

Transmission Expansion Advisory Committee FirstEnergy Supplemental Projects

August 8, 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

Need Number: APS-2023-021

Process Stage: Need Meeting 8/8/2023

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:

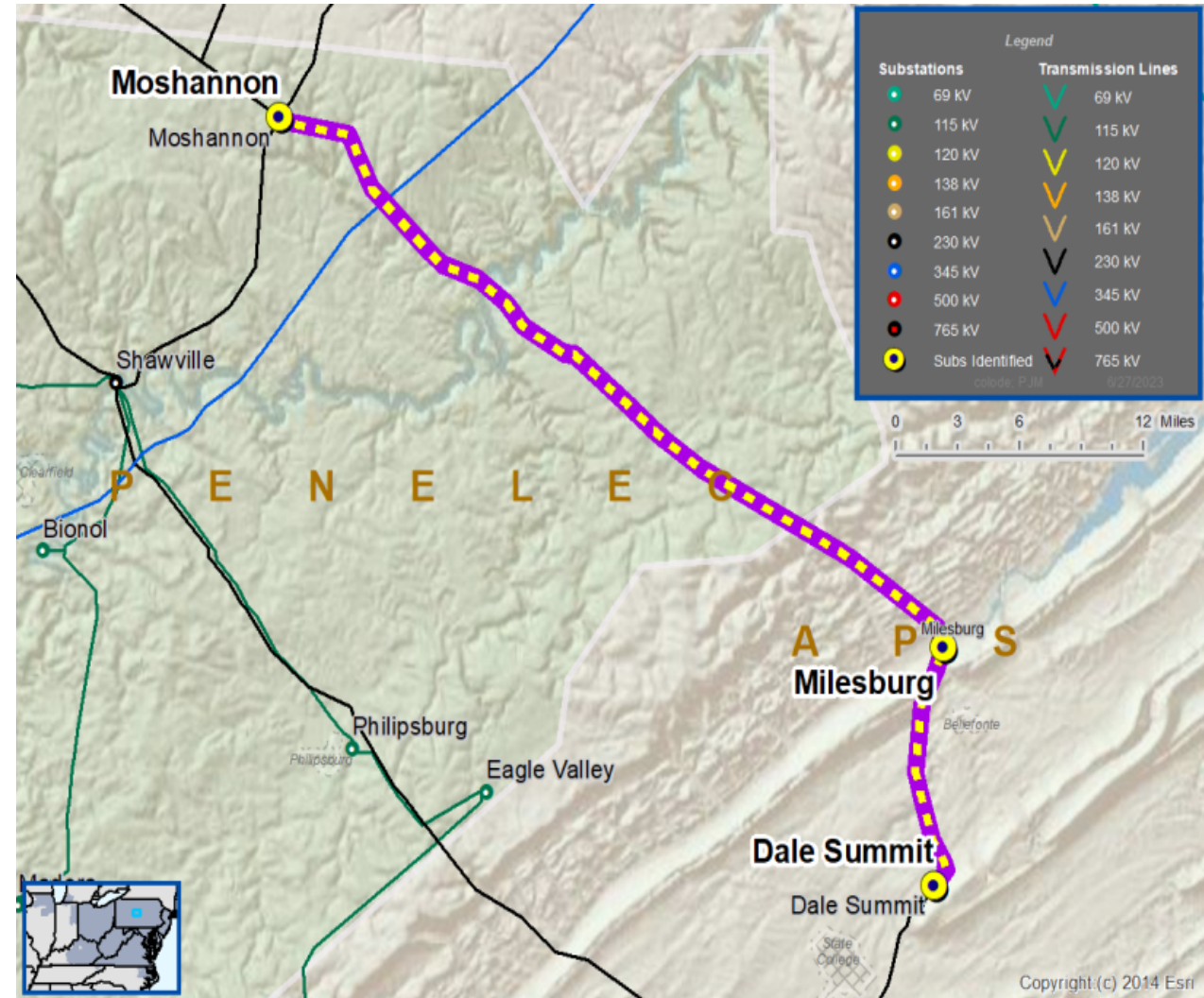
- The existing 230 kV yard at Milesburg is configured as a straight bus. Milesburg serves approximately 107.6 MW of load and 3,116 customers, which will be outaged by a single stuck breaker contingency.
- Transmission line ratings are limited by terminal equipment:

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)



