Subregional RTEP Committee - Western
FirstEnergy Supplemental Projects

May 16, 2025

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
Black Oak – Cross School 138 kV Line

Need Number: APS-2025-018

Process Stage: Need Meeting 5/16/2025

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Global Factors

- System Performance Projects Global Factors
- Substation/line equipment limits
- System reliability and performance

Substation Condition Rebuild/Replacement

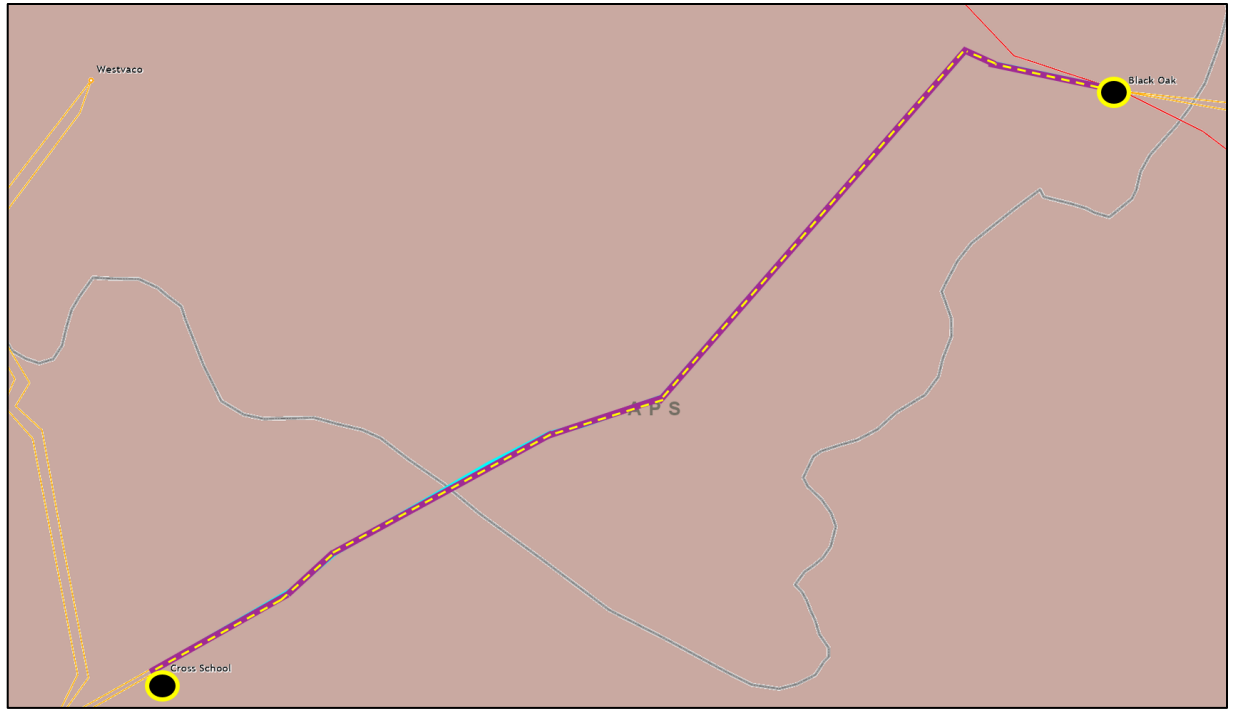
- Upgrade Relay Schemes
- Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
- Communication technology upgrades

Problem Statement:

- FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation on the Black Oak – Cross School 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cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology.
- Transmission line ratings are limited by terminal equipment.

Black Oak - Cross School 138 kV Line:

- Existing line ratings: 221 / 268 / 250 / 306 MVA (SN/SE/WN/WE)
- Existing conductor ratings: 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)



