

TEAC Committee FirstEnergy Supplemental Projects

July 8, 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

Need Number: ATSI-2024-006
Process Stage: Solution Meeting - 07/08/2025
Previously Presented: Need Meeting - 04/02/2024

Project Driver(s):

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Global Factors

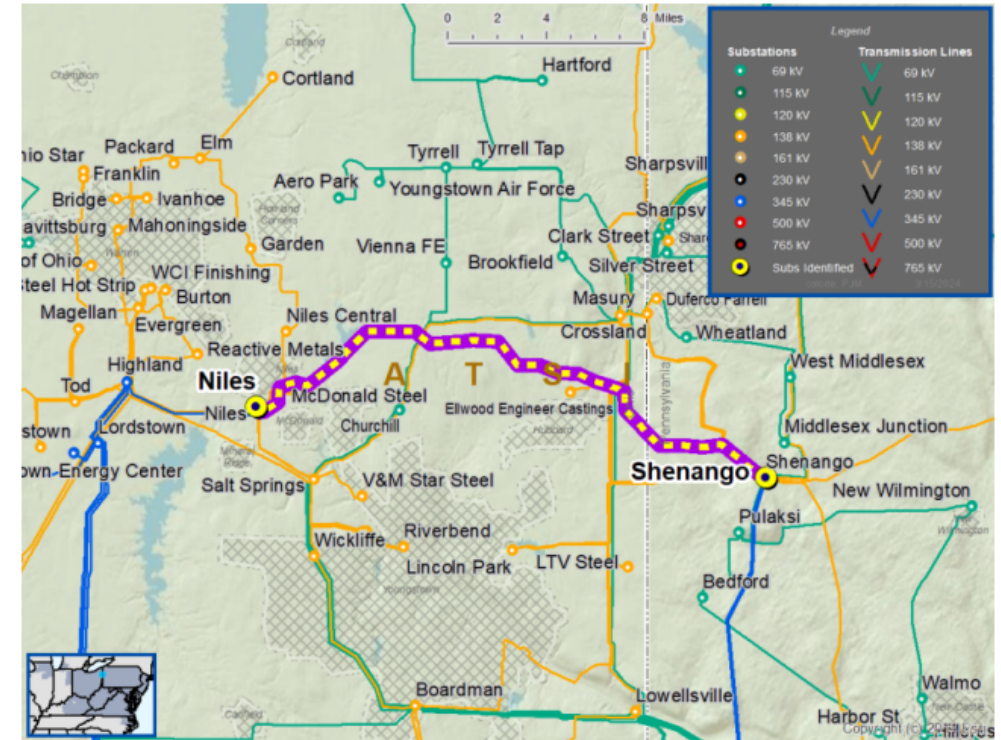
- Past system reliability/performance
- Substation/Line equipment limits

Line Condition Rebuild/Replacement

- Age/condition of wood pole transmission line structures

Problem Statement:

- The Niles – Shenango 345 kV Line was constructed approximately 48 years ago and is approaching end of life. It is approximately 19 miles long with 122 total structures of which 64 are wood pole structures.
- Per recent inspections, a 12-mile section of the line comprised of 64 wood pole structures is exhibiting deterioration resulting in increased maintenance costs. Inspection findings include rotten/cracked wood poles and crossarms, woodpecker damage, burnt and broken insulators, and worn static-wire attachments.
 - 37 structures require repairs due to deterioration of wood pole structures.
 - 23 structures require repairs to insulators and related hardware deterioration, indicating that the components are reaching end of life
- Since 2015, the line has had two unscheduled sustained outages relating to failure of line equipment
- Existing Transmission Line Rating:
 - 1542 / 1878 / 1746 / 2143 MVA (SN/SE/WN/WE)





ATSI Transmission Zone M-3 Process Niles – Shenango 345 kV Line

Need Number: ATSI-2024-006
Process Stage: Solution Meeting - 07/08/2025

Proposed Solution:

Niles – Shenango 345 kV Line

- Rebuild the 12.4 mile wood pole section (total length 14.5 miles) from Structure 41946 to Structure 42033 an install new conductor.
- Reconductor approximately 2.1 miles from the Niles Substation to Structure 41946.

