# Subregional RTEP Committee - Mid-Atlantic
# FirstEnergy Supplemental Projects

# 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

# Penelec Transmission Zone M-3 Process
# Edinboro South Substation

**Need Number:** PN-2023-006

**Process Stage:** Solution Meeting – 09/18/2025

**Previously Presented:** Need Meeting – 07/20/2023

**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

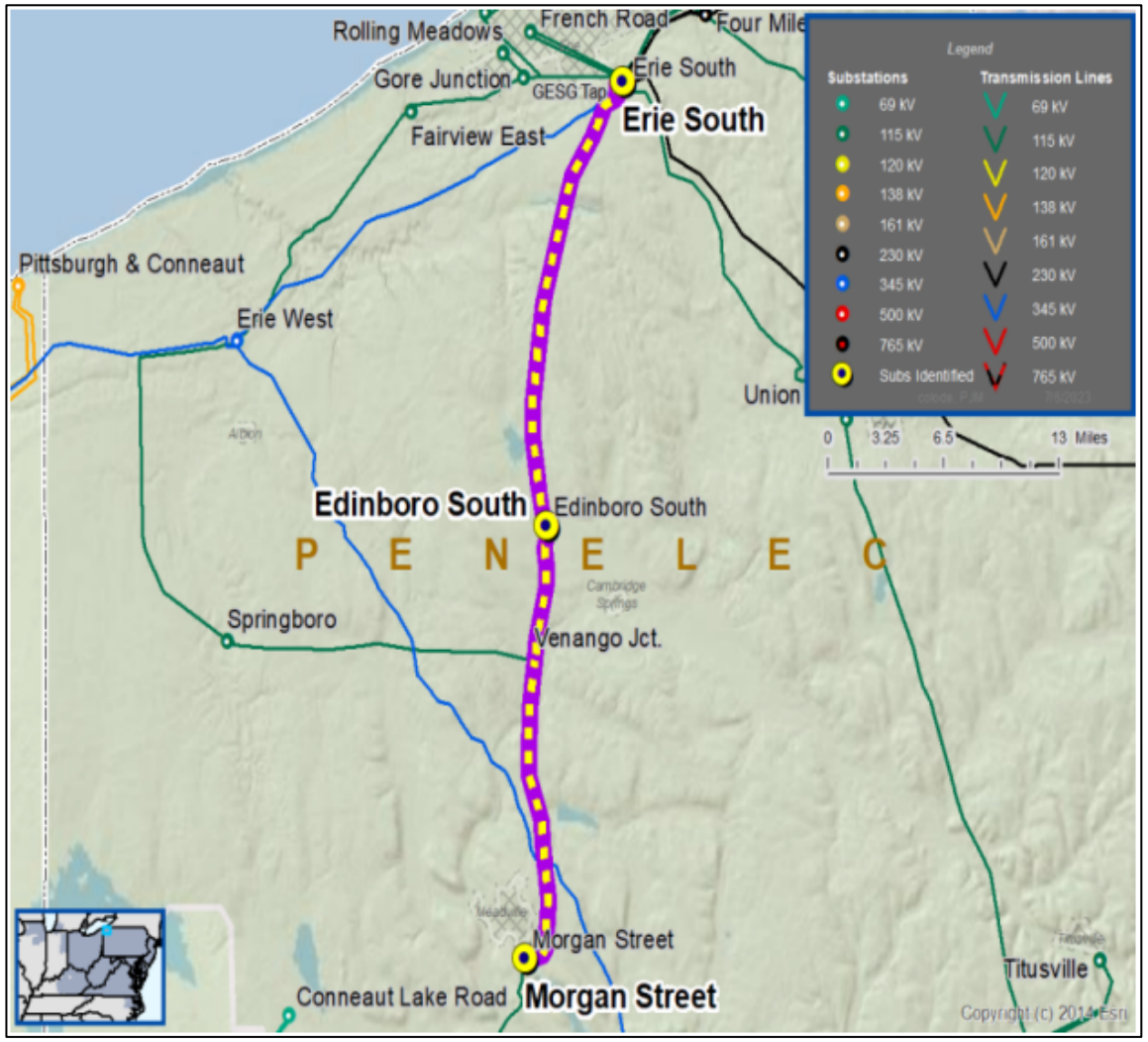
- Load and/or customers at risk on single transmission line

System Conversion Methodology

- Customer feedback

**Problem Statement:**

- Edinboro South Substation serves approximately 43 MW of load to 4,044 customers. A fault on the Erie South - Edinboro South 115 kV Line results in interruption of service to the No. 1 115-34.5 kV transformer with limited network transfer capability during peak conditions.
- The Erie South - Edinboro South 115 kV Line is approximately 16.9 miles long. Over the past five years, the Erie South - Edinboro South 115 kV Line has experienced two sustained outages.
- Edinboro South – Morgan Street – Springboro 115 kV Line has experienced a total of ten outages and there are five sustained outages over the past five years.



