Subregional RTEP Committee - Mid-Atlantic
FirstEnergy Supplemental Projects

Submission of Supplemental Projects for Inclusion in the Local Plan

Penelec Transmission Zone M-3 Process
Westfall Substation

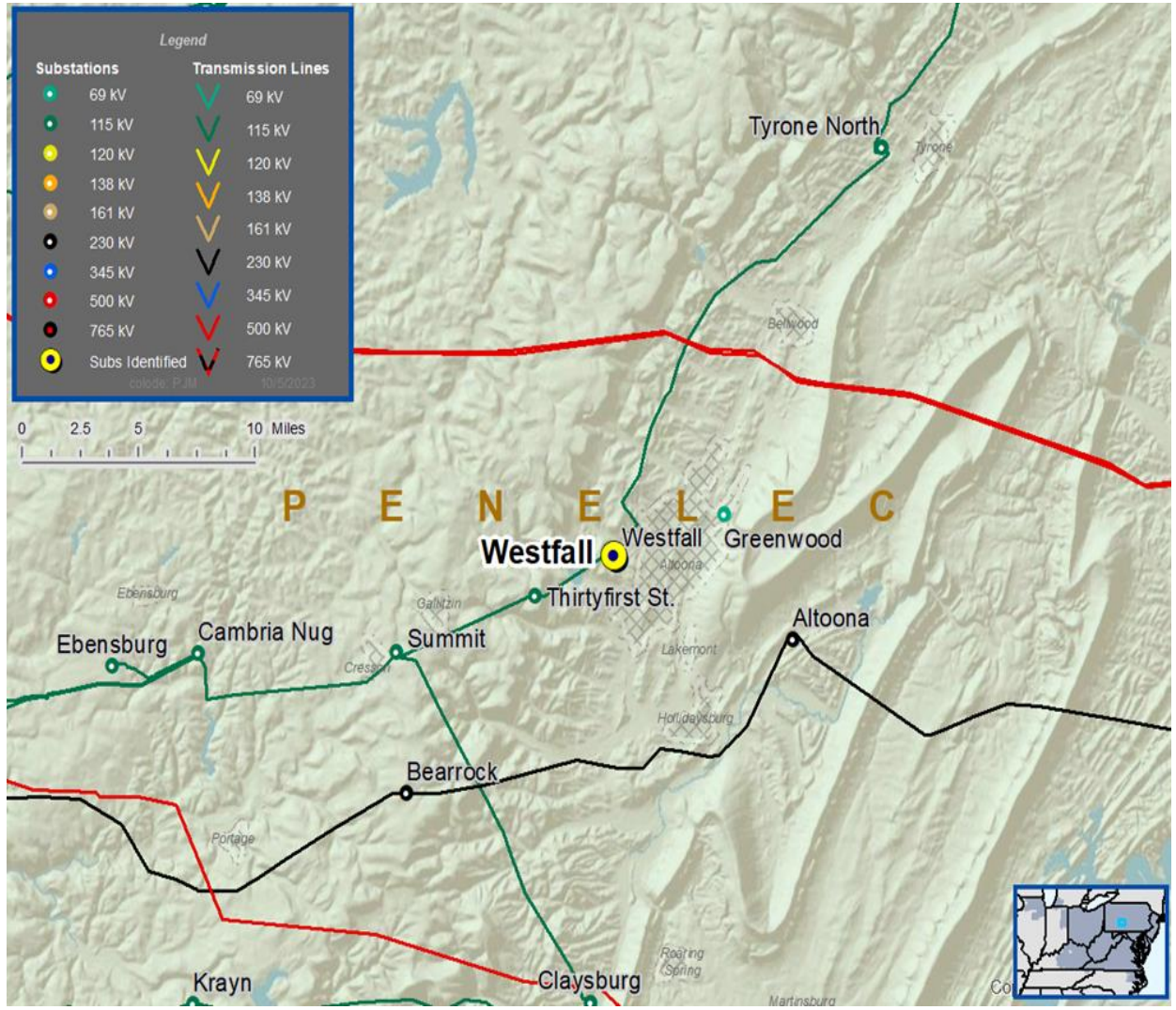
Need Number: PN-2023-013
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan
Previously Presented: Need Meeting 10/19/2023
Solution Meeting 12/13/2023

Project Driver:
Equipment Material Condition, Performance and Risk

Specific Assumption Reference:
System Performance Projects
- System reliability and performance
- Substation and line equipment limits
- Reliability of Non-Bulk Electric System (Non-BES) Facilities

Problem Statement:
- The Westfall Substation control building is small and congested. The condition of the control building is deteriorating.
- Transmission line ratings are limited by terminal equipment

Thirty-First Street – Westfall 115 kV Line
- Existing line rating: 232/282 MVA SN/SE and 263/307 MVA WN/WE
  - Existing transmission conductor rating: 232 / 282 MVA (SN / SE) and 263/334 MVA WN/WE



Penelec Transmission Zone M-3 Process
Westfall Substation

Need Number: PN-2023-013

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Selected Solution:
Westfall 115 kV Substation

- Replace the existing control building with a new Package Control Enclosure that can accommodate all relaying and equipment.

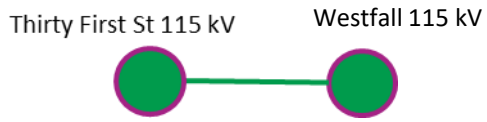
Transmission Line Ratings:

- **Thirty First St –Westfall 115 kV Line**
  - Existing line rating: 232/282/263/307 MVA SN/SE/WN/WE
  - – Existing transmission conductor rating: 232/282/263/334 MVA SN/SE/WN/WE

Estimated Project Cost: $6.7 M

Projected In-Service: 6/1/2025

Supplemental Project ID: s3268.1



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

Penelec Transmission Zone M-3 Process
Yeagertown No. 1 230-46 kV Transformer

Need Number: PN-2023-019

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Previously Presented: Need Meeting 12/05/2023

Solution Meeting 03/05/2024

Project Driver:

Equipment Material Condition, Performance and Risk

Operational Flexibility and Efficiency

Specific Assumption Reference:

System Performance Projects Global Factors

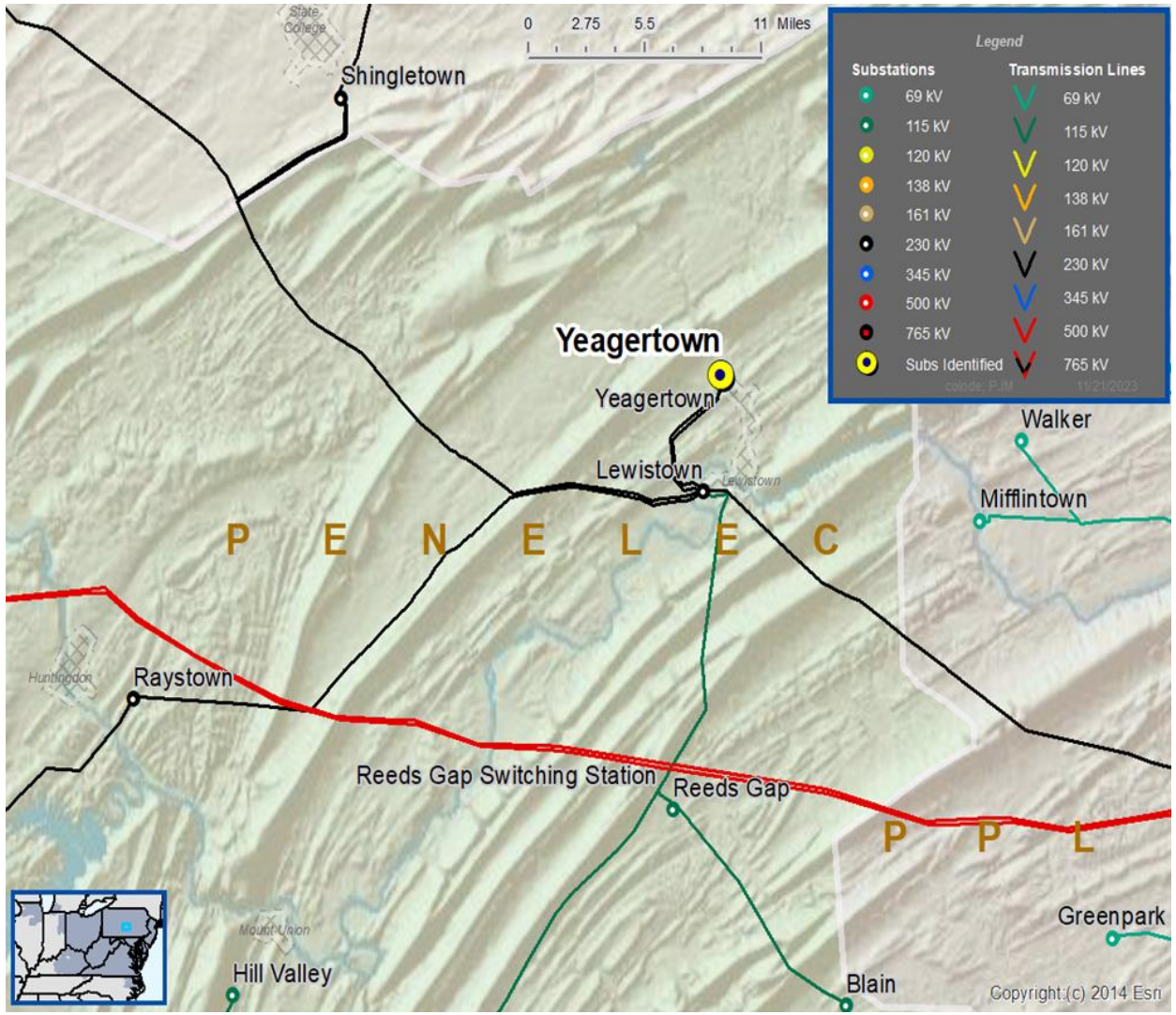
- System reliability and performance
- Reliability of Non-Bulk Electric System (Non-BES) Facilities

Add/Replace Transformers

Past System Reliability/Performance

Problem Statement:

- The existing Yeagertown No. 1 230-46 kV Transformer is approximately 51 years old and is reaching end of life.
- The transformer is constructed with Type U bushings.
  - Type U bushing designs have been documented to dramatically increase the risk of bushing failures.
- Existing transformer ratings:
  - 83/83/83/83 MVA (SN/SLTE/WN/WLTE)



Penelec Transmission Zone M-3 Process
Yeagertown No. 1 230-46 kV Transformer

Need Number: PN-2023-019

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Selected Solution:

At Yeagertown Substation:

- Replace the Yeagertown No. 1 230-46 kV Transformer.
- Replace transformer relaying.

Transformer Ratings:

Yeagertown No. 1 230-46 kV Transformer:

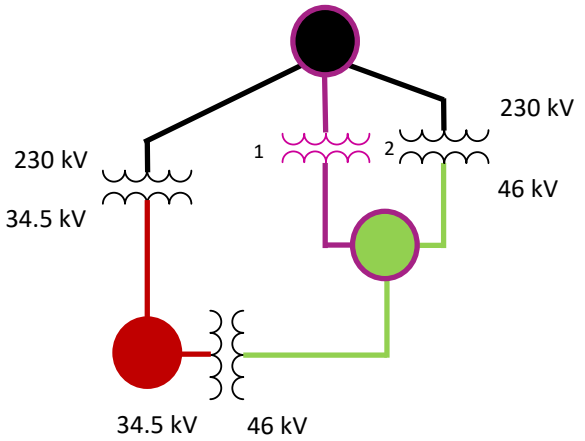
- Before Proposed Solution: 83 / 83 / 83 / 83 MVA (SN/SSTE/WN/WSTE)
- After Proposed Solution: 91 / 109 / 112 / 134 (SN/SSTE/WN/WSTE)

Estimated Project Cost: $3.50M

Projected In-Service: 10/17/2025

Supplemental Project ID: s3269.1

Yeagertown Substation



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

Penelec Transmission Zone M-3 Process
Yeagertown No. 2 230-46 kV Transformer

Need Number: PN-2023-020

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Previously Presented: Need Meeting 12/05/2023

Solution Meeting 03/05/2024

Project Driver:

Equipment Material Condition, Performance and Risk

Operational Flexibility and Efficiency

Specific Assumption Reference:

System Performance Projects Global Factors

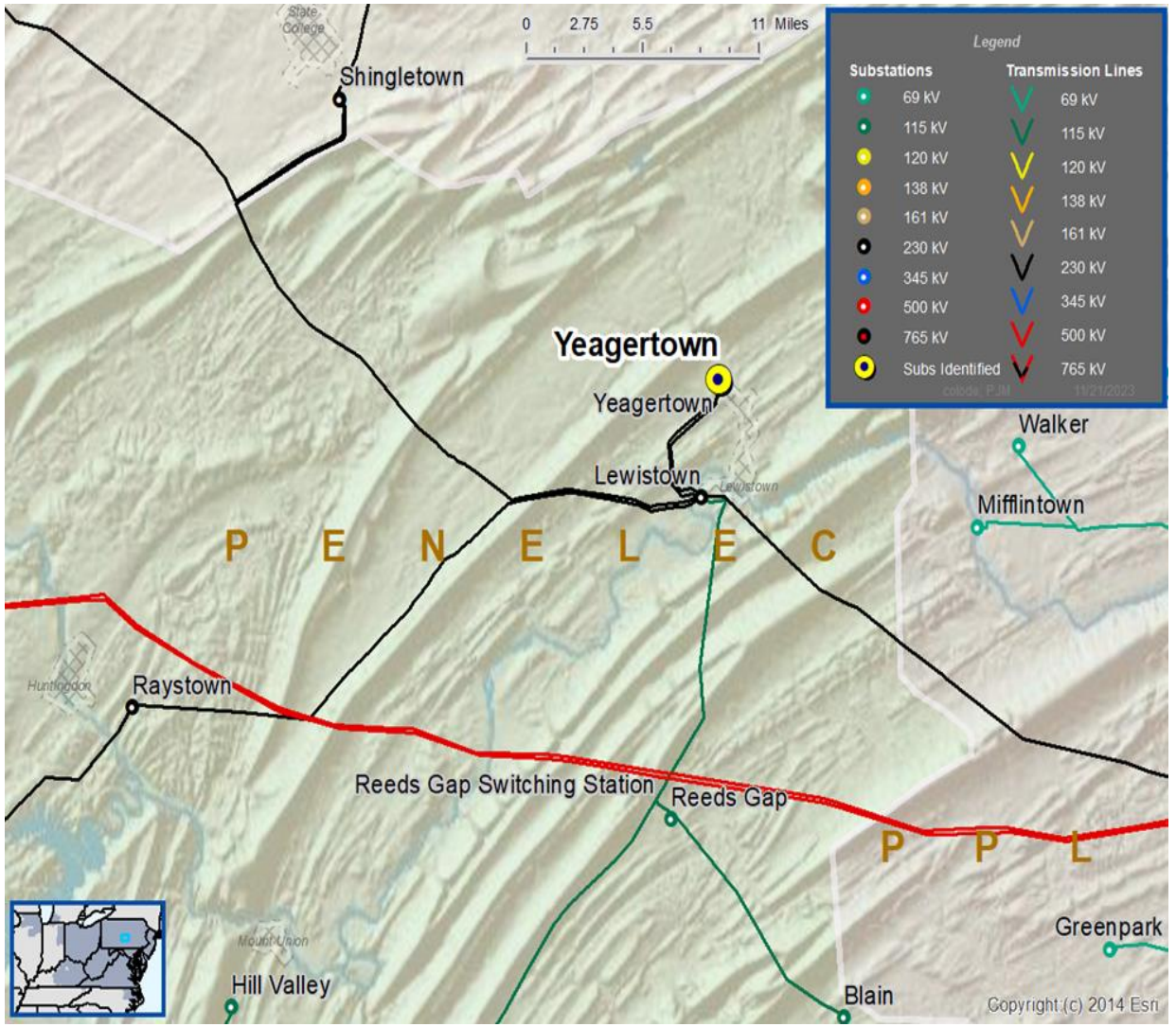
- System reliability and performance
- Reliability of Non-Bulk Electric System (Non-BES) Facilities

Add/Replace Transformers

Past System Reliability/Performance

Problem Statement:

- The existing Yeagertown No. 2 230-46 kV Transformer is approximately 51 years old and is reaching end of life.
- The transformer is constructed with Type U bushings.
  - Type U bushing designs have been documented to dramatically increase the risk of bushing failures.
- Existing transformer ratings:
  - 69/75/83/83 MVA (SN/SLTE/WN/WLTE)



Penelec Transmission Zone M-3 Process
Yeagertown No. 2 230-46 kV Transformer

Need Number: PN-2023-020

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Selected Solution:

At Yeagertown Substation:

- Replace the Yeagertown No. 2 230-46 kV Transformer.
- Replace transformer relaying.

Transformer Ratings:

Yeagertown No. 2 230-46 kV Transformer:

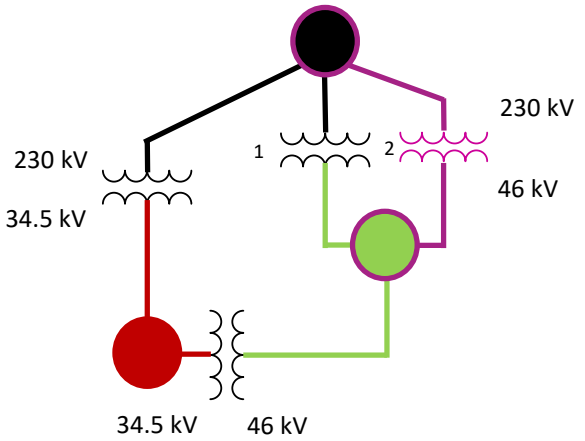
- Before Proposed Solution: 69 / 75 / 83 / 83 MVA (SN/SSTE/WN/WSTE)
- After Proposed Solution: 91 / 109 / 112 / 134 (SN/SSTE/WN/WSTE)

Estimated Project Cost: $4.00M

Projected In-Service: 05/16/2025

Supplemental Project ID: s3270.1

Yeagertown Substation



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

Penelec Transmission Zone M-3 Process
Altoona — Hollidaysburg 46 kV ALH Line

Need Number: PN-2023-034

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Previously Presented: Need Meeting 12/13/2023
Solution Meeting 03/14/2024

