Transmission Expansion Advisory Committee
FirstEnergy Supplemental Projects

June 4th, 2024

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 Numbers: APS-2024-057, APS-2024-058, APS-2024-059

Process State: Need Meeting – 06/04/2024

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

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cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology.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

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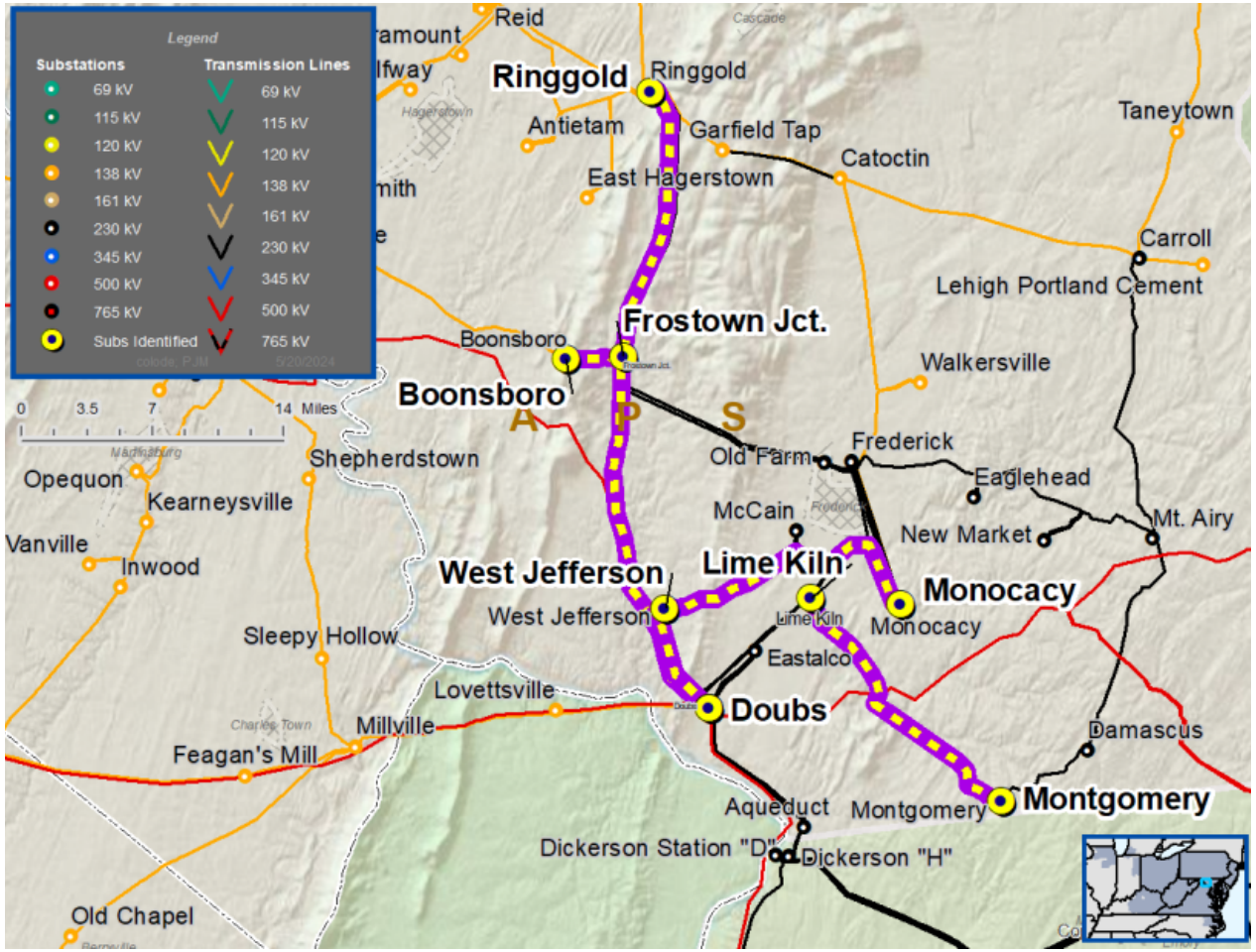