At Niles Substation:

- Replace five disconnect switches
- Replace line relaying

At Shenango Substation:

- Replace line relaying

Transmission Line Ratings:

Niles – Shenango 345 kV Line:

- Before Proposed Solution: 1542 / 1878 / 1746 / 2143 MVA (SN/SE/WN/WE)
- After Proposed Solution: 2504 / 2883 / 2505 / 3033 MVA (SN/SE/WN/WE)

Alternatives Considered:

Maintain line in existing condition with increased risk of failure due to deteriorating wood pole structures.

Estimated Project Cost: \$73.92M

Projected In-Service: 12/17/2027

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	

ATSI Transmission Zone M-3 Process Beaver Valley – Hanna 345 kV Line and Hanna – Mansfield 345 kV Line

Need Number: ATSI-2024-013
Process Stage: Solution Meeting - 07/08/2025
Previously Presented: Need Meeting - 04/02/2024

Project Driver(s):

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Global Factors

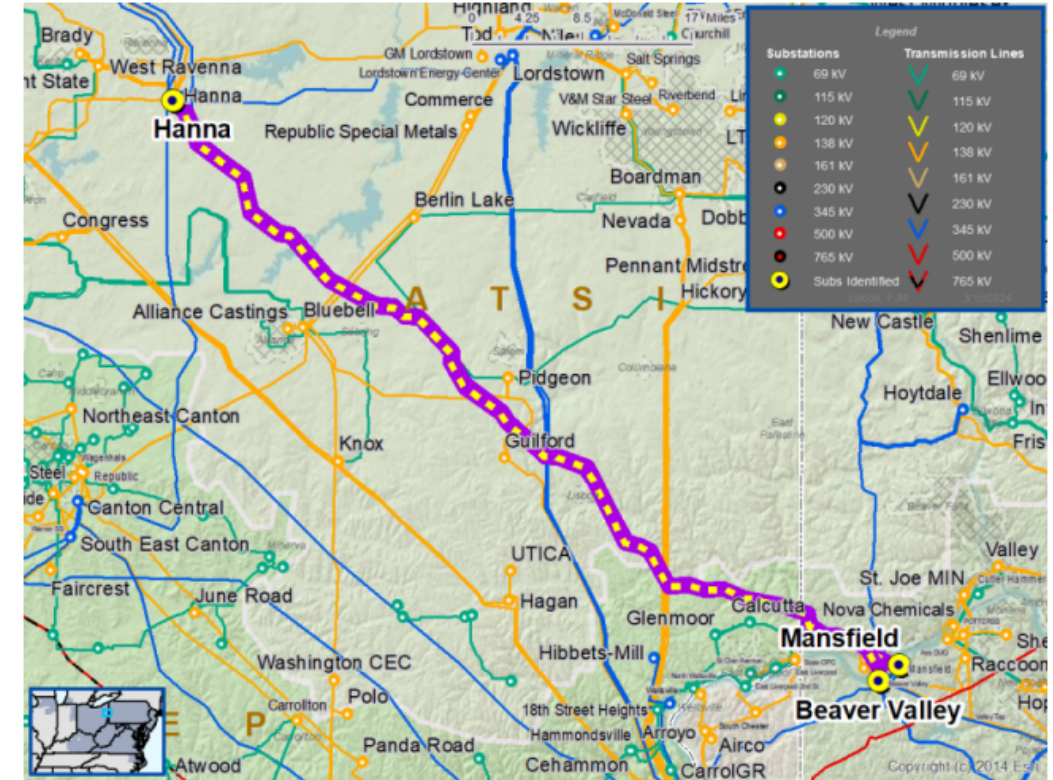
- Past system reliability/performance
- Substation/Line equipment limits

Line Condition Rebuild/Replacement

- Age/condition of steel and wood pole transmission line structures

Problem Statement:

- The double circuit section of the Beaver Valley – Hanna 345 kV Line and Hanna – Mansfield 345 kV Line were constructed approximately 46 years ago. The double circuit line section is approximately 60 miles long with 314 steel transmission line structures.
- Recent inspections have indicated that a seven-mile section of the double circuit line comprised of 33 steel structures has weathering lattice steel structures that are exhibiting severe deterioration. Inspection findings revealed heavy corrosion/thinning at the concrete/leg interface, advanced pack-out, and deep pitting.
 - 33 steel structures require repairs due to deterioration.
 - 13 wood pole structures require repairs due to deterioration (OH).
- Since 2015, the Beaver Valley – Hanna 345 kV Line has had one unscheduled sustained outage.
- Since 2015, the Hanna – Mansfield 345 kV Line has had two unscheduled sustained outage.
- Existing Beaver Valley – Hanna 345 kV Line Rating:
 - 1486 / 1739 / 1723 / 1739 MVA (SN/SE/WN/WE)
- Existing Hanna – Mansfield 345 kV Line Rating:
 - 1415 / 1745 / 1637 / 2116 MVA (SN/SE/WN/WE)





ATSI Transmission Zone M-3 Process

Beaver Valley – Hanna 345 kV Line and Hanna – Mansfield 345 kV Line

Need Number: ATSI-2024-013
Process Stage: Solution Meeting - 07/08/2025

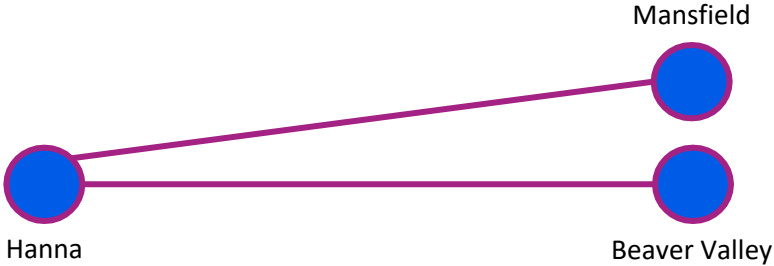
Proposed Solution:

Beaver Valley – Hanna 345 kV Line and Hanna – Mansfield 345 kV Line

- Replace 33 steel structures from Structure 6270 to Structure 6632.
- Install new conductor on the Beaver Valley-Hanna line (approximately 6.9 miles).
- Install new conductor on the Hanna-Mansfield line (approximately 6.6 miles).

At Beaver Valley, Mansfield and Hanna substations:

- Adjust relay settings



Transmission Line Ratings:

Beaver Valley – Hanna 345 kV Line:

- Before Proposed Solution: 1486 / 1739 / 1723 / 1739 MVA (SN/SE/WN/WE)
- After Proposed Solution: 1560 / 1900 / 1766 / 2251 MVA (SN/SE/WN/WE)

Hanna – Mansfield 345 kV Line:

- Before Proposed Solution: 1415 / 1745 / 1637 / 2116 MVA (SN/SE/WN/WE)
- After Proposed Solution: 1542 / 1878 / 1746 / 2225 MVA (SN/SE/WN/WE)

Alternatives Considered:

Maintain line in existing condition with elevated risk of failure due to deteriorating steel and wood pole structures.

Estimated Project Cost: \$53.35M

Projected In-Service: 5/31/2028

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	

Need Number: ATSI-2024-019
Process Stage: Solution Meeting - 07/08/2025
Previously Presented: Need Meeting - 04/02/2024

Project Driver(s):