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Projects Global Factors

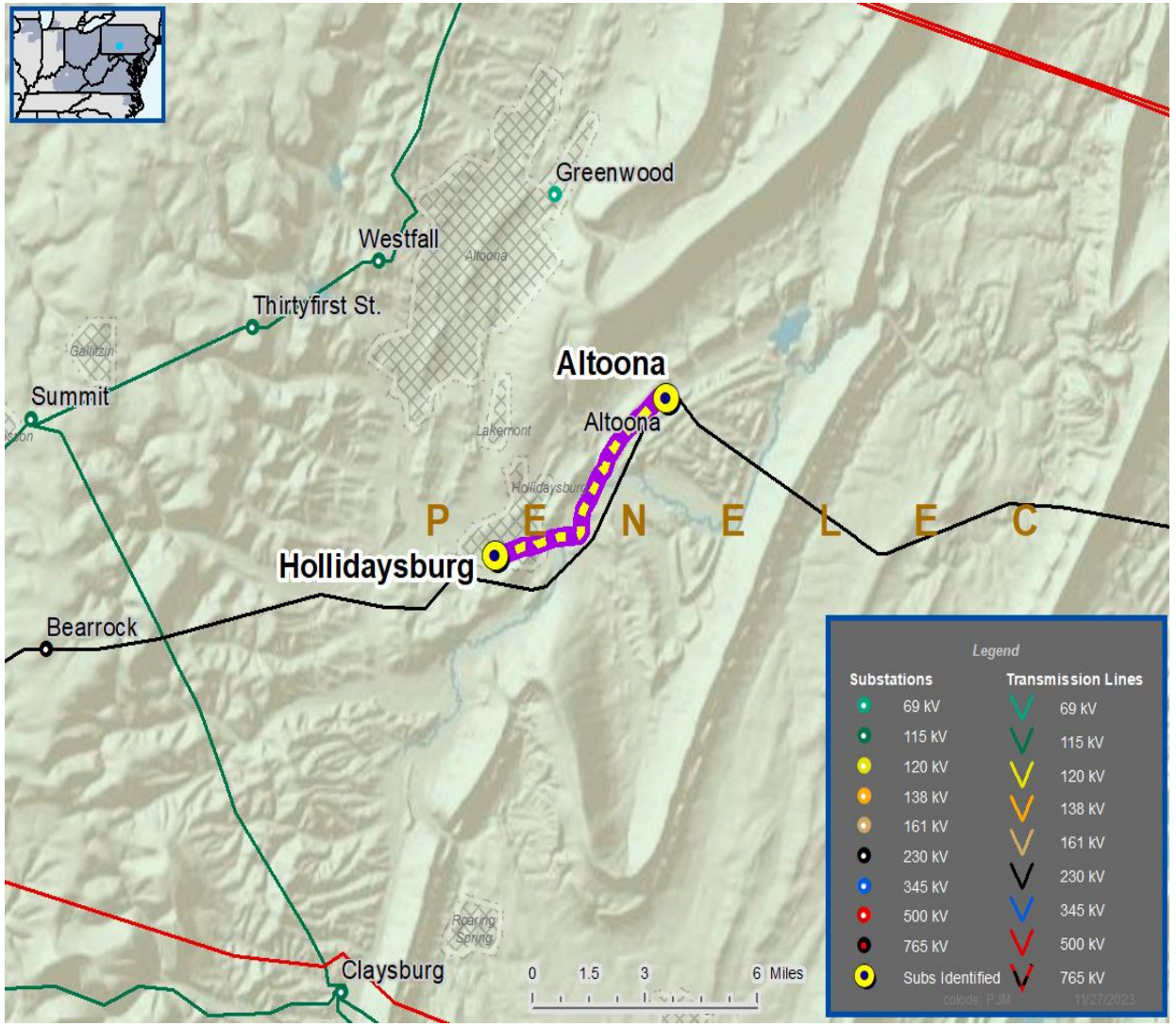
- System reliability and performance
- Substation/line equipment limit

Upgrade Relay Schemes

- Obsolete and difficult to repair communication equipment
- Communication technology upgrades

Problem Statement:

- The Altoona - Hollidaysburg 46 kV Line has old electromechanical relays for overcurrent protection that have directional tripping.
- The relays limit the line and cause an operation monitoring issue.
- Existing line rating 40/40/40/40 MVA (SN/SE/WN/WE)



Penelec Transmission Zone M-3 Process
Altoona — Hollidaysburg 46 kV ALH Line

Need Number: PN-2023-034

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Selected Solution:

- Replace relaying at Altoona and Hollidaysburg substations
- Replace disconnect switches and substation conductor at Altoona and Hollidaysburg substations

Transmission Line Ratings:

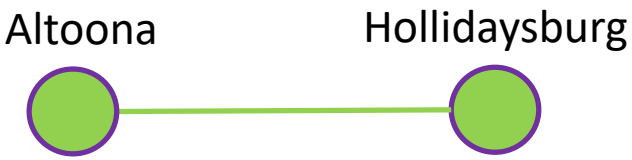
Altoona – Hollidaysburg 46 kV ALH Line

- Before Proposed Solution:
  - 40 / 40 / 40 / 40 MVA (SN/SE/WN/WE)
- After Proposed Solution:
  - 81 / 98 / 91 / 116 MVA (SN/SE/WN/WE)

Estimated Project Cost: $1.5M

Projected In-Service: 12/31/2026

Supplemental Project ID: s3271.1



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

Penelec Transmission Zone M-3 Process
Niles Valley 115 kV Ring Bus

Need Number: PN-2023-005

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Previously Presented: Need Meeting 07/20/2023
Solution Meeting 02/15/2024

