Transmission Expansion Advisory Committee – APS Supplemental Projects

June 6, 2023

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 Zones M-3 Process
Doubs Substation

Need Number: APS-2023-016

Process State: Need Meeting 06/06/2023

Project Driver:

Performance and Risk, Operational Flexibility and Efficiency

Specific Assumption Reference:

System Performance Projects Global Factors

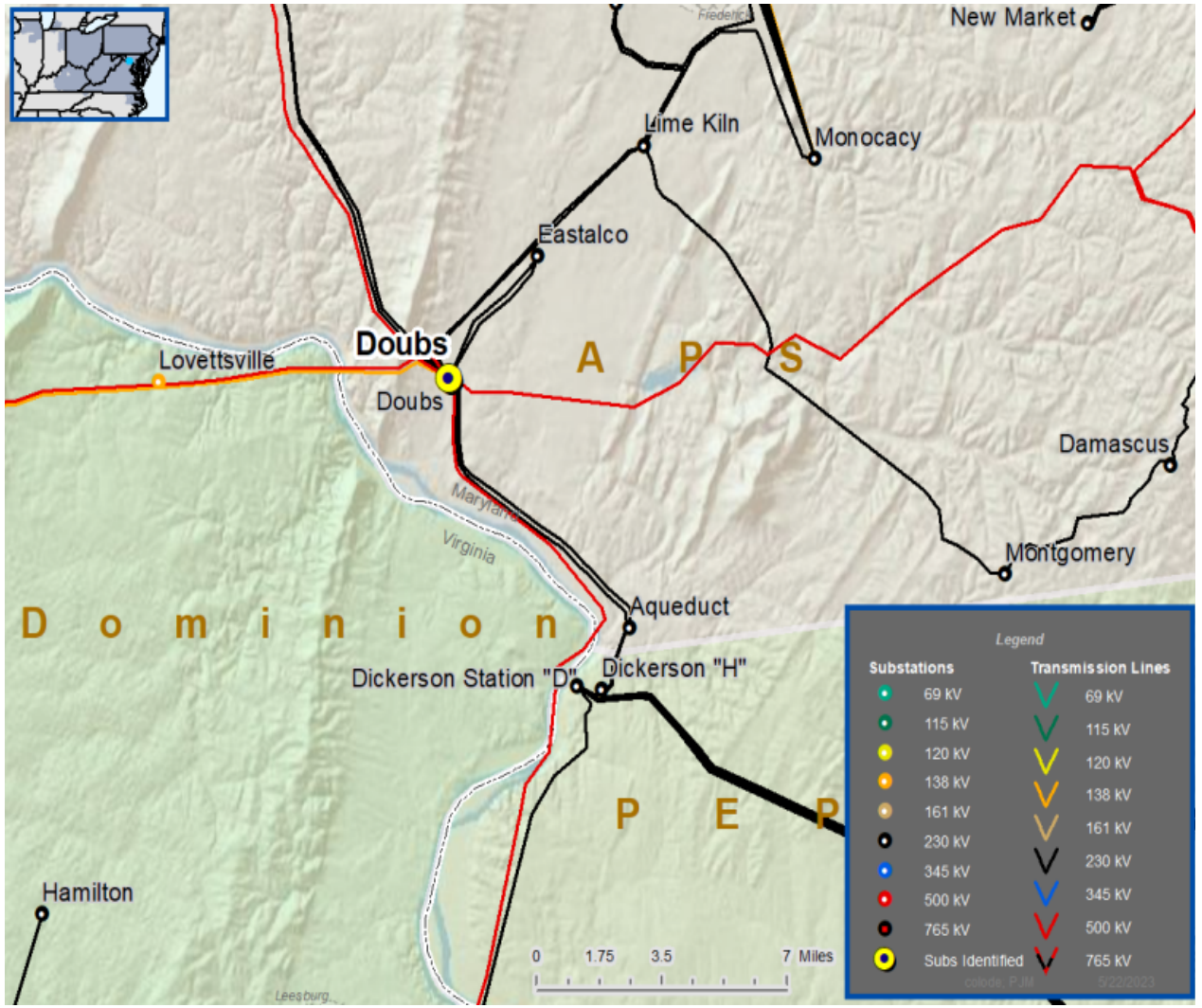
- System reliability and performance
- Reliability of Non-Bulk Electric System (Non-BES) Facilities
- Add/Replace Transformers
- Past System Reliability/Performance

Problem Statement:

- The 230/138 kV No. 5 Transformer at Doubs was installed 60 years ago and is approaching end of life.
- The transformer exhibits multiple maintenance issues including:
  - Elevated levels of methane and ethane gases
  - Wet oil
  - Low dielectric

