

# Sub-Regional RTEP Committee – Mid-Atlantic FirstEnergy Supplemental Projects

December 14, 2022

**Need Number:** PN-2022-004

**Process State:** Need Meeting 12/14/2022

**Project Driver:**

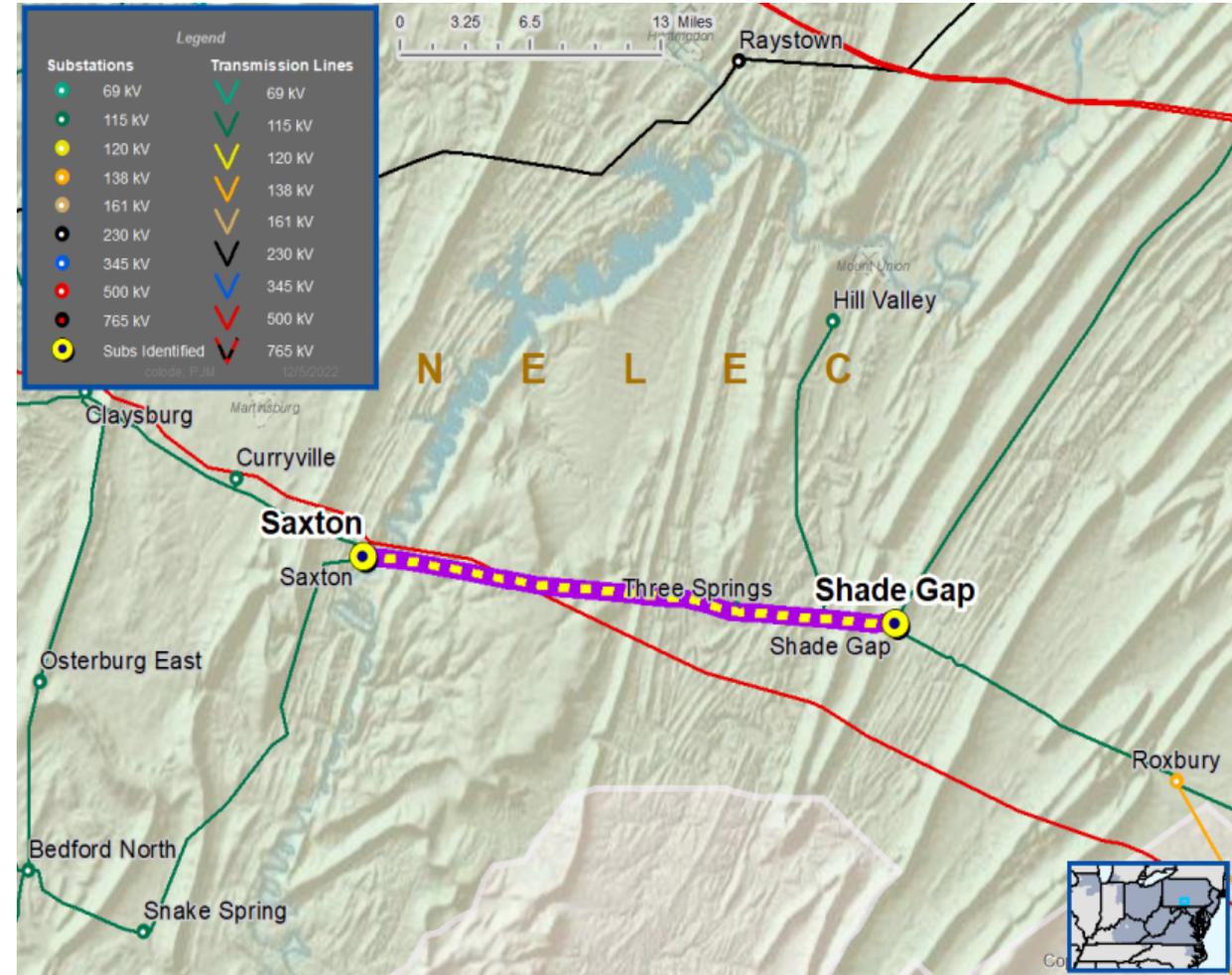
*Customer Service*

**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 115 kV service for load of approximately 20 MW near the Saxton – Shade Gap 115 kV line. Requested in-service date is 09/01/2024.