# Penelec Transmission Zone M-3 Process
# Edinboro South Substation

**Need Number:** PN-2023-006

**Process Stage:** Solution Meeting – 09/18/2025

**Proposed Solution:**

Convert the Edinboro South Substation into a four-breaker ring bus.

Adjust relay settings at Erie South and Morgan Street substations.

**Alternatives Considered:**

Maintain existing substation topology with risk of customer outages under contingency scenarios.

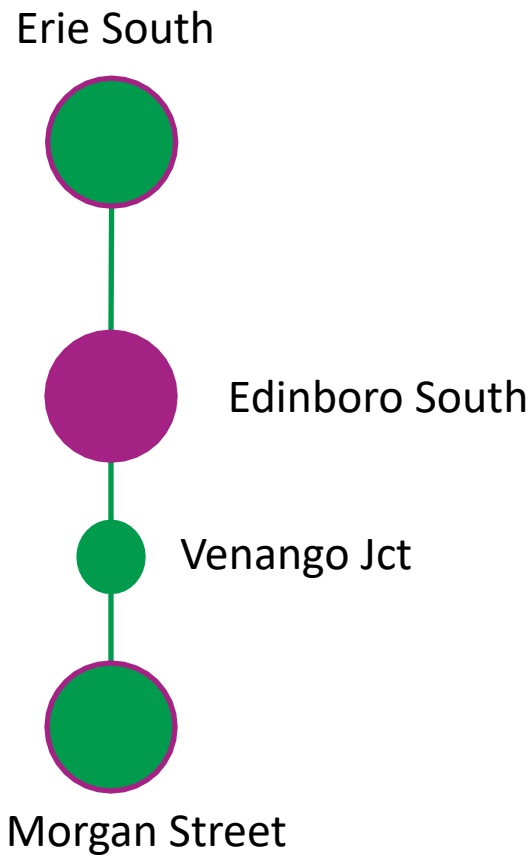
**Estimated Project Cost:** $13.57M

**Projected In-Service:** 6/18/2027

**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 | |



# Penelec Transmission Zone M-3 Process
# Morgan Street Substation

**Need Number:** PN-2023-008

**Process Stage:** Solution Meeting – 09/18/2025

**Previously Presented:** Need Meeting – 08/17/2023

**Project Driver:**

*Operational Flexibility and Efficiency*

**Specific Assumption Reference:**

Add/Expand Bus Configuration

- Eliminate simultaneous outages to multiple network elements

System Performance Projects

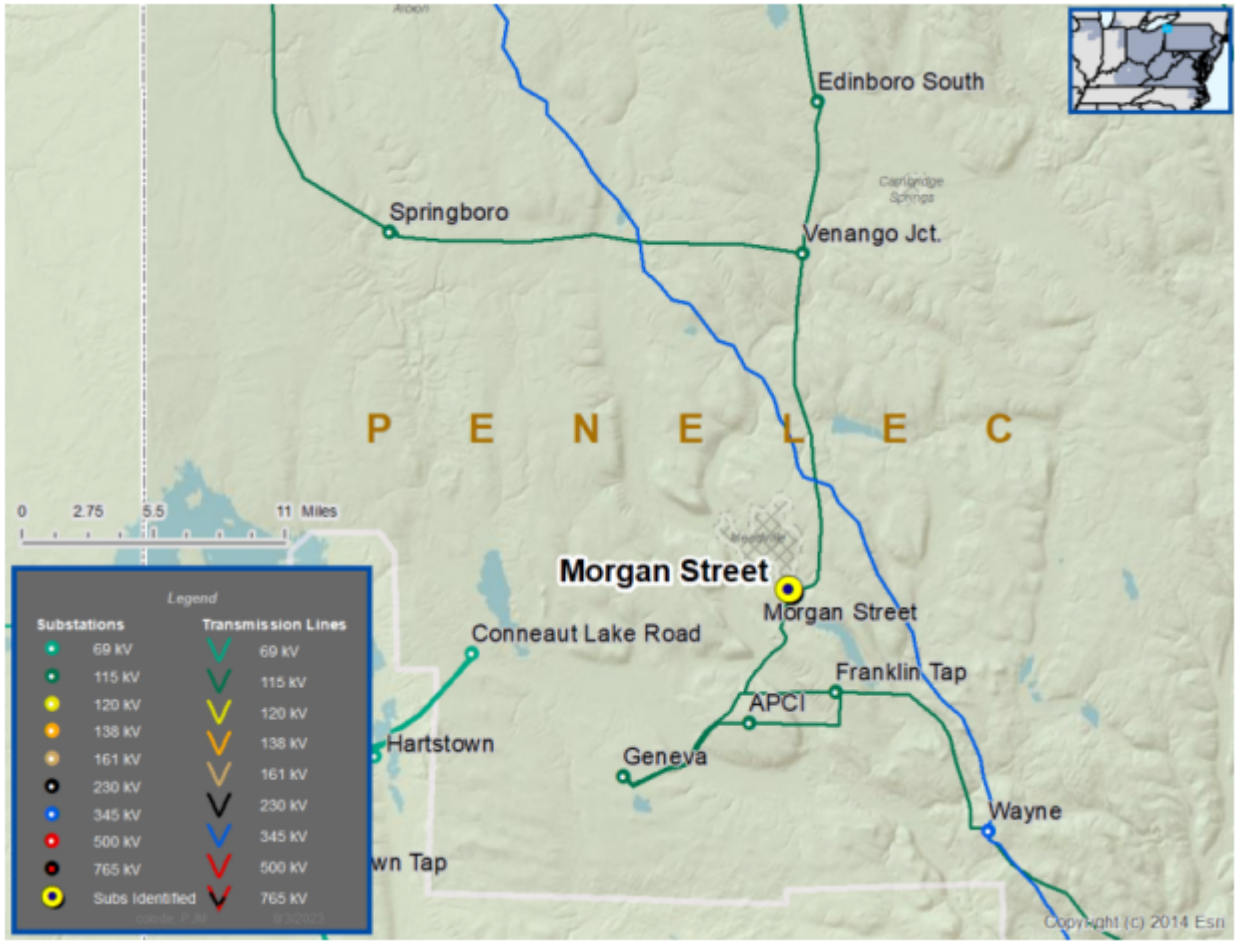
- Substation/line equipment limits

System Performance Projects Global Factors

- Load and/or customers at risk

**Problem Statement:**

- Morgan Street Substation serves 7,100 customers and 67 MW of load in the Meadville, Pennsylvania area.
- The current substation configuration of Morgan Street Substation is a straight bus with a bus tie breaker. In the event of a tie breaker failure, the entire Morgan Street Substation 115 kV bus is interrupted.
- In addition to a tie breaker failure at Morgan Street Substation, the consequential N-1-1 loss of the Geneva – Morgan Street 115 kV Line and the Edinboro South – Morgan Street – Springboro 115 kV Line eliminates the 115 kV source to the 34.5 kV system fed from Morgan Street Substation.



# Penelec Transmission Zone M-3 Process
# Morgan Street Substation

**Need Number:** PN-2023-008

**Process Stage:** Solution Meeting – 09/18/2025

**Proposed Solution:**

Convert the Morgan Street Substation into a nine-breaker, breaker-and-a-half substation.

Adjust relay settings at Geneva and Edinboro South substations.

**Transmission Line Ratings:**

Morgan Street - Venango Jct 115 kV Line:

- Before Proposed Solution: 147 / 191 / 201 / 201 MVA (SN/SE/WN/WE)
- After Proposed Solution: 232 / 282 / 263 / 334 MVA (SN/SE/WN/WE)

