

Subregional RTEP Committee - Mid-Atlantic FirstEnergy Supplemental Projects

October 19, 2023

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: PN-2023-012

Process Stage: Need Meeting – 10/19/2023

Project Driver(s):

Customer Service

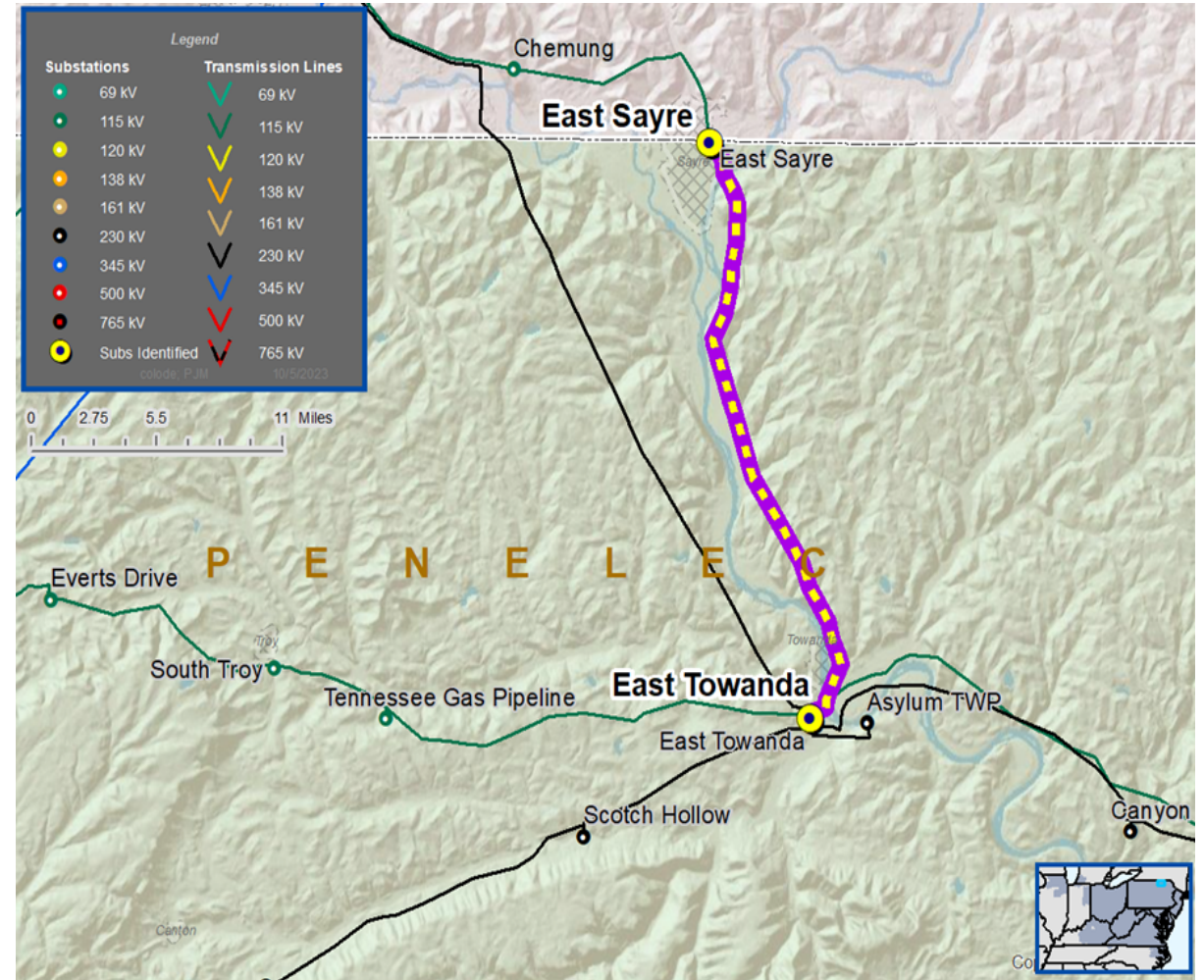
Specific Assumption Reference(s)

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.