Sub-Regional RTEP Committee – Mid-Atlantic  
FirstEnergy Supplemental Projects  
Cost Update (s1776.1-3)

# Penelec Transmission Zone M-3 Process

## Tyrone North Replace 115- 46 kV Transformer #2 and Construct 115 kV Ring Bus

**Need Number:** PN-2018-008

**Process Stage:** Solution Meeting 10/29/2018

**Project Driver:**

- *Operational Flexibility and Efficiency*
- *Equipment Material Condition, Performance and Risk*

**Specific Assumption Reference:**

Substation Condition Rebuild/Replacement

- Show an increasing negative trend in maintenance findings and/or costs.
- Are near or beyond expected service life or obsolete.

Add/Replace Transformers

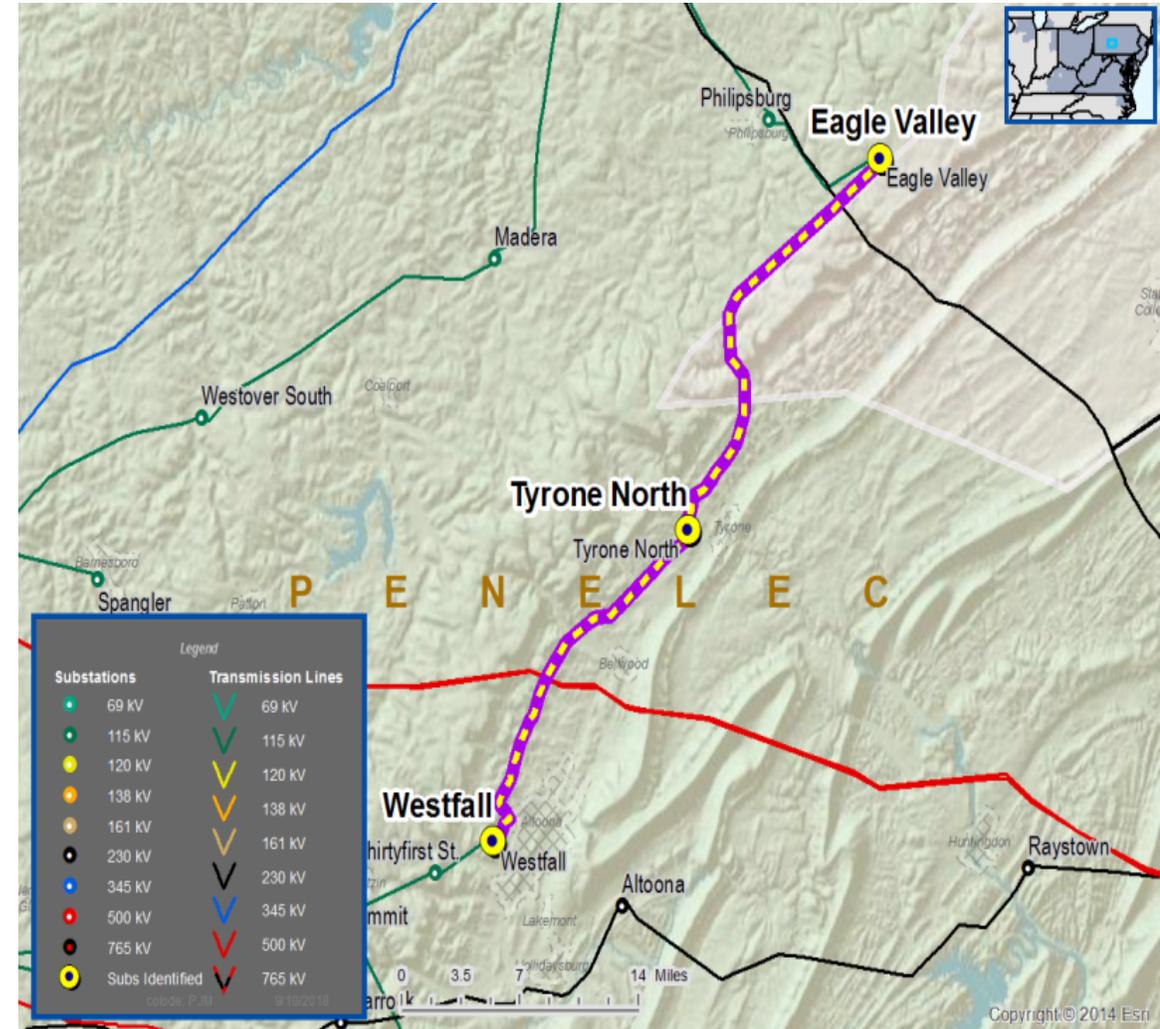
- Transformer that if added or replaced would alleviate loading conditions under contingency scenarios