**Alternatives Considered:**

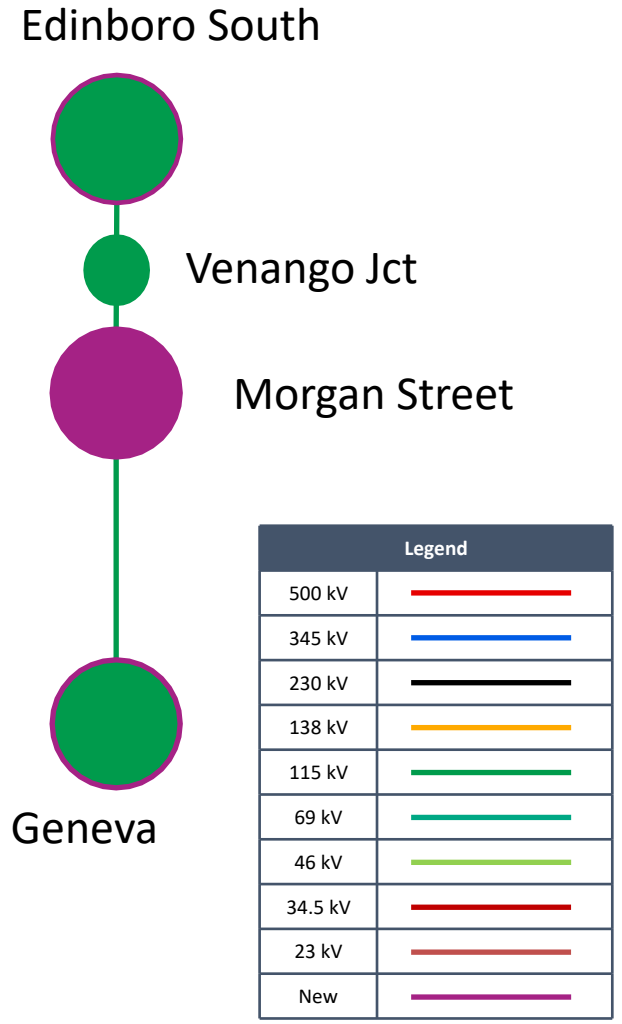
Maintain existing substation topology with risk of customer outages under contingency scenarios.

**Estimated Project Cost:** $26.91M

**Projected In-Service:** 12/3/2027

**Project Status:** Conceptual

**Model:** 2024 RTEP model for 2029 Summer (50/50)



# Penelec Transmission Zone M-3 Process
# Spangler Substation

**Need Number:** PN-2024-003

**Process Stage:** Solution Meeting – 09/18/2025

**Previously Presented:** Need Meeting – 03/14/2024

**Project Driver:**

*Operational Flexibility and Efficiency*

*Equipment Material Condition, Performance, and Risk*

**Specific Assumption Reference:**

System Performance Projects Global Factors

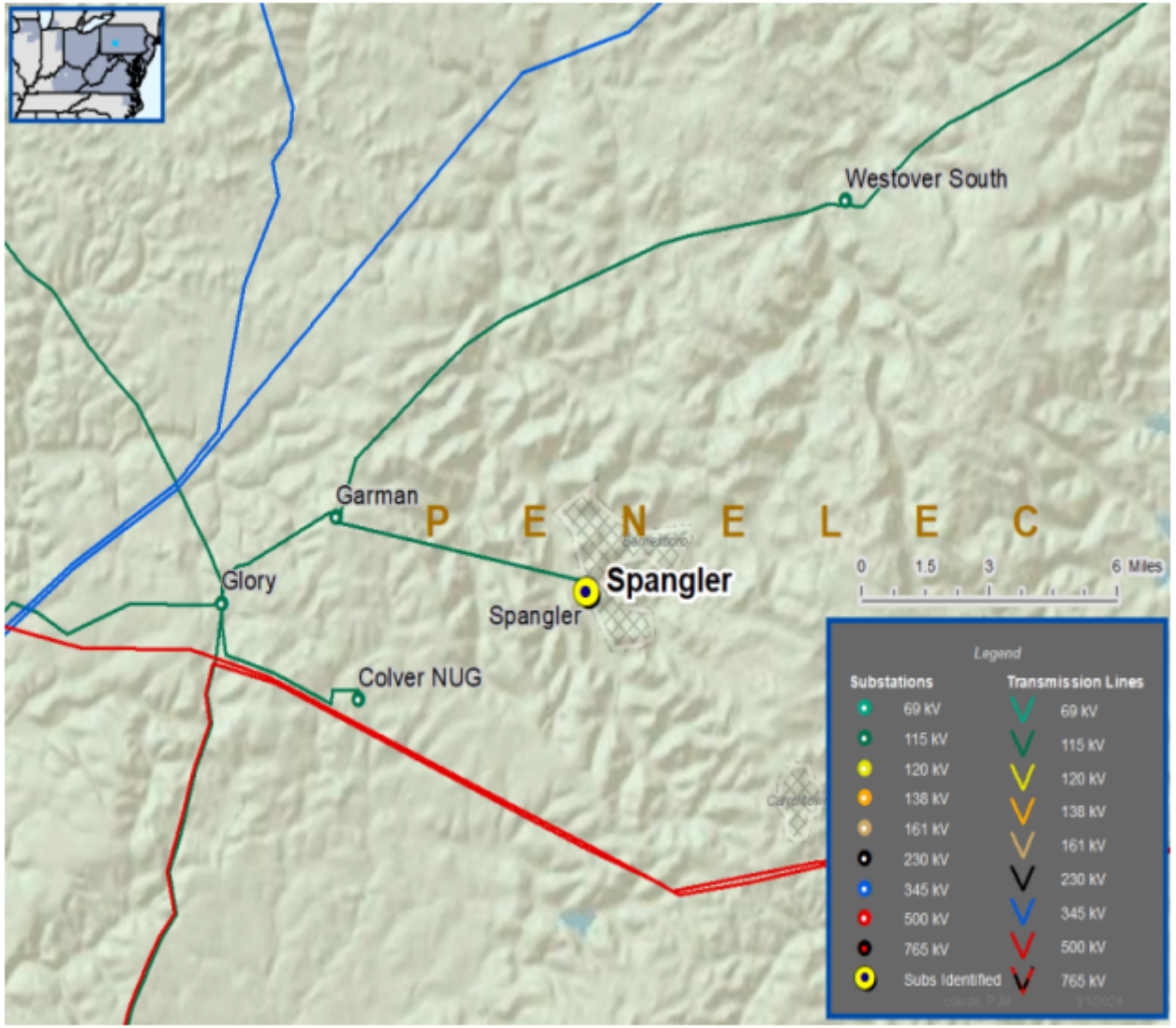
- System reliability and performance
- Substation and line equipment limits

