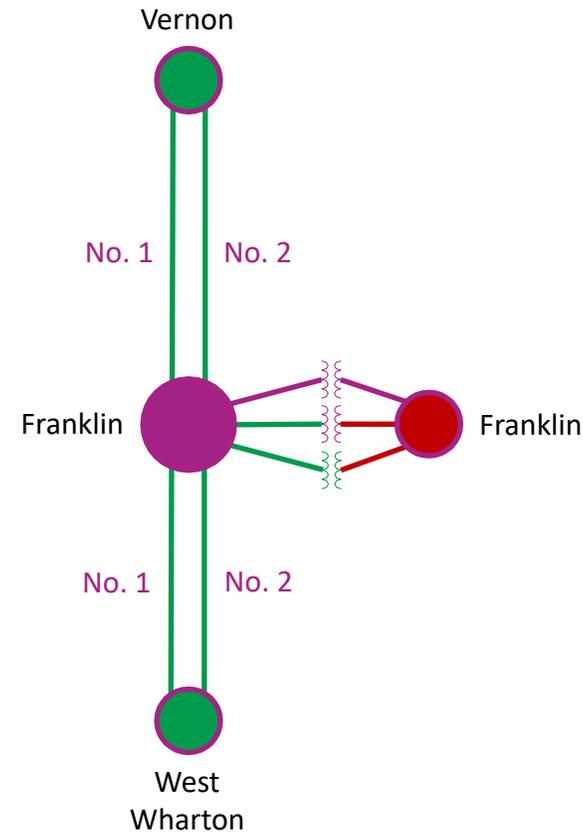
- Operate transmission lines and transformers as-is, placing customers and load at risk

**Estimated Project Cost:** \$32.0 M

**Projected In-Service:** 12/31/2025

**Project Status:** Engineering

**Model:** 2023 RTEP model for 2028 Summer (50/50)



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	





# JCPL Transmission Zone M-3 Process Automatic Restoration Projects

Need #	Transmission Line / Substation Locations	Existing Line Rating (SN / SE)	Existing Conductor Rating (SN / SE)
JCPL-2023-008	Citgo D Tap – Monroe 34.5 kV	70/84	70/85
	Hoffman Solar Tap – Monroe 34.5 kV	44/57	70/85



## JCPL Transmission Zone M-3 Process Automatic Restoration Projects

Need #	Transmission Line / Substation Locations	Existing Line Rating (SN / SE)	Existing Conductor Rating (SN / SE)
JCPL-2023-009	Freneau – Hillsdale Tap 34.5 kV	44/48	44/53
	Freneau – Pennwalt Tap 34.5 kV	44/48	44/53
	Freneau – Hazlet 34.5 kV	55/67	55/67
	Freneau – Ernston Tap 34.5 kV	40/48	40/48



## JCPL Transmission Zone M-3 Process Automatic Restoration Projects

Need #	Transmission Line	Existing Line Rating (SN/SE/WN/WE)	Existing Conductor Rating (SN/SE/WN/WE)
JCPL-2023-013	Manitou – Toms River Tap V126 34.5 kV	66/72/72/72	70/85/79/100
	Manitou - Pine Beach Tap X50 34.5 kV	55/63/63/63	55/67/63/79
JCPL-2023-014	Bernardsville – ELRR Tap C757 34.5 kV	44/53/50/57	44/53/50/63
	Bernardsville - Lyons B730 34.5 kV	44/47/47/47	44/53/50/63
JCPL-2023-016	Allenhurst - Oceanview H216 34.5 kV	44/48/48/48	55/67/63/79
JCPL-2023-017	Air Reduction – Murray Hill D108 34.5 kV	44/53/50/61	44/53/50/63
JCPL-2023-018	Rocktown Road - Mercer Tap N716 34.5 kV	39/48/45/48	39/48/45/56
	Alexauken Tap - Rocktown Road Y727 34.5 kV	38/38/38/38	40/48/45/57
JCPL-2023-019	Air Reduction Tap – New Providence D108 34.5 kV	35/46/48/48	41/50/48/60
JCPL-2023-020	West Wharton - Route 15 Switch Point T254 34.5 kV	55/67/63/72	55/67/63/79
	West Wharton - Kenvil Tap Z728 34.5 kV	55/67/63/77	55/67/63/79
JCPL-2023-021	Lanes Mill Tap - Point Pleasant T146 34.5 kV	41/48/48/48	44/53/50/63
	Brielle - Point Pleasant B106 34.5 kV	39/48/40/48	39/48/40/50
JCPL-2023-024	Englishtown - Hoffman Solar Tap H34 34.5 kV	70/72/72/72	70/85/79/100
	Englishtown - Route 33 Switch Point I87 34.5 kV	41/50/48/56	41/50/48/60
	Englishtown - Gordons Corner A209 34.5 kV	44/53/50/61	44/53/50/63