Existing TR Ratings:

- 253 / 335 MVA (SN / SSTE)



APS Transmission Zone M-3 Process
Sage 230 kV Customer Load Increase

Need Number: APS-2023-017

Process Stage: Need Meeting – 06/06/2023

Project Driver(s):

Customer Service

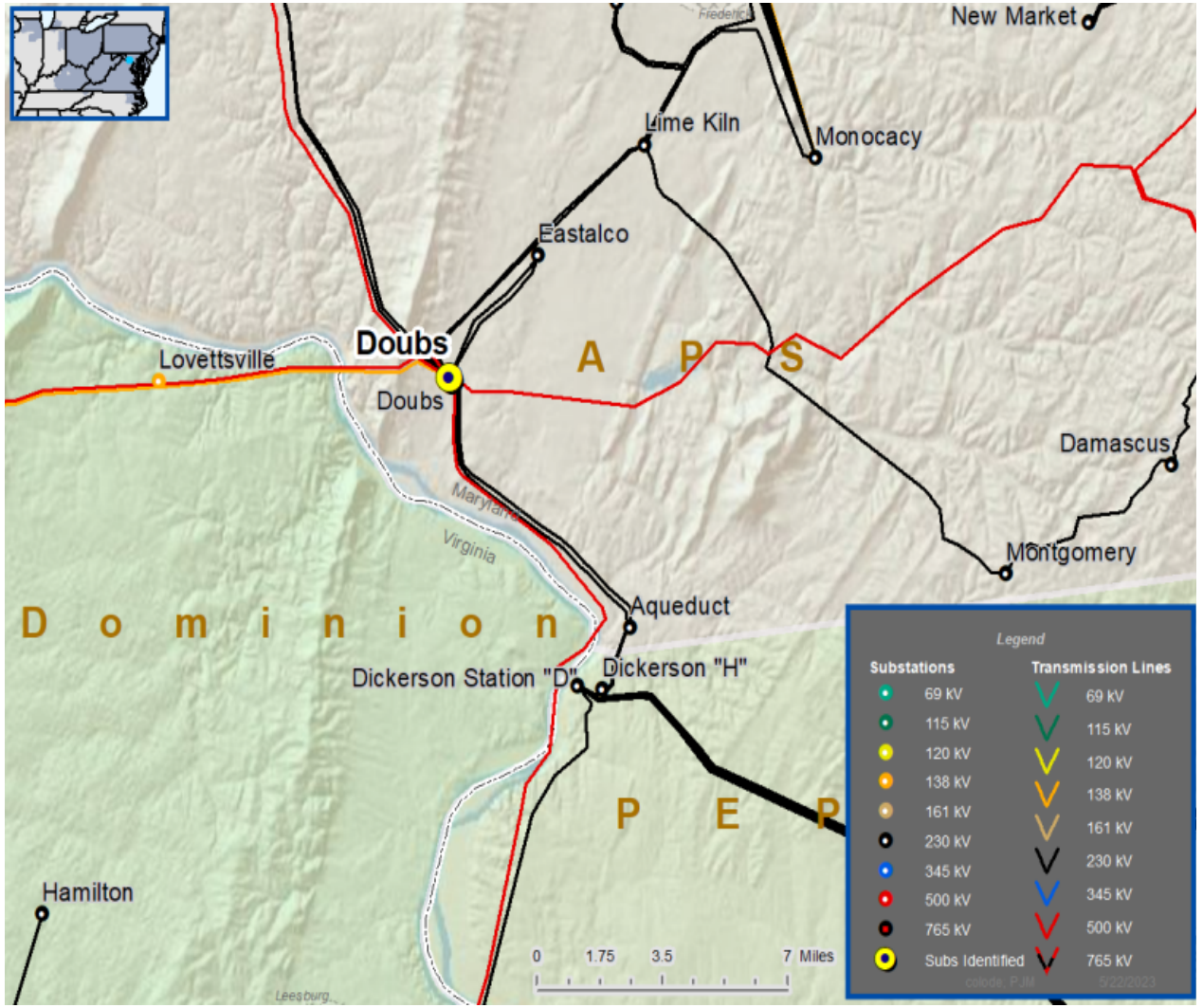
Specific Assumption Reference(s)

New customer connection request will be evaluated per FirstEnergy's "Requirements for Transmission Connected Facilities" document and "Transmission Planning Criteria" document.

Problem Statement

Existing Customer Connection load increase - has requested a load addition to the 230 kV delivery point Sage Substation (s2881). The anticipated load increase is 336 MW with a total site load of 576 MW.

Requested in-service date is 02/13/2026.