System Performance

- Criticality, impact on reliability, customer outages
- Reliability of non-bulk electric system (Non-BES) Facilities
- Load at risk and customers impacted

**Problem Statement:**

- Spangler Substation is currently configured as a 46 kV straight bus where bus faults and/or breaker failures result in the interruption of the entire substation.
- Spangler Substation serves approximately 27 MW of load and 2,600 customers.
- The existing Spangler No. 2 115-46 kV Transformer is 48 years old. The transformer has required corrective maintenance for moisture due to leaks, consists of obsolete parts not supported by the OEM, and is limited by terminal equipment.
- Existing Ratings
  - 34 / 44 / 49 / 55 (SN/SE/WN/WE)



# Penelec Transmission Zone M-3 Process
# Spangler Substation

**Need Number:** PN-2024-003

**Process Stage:** Solution Meeting – 09/18/2025

**Proposed Solution:**

At Spangler:

- Convert the 46 kV yard into a five-breaker ring bus.
- Replace No. 2 115/46 kV transformer and install high side circuit breaker.

At Garman:

- Replace line relaying and substation conductor

At Carrolltown and Nanty Glo substations:

- Adjust remote end relaying

**Transmission Line Ratings:**

Spangler – St. Benedict 46 kV Line:

- Before Proposed Solution: 33 / 38 / 40 / 44 MVA (SN/SE/WN/WE)
- After Proposed Solution: 36 / 43 / 40 / 51 MVA (SN/SE/WN/WE)

Spangler No. 2 115/46 kV Transformer:

- Before Proposed Solution: 34 / 44 / 49 / 55 MVA (SN/SLTE/WN/WLTE)
- After Proposed Solution: 58 / 70 / 71 / 81 MVA (SN/SE/WN/WE)

Spangler – Garman 115 kV Line:

- Before Proposed Solution: 120 / 120 / 120 / 120 MVA (SN/SE/WN/WE)
- After Proposed Solution: 232 / 282 / 263 / 334 MVA (SN/SE/WN/WE)