Requested in-service date is 08/30/2024



Need Number: PN-2023-013

Process State: Need Meeting 10/19/2023

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:

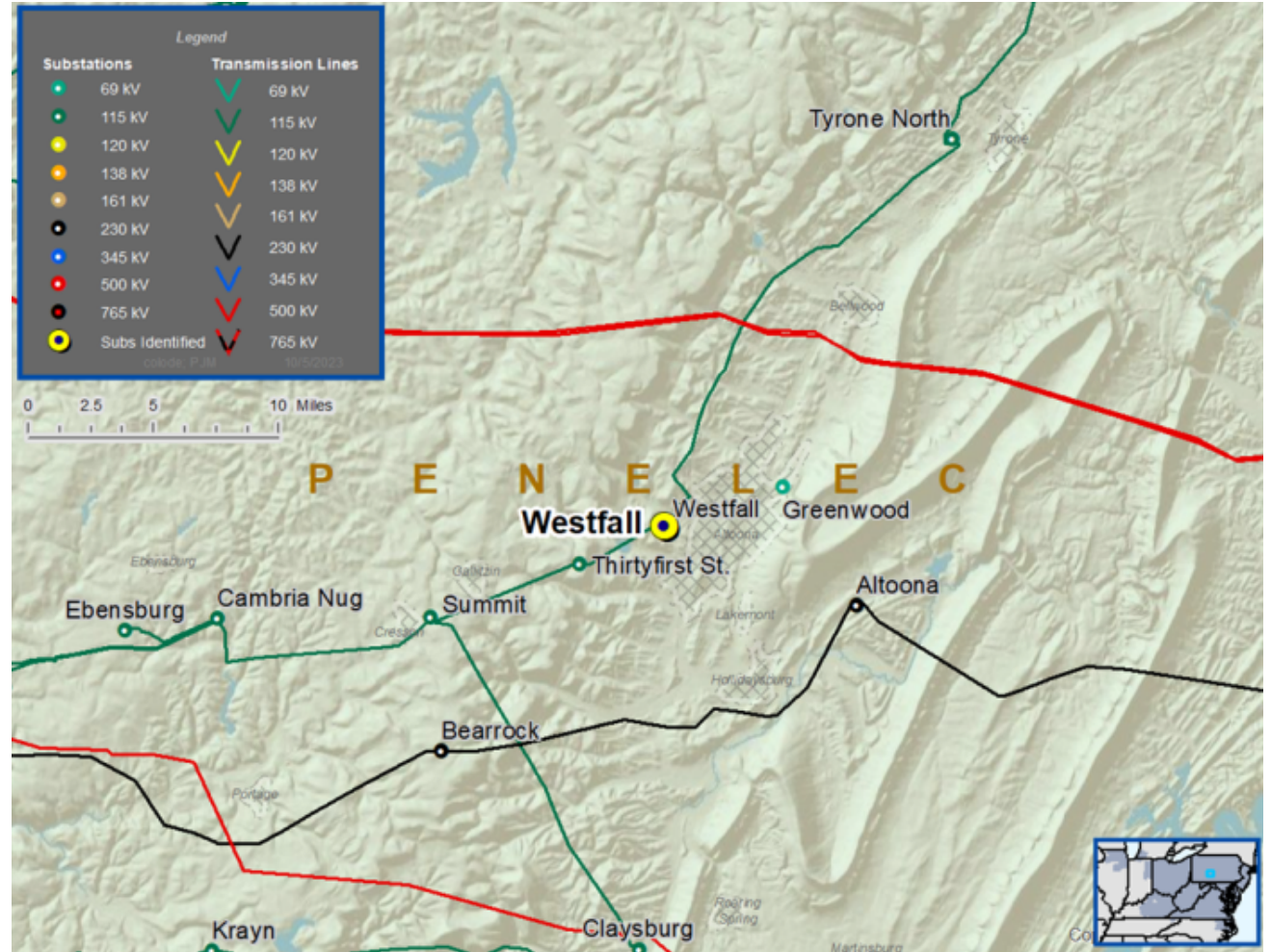
- The Westfall Substation control building is small and congested. The condition of the control building is deteriorating.
- Transmission line ratings are limited by terminal equipment

Thirty-First Street – Westfall 115 kV Line

- Existing line rating: 175 / 237 MVA (SN / SE)
- Existing transmission conductor rating: 232 / 282 MVA (SN / SE)

Eldorado – Westfall 46 kV Line

- Existing line rating : 34 / 44 MVA (SN / SE)
- Existing transmission conductor rating: 53 / 64 MVA (SN / SE)



Need Number: PN-2023-017

Process State: Need Meeting 10/19/2023

Project Driver:

Customer Service

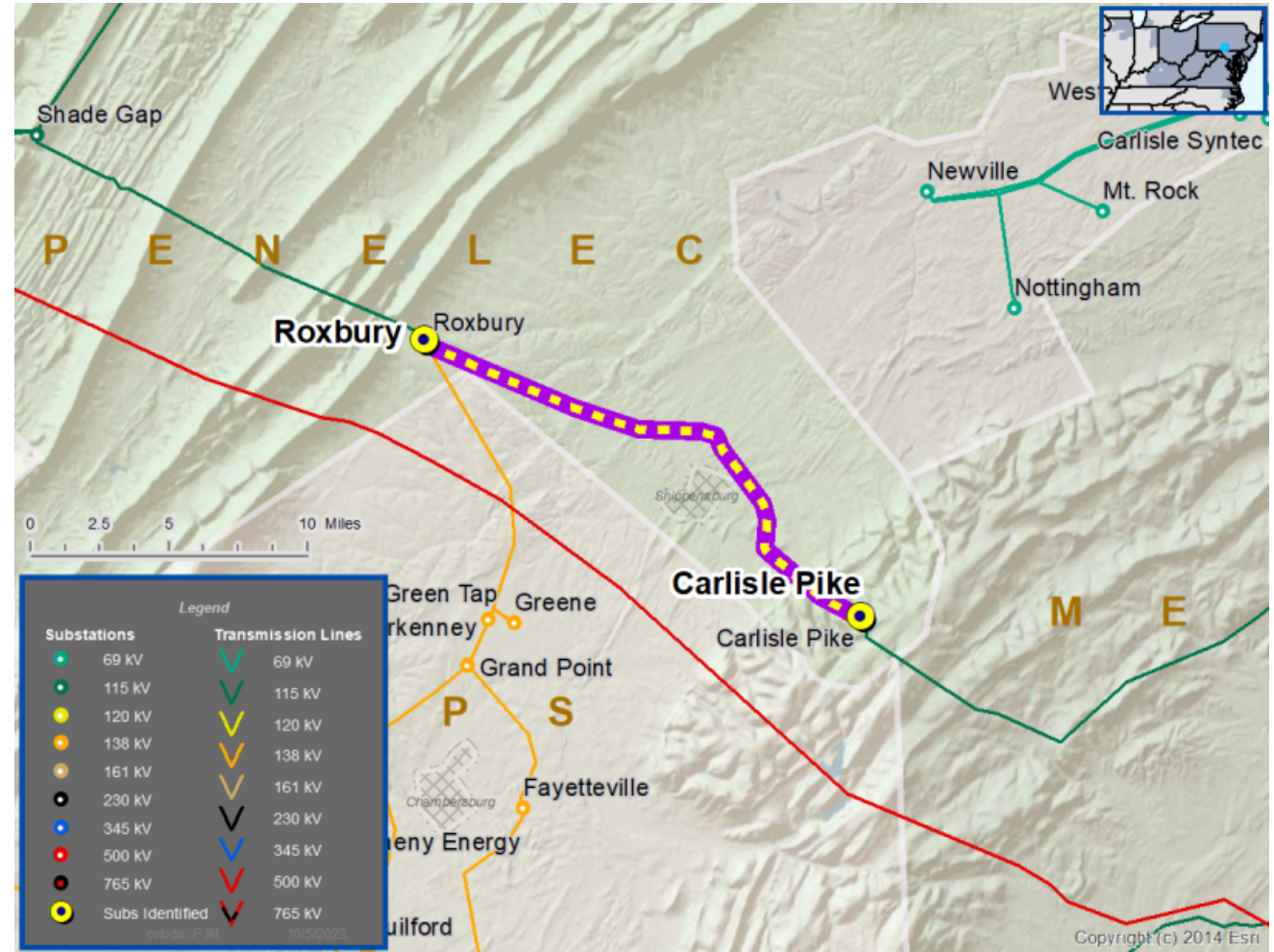
Specific Assumption Reference:

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.

