Subregional RTEP Committee – Western
FirstEnergy Supplemental Projects

APS Transmission Zone

September 18, 2026

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

APS Transmission Zone M-3 Process Misoperation Relays

Need Number: APS-2026-055
Process Stage: Need Meeting 09/18/2026
Project Driver: Equipment Condition/Performance/Risk

Specific Assumption References:

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.

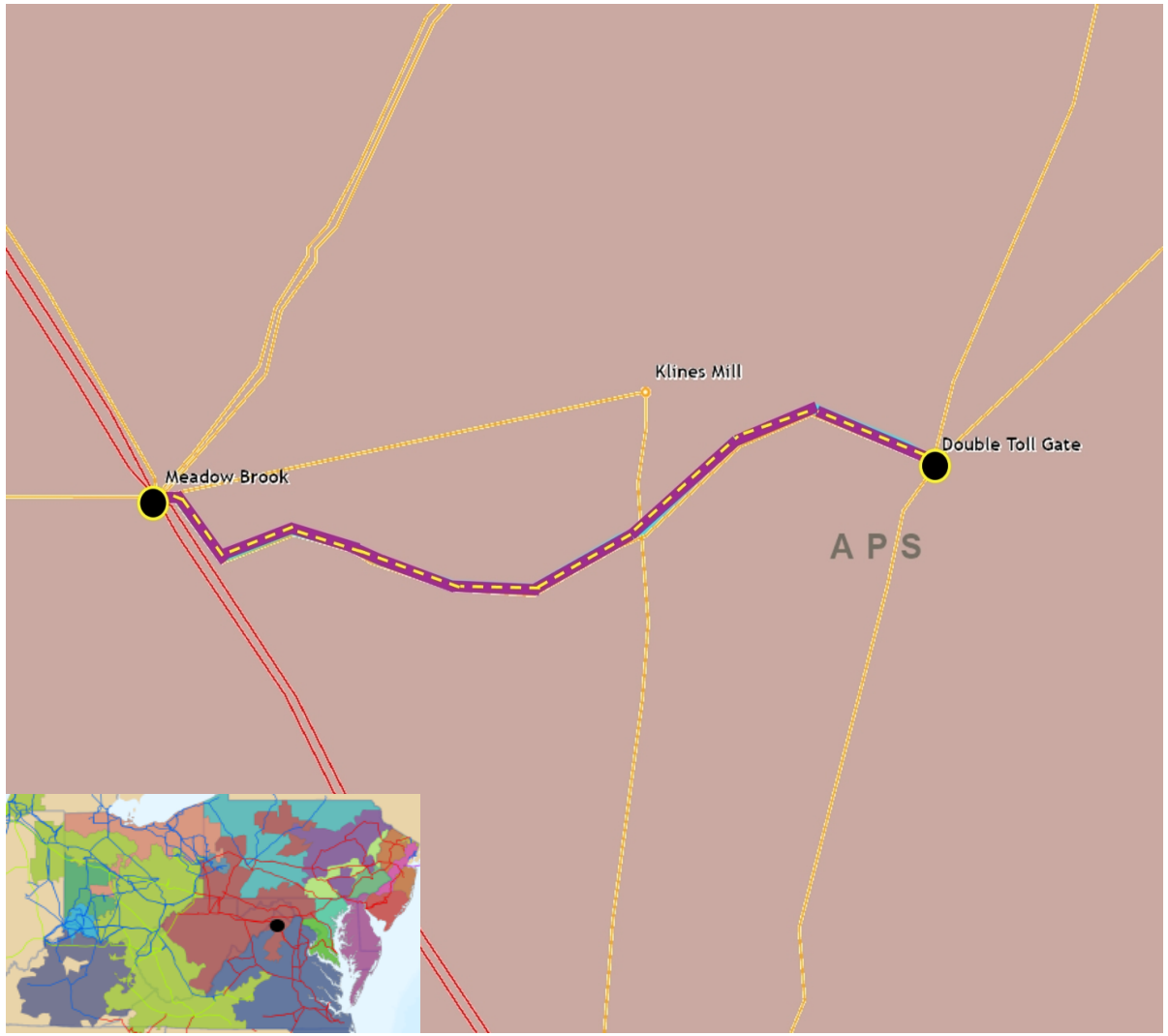
In many cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology.

Transmission line ratings are limited by terminal equipment.

Double Toll Gate - Meadow Brook 138 kV MBG Line:

Existing Line Rating: 295 / 358 / 349 / 410 MVA (SN/SE/WN/WE)

Existing Conductor Rating: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)



APS Transmission Zone M-3 Process Misoperation Relays

Need Number: APS-2026-056
Process Stage: Need Meeting 09/18/2026
Project Driver: Equipment Condition/Performance/Risk

Specific Assumption References:

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.