**Alternatives Considered:**

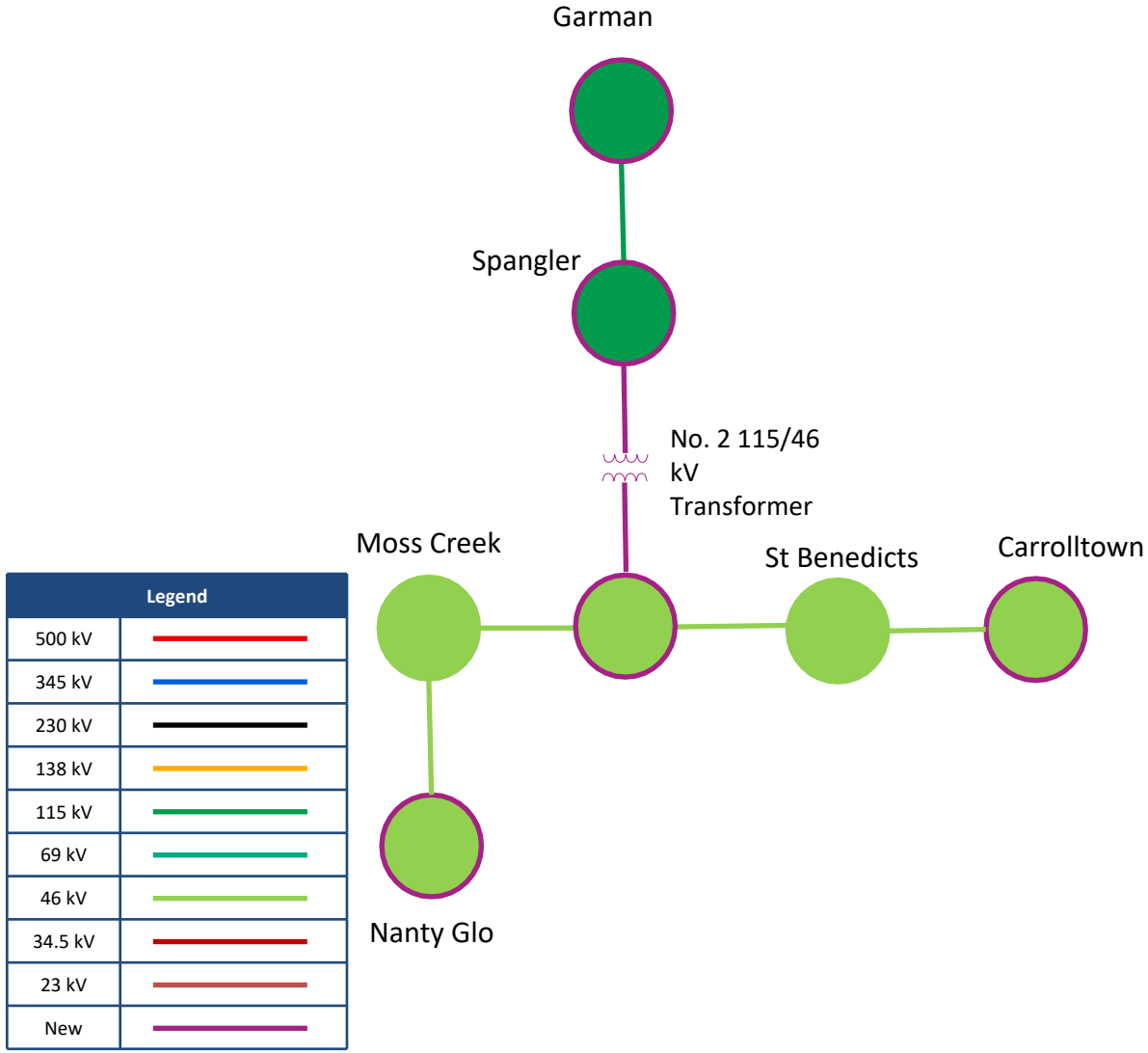
Maintain existing substation topology with risk of customer outages under contingency scenarios and elevated risk of failure due to aging transformer.

**Estimated Project Cost**: $14.2M

**Projected In-Service:** 7/12/2027

**Status:** Conceptual

**Model:** 2024 RTEP model for 2029 Summer (50/50)



# Changes to Existing Projects

# Penelec Transmission Zone Supplemental Scope Change
# North Meshoppen Substation

s1729: Originally presented in 7/20/2018 and 8/24/2018 SRRTEP Western meetings Changes are marked in red

**Supplemental 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 115 kV Substation consists of four transmission 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 outage the East Towanda - North Meshoppen 230 kV and 115 kV lines, causing overloads as the New York system tries to push toward Lackawanna through the 115 kV.

Geographic Map:
Include all facilities mentioned on slide, small locator map and a legend.