Requested in-service date is 12/29/2023



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: PN-2023-010

Process Stage: Solutions Meeting 10/19/2023

Previously Presented: Needs Meeting 09/14/2023

Project Driver:

Equipment Material Condition, Performance, and Risk

Infrastructure Resilience

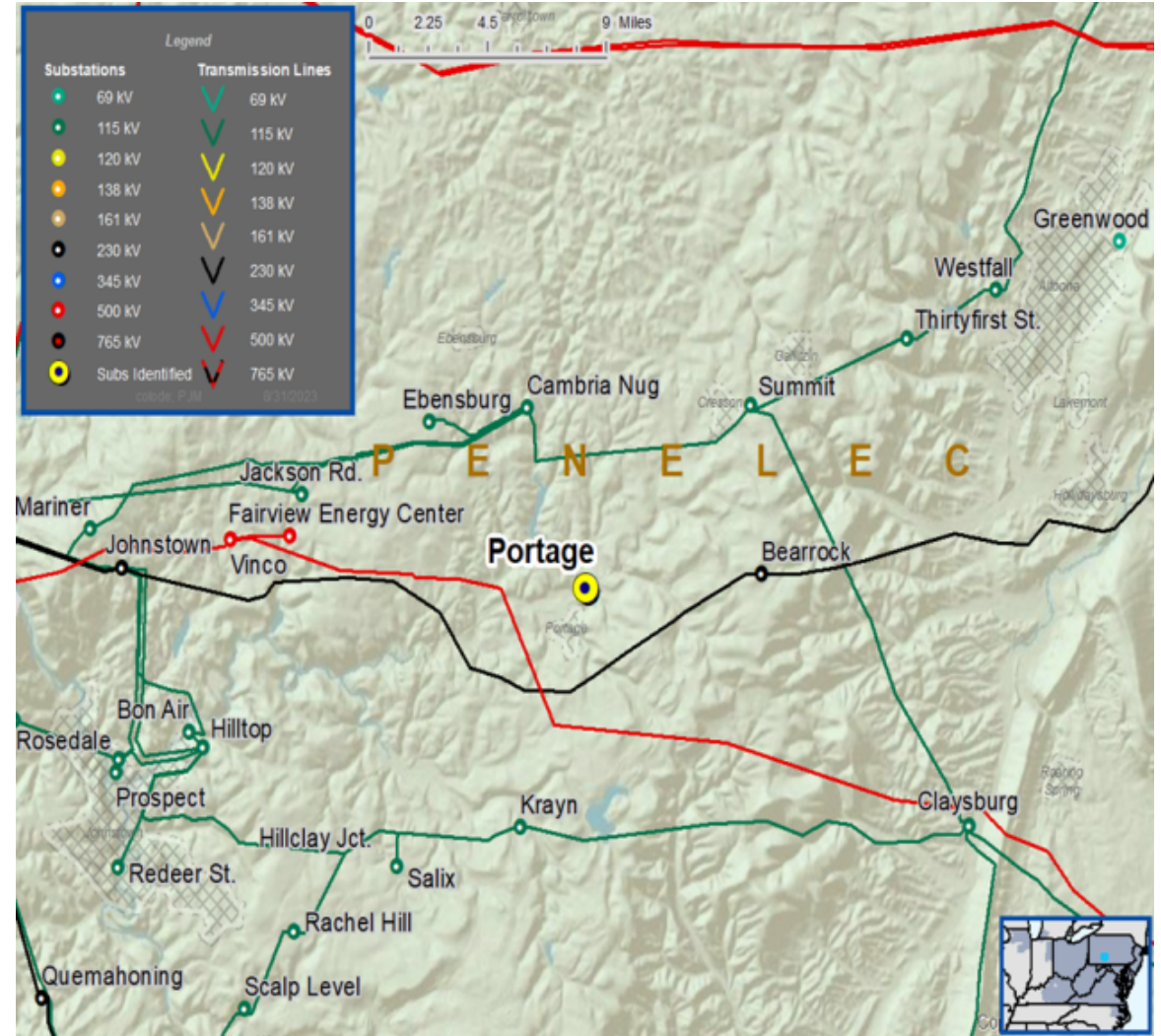
Specific Assumption Reference:

Substation Condition Rebuild/Replacement

- Increasing negative trend in maintenance findings and/or costs
- Failure risk, to the extent caused by asset design characteristics, or historical industry/company performance data, or application design error
- Expected service life (at or beyond) or obsolescence

Problem Statement:

- The 46 kV bus, insulators, and wood structures at Portage Substation are old and deteriorated.
- The Lilly, Bus Section, and Wilmore Jct. MOABs at Portage Substation have increasing maintenance concerns, deteriorated operating mechanisms, and increasing maintenance trends. The Lilly MOAB is currently inoperable.
 - The substation is about 70 years old.