Add/Expand Bus Configuration

- Loss of substation bus adversely impacts transmission system performance.
- Reduce the amount of exposed potential local load loss during contingency conditions.
- Eliminate simultaneous outages to multiple networked elements under N-1 analysis

**Problem Statement**

- Tyrone North 115 kV switching station serves ~50 MW of radial load and relies on breakers at Eagle Valley and Westfall 115 kV substations for remote clearing of fault conditions. Transformer or line faults result in interruption of the entire network path and interruption of service to both the #1 and #2 115-46 kV transformers with limited network transfer capability. In the event of a #1 115-46 kV transformer fault, all load cannot be served by the #2 115-46 kV transformer (the transformer loads to 123% of its 41 MVA summer emergency rating during restoration efforts under peak conditions).
- Tyrone North #2 115-46 kV transformer has an increased failure probability due to aging/deteriorating bushings, components and fluid. The transformer was manufactured in 1950.



# Penelec Transmission Zone M-3 Process

## Tyrone North Replace 115- 46 kV Transformer #2 and Construct 115 kV Ring Bus

**Need Number:** PN-2018-008

**Process State:** Solution Meeting 10/29/2018

**Proposed Solution:**

*Tyrone North 115 kV Ring Bus & #2 115/46 kV Transformer Replacement*

- Construct a four breaker 115 kV ring bus
- Replace the #2 115/46 kV 45/60/75 MVA transformer
- Install a 46 kV 1200 A bypass switch between the Tipton and Warrior Ridge 46 kV lines

**Transmission Line Ratings:**

- Tyrone North – Westfall 115 kV Line
  - Before Proposed Solution: 175 MVA SN / 237 MVA SE
  - After Proposed Solution: 202 MVA SN / 245 MVA SE
- Tyrone North – Eagle Valley 115 kV Line
  - Before Proposed Solution: 147 MVA SN / 191 MVA SE
  - After Proposed Solution: 202 MVA SN / 245 MVA SE
- Tyrone North #2 115-46 kV Transformer
  - Before Proposed Solution: 38 MVA SN / 41 MVA SE
  - After Proposed Solution: 97 MVA SN / 97 MVA SE