Need Numbers: APS-2023-026

Process State: Need Meeting 8/8/2023

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

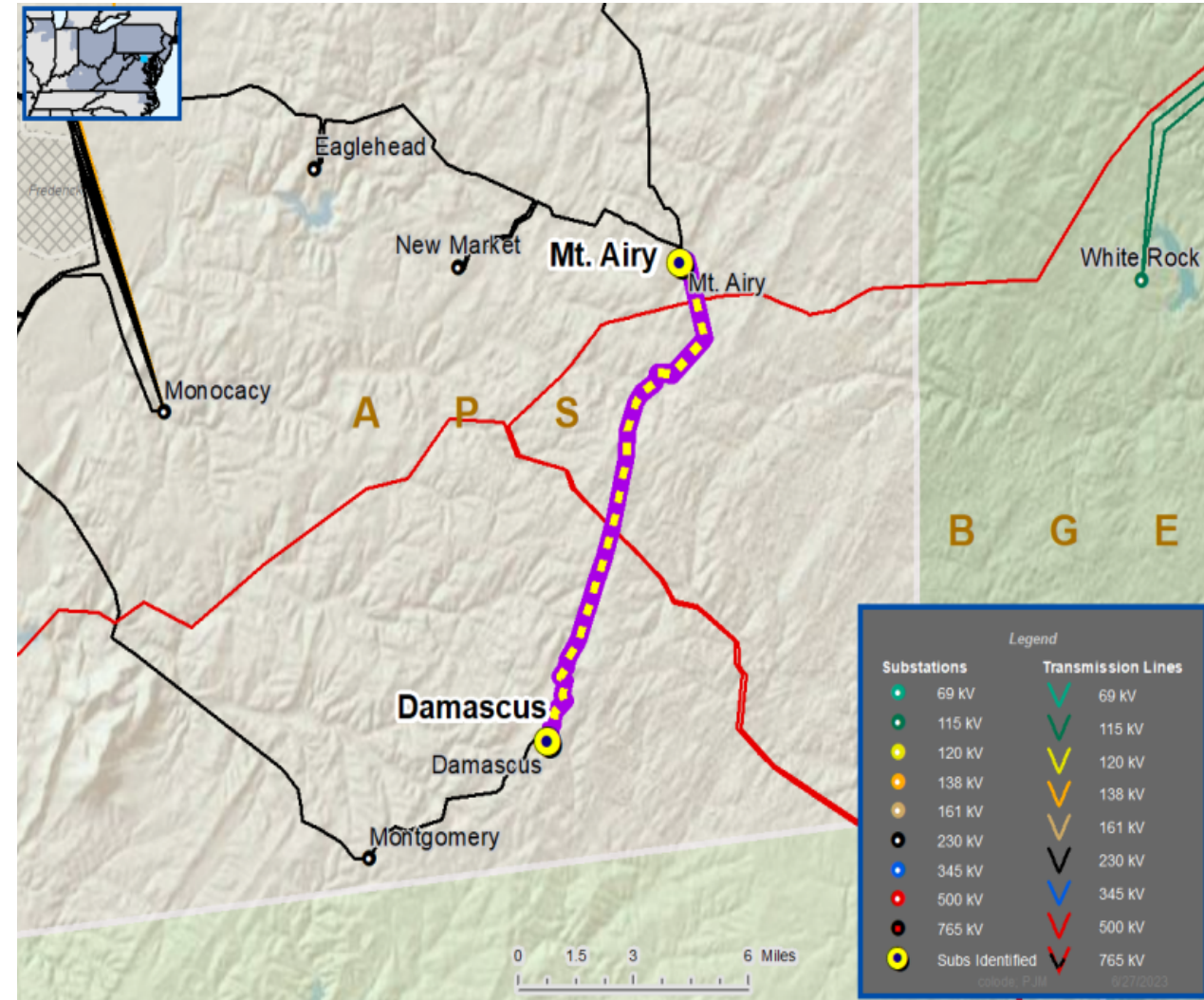
Upgrade Relay Schemes

- 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cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology.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 Zones M-3 Process Damascus – Mount Airy 230 kV Misoperation Relays

Need #	Transmission Line / Substation Locations	Existing Line Rating (SN / SE)	Existing Conductor Rating (SN / SE)	Limiting Terminal Equipment
APS-2023-026	Damascus – Mount Airy 230 kV	478/523	617/754	

Need Number: APS-2023-029

Process Stage: Need Meeting – 8/8/2023

Project Driver(s):