## JCPL Transmission Zone M-3 Process Automatic Restoration Projects

Need #	Transmission Line	Existing Line Rating (SN/SE/WN/WE)	Existing Conductor Rating (SN/SE/WN/WE)
JCPL-2023-026	Lakehurst - Ship Test E109 34.5 kV	25/25/25/25	44/53/50/63
	Lakehurst - Lakehurst Solar Tap N140 34.5 kV	18/18/19/19	18/18/20/20
	Lakehurst - South Lakewood W777 34.5 kV	41/50/48/57	41/50/48/60
	Lakehurst - TRC O Tap O41 34.5 kV	41/50/48/51	41/50/48/60
JCPL-2023-028	Pompton Plains Tap – Riverdale M117 34.5 kV	41/48/48/48	41/50/48/60
	Riverdale Quarry Tap - Riverdale I9 34.5 kV	44/53/50/57	44/53/50/63
JCPL-2023-029	Traynor - Canoe Brook T72 34.5 kV	41/48/48/48	41/50/48/60
	Traynor - ELRR Summit Q Tap Q17 34.5 kV	42/48/48/48	44/53/50/63
	Canoe Brook Tap - Traynor C81 34.5 kV	44/53/50/53	44/53/50/63
JCPL-2023-030	Larrabee - Laurelton Tap Q43 34.5 kV	55/67/63/72	55/67/63/79
	Hyson - Larrabee K219 34.5 kV	66/76/76/76	70/85/79/100
	Larrabee - Metedeconk Tap E213 34.5 kV	41/50/48/53	41/50/48/60
	Larrabee - Allaire Tap B106 34.5 kV	41/50/48/52	41/50/48/60
JCPL-2023-040	Red Bank - Little Silver Z78 34.5 kV	55/67/63/72	55/67/63/79
JCPL-2023-041	Manitou - Whitings L138 34.5 kV	41/50/48/56	41/50/48/60



## JCPL Transmission Zones M-3 Process Automatic Restoration Projects

### Proposed Solution:

Need #	Transmission Line	New Line Rating (SN/SE/WN/WE)	Scope of Work	Estimated Cost (\$ M)	Target ISD
JCPL-2023-008	Citgo D Tap – Monroe D82 34.5 kV	70/85/79/100	• At Monroe, replace relaying	\$1.89	12/31/2024
	Hoffman Solar Tap – Monroe H34 34.5 kV	44/57/63/71			
JCPL-2023-009	Freneau – Hillsdale Tap F32 34.5 kV	44/53/50/63	• At Freneau, replace relaying	\$3.78	12/31/2024
	Freneau – Pennwalt Tap V100 34.5 kV	44/53/50/63			
	Freneau – Hazlet S45 34.5 kV	55/67/63/79			
	Freneau – Ernston Tap W101 34.5 kV	40/48/45/57			
JCPL-2023-013	Manitou – Toms River Tap V126 34.5 kV	66/79/79/90	• At Manitou, replace relaying	\$1.92	10/15/2024
	Manitou - Pine Beach Tap X50 34.5 kV	55/67/63/79			
JCPL-2023-014	Bernardsville – ELRR Tap C757 34.5 kV	44/53/50/63	• At Bernardsville, replace relaying	\$1.28	11/15/2024
	Bernardsville - Lyons B730 34.5 kV	44/53/50/63			
JCPL-2023-016	Allenhurst - Oceanview H216 34.5 kV	44/57/63/71	• At Allenhurst, replace relaying	\$1.28	11/16/2024
JCPL-2023-017	Air Reduction – Murray Hill D108 34.5 kV	35/46/48/57	• At Murray Hill, replace relaying	\$0.64	12/15/2024
JCPL-2023-018	Rocktown Road - Mercer Tap N716 34.5 kV	39/48/45/56	• At Rocktown Road, replace relaying	\$1.28	12/31/2024
	Alexauken Tap - Rocktown Road Y727 34.5 kV	40/48/45/57			