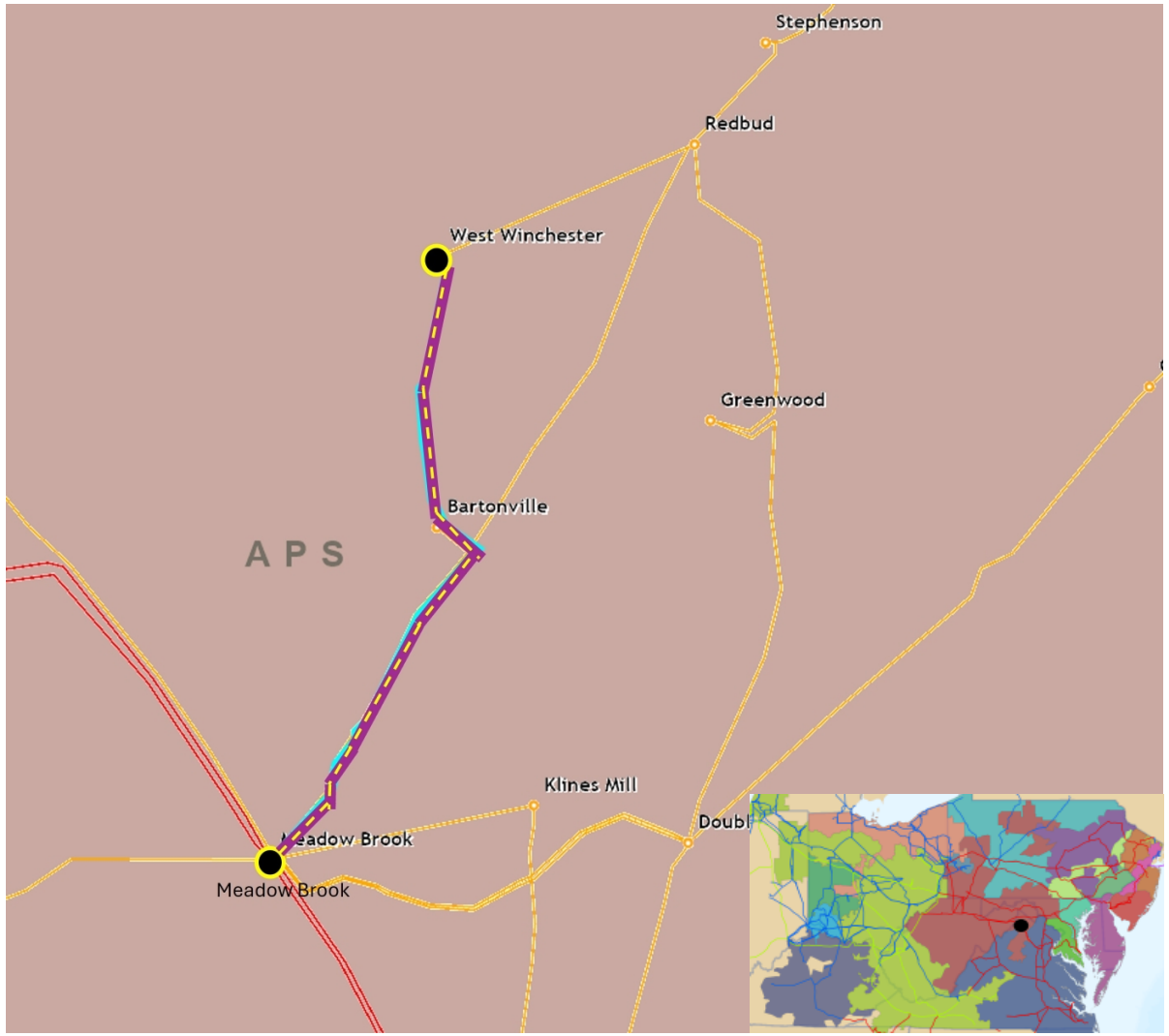
In many cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology.

Transmission line ratings are limited by terminal equipment.

Meadow Brook - West Winchester 138 kV Line:

Existing Line Rating: 292 / 314 / 325 / 343 MVA (SN/SE/WN/WE)

Existing Conductor Rating: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)



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

APS Transmission Zone M-3 Process Misoperation Relays

Need Number: APS-2024-103
Process Stage: Solution Meeting 09/18/2026
Previously Presented: Need Meeting 12/13/2024
Project Driver: Equipment Condition/Performance/Risk
Specific Assumption References:

System Performance Projects Global Factors

- System reliability and performance
- Substation/line equipment limits

System Condition Projects

- Substation Condition Rebuild/Replacement
- 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.

Springdale – Murrycrest 138 kV Line:

Existing Line Rating: 292 / 314 / 325 / 343 MVA (SN/SE/WN/WE)

Existing Conductor Rating: 297 / 365 / 345 / 441 MVA (SN/SE/WN/WE):

Murrycrest – Sunoco Delmont 138 kV Line:

Existing Line Rating: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)

Existing Conductor Rating: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)

Sunoco Delmont – White Valley 138 kV Line:

Existing Line Rating: 292 / 314 / 325 / 343 MVA (SN/SE/WN/WE)

Existing Conductor Rating: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)

APS Transmission Zone M-3 Process Misoperation Relays

Need Number: APS-2024-103
Process Stage: Solution Meeting 09/18/2026

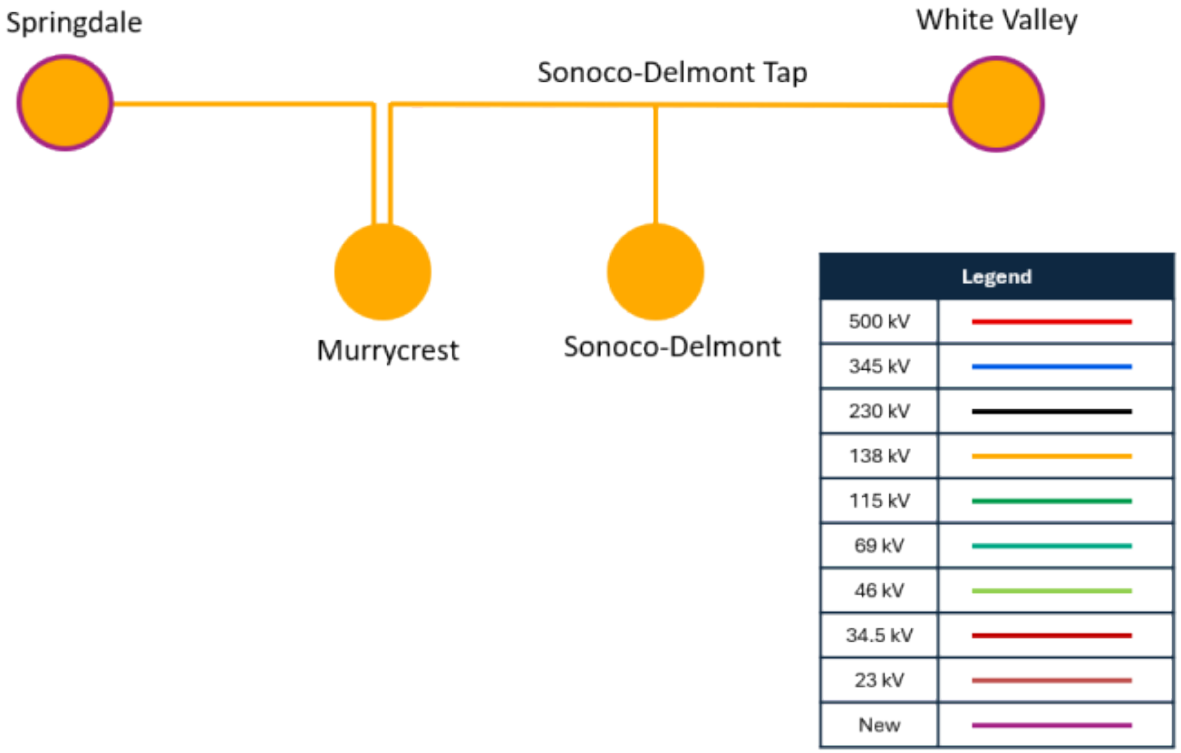
Proposed Solution:
At Springdale Substation, replace wave trap, CVT and relaying
At Murrycrest Substation, replace disconnect switches, CVT and relaying
At White Valley Substation, replace circuit breaker, disconnect switches, substation conductors, wave trap, CVT and relaying

