Transmission Expansion Advisory Committee – FirstEnergy-JCPL Supplemental Projects

September 9, 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

JCPL Transmission Zone M-3 Process
West Wharton No. 1 230-34.5 kV Transformer

Need Number: JCPL-2024-002
Process Stage: Solution Meeting 09/09/2025
Previously Presented: Need Meeting 01/09/2024

Project Driver:
Equipment Material Condition, Performance and Risk

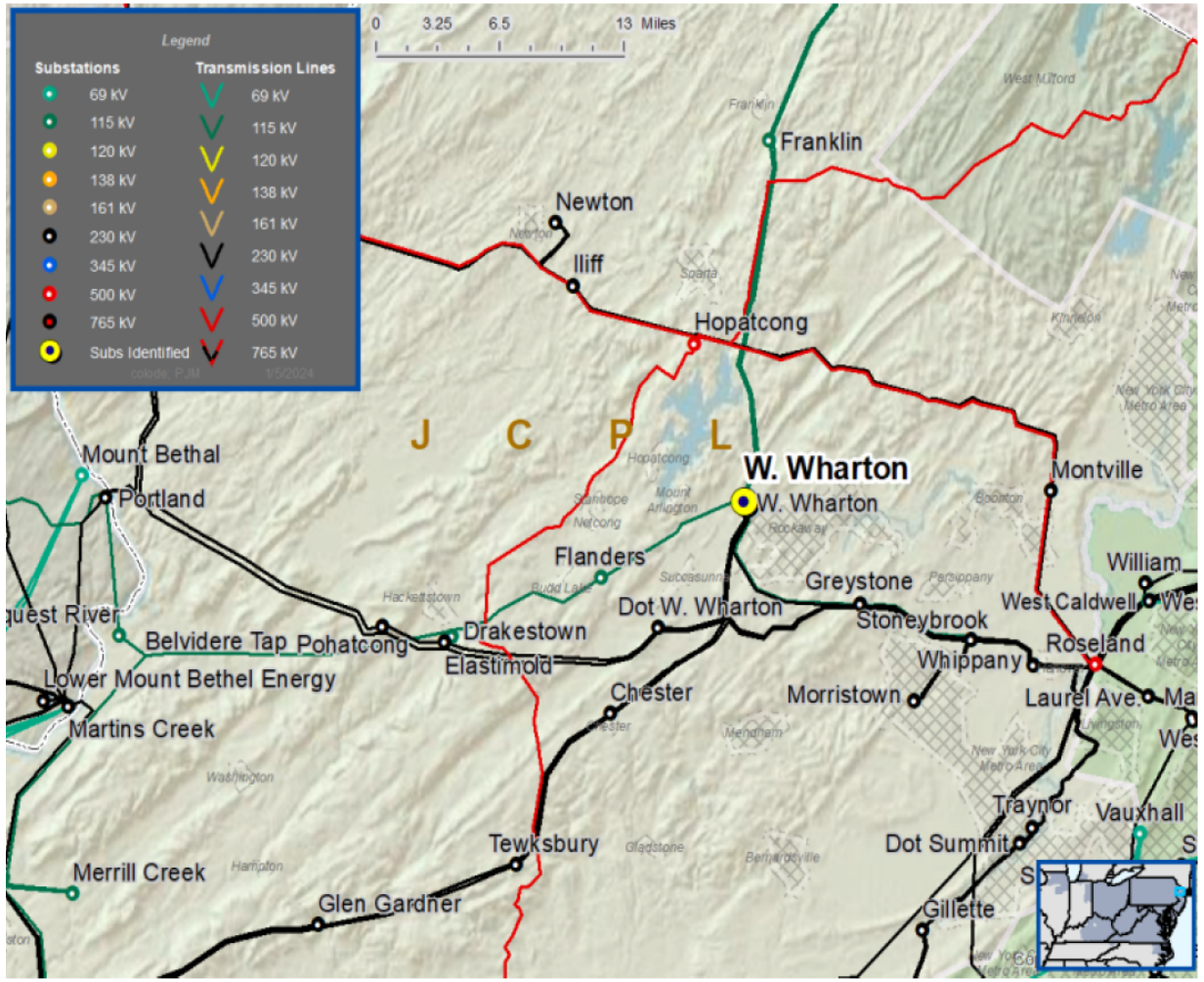
Specific Assumption References:
System Performance Projects Global Factors

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

Add/Replace Transformers
Past System Reliability/Performance

Problem Statement:

- The 230-34.5 kV No. 1 Transformer at West Wharton Substation is approximately 45 years old and is reaching end of life.
- Dielectric strength of the transformer is measuring below acceptable IEEE limits.
  - Low measured dielectric strength reduces breakdown voltage and greatly increases risk of failure from arcing.
- Existing transformer ratings:
  - 156 / 164 / 197 / 198 MVA (SN/SLTE/WN/WLTE)



JCPL Transmission Zone M-3 Process
West Wharton No. 1 230-34.5 kV Transformer

Need Number: JCPL-2024-002

Process Stage: Solution Meeting 9/9/2025

Proposed Solution:

At West Wharton Substation:

- Replace No. 1 230-34.5kV Transformer with a new 230-34.5 kV 168 MVA unit
- Replace one 230 kV circuit switcher with a new 230 kV circuit breaker
- Replace two 34.5 kV circuit breakers and associated disconnect switches

West Wharton No. 1 230-34.5 kV Transformer Ratings:

- Before Proposed Solution: 156 / 164 / 197 / 198 MVA (SN/SLTE/WN/WLTE)
- After Proposed Solution: 168 / 176 / 202 / 218 MVA (SN/SLTE/WN/WLTE)

Alternatives Considered:

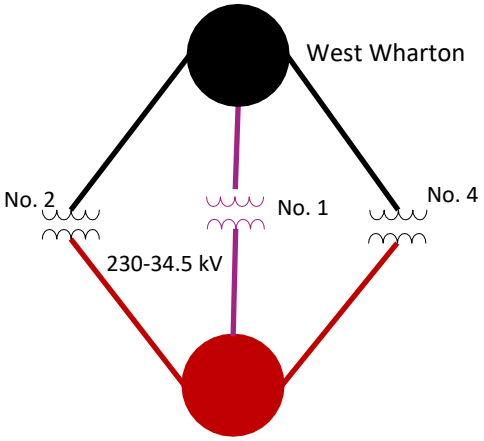
Maintain transformer in existing condition with elevated risk of failure due to condition.

Estimated Project Cost: $12.00 M

Projected In-Service: 11/9/2029

Project Status: Conceptual

Model: 2024 RTEP model for 2029 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
West Wharton No. 2 230-34.5 kV Transformer

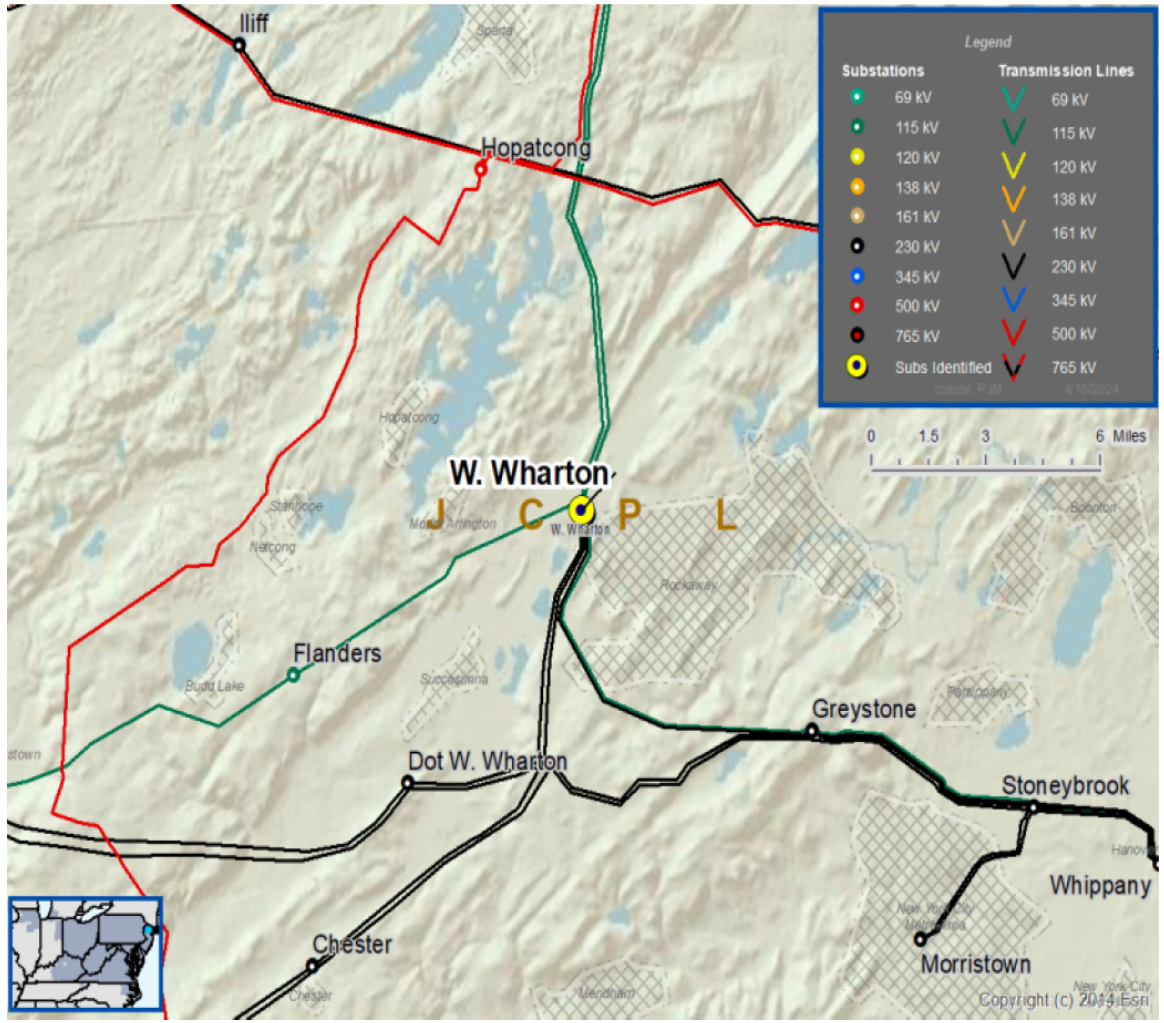
Need Number: JCPL-2024-024
Process Stage: Solution Meeting 09/09/2025
Previously Presented: Need Meeting 04/30/2024