APS Transmission Zone M-3 Process
Loughs Lane – Pickens 138 kV Line

Need Number: APS-2025-016

Process Stage: Need Meeting 5/16/2025

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Global Factors

- System reliability/performance
- Substation/Line equipment limits

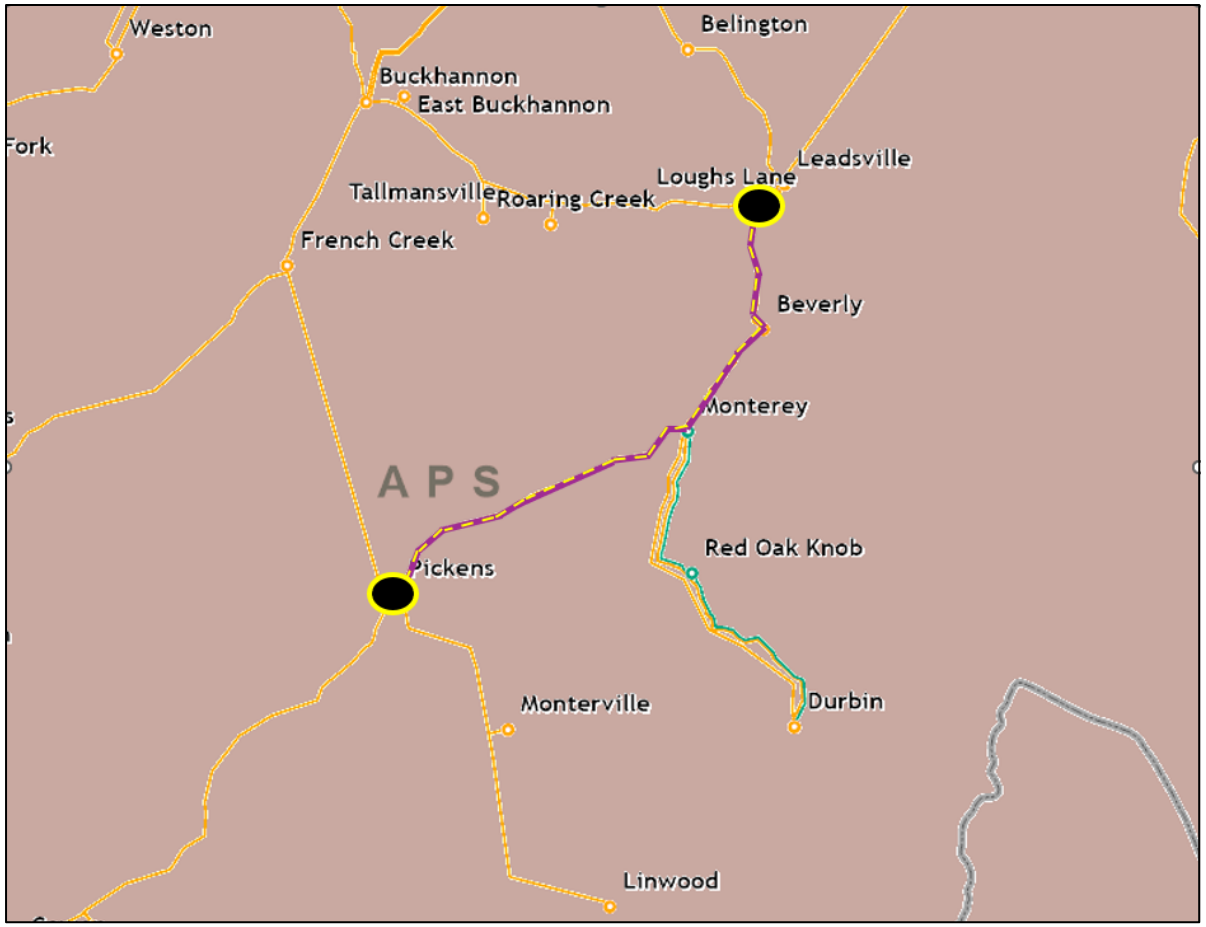
Line Condition Rebuild/Replacement

Problem Statement:

- Line Switch 1007 on the Loughs Lane - Pickens 138 kV Line at Durbin Tap is obsolete and underrated.
- The Transmission Line ratings are limited by the switch.

Beverly Tap - Durbin Tap 138 kV Branch

- Existing Line Ratings: 164 / 206 / 216 / 248 MVA (SN/SE/WN/WE)
- Existing Conductor Ratings: 169 / 213 / 217 / 280 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
Huntingdon – Springdale 138 kV Line

Need Number: APS-2025-006
Process Stage: Solution Meeting 5/16/2025
Previously Presented: Need Meeting 03/14/2025

Project Driver:

Equipment Material Condition, Performance & Risk

Specific Assumption References:

System Performance Projects Global Factors

- Substation/line equipment limits
- System reliability and performance

Substation Condition Rebuild/Replacement

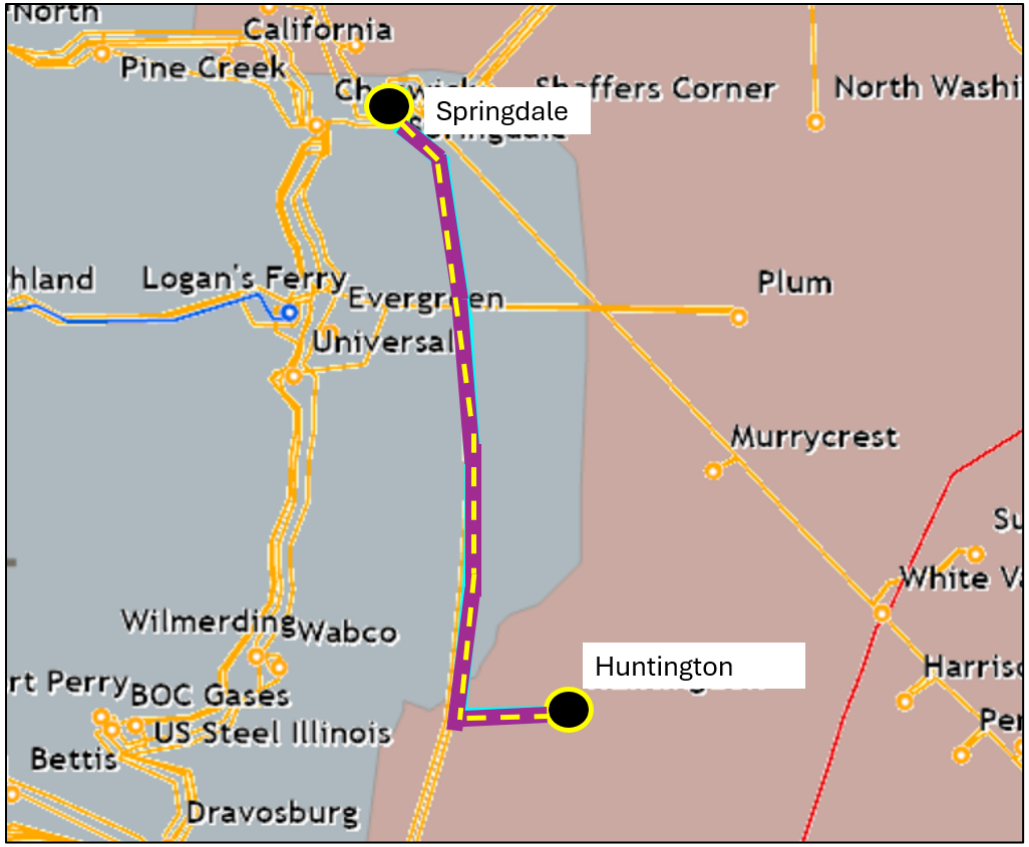
- Upgrade Relay Schemes
- Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
- Communication technology upgrades

Problem Statement:

- FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation on the Huntingdon - Springdale 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.
- Transmission line ratings are limited by terminal equipment.

Huntingdon - Springdale 138 kV Line:

- Existing line ratings: 267 / 287 / 287 / 287 MVA (SN/SE/WN/WE)
- Existing conductor ratings: 297 / 365 / 345 / 441 MVA (SN/SE/WN/WE)



APS Transmission Zone M-3 Process
Huntingdon – Springdale 138 kV Line

Need Number: APS-2025-006
Process Stage: Solution Meeting 5/16/2025

Proposed Solution:

- At Huntingdon Substation, replace circuit breaker, disconnect switches, substation conductor, line trap, surge arresters, CVTs, and relaying.
- At Springdale Substation, replace disconnect switches, substation conductor, line trap, surge arresters, CVTs, and relaying.

Transmission Line Ratings:

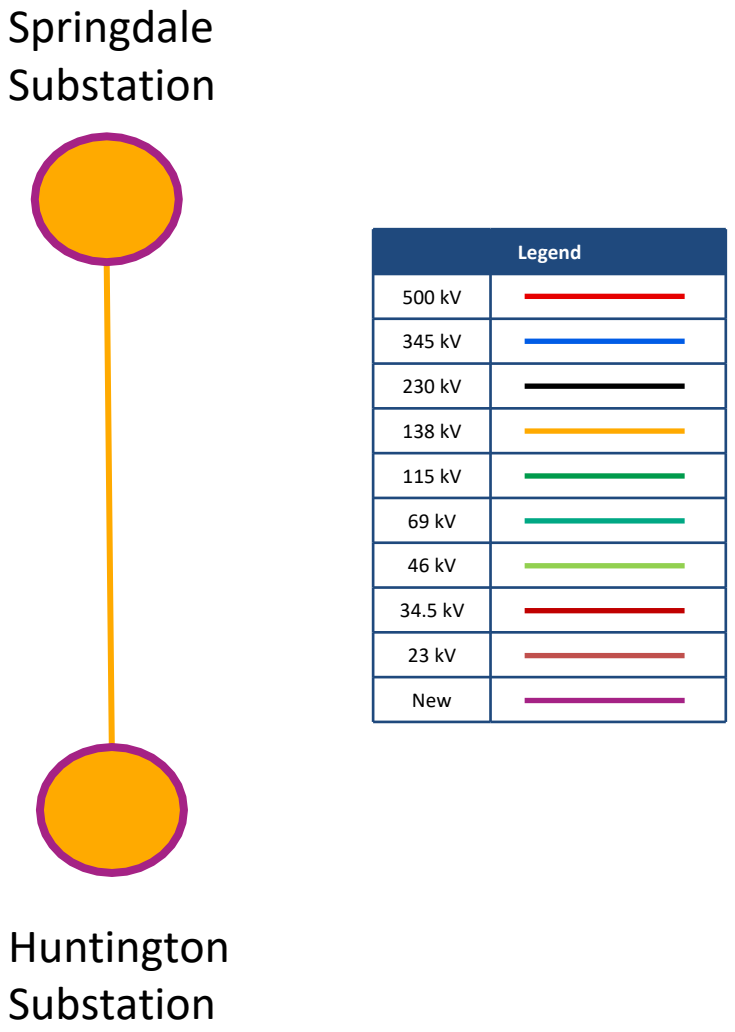
Huntingdon – Springdale 138 kV Line:

- Existing Line Ratings: 267 / 287 / 287 /287 MVA (SN/SE/WN/WE)
- New Line Ratings: 297 / 365 / 345 / 441 MVA (SN/SE/WN/WE)

Alternatives Considered:

Maintain equipment in existing condition with elevated risk of misoperations.

Estimated Project Cost: $4.71M
Projected In-Service: 5/1/2028
Project Status: Conceptual
Model: 2024 RTEP model for 2029 Summer (50/50)



APS Transmission Zone M-3 Process
Bedington – Marlowe 138 kV Line

Need Number: APS-2025-007
Process Stage: Solution Meeting 5/16/2025
Previously Presented: Need Meeting 03/14/2025

Project Driver:

Equipment Material Condition, Performance & Risk

Specific Assumption References:

System Performance Projects Global Factors

- Substation/line equipment limits
- System reliability and performance

Substation Condition Rebuild/Replacement

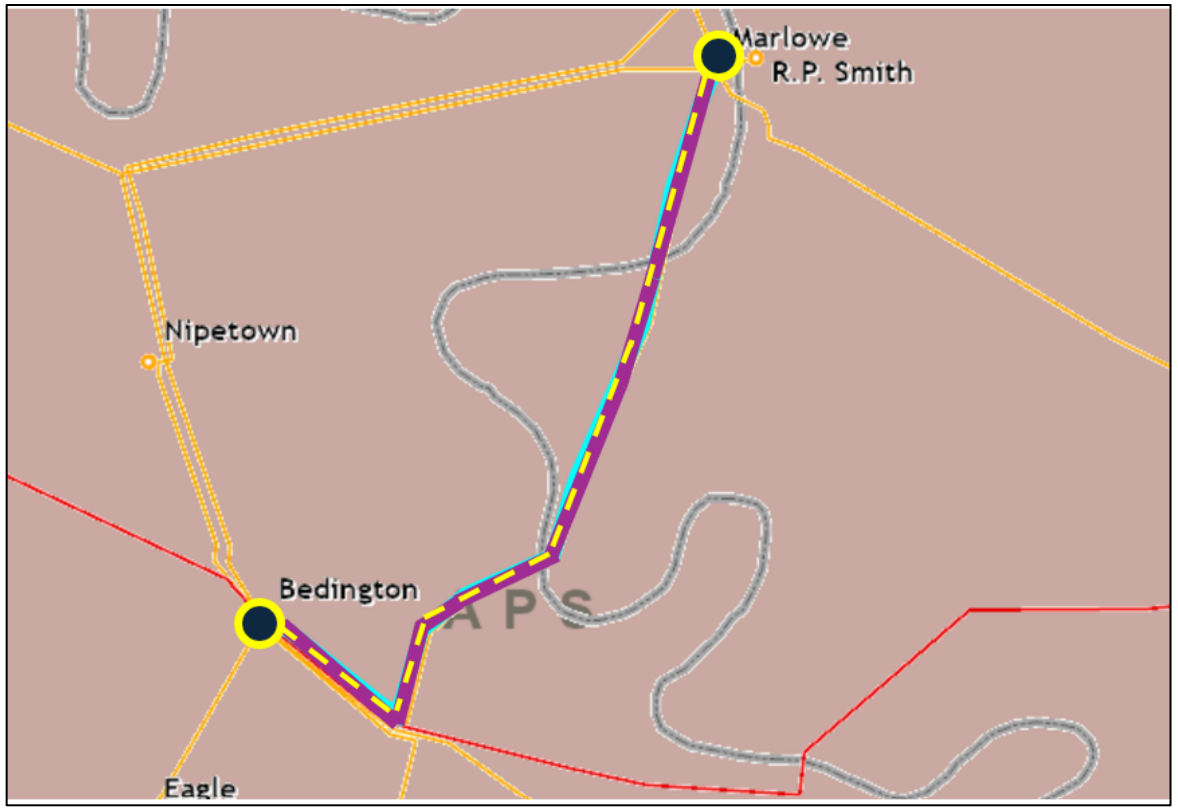
- Upgrade Relay Schemes
- Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
- Communication technology upgrades