Need Number: PN-2023-010

Process Stage: Solutions Meeting 10/19/2023

Proposed Solution:

- At Portage Substation, replace the 46 kV structure, including 46 kV line switches.

Transmission Line Ratings:

- Portage – Wilmore Dam 46 kV Line
 - Before Proposed Solution: 55 / 69 MVA (SN/SE)
 - After Proposed Solution: 59 / 71 MVA (SN/SE)

Alternatives Considered:

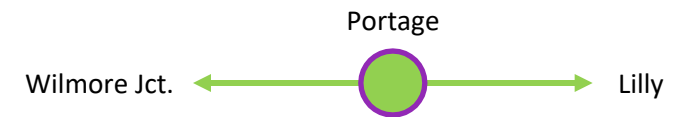
- Maintain existing condition with risk of equipment failure and compromised operational flexibility

Estimated Project Cost: \$3.7M

Projected In-Service: 03/28/2025

Project Status: Engineering

Model: 2023 Series 2028 Summer RTEP Case



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

Need Numbers: PN-2023-014, PN-2023-015

Process State: Solution Meeting 10/19/2023

Previously Presented: Need Meeting 09/14/2023

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Projects Global Factors

- System reliability and performance
- Substation/line equipment limits

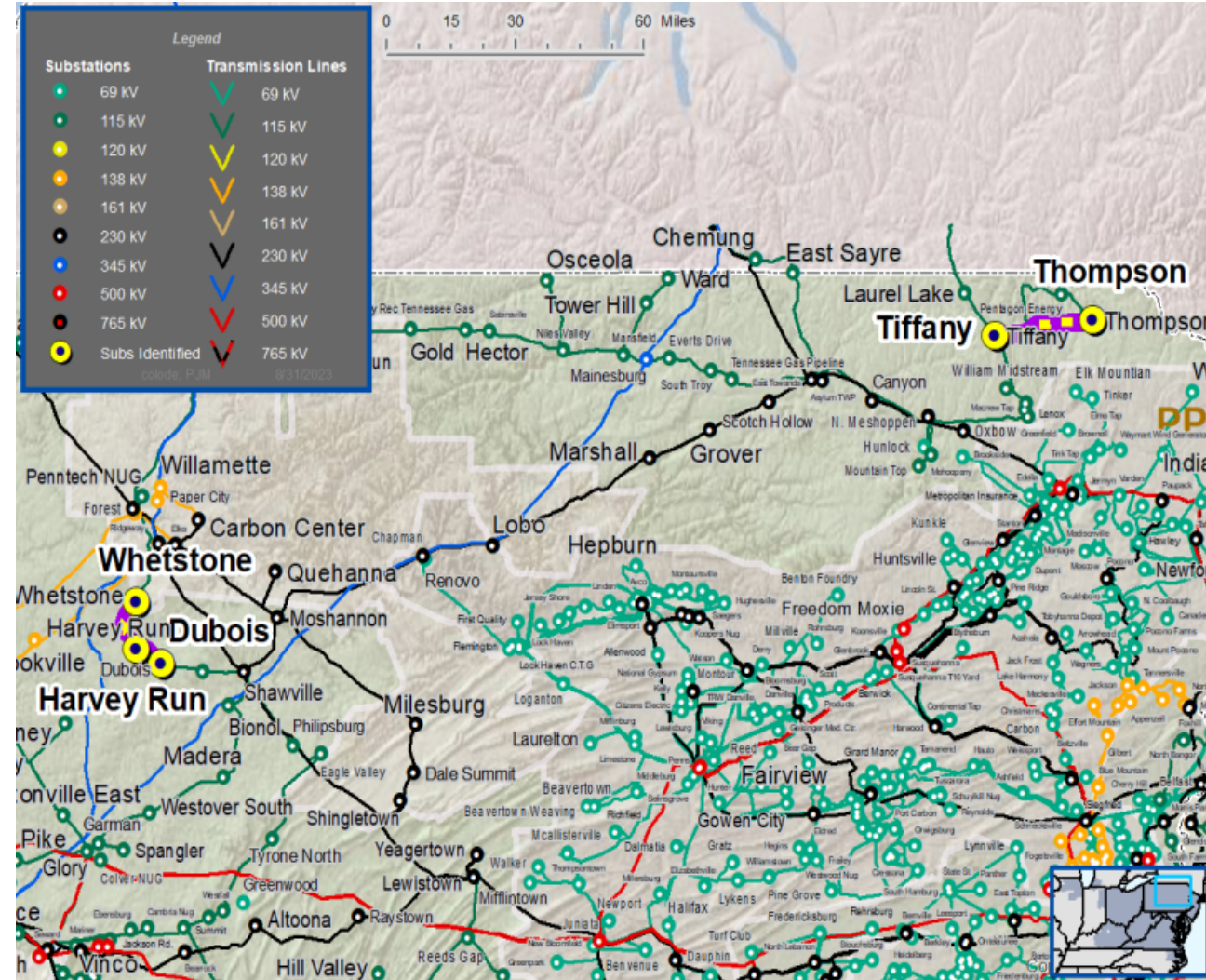
Upgrade Relay Schemes

- Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
- Communication technology upgrades

Problem Statement:

- FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation.
- Proper operation of the protection scheme requires all the separate components perform adequately during a fault.
- In many cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology.
- Transmission line ratings are limited by terminal equipment.

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Penelec Transmission Zone M-3 Process Dubois – Whetstone 115 kV Misoperation Relays

Need #	Transmission Line / Substation Locations	Existing Line Rating (SN / SE)	Existing Conductor Rating (SN / SE)
PN-2023-014	Tiffany – Thompson 115 kV	125 / 145	132 / 159