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

Need Number: APS-2023-002
Process Stage: Solution Meeting 06/06/2023
Previously Presented: Need Meeting 03/07/2023

Project Driver:
Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

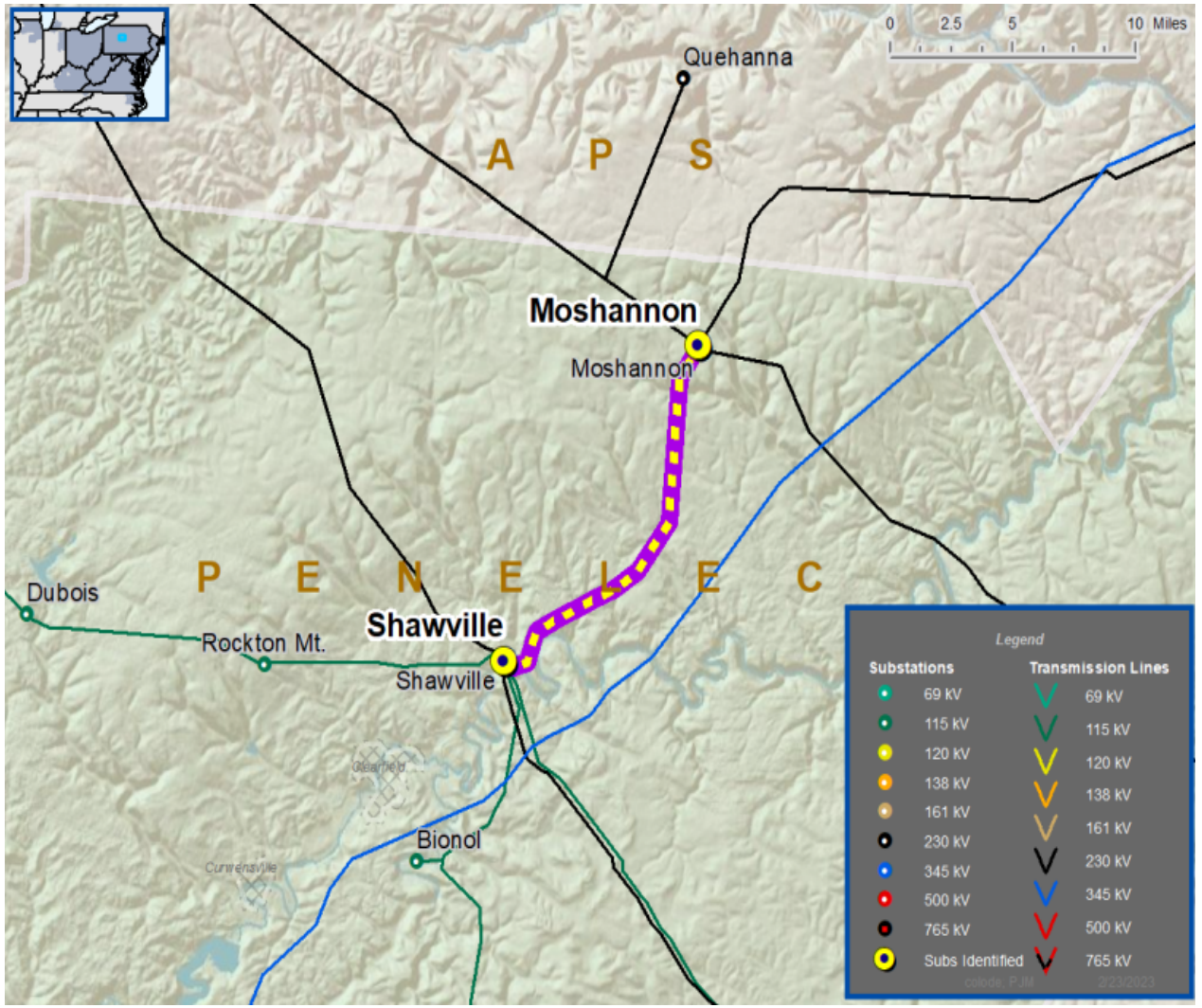
Global Factors

- System reliability and performance
- Substation and line equipment limits
- Upgrade Relay Schemes
  - Relay schemes that have a history of misoperation
  - Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
  - Communication technology upgrades
  - Bus protection schemes

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 properly together during a fault
- The identified protection equipment cannot be effectively repaired for reasons such as lack of replacement parts and available expertise in the outdated technology.
- Newer equipment provides better monitoring, enhances capability of system event analysis, and performs more reliably
- Transmission line ratings are limited by terminal equipment

Shawville – Moshannon 230 kV Line
  – Existing line rating: 445 / 587 MVA (SN / SE)
  - Existing Transmission Conductor Rating: 546 / 666 MVA (SN / SE)