Problem Statement:

- FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation on the Bedington – Marlowe 138 kV BMR 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.
- Transmission line ratings are limited by terminal equipment.

Bedington – Marlowe 138 kV BMR Line:

- Existing line ratings: 265 / 314 / 325 / 343 MVA (SN/SE/WN/WE)
- Existing conductor ratings: 308 / 376 / 349 / 445 (MVA SN/SE/WN/WE)



APS Transmission Zone M-3 Process
Marlowe – Bedington 138 kV Line

Need Number: APS-2025-007
Process Stage: Solution Meeting 5/16/2025

Proposed Solution:

- At Marlowe Substation, replace disconnect switches, substation conductor, line trap, surge arresters, and relaying.
- At Bedington Substation, replace circuit breakers, disconnect switches, substation conductor, line trap, surge arresters, CVT and relaying.

Transmission Line Ratings:

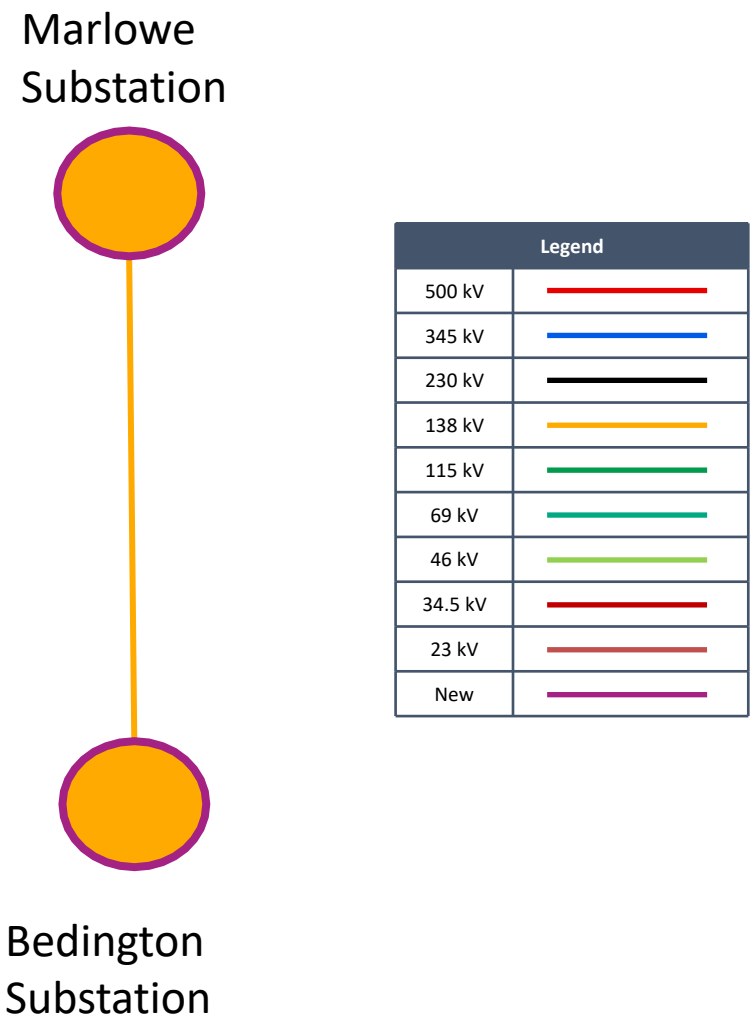
Marlowe – Bedington 138 kV Line:

- Existing Line Ratings: 265 / 314 / 325 / 343 MVA (SN/SE/WN/WE)
- New Line Ratings: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)

Alternatives Considered:

Maintain equipment in existing condition with elevated risk of misoperations.

Estimated Project Cost: $4.00M
Projected In-Service: 7/26/2029
Project Status: Conceptual
Model: 2024 RTEP model for 2029 Summer (50/50)



APS Transmission Zone M-3 Process
Hardy – North Petersburg 138 kV Line

Need Number: APS-2025-008
Process Stage: Solution Meeting 5/16/2025
Previously Presented: Need Meeting 03/14/2025

Project Driver:

Equipment Material Condition, Performance & Risk

Specific Assumption References:

System Performance Projects Global Factors

- Substation/line equipment limits
- System reliability and performance

Substation Condition Rebuild/Replacement

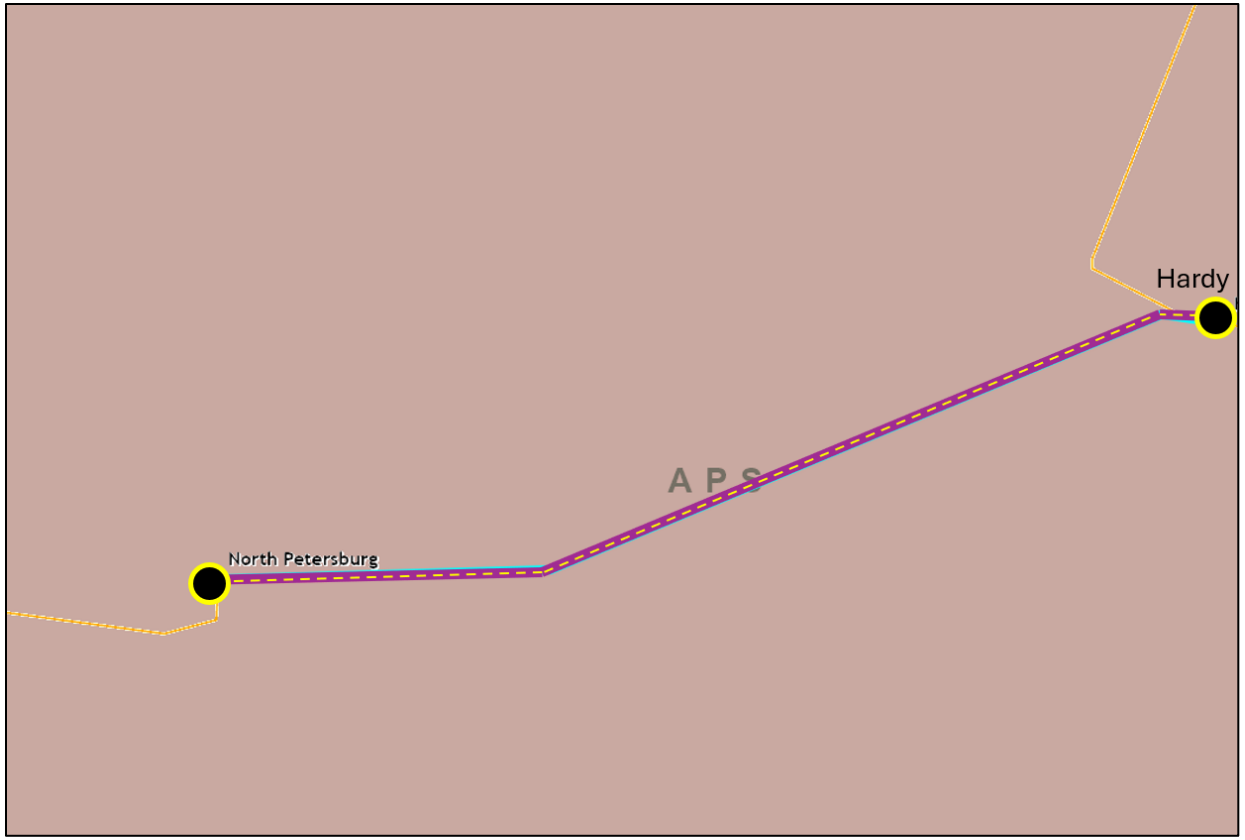
- Upgrade Relay Schemes
- Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
- Communication technology upgrades

Problem Statement:

- FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation on the Hardy - North Petersburg 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.
- Transmission line ratings are limited by terminal equipment.