PN-2023-015	Dubois – Whetstone 115 kV	147 / 179	202 / 245

Need Number: PN-2023-014

Process Stage: Solution Meeting 10/19/2023

Proposed Solution:

- Replace relays, breakers, disconnect switches, and substation conductor at Tiffany 115 kV Substation

Need #	Transmission Line	Existing Line Rating (SN / SE)	Post Project Line Rating (SN / SE)
PN-2023-014	Tiffany – Thompson 115 kV Line	125 /145	132 / 159

Alternatives Considered:

- Maintain line and vintage relay schemes in existing condition with risk of misoperations

Estimated Project Cost: \$ 0.47M

Projected In-Service: 11/07/2022

Project Status: In-Service

Model: 2023 Series 2028 Summer RTEP Case



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

Need Number: PN-2023-015

Process Stage: Solution Meeting 10/19/2023

Proposed Solution:

- Replace substation conductor, wave trap, line tuners, disconnect switch, breaker, and relaying at Dubois 115 kV substation
- Replace substation conductor at Harvey Run 115 kV Substation
- Replace wave trap, CCVT, line tuners, arresters, and relaying at Whetstone 115 kV Substation

Need #	Transmission Line	Existing Line Rating (SN / SE)	Post Project Line Rating (SN / SE)
PN-2023-015	Dubois – Whetstone 115 kV Line	147 / 179	202 / 245

Alternatives Considered:

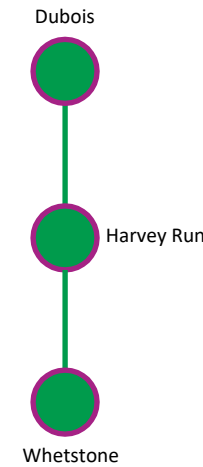
- Maintain line and vintage relay schemes in existing condition with risk of misoperations

Estimated Project Cost: \$2.1M

Projected In-Service: 11/29/2023

Project Status: Construction

Model: 2023 Series 2028 Summer RTEP Case



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

Re-Present 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: s1729

Process Stage: Re-Present Solution Meeting – 10/19/2023

Previously Presented:

First Read – 07/20/2018

Second Read – 08/24/2018

Project Driver:

Operational Flexibility, Improved Reliability Performance

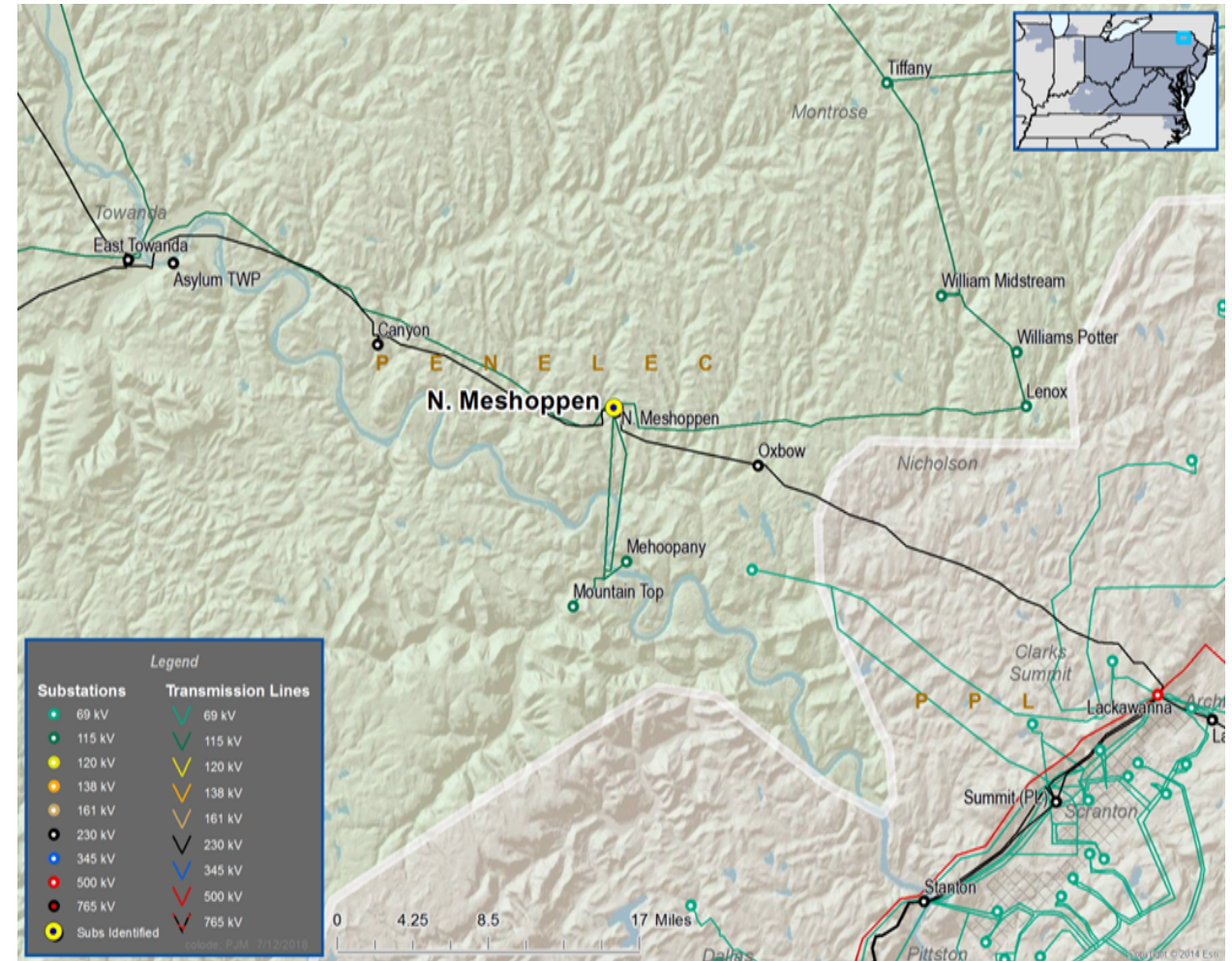
Specific Assumption Reference:

Operational Flexibility and Efficiency

- Improve operational flexibility during maintenance and restoration efforts.
- Reduce amount of potential local load loss under contingency conditions
- Eliminate simultaneous outages to three or more system elements

Problem Statement:

The North Meshoppen Substation consists of four 115 kV line terminals, two 230/115 kV transformers, two 115-34.5 kV transformers, and a 115 kV capacitor bank in a straight bus configuration. A stuck breaker condition would cause multiple 115 kV lines to be outaged, as well as the 230/115 kV transformers and 115-34.5 kV transformers.



Need Number: s1729

Process Stage: Re-Present Solution Meeting – 10/19/2023

Previously Presented:

First Read – 07/20/2018

Second Read – 08/24/2018

Proposed Solution:

North Meshoppen 115 kV Substation:

- ~~Expand the existing 115 kV yard to a breaker and a half configuration.~~
- Construct a breaker and a half bus substation adjacent to the existing 230 kV yard consisting of twelve 115 kV breakers and a 115 kV 36 MVAR capacitor and rerouting the existing 115 kV lines.
- Install two new structures to move the Lackawanna – North Meshoppen and the East Towanda – North Meshoppen 230 kV lines to allow for the 115 kV line crossings.

East Towanda Substation:

- Replace relaying.