Customer Service

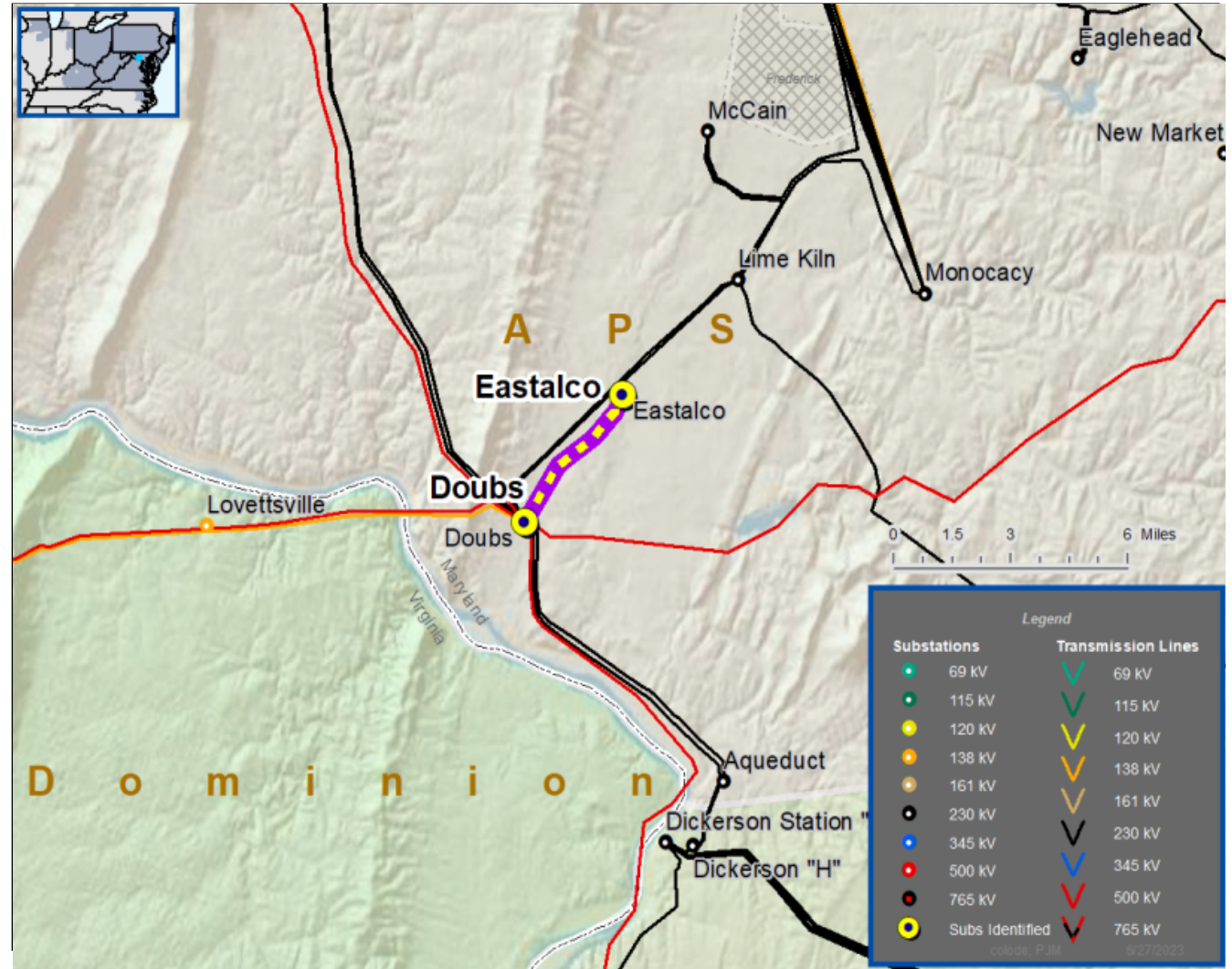
Specific Assumption Reference(s)

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

Problem Statement

New Customer Connection- A customer has requested 230 kV transmission service for approximately 300 MW of load near the Doubs-Eastalco #206 230 kV line.

Requested In-Service Date: May 15, 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: APS-2023-017

Process Stage: Need Meeting –6/6/2023

Project Driver(s):