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Global Factors

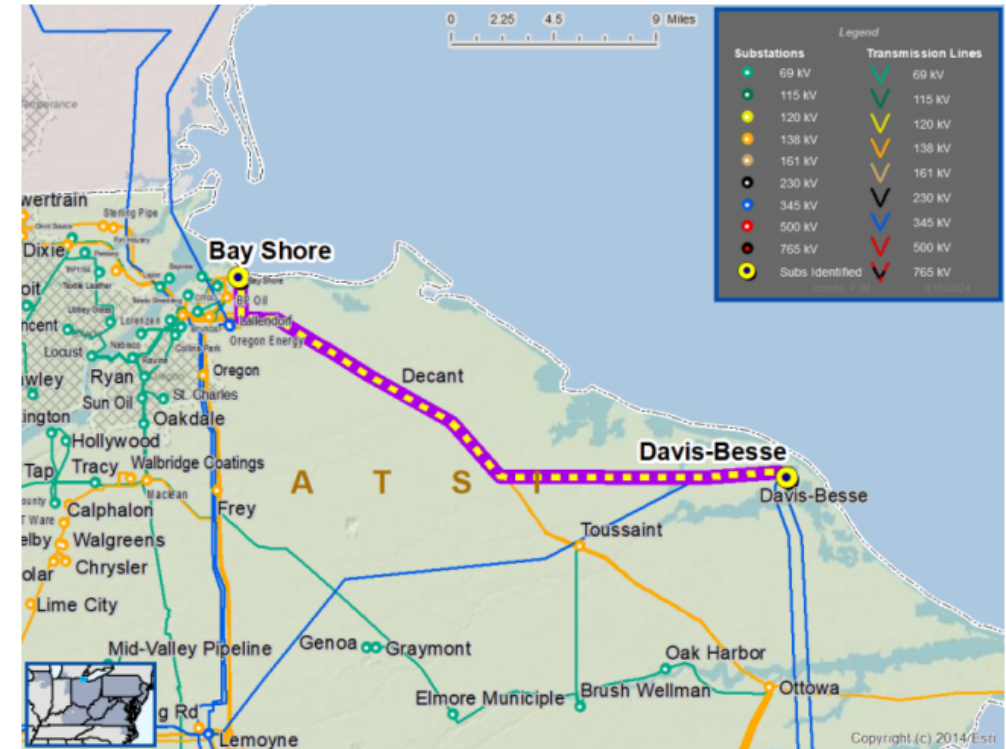
- Past system reliability/performance
- Substation/Line equipment limits

Line Condition Rebuild/Replacement

- Age/condition of wood pole transmission line structures

Problem Statement:

- The Bayshore – Davis Besse 345 kV Line was constructed approximately 55 years ago. It is approximately 21 miles long with a total of 110 structures with 17 wooden H-frame structures.
- Recent inspections have indicated that a four-mile section of the line comprised of 17 wood pole H-frame structures is exhibiting deterioration. Inspection findings include cracked wood poles, rotten braces, corona damage and broken down grounds.
 - 14 structures require repair due to deterioration.
 - 4 structures are phase-raised.
- The line has not had any unscheduled sustained outages over the last five years.
- Existing Transmission Line Rating:
 - 1411 / 1683 / 1723/ 1925 MVA (SN/SE/WN/WE)





ATSI Transmission Zone M-3 Process Bayshore – Davis Besse 345 kV Line

Need Number: ATSI-2024-019
Process Stage: Solution Meeting - 07/08/2025

Proposed Solution:

Bayshore – Davis Besse 345 kV Line

- Replace 17 deteriorated wood pole and phase-raised structures on the four-mile section from Structure 9 to Structure 25 and install new conductor.

At Bayshore and Davis Besse substations:

- Replace line relaying

Transmission Line Ratings:

Bayshore – Davis Besse 345 kV Line:

- Before Proposed Solution: 1411 / 1683 / 1723 / 1925 MVA (SN/SE/WN/WE)
- After Proposed Solution: 1411 / 1683 / 1723 / 1925 MVA (SN/SE/WN/WE)

Alternatives Considered:

Maintain line in existing condition with elevated risk of failure due to deteriorating wood pole structures.

Estimated Project Cost: \$21.12M

Projected In-Service: 05/28/2027

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	

Need Number: ATSI-2024-027
Process Stage: Solution Meeting - 07/08/2025
Previously Presented: Need Meeting - 04/02/2024

Project Driver(s):