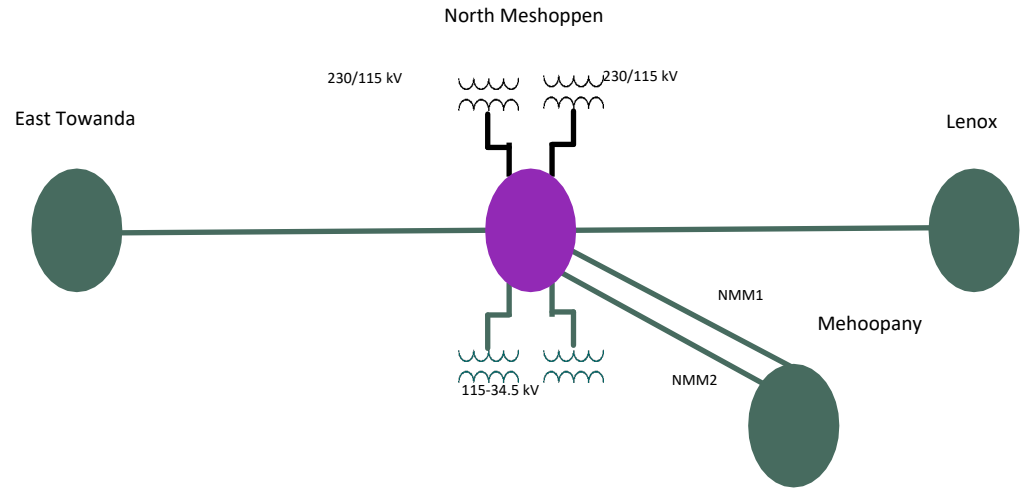
Lenox Substation:

- Replace substation conductor, wave trap, and relaying.

Alternatives Considered:

Expand substation within the existing substation footprint was originally planned for the project. However, engineering determined that the existing land owned by Penelec was not sufficient for the expansion and identified environmental mitigation risks associated with existing property. For these reasons it was determined to build a new 115 kV substation adjacent to the existing substation as the preferred solution.

Penelec Transmission Zone M-3 Process North Meshoppen 115 kV Substation



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

Transmission Line Ratings:

North Meshoppen - Lenox

- Before Proposed Solution: 118 / 152 MVA (SN/SE)
- After Proposed Solution: 167 / 202 MVA (SN/SE)

North Meshoppen – East Towanda

- Before Proposed Solution: 167/202 MVA (SN/SE)
- After Proposed Solution: 167/202 MVA (SN/SE)

North Meshoppen – Mehoopany (NMM1 and NMM2)

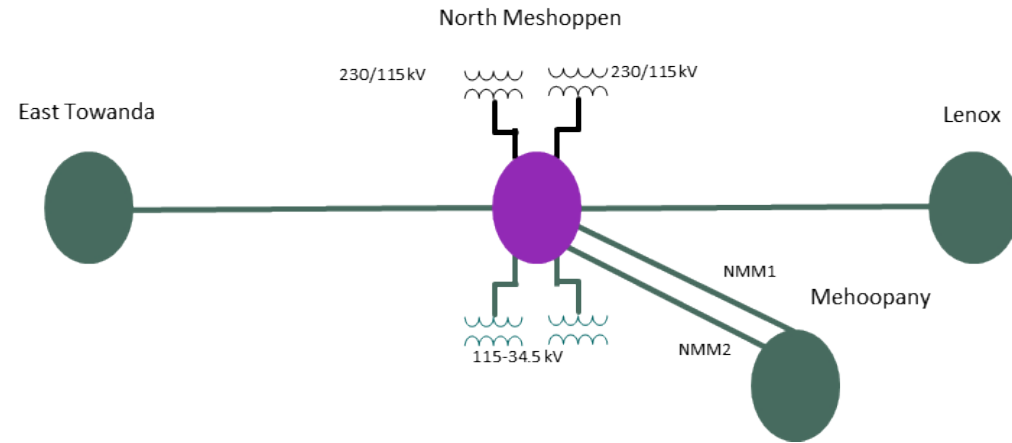
- Before Proposed Solution: 133/160 MVA (SN/SE)
- After Proposed Solution: 133/160 MVA (SN/SE)

Estimated Project Cost: ~~\$17.6M~~-\$31.5M

Projected In-Service: ~~12/31/2020~~ 12/31/2024

Project Status: ~~Conceptual~~ Engineering

Model: 2022 RTEP model for 2027 Summer (50/50)



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



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

10/9/2023 – V1 – Original version posted to pjm.com