Customer Service

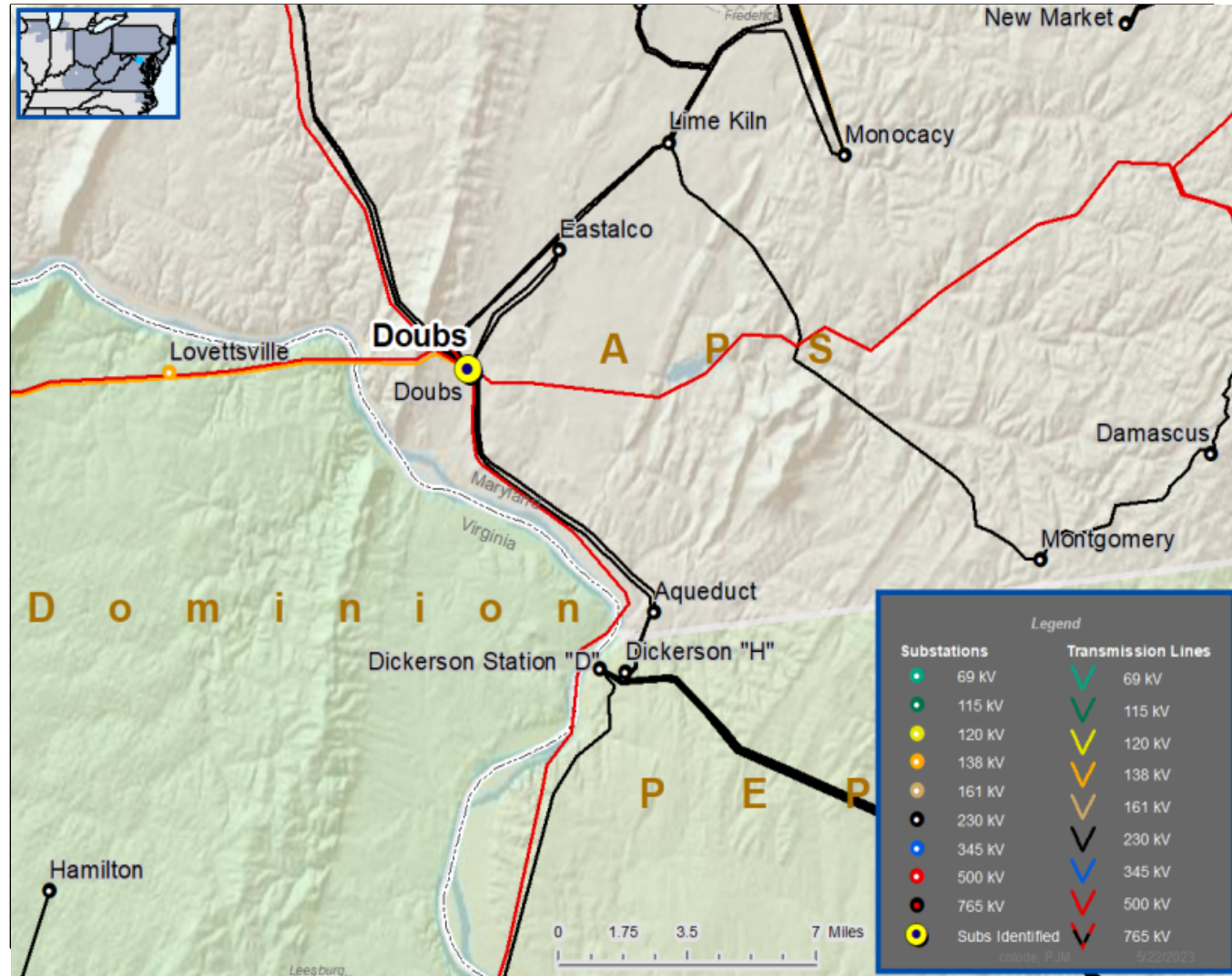
Specific Assumption Reference(s)

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.



Need Number: APS-2023-017
Process Stage: Solution Meeting –8/8/2023
Previously Presented: Need Meeting – 6/6/2023

Proposed Solution 1 of 3:

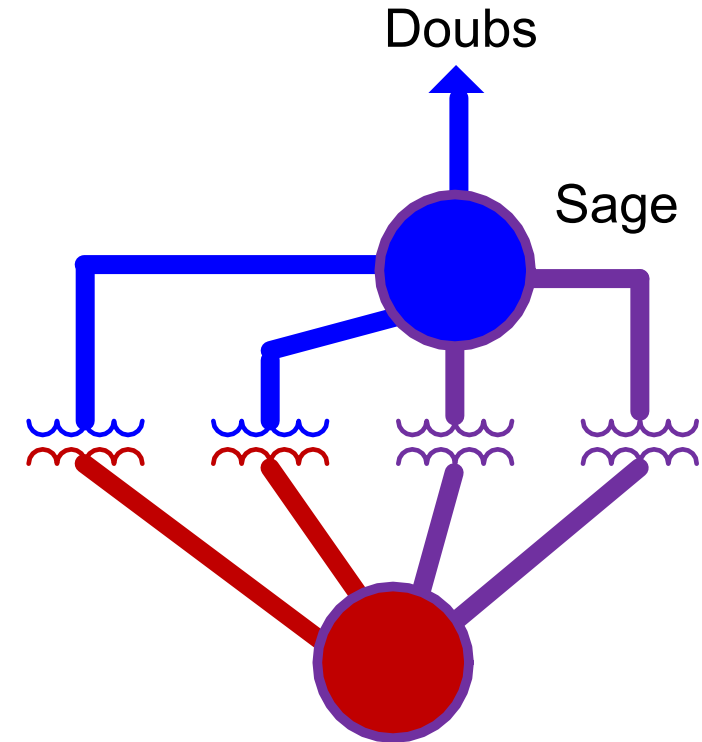
230 kV Transmission substation Expansion