APS Transmission Zone M-3 Process

Need Number: APS-2023-002

Process Stage: Solution Meeting 06/06/2023

Proposed Solution:

- Replace limiting substation conductor and relaying at Moshannon

Transmission Line Ratings:

- Moshannon – Shawville 230 kV Line
  - Before Proposed Solution: 445 / 587 MVA (SN / SE)
  - After Proposed Solution: 546 / 666 MVA (SN / SE)

Alternatives Considered:

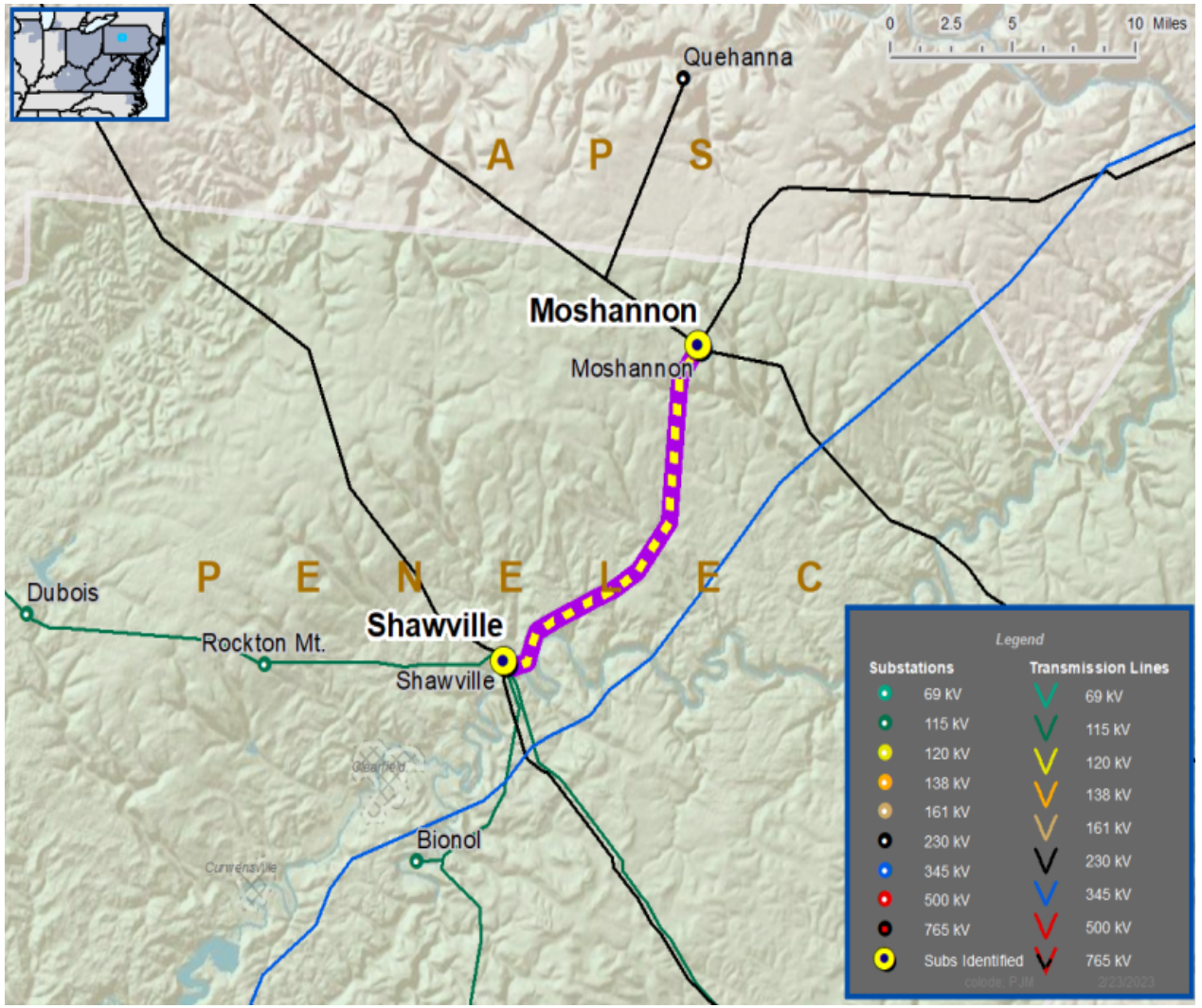
- Maintain line and vintage relay schemes in existing condition

Estimated Project Cost: $ 0.55M

Projected In-Service: 12/8/2023

Project Status: Engineering

Model: 2022 RTEP model for 2027 Summer (50/50)



Questions?

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

5/25/2023 - V1 – Original version posted to pjm.com