Springdale - Murrycrest 138 kV Line Ratings:
Before Proposed Solution: 292 / 314 / 325 / 343 MVA (SN/SE/WN/WE)
After Proposed Solution: 297 / 365 / 345 / 441 MVA (SN/SE/WN/WE)

Sunoco - Delmont Tap - White Valley 138 kV Line Ratings:
Before Proposed Solution: 292 / 314 / 325 / 343 MVA (SN/SE/WN/WE)
After Proposed Solution: 297 / 365 / 345 / 441 MVA (SN/SE/WN/WE)

Alternatives Considered:
Maintain equipment in existing condition with elevated risk of misoperations.

Transmission Cost Estimate: $4.63 M
Projected In-Service: 12/31/2029
Project Status: Conceptual
Model: 2025 RTEP model for 2030 Summer (50/50)



APS Transmission Zone M-3 Process Misoperation Relays

Need Number: APS-2024-111

Process Stage: Solution Meeting 09/18/2026

Previously Presented: Need Meeting 12/13/2024

Project Driver: Equipment Condition/Performance/Risk

Specific Assumption References:

System Performance Projects Global Factors

- System reliability and performance
- Substation/line equipment limits

System Condition Projects

- Substation Condition Rebuild/Replacement
- 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.

Eldora – Whitehall Junction 138 kV Line:

Existing Line Rating: 294 / 350 / 349 / 401 MVA (SN/SE/WN/WE)

Existing Conductor Rating: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)

Pruntytown – Whitehall Junction 138 kV Line:

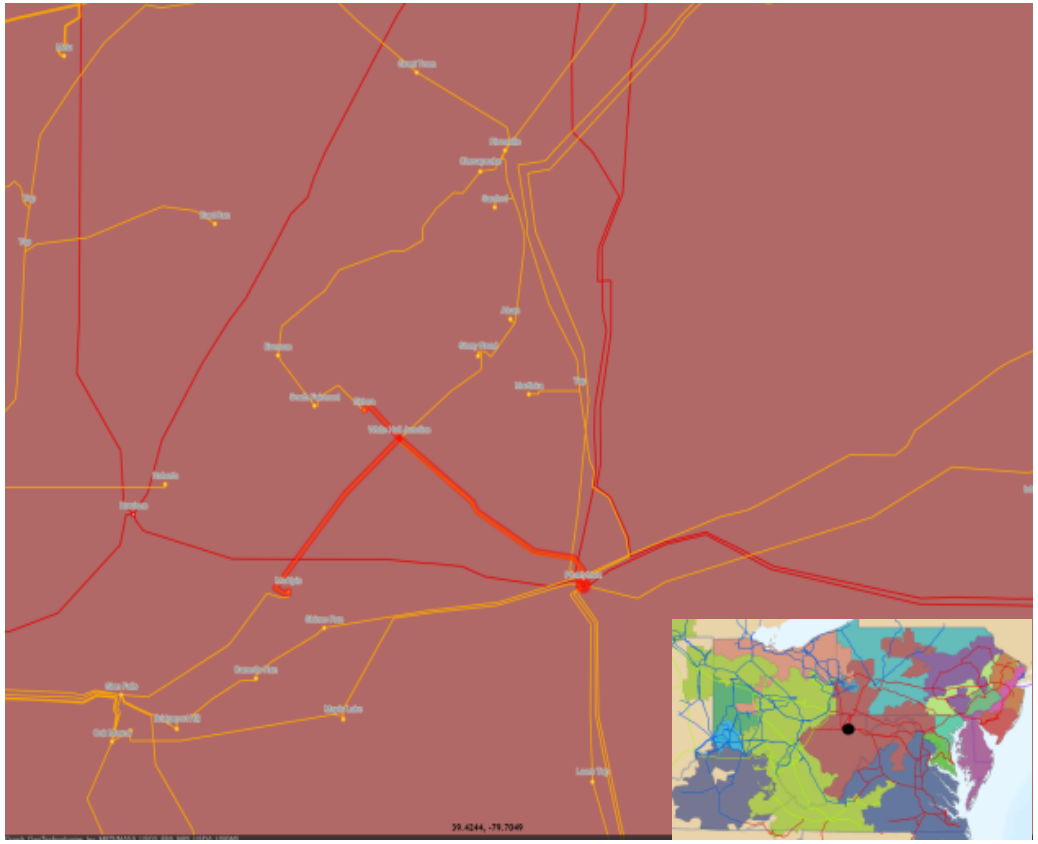
Existing Line Rating: 292 / 314 / 325 / 343 MVA (SN/SE/WN/WE)

Existing Conductor Rating: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)

McAlpin – Whitehall Junction 138 kV Line:

Existing Line Rating: 292 / 314 / 325 / 343 MVA (SN/SE/WN/WE)

Existing Conductor Rating: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)



APS Transmission Zone M-3 Process Misoperation Relays

Need Number: APS-2024-111
Process Stage: Solution Meeting 09/18/2026

Proposed Solution:

At Eldora Substation: replace breaker, associated disconnect switches, substation conductor, wavetrap, and relays

At McAlpin Substation: replace breaker, associated disconnect switches, substation conductor, wavetrap, and relays

At Pruntytown Substation: replace breaker, associated disconnect switches, substation conductor, wavetrap, and relays

Transmission Line Ratings:

Eldora - Whitehall Junction 138 kV Line:

Before Proposed Solution: 294 / 350 / 349 / 401 MVA (SN/SE/WN/WE)

After Proposed Solution: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)

Pruntytown - Whitehall Junction 138 kV Line:

Before Proposed Solution: 292 / 314 / 325 / 343 MVA (SN/SE/WN/WE)

After Proposed Solution: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)

McAlpin - Whitehall Junction 138 kV Line:

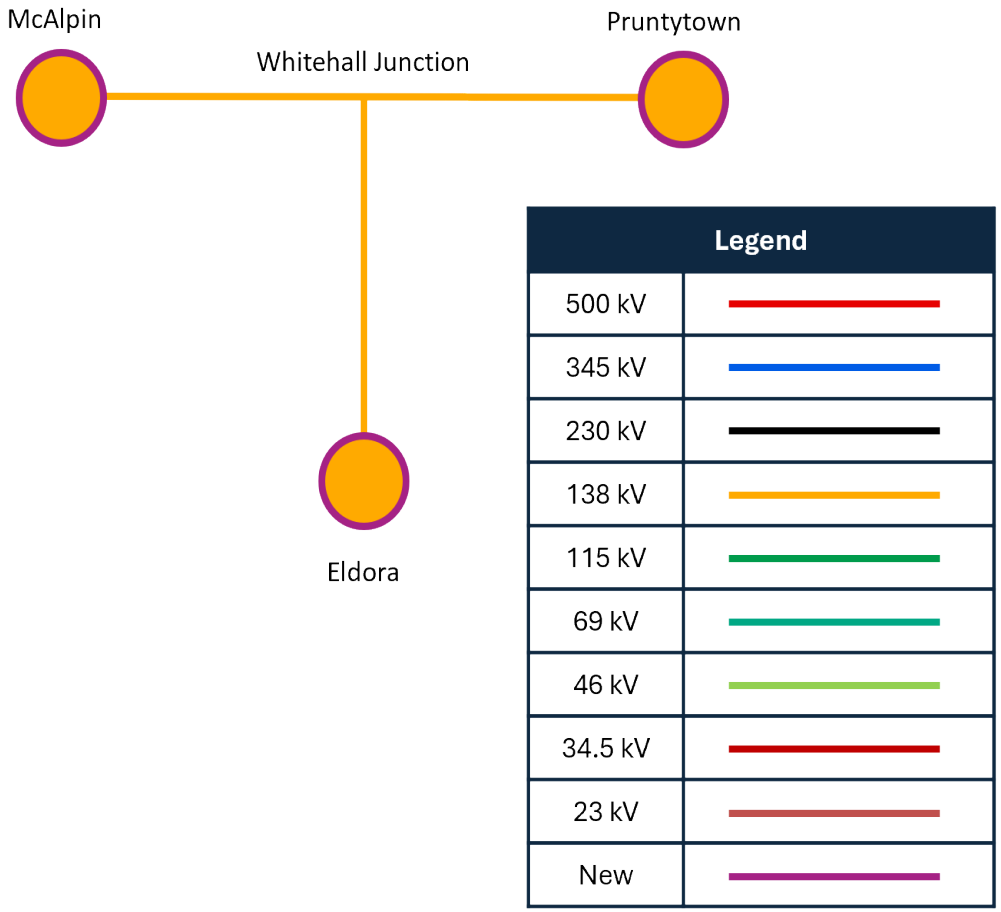
Before Proposed Solution: 292 / 314 / 325 / 343 MVA (SN/SE/WN/WE)

After Proposed Solution: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)

Alternatives Considered:

Maintain equipment in existing condition with elevated risk of misoperations.

Transmission Cost Estimate: $4.73 M
Projected In-Service: 11/03/2028
Project Status: Conceptual
Model: 2025 RTEP model for 2030 Summer (50/50)



APS Transmission Zone M-3 Process Misoperation Relays

Need Number: APS-2024-113
Process Stage: Solution Meeting 09/18/2026
Previously Presented: Need Meeting 12/13/2024
Project Driver: Equipment Condition/Performance/Risk

Specific Assumption References:

System Performance Projects Global Factors

- System reliability and performance
- Substation/line equipment limits

System Condition Projects

- Substation Condition Rebuild/Replacement
- 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.

Pickens – Back Fork 138 kV Line

Existing Line Rating: 169 / 209 / 217 / 229 MVA (SN/SE/WN/WE)

Existing Conductor Rating: 169 / 213 / 217 / 280 MVA (SN/SE/WN/WE)

APS Transmission Zone M-3 Process Misoperation Relays

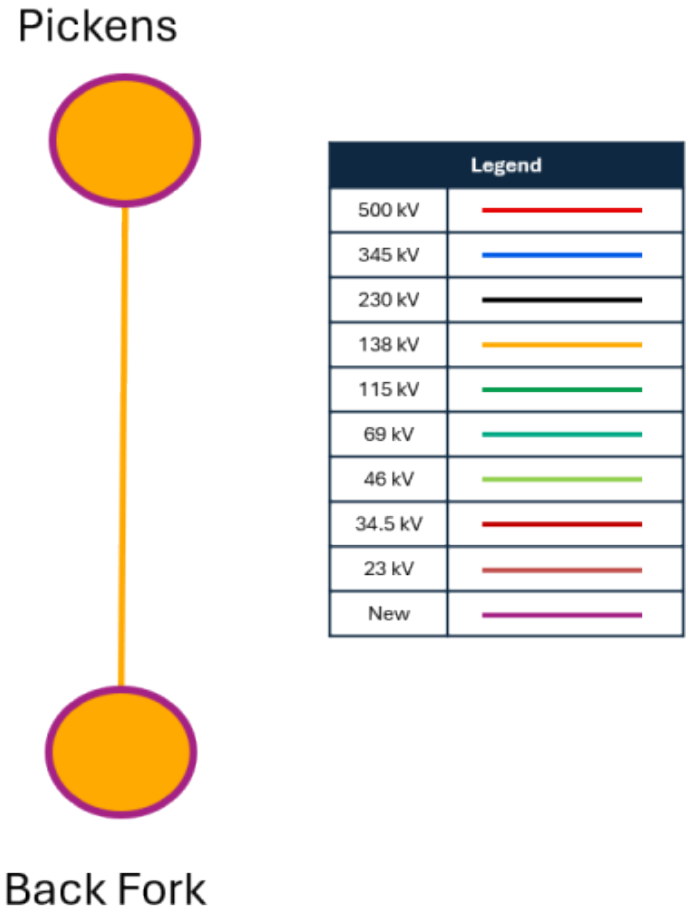
Need Number: APS-2024-113
Process Stage: Solution Meeting 09/18/2026