Hardy - North Petersburg 138 kV Line:

- Existing line ratings: 292 / 314 / 325 / 343 MVA SN/SE/WN/WE
- Existing conductor ratings: 309 / 376 / 349 / 445 MVA SN/SE/WN/WE



APS Transmission Zone M-3 Process
Hardy – North Petersburg 138 kV Line

Need Number: APS-2025-008
Process Stage: Solution Meeting 5/16/2025

Proposed Solution:

- At Hardy Substation, replace circuit breaker, disconnect switches, substation conductor, line trap, surge arresters, CVT and relaying.
- At North Petersburg Substation, replace disconnect switches, substation conductor, line trap, surge arresters, CVT and relaying.

Transmission Line Ratings:

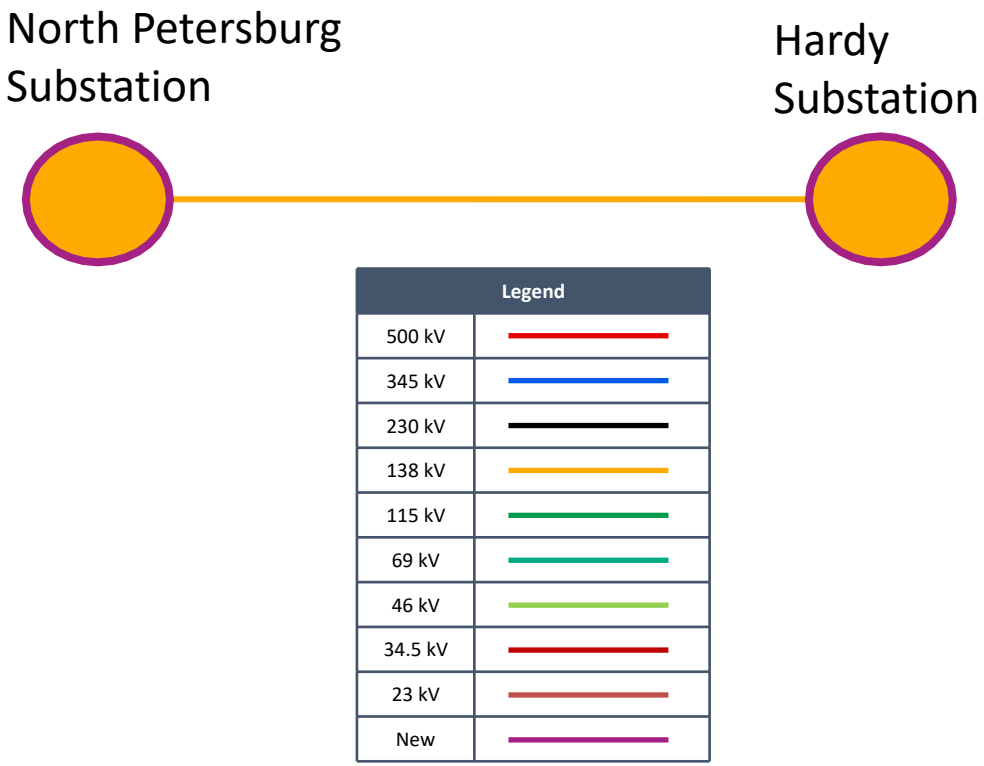
Hardy – North Petersburg 138 kV Line:

- Existing Line Ratings: 292 / 314 / 325 / 343 MVA (SN/SE/WN/WE)
- New Line Ratings: 309 / 376 / 349 / 445 MVA (SN/SE/WN/WE)

Alternatives Considered:

Maintain equipment in existing condition with elevated risk of misoperations.

Estimated Project Cost: $5.20M
Projected In-Service: 7/26/2025
Project Status: Conceptual
Model: 2024 RTEP model for 2029 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

05/06/2025– V1 – Original version posted to pjm.com