# Penelec Transmission Zone Supplemental Scope Change
# North Meshoppen Substation

**Need Number:** s1729

**Process Stage:** Re-Present Solution Meeting – 09/18/2025

**Proposed Solution:**

*North Meshoppen 115 kV Substation:*

- Construct a breaker and a half bus substation adjacent to the existing 230 kV yard consisting of twelve 115 kV breakers and a new 115 kV 36MVA capacitor.

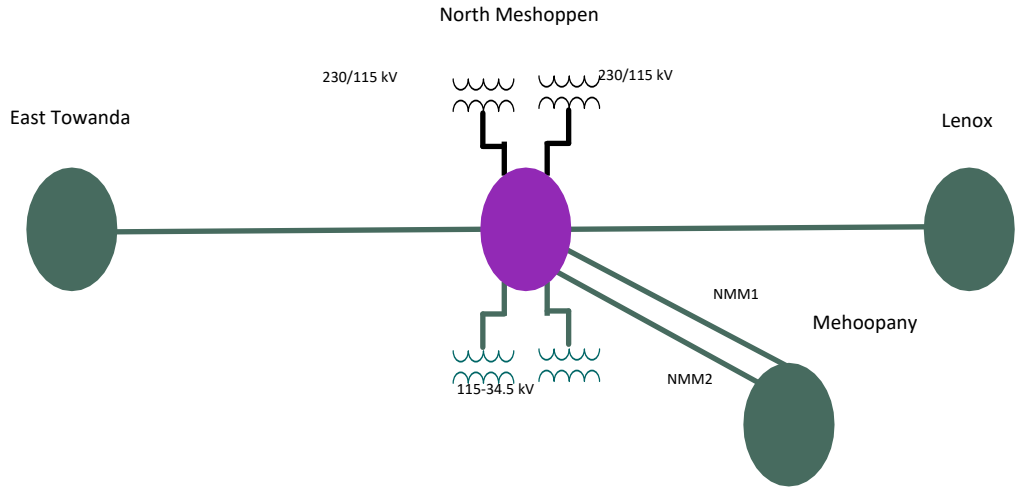
*East Towanda Substation:*

- Replace relaying.

~~*Lenox Substation:*~~

- ~~Replace substation conductor, wave trap, and relaying.~~

**Alternatives Considered**: Expand substation within the existing substation footprint.




| Legend | |
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| 500 kV | |
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| 46 kV | |
| 34.5 kV | |
| 23 kV | |
| New | |

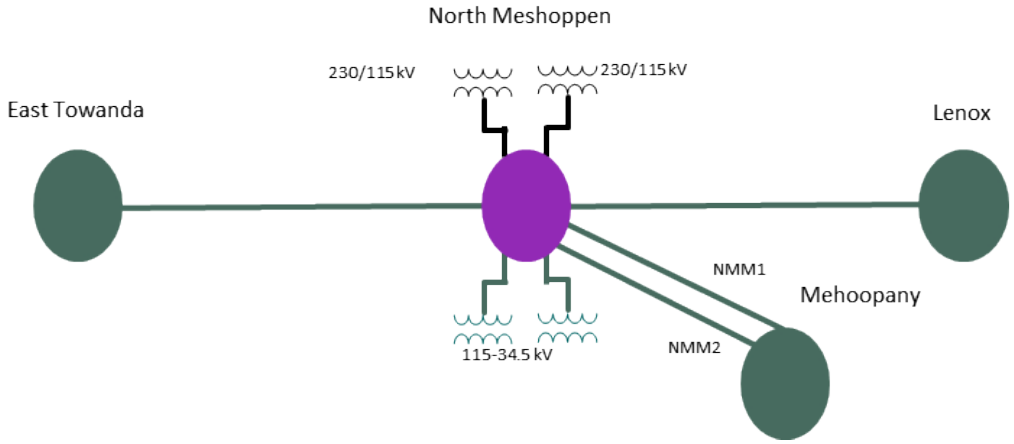
# Penelec Transmission Zone Supplemental Scope Change
# North Meshoppen Substation

**Transmission Line Ratings:**

**North Meshoppen - Lenox**
- Before Proposed Solution: 118 / 152 MVA (SN/SE)
- After Proposed Solution: 118 / 152 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)

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| 46 kV | |
| 34.5 kV | |
| 23 kV | |
| New | |

**Estimated Project Cost:** $31.5 M
**Projected In-Service:** 3/12/2025
**Project Status:** In Service
**Model:** 2022 RTEP model for 2027 Summer (50/50)