Proposed Solution:
At Back Fork Substation: Replace relays, and limiting substation conductor
At Pickens Substation: Replace wavetrap and relays

Transmission Line Ratings:
Back Fork - Pickens 138 kV Line
Before Proposed Solution: 169 / 209 / 217 / 229 MVA (SN/SE/WN/WE)
After Proposed Solution: 169 / 213 / 217 / 280 MVA (SN/SE/WN/WE)

Alternatives Considered:
Maintain equipment in existing condition with elevated risk of misoperations.

Transmission Cost Estimate: $2.35 M
Projected In-Service: 12/31/2028
Project Status: Conceptual
Model: 2025 RTEP model for 2030 Summer (50/50)



APS Transmission Zone M-3 Process
Misoperation Relays

Need Number: APS-2024-118
Process Stage: Solution Meeting 09/18/2026
Previously Presented: Need Meeting 12/13/2024
Project Driver: Equipment Condition/Performance/Risk

Specific Assumption References:

System Performance Projects Global Factors

- System reliability and performance
- Substation/line equipment limits

System Condition Projects

- Substation Condition Rebuild/Replacement
- 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.

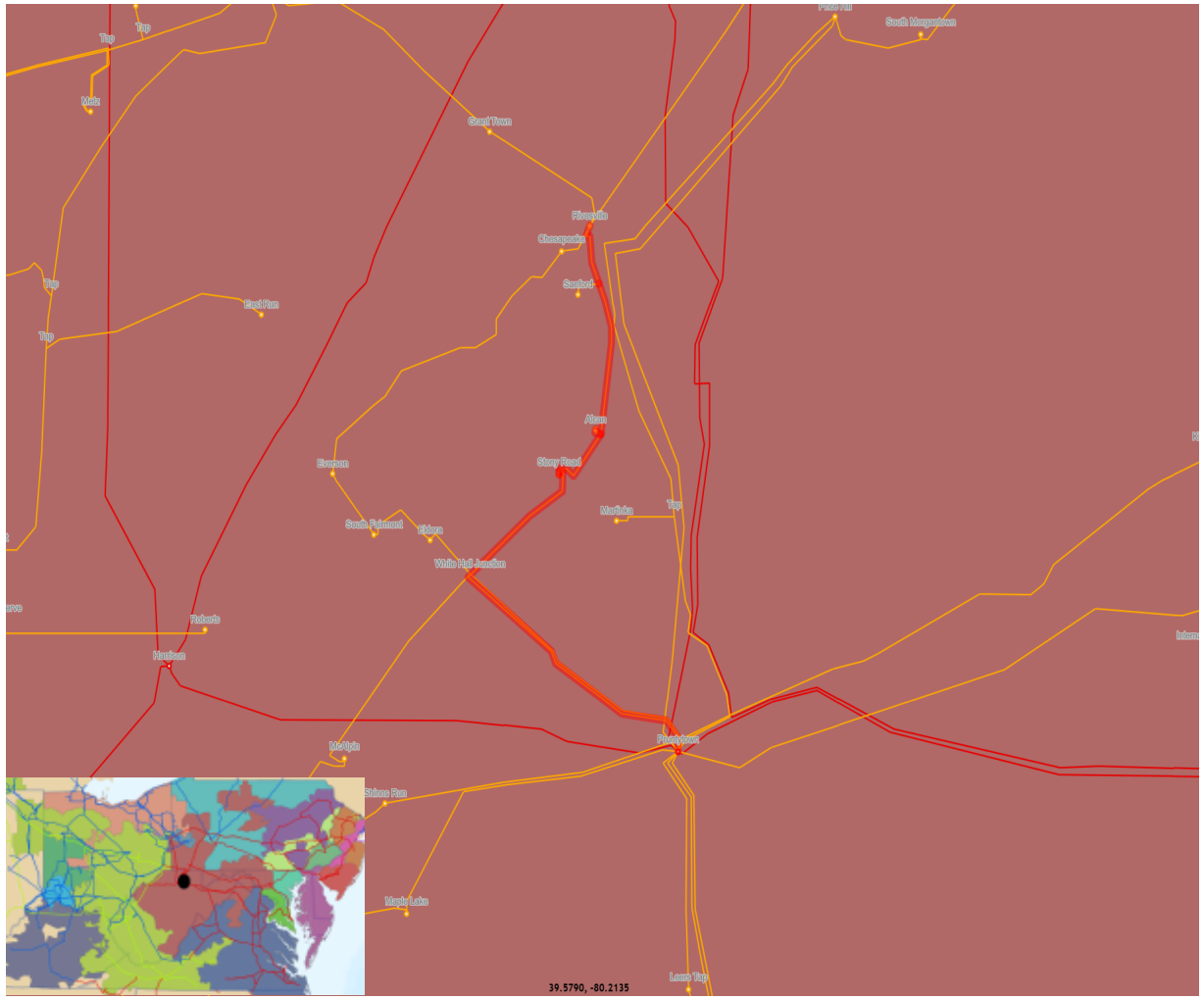
In many cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology.

Transmission line ratings are limited by terminal equipment.