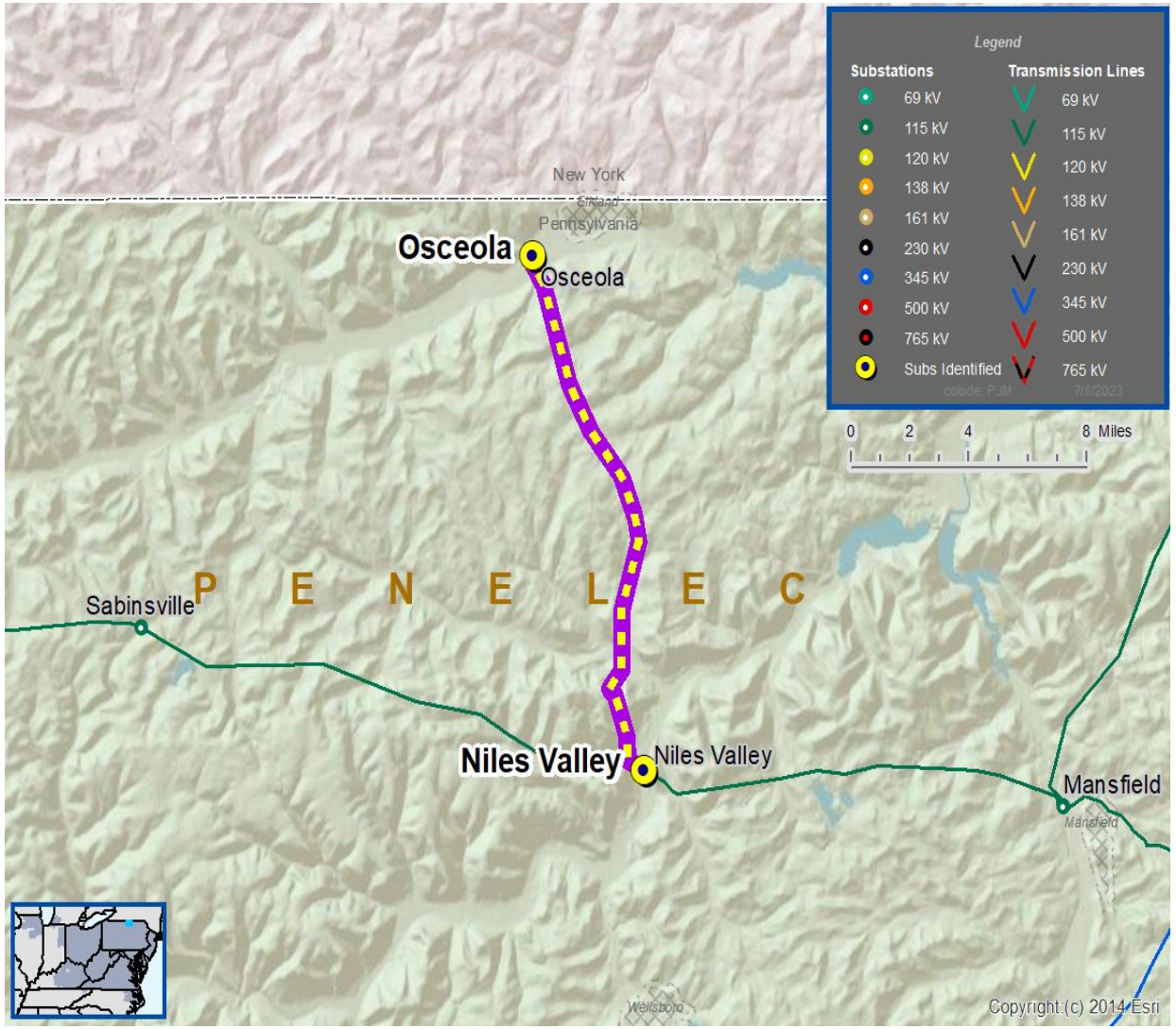
Project Driver:
Operational Flexibility and Efficiency

Specific Assumption Reference:
Add/Expand Bus Configuration
- Eliminate simultaneous outages to multiple network elements

System Performance Projects
- Substation/line equipment limits

System Performance Projects Global Factors
- Load and/or customers at risk on single transmission line

Problem Statement:
- Niles Valley Substation serves approximately 30 MW of load and 331 customers, including one large electric distribution company (Wellsboro).
- An additional 12 MW of load and 2,746 customers are served radially from Niles Valley at Osceola Substation.
- The existing Niles Valley Substation contains two networked 115 kV lines, two radial 115 kV lines, two 115-34.5 kV transformers, and one 115 kV capacitor bank.
- There are straight busses separated by a bus tie breaker. The distribution transformers do not have high side protection devices. During breaker maintenance (a potential two day outage), the Wellsboro 115 kV service point would be interrupted with no backup service (26 MVA of load).



Penelec Transmission Zone M-3 Process
Niles Valley 115 kV Ring Bus

Need Number: PN-2023-005

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

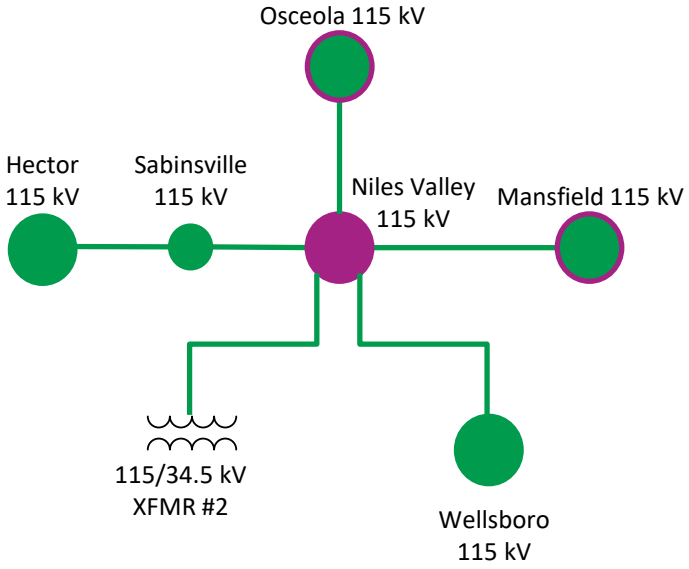
Selected Solution:

At Niles Valley Substation:

- Construct a 115 kV, six breaker ring bus
- Remove Niles Valley No. 1 115-34.5 kV Transformer
- Remove the 115 kV bypass switch between the Wellsboro and Mansfield line exits (s2835) upon ring bus completion
- Adjust relay settings

Transmission Line Ratings:

- Niles Valley – Sabinsville/Hector 115 kV Line:
  - Before Proposed Solution 147/191 MVA SN/SE
  - After Proposed Solution 202/245 MVA SN/SE
- Niles Valley – Mansfield 115 kV Line:
  - Before Proposed Solution 147/185 MVA SN/SE
  - After Proposed Solution 202/245 MVA SN/SE
- Niles Valley – Wellsboro 115 kV Line:
  - Before Proposed Solution 147/191 MVA SN/SE
  - After Proposed Solution 232/ 282 MVA SN/SE
- Niles Valley – Osceola 115 kV Line:
  - Before Proposed Solution 147/191 MVA SN/SE
  - After Proposed Solution 232/282 MVA SN/SE