APS Transmission Zone M-3 Process
Misoperation Relays

Need #	Transmission Line / Substation Locations	Existing Line Rating MVA (SN / SE / WN /WE)	Existing Conductor Rating MVA (SN / SE / WN / WE)
APS-2024-057	Doubs – Frostown Junction 230 kV Line	617 / 698 / 699 / 762	617 / 754 / 699 / 894
	Frostown Junction – Ringgold 230 kV Line	324 / 349 / 361 / 381	617 / 754 / 699 / 894
	Boonsboro – Frostown Junction 230 kV Line	289 / 353 / 346 / 410	617 / 754 / 699 / 894
APS-2024-058	Lime Kiln – Montgomery 230 kV Line	548 / 688 / 699 / 804	617 / 754 / 699 / 894
APS-2024-059	Monocacy – West Jefferson 230 kV Line	548 / 688 / 699 / 765	617 / 754 / 699 / 894
	West Jefferson – Doubs 230 kV Line	617 / 754 / 699 / 894	617 / 754 / 699 / 894

APS Transmission Zone M-3 Process
Monocacy No. 4 230/138 kV Transformer

Need Number: APS-2024-061

Process Stage: Need Meeting – 06/04/2024

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Projects Global Factors

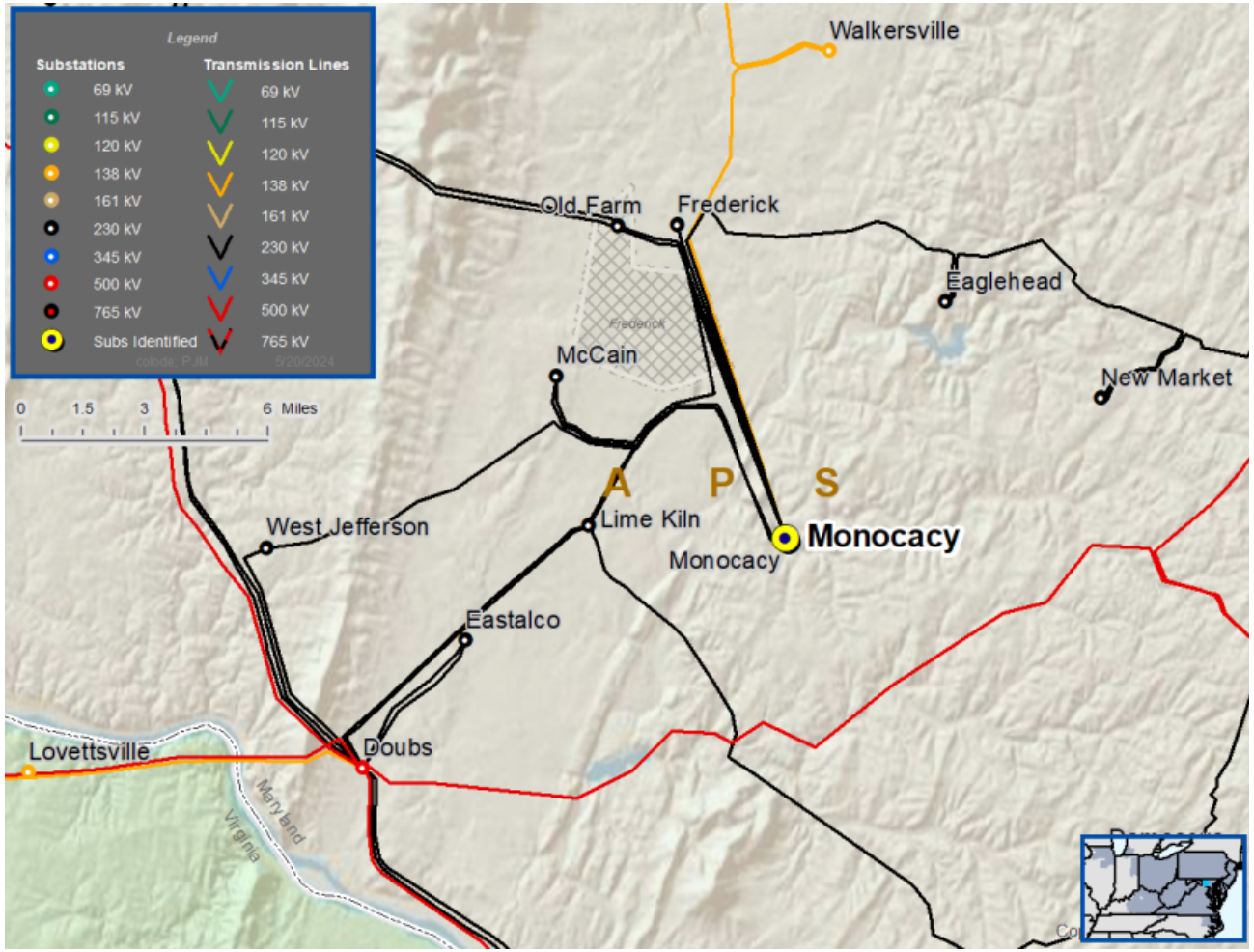
- System reliability and performance

Add/Replace Transformers

Past System Reliability/Performance

Problem Statement:

- The Monocacy No. 4 230/138 kV Transformer is approximately 51 years old and is approaching end of life.
- The transformer has experienced an increase in the level of acetylene.
- The transformer relaying is obsolete.
- Existing transformer ratings:
  - 260 / 273 MVA (SN/SLTE)
  - 313 / 326 MVA (WN/WLTE)



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 Zones M-3 Process
Milesburg 230 kV Substation

Need Number: APS-2023-021
Process Stage: Solution Meeting – 06/04/2024
Previously Presented: Need Meeting – 08/08/2023
Project Driver:
System Performance and Operational Flexibility
Specific Assumption Reference:
Global Factors

- System reliability and performance
- Substation and line equipment limits
- Add/Expand Bus Configuration

Problem Statement:

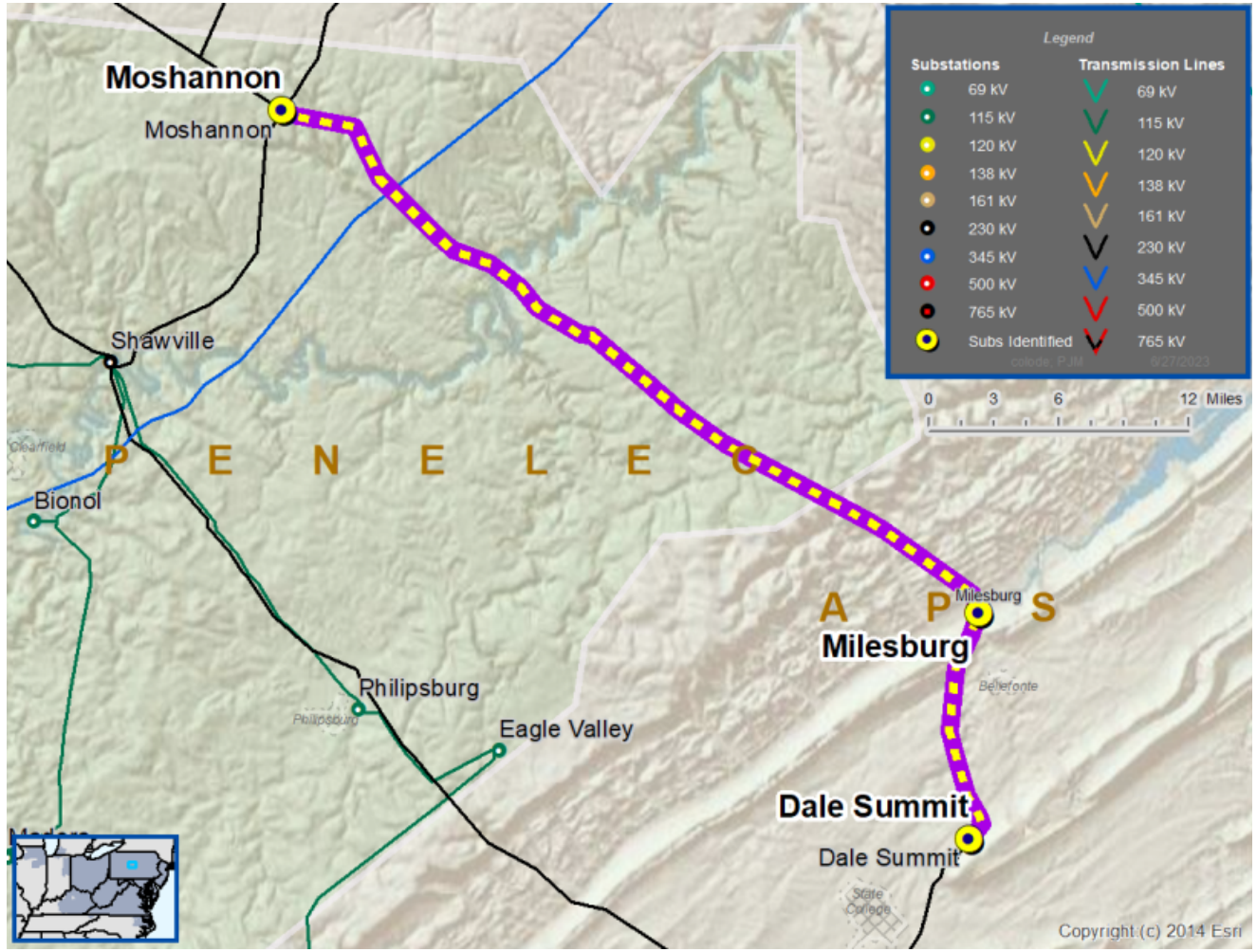
- The existing 230 kV yard at Milesburg is configured as a straight bus. Milesburg serves approximately 107.6 MW of load and 3,116 customers, which will be outaged by a single stuck breaker contingency.
- Transmission line ratings are limited by terminal equipment:

Milesburg – Moshannon 230 kV Line

- Existing line rating: 548 / 688 MVA (SN / SE)
- Existing Transmission Conductor Rating: 617/ 754 MVA (SN / SE)

Milesburg – Dale Summit 230 kV Line

- Existing line rating: 548 / 688 MVA (SN / SE)
- Existing Transmission Conductor Rating: 617/ 754 MVA (SN / SE)



APS Transmission Zones M-3 Process
Milesburg 230 kV Substation

Need Number: APS-2023-021

Process Stage: Solution Meeting – 06/04/2024

Proposed Solution:

- Convert Milesburg Substation into a four-breaker 230 kV ring bus

Transmission Line Ratings:

Milesburg – Moshannon 230 kV Line:

- Before proposed solution: 548 / 688 / 699 / 804 MVA (SN / SE / WN / WE)
- After proposed solution: 617 / 754 / 699 / 894 MVA (SN / SE / WN / WE)

Milesburg – Dale Summit 230 kV Line:

- Before proposed solution: 548 / 688 / 699 / 804 MVA (SN / SE / WN / WE)
- After proposed solution: 617 / 754 / 699 / 894 MVA (SN / SE / WN / WE)

Alternatives Considered:

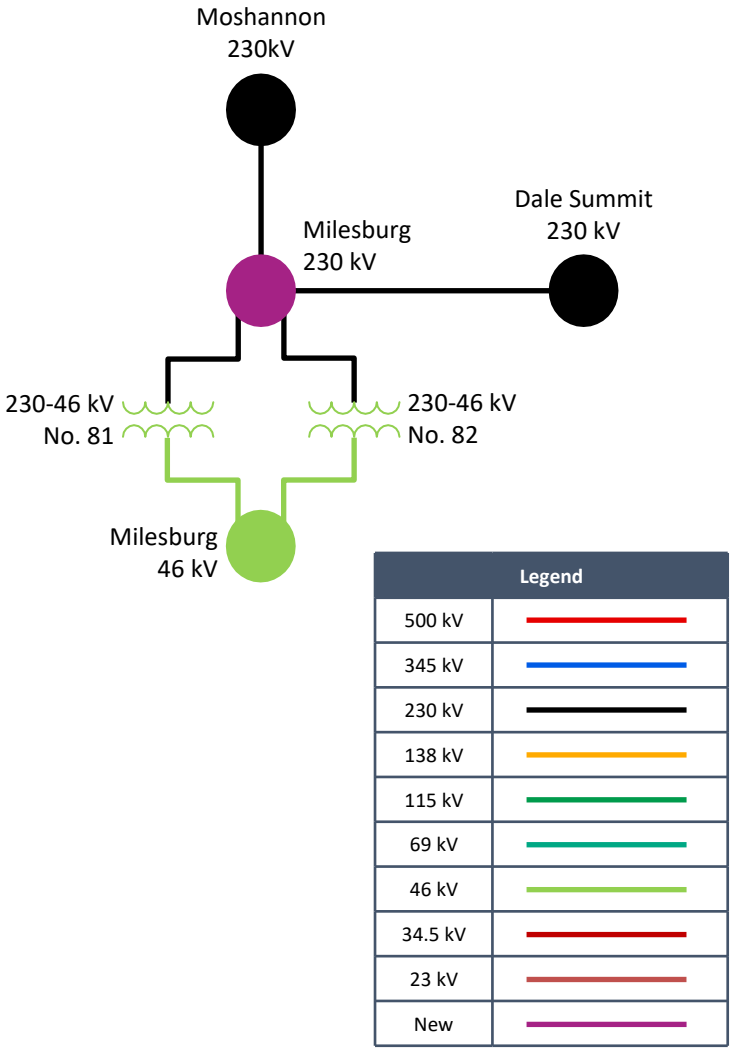
- Maintain the existing configuration with risk of customer interruptions under contingency scenarios.

Estimated Project Cost: $9.8M

Projected In-Service: 12/17/2027

Project Status: Conceptual

Model: 2023 RTEP model for 2028 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

5/23/2024– V1 – Original version posted to pjm.com