Pruntytown – Stony Road 138 kV Line

Existing Line Rating: 221 / 268 / 250 / 287 MVA (SN/SE/WN/WE)

Existing Conductor Rating: 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)



APS Transmission Zone M-3 Process Misoperation Relays

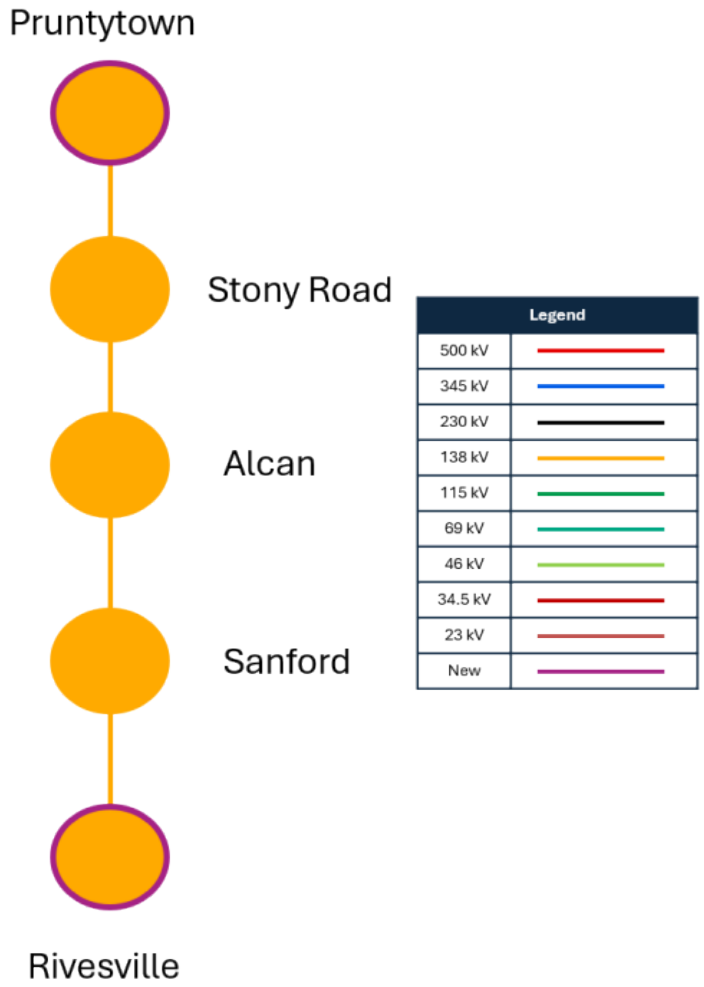
Need Number: APS-2024-118
Process Stage: Solution Meeting 09/18/2026

Proposed Solution:
Rivesville Substation - Replace wavetrap and relays
Pruntytown Substation - Replace wavetrap, meters, and relays

Transmission Line Ratings:
Pruntytown - Stony Road 138 kV Line
Before Proposed Solution: 221 / 268 / 250 / 287 MVA (SN/SE/WN/WE)
After Proposed Solution: 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)

Alternatives Considered:
Maintain equipment in existing condition with elevated risk of misoperations.

Transmission Cost Estimate: $6.51 M
Projected In-Service: 09/30/2026
Project Status: Conceptual
Model: 2025 RTEP model for 2030 Summer (50/50)



APS Transmission Zone M-3 Process
Misoperation Relays

Need Number: APS-2025-014
Process Stage: Solution Meeting 09/18/2026
Previously Presented: Need Meeting 04/11/2025
Project Driver: Equipment Condition/Performance/Risk

Specific Assumption References:

System Performance Projects Global Factors

- Substation/line equipment limits
- System reliability and performance

Substation Condition Rebuild/Replacement

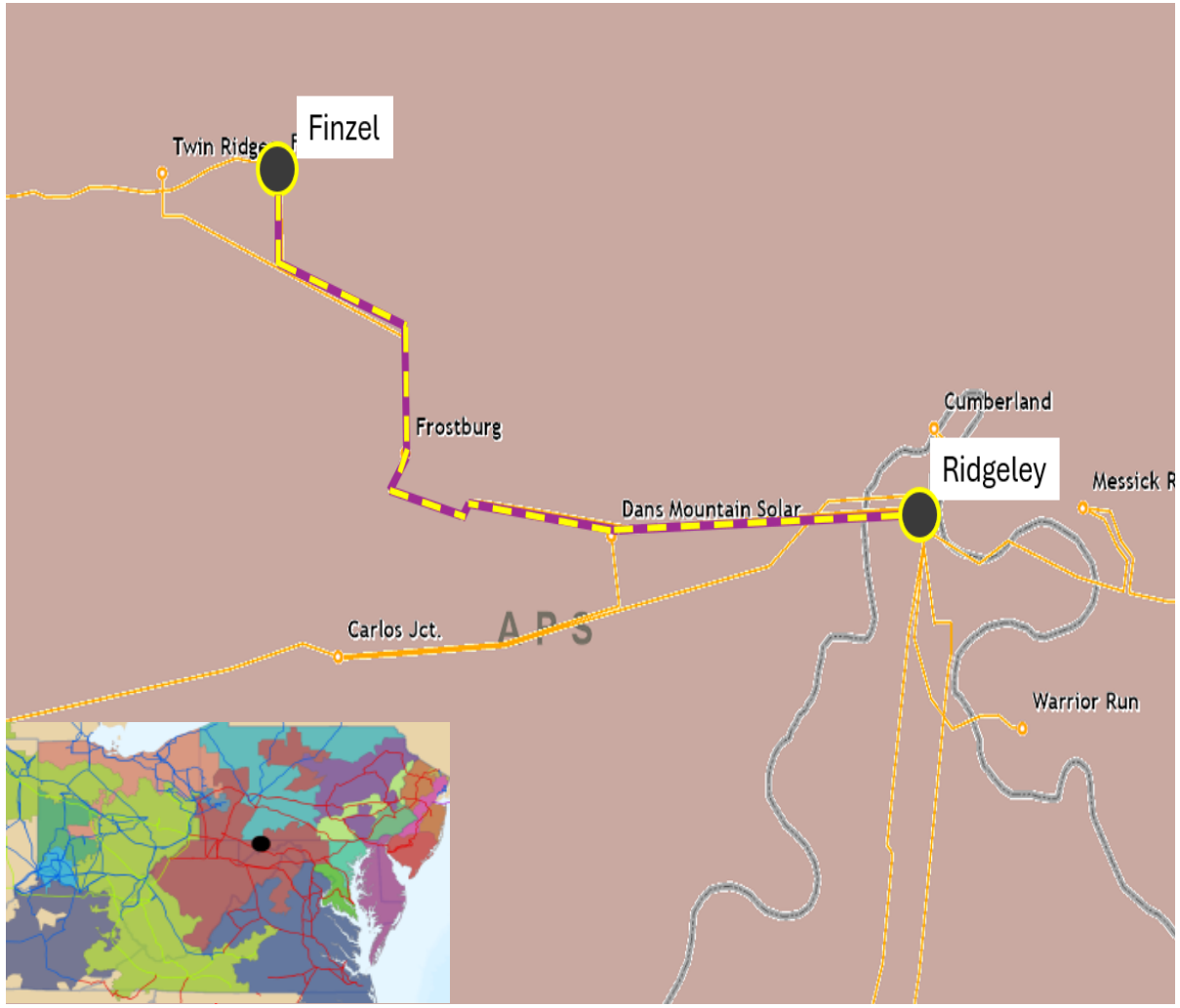
- Upgrade Relay Schemes
- Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
- Communication technology upgrades