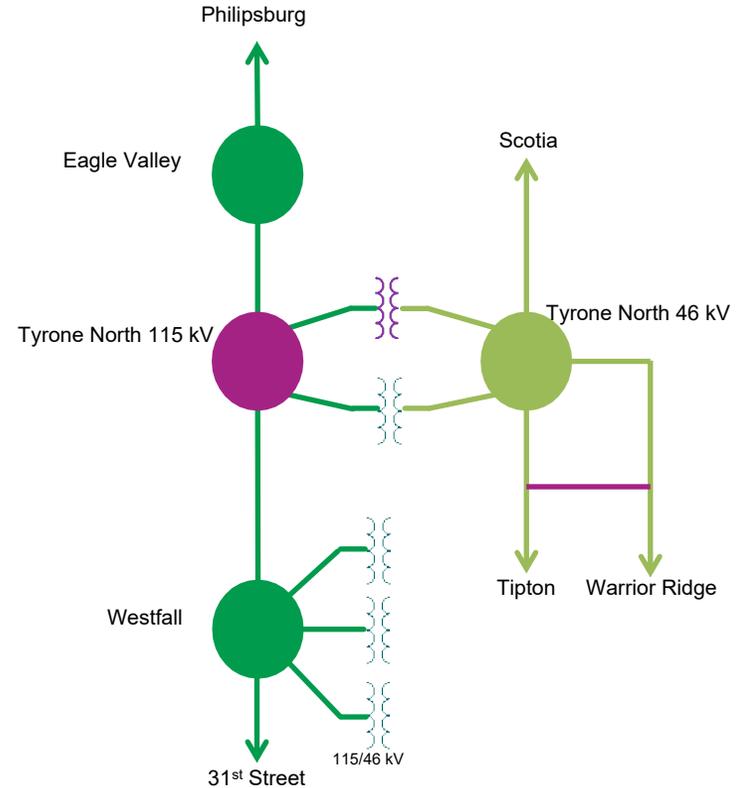
**Alternatives Considered:**

- Maintain existing condition and elevated risk of failure

**Estimated Project Cost:** \$4.8M

**Projected In-Service:** 12/31/2020

**Project Status:** Conceptual



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

### Project Cost Increased

**Need Number:** PN-2018-008

**Process State:** Solution Meeting 10/29/2018

**Proposed Solution:**

*Tyrone North 115 kV Ring Bus & #2 115/46 kV Transformer Replacement*

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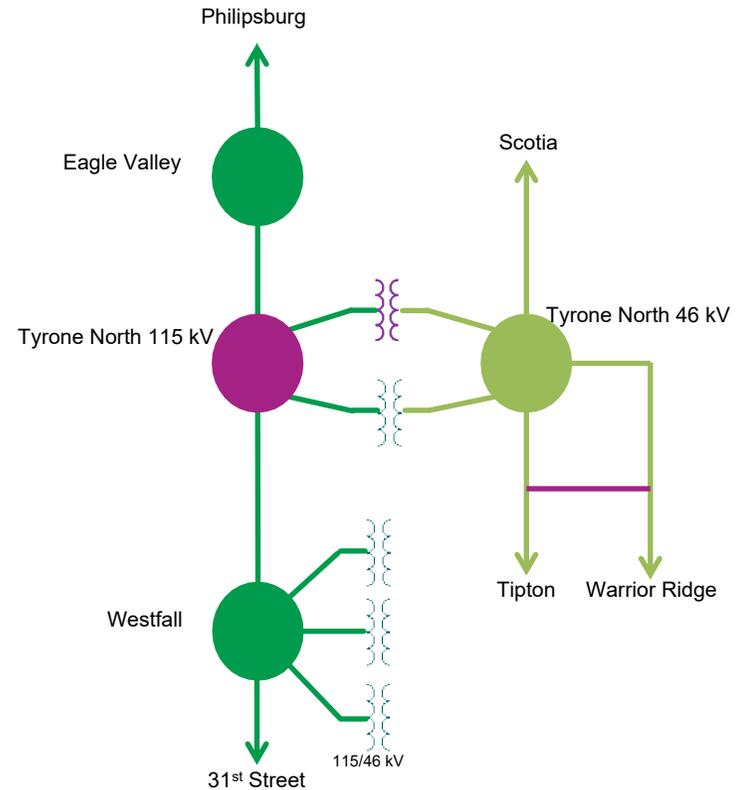
**Cost Increase Due to :**

- Errors in original estimate
- Actual material and labor cost increases
- Middle phase of transformer #2 failed in July 2021
- Project schedule shifted creating need to complete all work in 2022

**Estimated Project Cost:** \$18.9M

**Projected In-Service:** 12/16/2022

**Project Status:** Under Construction



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

# Revision History

11/2/2022 – V1 – Original version posted to pjm.com