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Global Factors

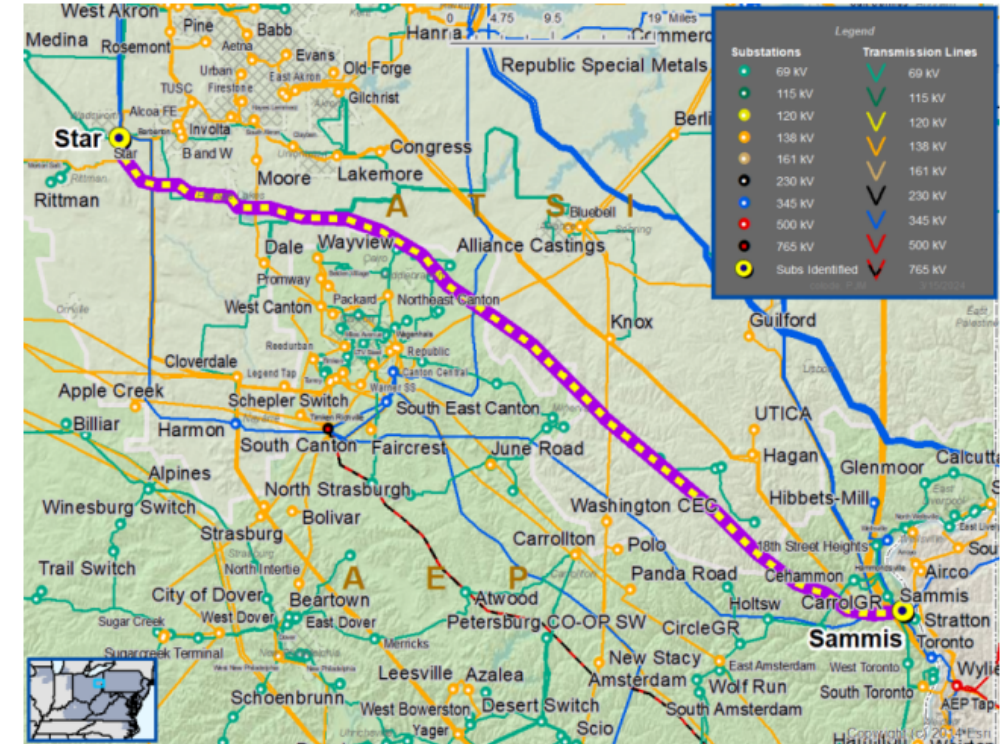
- Past system reliability/performance

Line Condition Rebuild/Replacement

- System characteristics including structural capacity needs
- Current design criteria, applicable codes and industry best practices

Problem Statement:

- The Sammis – Star 345 kV Line was constructed approximately 65 years ago. It is approximately 68.6 miles long and consists of 375 steel lattice towers and 22 wood pole H-frame structures.
- Suspension towers are susceptible to cascading failures. A tornado-induced tower failure destroyed 13 towers due to cascading.
- Current modeling techniques indicate the steel towers do not have the structural strength to withstand NESC required load cases, nor the additional wind and ice load cases required by FirstEnergy.
- Existing Transmission Line Ratings:
 - 1382 / 1712 / 1637 / 2116 MVA (SN/SE/WN/WE)





ATSI Transmission Zone M-3 Process Sammis – Star 345 kV Line

Need Number: ATSI-2024-027
Process Stage: Solution Meeting - 07/08/2025

Proposed Solution:
Sammis – Star 345 kV Line

- Rebuild the existing Sammis – Star 345 kV line (approximately 68.6 miles)

At Sammis and Star substations:

- Replace line relaying

Transmission Line Ratings:
Sammis – Star 345 kV Line:

- Before Proposed Solution: 1382 / 1712 / 1637 / 2116 MVA (SN/SE/WN/WE)
- After Proposed Solution: 2504 / 2883 / 2505 / 3033 MVA (SN/SE/WN/WE)

Alternatives Considered:
Maintain line in existing condition with elevated risk of failure due to suspension towers susceptible to cascading failures.

Estimated Project Cost: \$343.70M
Projected In-Service: 5/30/2031
Project Status: Conceptual
Model: 2024 RTEP model for 2029 Summer (50/50)



Legend	
500 kV	<div></div>
345 kV	<div></div>
230 kV	<div></div>
138 kV	<div></div>
115 kV	<div></div>
69 kV	<div></div>
46 kV	<div></div>
34.5 kV	<div></div>
23 kV	<div></div>
New	<div></div>

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/xx/2025– V1 – Original version posted to pjm.com