## JCPL Transmission Zones M-3 Process Automatic Restoration Projects

### Proposed Solution:

Need #	Transmission Line	New Line Rating (SN/SE/WN/WE)	Scope of Work	Estimated Cost (\$ M)	Target ISD
JCPL-2023-019	Air Reduction Tap – New Providence D108 34.5 kV	44/53/50/63	• At New Providence, replace relaying	\$0.64	12/10/2027
JCPL-2023-020	West Wharton - Route 15 Switch Point T254 34.5 kV	55/67/63/79	• At West Wharton, replace relaying	\$1.92	6/1/2025
	West Wharton - Kenvil Tap Z728 34.5 kV	55/67/63/79			
JCPL-2023-021	Lanes Mill Tap - Point Pleasant T146 34.5 kV	41/52/50/62	• At Point Pleasant, replace relaying	\$1.92	5/15/2025
	Brielle - Point Pleasant B106 34.5 kV	39/48/40/50			
JCPL-2023-024	Englishtown - Hoffman Solar Tap H34 34.5 kV	70/85/79/100	• At Englishtown, replace relaying	\$2.56	10/15/2025
	Englishtown - Route 33 Switch Point I87 34.5 kV	41/50/48/60			
	Englishtown - Gordons Corner A209 34.5 kV	44/53/50/63			
JCPL-2023-026	Lakehurst - Ship Test E109 34.5 kV	44/53/50/63	• At Lakehurst, replace relaying	\$2.56	12/31/2025
	Lakehurst - Lakehurst Solar Tap N140 34.5 kV	18/18/20/20			
	Lakehurst - South Lakewood W777 34.5 kV	41/50/48/60			
	Lakehurst - TRC O Tap O41 34.5 kV	41/50/48/57			
JCPL-2023-028	Pompton Plains Tap – Riverdale M117 34.5 kV	41/50/48/60	• At Riverdale, replace relaying	\$1.28	12/31/2025
	Riverdale Quarry Tap - Riverdale I9 34.5 kV	44/53/50/63			



# JCPL Transmission Zones M-3 Process Automatic Restoration Projects

## Proposed Solution:

Need #	Transmission Line	New Line Rating (SN/SE/WN/WE)	Scope of Work	Estimated Cost (\$ M)	Target ISD
JCPL-2023-029	Traynor - Canoe Brook T72 34.5 kV	41/50/48/60	• At Traynor, replace relaying	\$1.92	12/31/2025
	Traynor - ELRR Summit Q Tap Q17 34.5 kV	42/50/50/57			
	Canoe Brook Tap - Traynor C81 34.5 kV	44/53/50/63			
JCPL-2023-030	Larrabee - Laurelton Tap Q43 34.5 kV	55/67/63/79	• At Larrabee, replace relaying	\$2.56	12/20/2024
	Hyson - Larrabee K219 34.5 kV	70/85/79/100			
	Larrabee - Metedeconk Tap E213 34.5 kV	41/50/48/60			
	Larrabee - Allaire Tap B106 34.5 kV	41/50/48/60			
JCPL-2023-040	Red Bank - Little Silver Z78 34.5 kV	55/67/63/79	• At Red Bank, replace relaying	\$1.28	12/31/2027
JCPL-2023-041	Manitou - Whitings L138 34.5 kV	41/50/48/60	• At Whitings, replace relaying	\$1.28	6/1/2025

**Alternatives Considered:** Maintain equipment in existing condition and reduced reliability to customers.

**Project Status:** Engineering

**Model:** 2023 RTEP model for 2028 Summer (50/50)



# Appendix

# High level M-3 Meeting Schedule

Assumptions	Activity	Timing
	Posting of TO Assumptions Meeting information	20 days before Assumptions Meeting
	Stakeholder comments	10 days after Assumptions Meeting
Needs	Activity	Timing
	TOs and Stakeholders Post Needs Meeting slides	10 days before Needs Meeting
	Stakeholder comments	10 days after Needs Meeting
Solutions	Activity	Timing
	TOs and Stakeholders Post Solutions Meeting slides	10 days before Solutions Meeting
	Stakeholder comments	10 days after Solutions Meeting
Submission of Supplemental Projects & Local Plan	Activity	Timing
	Do No Harm (DNH) analysis for selected solution	Prior to posting selected solution
	Post selected solution(s)	Following completion of DNH analysis
	Stakeholder comments	10 days prior to Local Plan Submission for integration into RTEP
	Local Plan submitted to PJM for integration into RTEP	Following review and consideration of comments received after posting of selected solutions

# Revision History

11/6/2023 – V1 – Original version posted to pjm.com

11/10/2023 – V2 – Replaced tables on slide # 18 and 19