Project Driver:
Equipment Material Condition, Performance and Risk

Specific Assumption Reference:
System Performance Projects Global Factors
- System reliability and performance
- Substation/line equipment limits

Add/Replace Transformers
Past System Reliability/Performance

Problem Statement:
- The West Wharton No. 2 230-34.5 kV Transformer is approximately 52 years old and is approaching end of life.
- The transformer is experiencing issues with bushing failures.
- The transformer has increased levels of water, carbon monoxide, oxygen and nitrogen in the transformer oil.
- The transformer is limited by terminal equipment.
- Existing Transformer Ratings:
  - 155 / 163 / 197 / 198 MVA (SN/SLTE/WN/WLTE)



JCPL Transmission Zone M-3 Process
West Wharton No. 2 230-34.5 kV Transformer

Need Number: JCPL-2024-024
Process Stage: Solution Meeting 9/9/2025

Proposed Solution:
At West Wharton Substation:

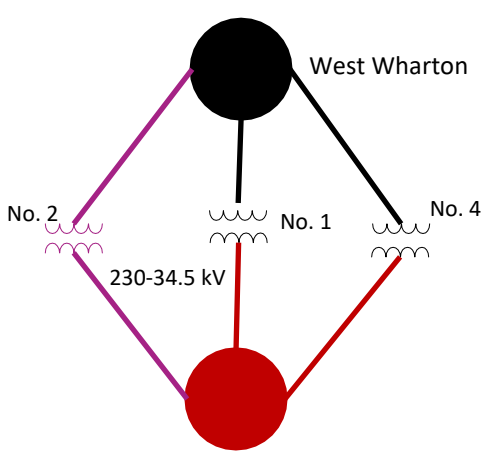
- Replace No. 2 230-34.5kV Transformer with a new 230-34.5 kV 168 MVA unit
- Replace one 230 kV circuit switcher with a new 230 kV circuit breaker
- Replace two 34.5 kV circuit breakers and associated disconnect switches

West Wharton No. 2 230-34.5 kV Transformer Ratings:

- Before Proposed Solution: 155 / 163 / 197 / 198 MVA (SN/SLTE/WN/WLTE)
- After Proposed Solution: 168 / 176 / 202 / 218 MVA (SN/SLTE/WN/WLTE)

Alternatives Considered:
Maintain transformer in existing condition with elevated risk of failure due to condition.

Estimated Project Cost: $12.00 M
Projected In-Service: 12/22/2028
Project Status: Conceptual
Model: 2024 RTEP model for 2029 Summer (50/50)



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

Revision History

8/29/2025– V1 – Original version posted to pjm.com