Problem Statement:

FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation on the Finzel - Ridgeley 138 kV Line.

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



APS Transmission Zone M-3 Process Misoperation Relays

Need Number: APS-2025-014
Process Stage: Solution Meeting 09/18/2026

Proposed Solution:
At Finzel Substation: replace wave trap and relaying
At Frostburg No. 1 Substation: replace disconnect switches, CVTs and relaying
At Ridgeley Substation: replace circuit breaker, substation conductors, wave trap, CVT and relaying

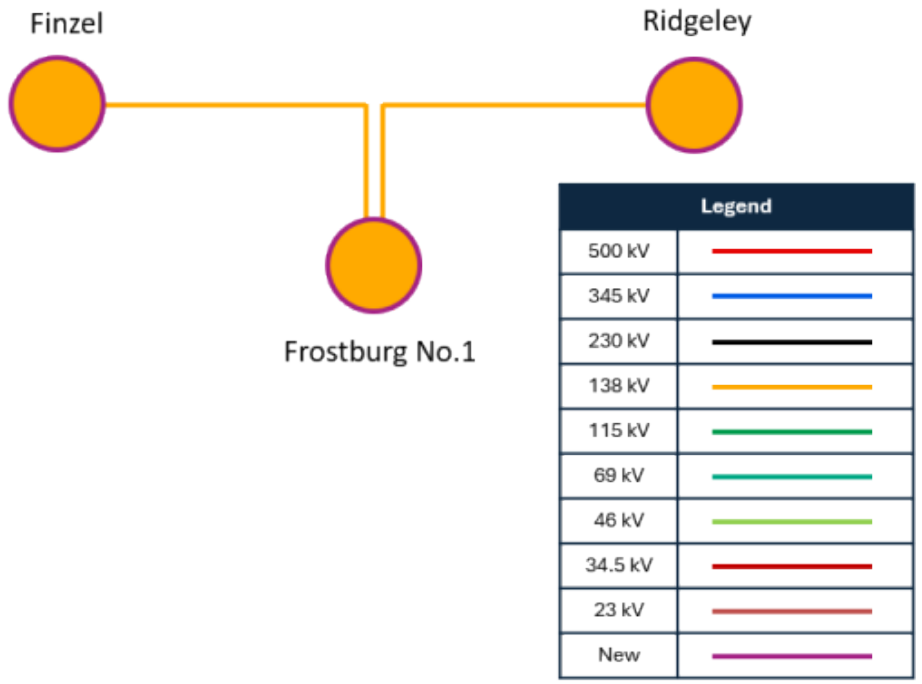
Transmission Line Ratings:

Finzel - Frostburg No. 1 138 kV Line Ratings:
Before Proposed Solution: 287 / 314 / 325 / 343 MVA (SN/SE/WN/WE)
After Proposed Solution: 304/ 373 / 349 / 445 MVA (SN/SE/WN/WE)

Frostburg No. 1 - Ridgeley 138 kV Line Ratings:
Before Proposed Solution: 292 / 306 / 306 / 306 MVA (SN/SE/WN/WE)
After Proposed Solution: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)

Alternatives Considered:
Maintain equipment in existing condition with elevated risk of misoperations.

Transmission Cost Estimate: $3.72 M
Projected In-Service: 12/31/2030
Project Status: Conceptual
Model: 2025 RTEP model for 2030 Summer (50/50)



APS Transmission Zone M-3 Process Misoperation Relays

Need Number: APS-2026-002
Process Stage: Solution Meeting 09/18/2026
Previously Presented: Need Meeting 01/16/2026
Project Driver: Equipment Condition/Performance/Risk

Specific Assumption References:

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.

Goff Run - Grantsville 138 kV Line:

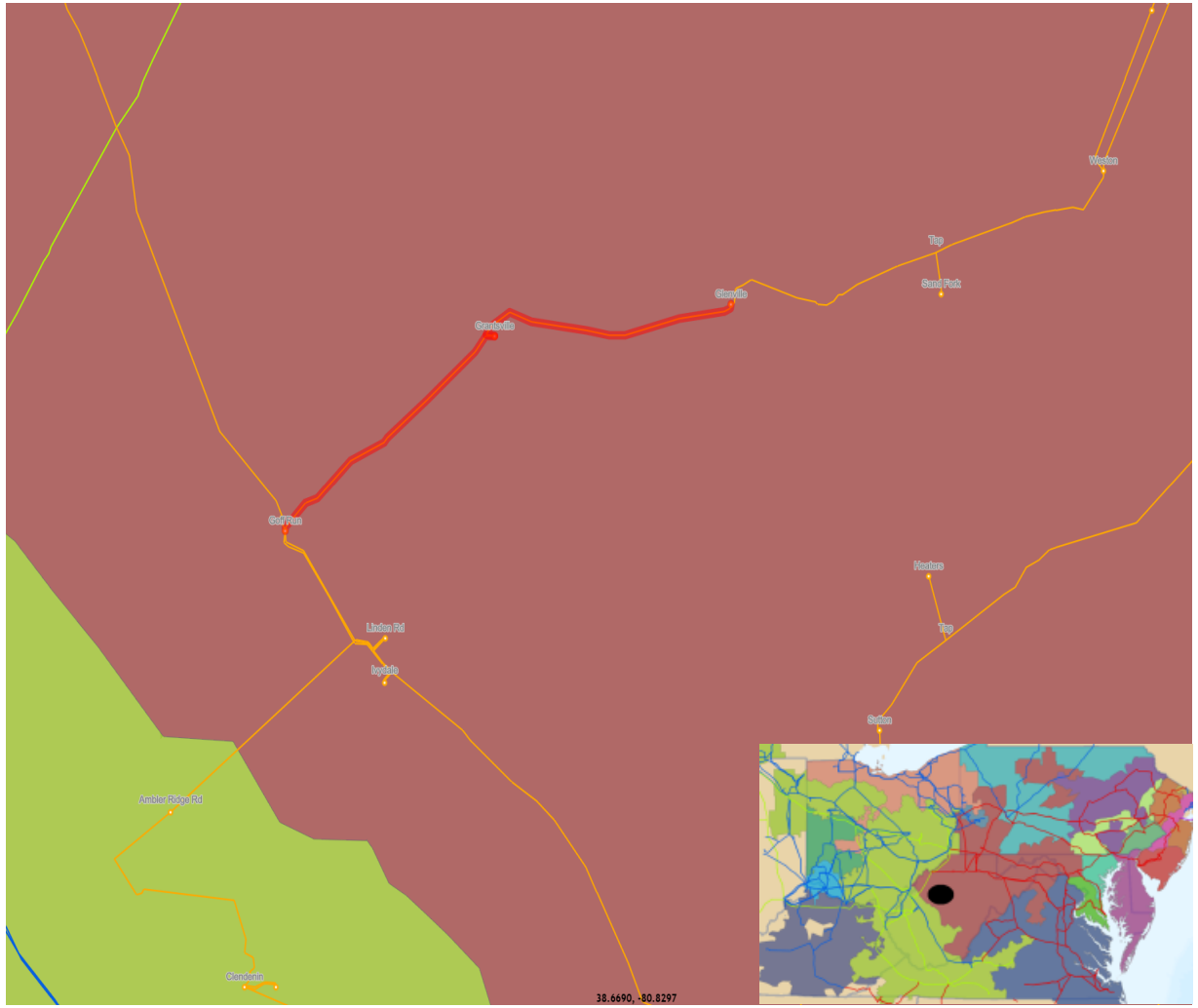
Existing Line Rating: 195 / 209 / 217 / 229 MVA (SN/SE/WN/SE)

Existing Conductor Rating: 221 / 268 / 250 / 317 MVA (SN/SE/WN/SE)

Grantsville - Glenville 138 kV Line:

Existing Line Rating: 195 / 209 / 217 / 229 MVA (SN/SE/WN/SE)

Existing Conductor Rating: 221 / 268 / 250 / 317 MVA (SN/SE/WN/SE)



APS Transmission Zone M-3 Process Misoperation Relays

Need Number: APS-2026-002
Process Stage: Solution Meeting 09/18/2026

Proposed Solution:
At Goff Run Substation: Replace circuit breaker, wavetrap, and relays
At Glenville Substation: Replace circuit breaker, wavetrap, meters, and relays

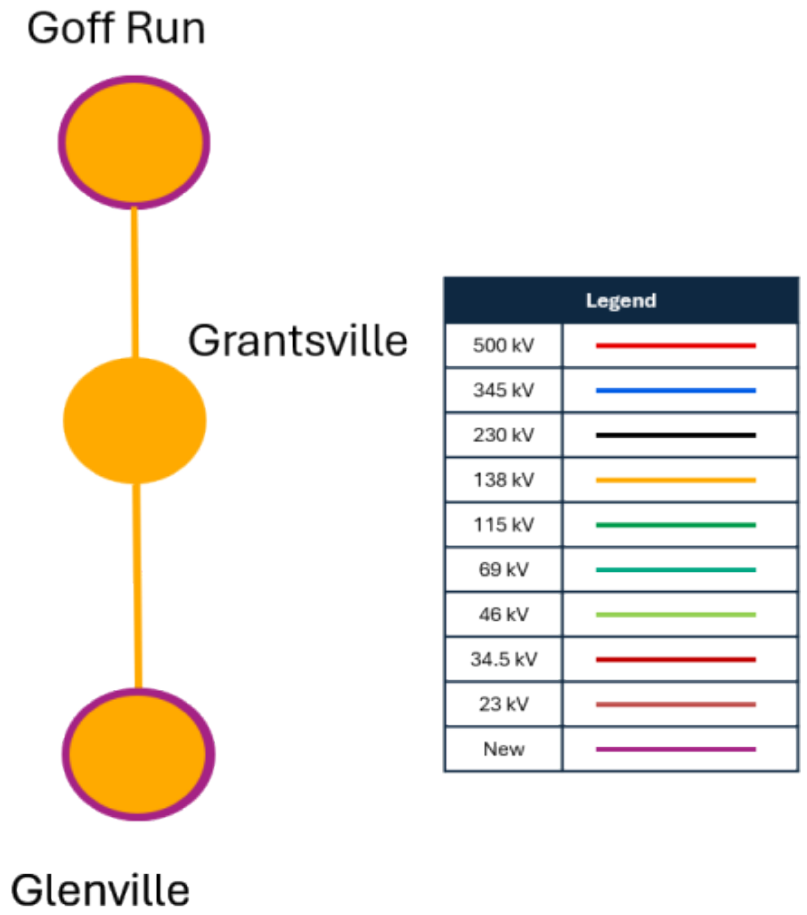
Transmission Line Ratings:

Goff Run - Grantsville 138 kV Line:
Before Proposed Solution: 195 / 209 / 217 / 229 MVA (SN/SE/WN/WE)
After Proposed Solution: 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)

Glenville - Grantsville 138 kV Line:
Before Proposed Solution: 195 / 209 / 217 / 229 MVA (SN/SE/WN/WE)
After Proposed Solution: 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)

Alternatives Considered:
Maintain equipment in existing condition with elevated risk of misoperations.

Transmission Cost Estimate: $3.67 M
Projected In-Service: 10/25/2028
Project Status: Conceptual
Model: 2025 RTEP model for 2030 Summer (50/50)



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

09/08/2026– V1 – Original version posted to pjm.com.
09/16/2026– V2 – Updating posting date for revision history V1