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

Penelec Transmission Zone M-3 Process
Niles Valley 115 kV Ring Bus

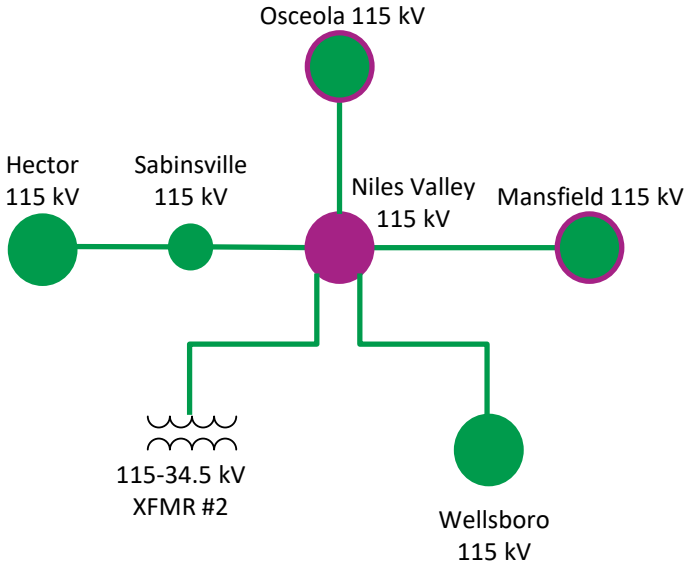
Need Number: PN-2023-005

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Estimated Project Cost: $16.0M

Projected In-Service: 11/04/2028

Supplemental Project ID: s3290.1



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

Penelec Transmission Zone M-3 Process
Warren – Falconer 115 kV Line: New Customer

Need Number: PN-2023-007

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Previously Presented: Need Meeting – 07/20/2023
Solution Meeting – 02/15/2024

Project Driver:

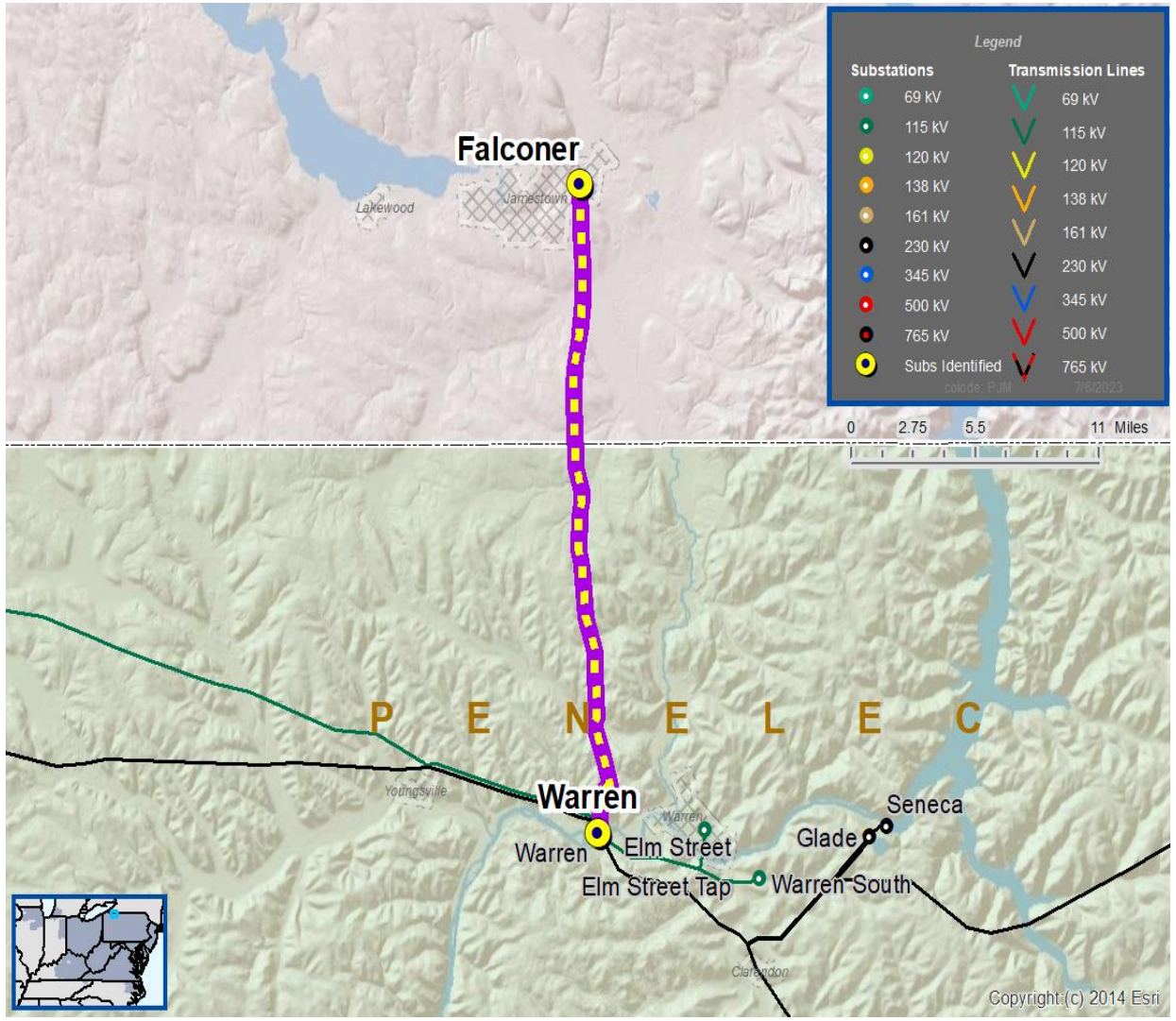
Customer Service

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 with an anticipated load of 22.4 MVA near the Warren – Falconer 115 kV Line.



Penelec Transmission Zone M-3 Process
Warren – Falconer 115 kV Line: New Customer

Need Number: PN-2023-007

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Selected Solution:

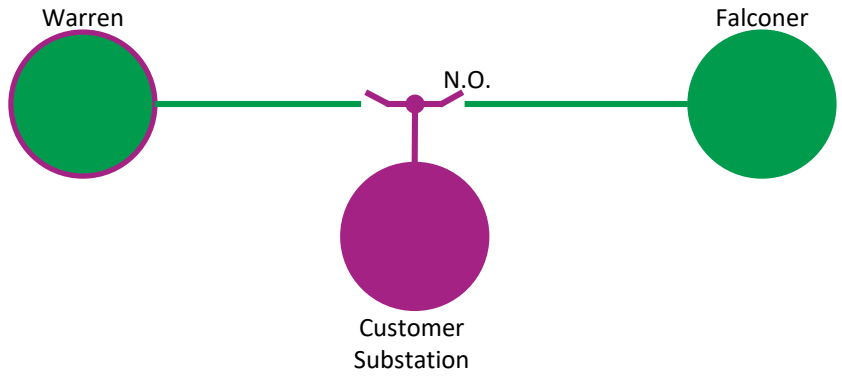
Provide 115 kV service from the Warren – Falconer 115 kV Line:

- Tap the Warren – Falconer 115 kV Line and build approximately 190 ft of transmission line from the tap point to customer substation
- Install one 115 kV revenue metering package at customer substation
- Adjust relay settings at Warren Substation
- Operate disconnect switch towards Falconer normally open

Estimated Project Cost: $1.5M

Projected In-Service: 04/28/2027

Supplemental Project ID: s3291.1



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

Penelec Transmission Zone M-3 Process
East Sayre – East Towanda 115 kV Line: New Customer

Need Number: PN-2023-012

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Previously Presented: Need Meeting – 10/19/2023
Solution Meeting – 02/15/2024

Project Driver(s):

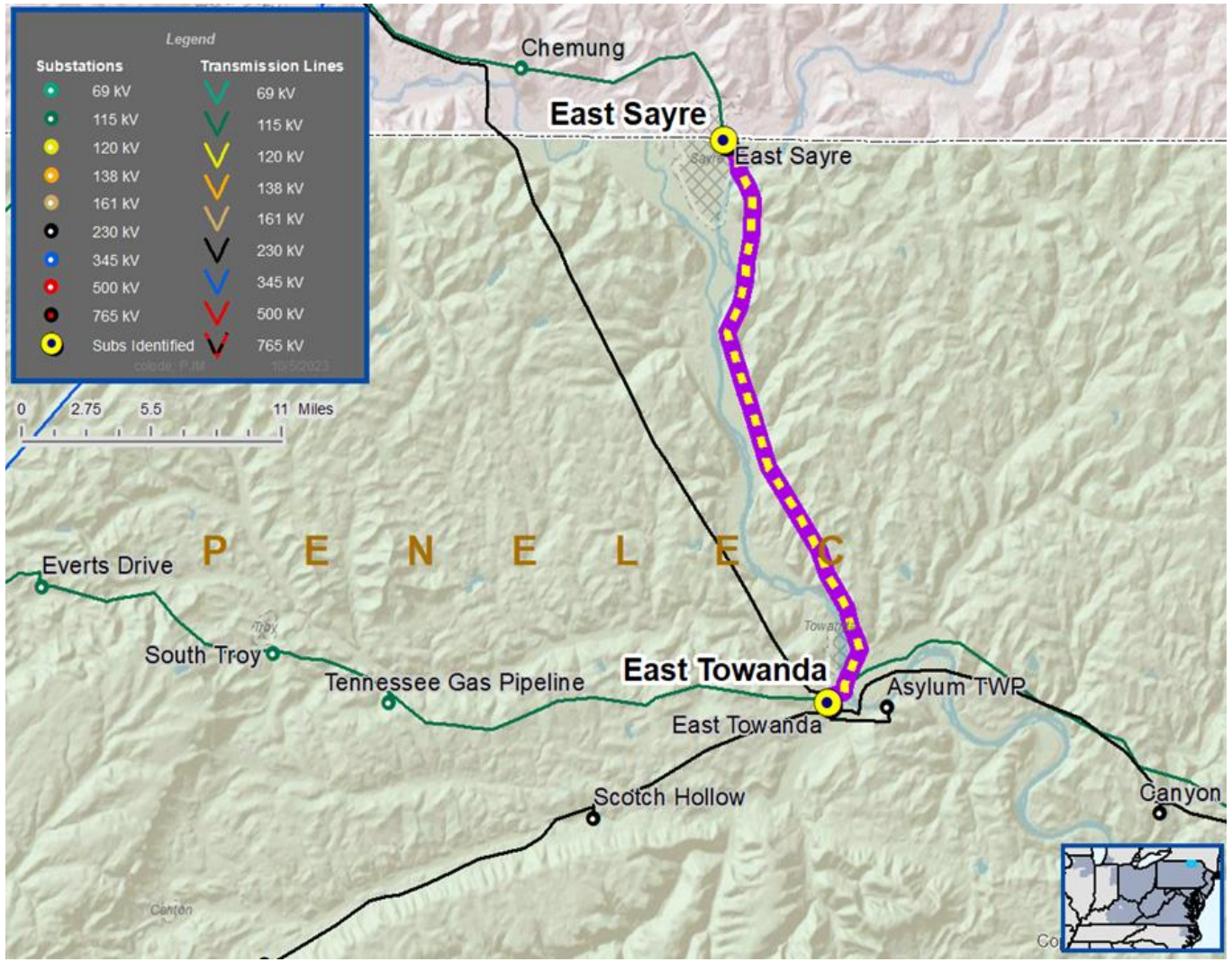
Customer Service

Specific Assumption Reference(s)

New customer connection request 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 a new 115 kV delivery point near the East Sayre-East Towanda 115 kV Line. The anticipated load of the new customer connection is 20 MVA.



Penelec Transmission Zone M-3 Process
East Sayre – East Towanda 115 kV Line: New Customer

Need Number: PN-2023-012

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Selected Solution:

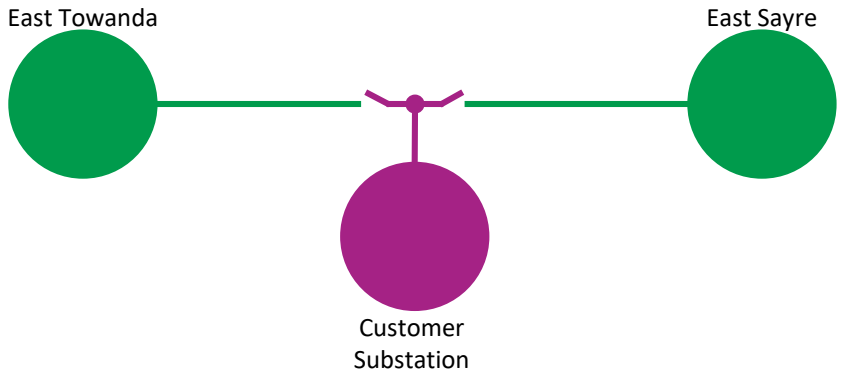
Provide 115 kV service from the East Sayre – East Towanda 115 kV Line:

- Tap the East Sayre – East Towanda 115 kV Line and build approximately 250 feet of transmission line to the customer substation
- Install three 115 kV motor-operated disconnects with SCADA
- Install one wave trap

Estimated Project Cost: $1.67M

Projected In-Service: 09/30/2025

Supplemental Project ID: s3292.1



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

Penelec Transmission Zone M-3 Process
Carlisle Pike – Roxbury 115 kV Line: New Customer

Need Number: PN-2023-017

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Previously Presented: Need Meeting 10/19/2023
Solution Meeting 02/15/2024

Project Driver:

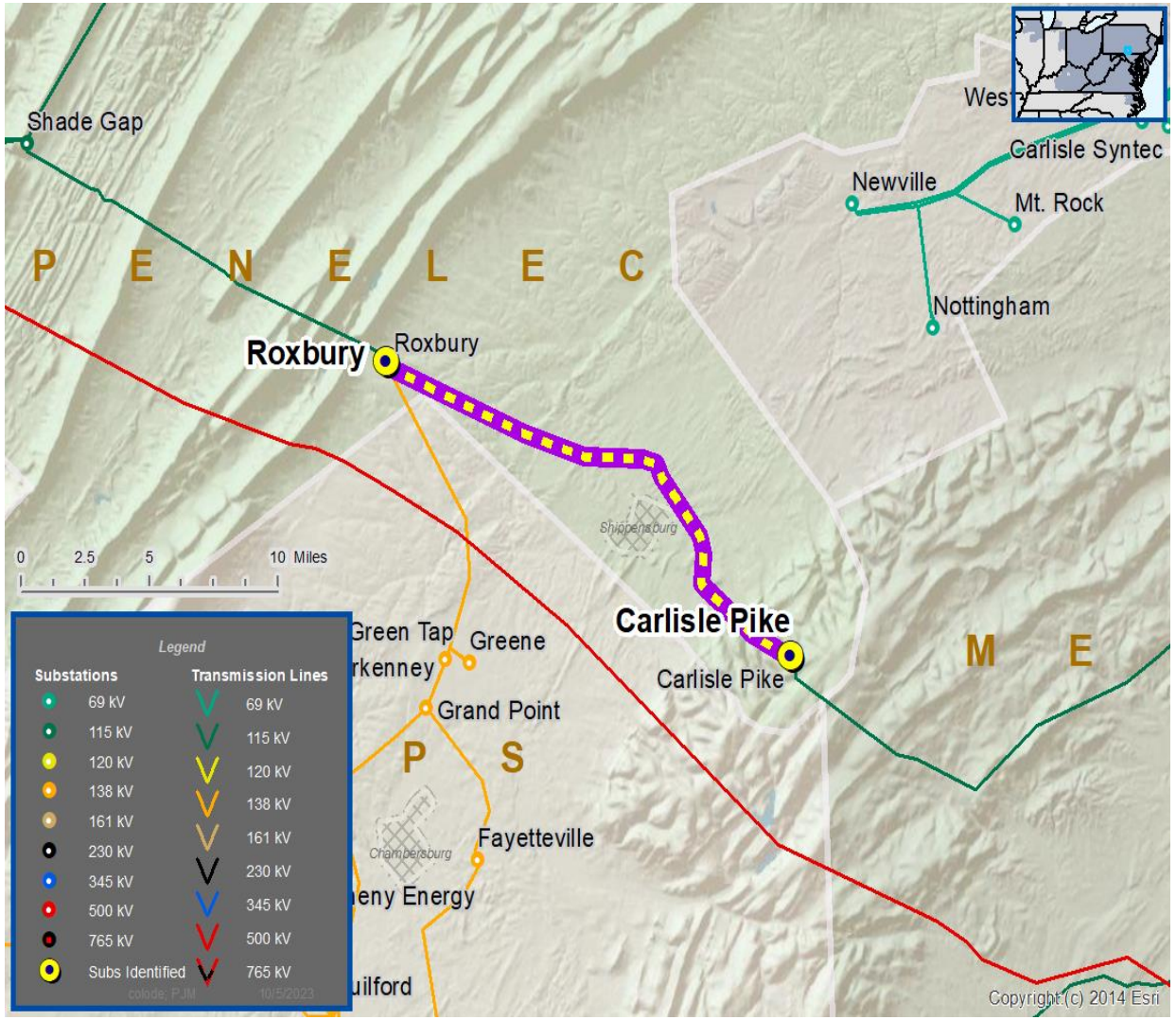
Customer Service

Specific Assumption Reference:

Customer request 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 a new 115 kV delivery point near the Roxbury – Carlisle Pike 115 kV Line. The anticipated load of the new customer is 33 MVA.



Penelec Transmission Zone M-3 Process
Carlisle Pike – Roxbury 115 kV Line: New Customer

Need Number: PN-2023-017

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Selected Solution:

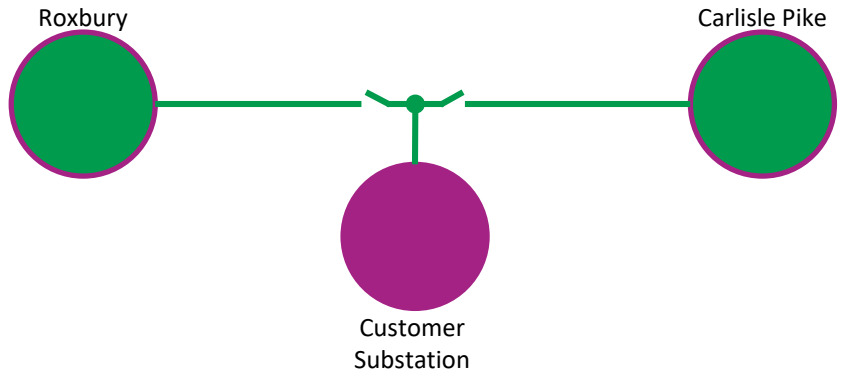
Provide 115 kV service from the Carlisle Pike – Roxbury 115 kV Line:

- Tap the Carlisle Pike – Roxbury 115 kV Line and build approximately 1.76 miles of transmission line to the customer substation
- Install one new 115 kV breaker at Carlisle Pike Substation
- Install one new 115 kV revenue metering package at the customer substation
- Adjust relaying at Carlisle Pike and Roxbury Substations

Estimated Project Cost: $8.0M

Projected In-Service: 12/31/2027

Supplemental Project ID: s3293.1



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

Questions?

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

6/25/2024 – V1 – Local Plan for s3268.1, s3269.1, s3270.1, s3271.1, s3290.1, s3291.1, s3292.1, s3293.1