- Expand the existing three-breaker ring bus into a six-breaker, breaker-and-a-half substation by installing three new 230 kV circuit breakers
- Install two 230-34.5 kV transformers
- Construct two 34.5 kV busses on the low side of transformers

Alternatives Considered:

- No feasible alternatives to meet customer’s request at requested load level

Estimated Project Cost: \$1.5M
Projected In-Service: 10/01/2025
Status: Engineering
Model: 2022 RTEP Model for 2027 Summer (50/50)



Legend	
500 kV	
230 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	

Need Number: APS-2023-017
Process Stage: Solution Meeting –8/8/2023
Previously Presented: Need Meeting – 6/6/2023

Proposed Solution 2 of 3 :

230 kV Transmission substation Expansion

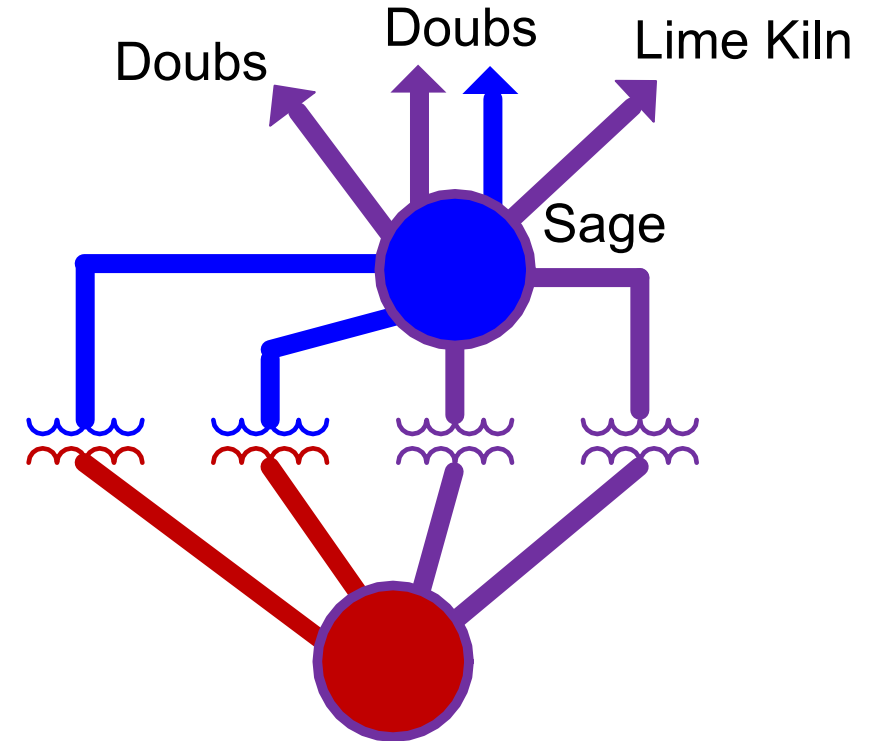
(Addresses load loss criteria violation and voltage concerns in area)

- Expand the six-breaker, breaker-and-a-half substation to 15 breakers by adding nine 230 kV circuit breakers.
- Terminate the Doubs-Eastalco 206 230 kV Line into the Sage 230 kV Substation
- Loop in the Doubs-Lime Kiln 207 230 kV Line into the Sage 230 kV Substation

Alternatives Considered:

- No feasible alternatives to meet reliability criteria violations due to customer’s load increase. The 206 and 207 lines are near and adjacent to the Sage Substation.

Estimated Project Cost: \$25M
Projected In-Service: 12/31/2027
Status: Project Initiation



Legend	
500 kV	
230 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	



Need Number: APS-2023-017
Process Stage: Solution Meeting –8/8/2023
Previously Presented: Need Meeting – 6/6/2023

Proposed Solution 3 of 3 :

Bartonville-Meadow Brook 138 kV Line upgrades

(Addresses thermal violation on transmission line)

- Replace one 1200 A Wave Trap at Meadow Brook Substation
- Revise relay settings

Line Ratings

- 292 MVA SN/314 MVA SE (Before Proposed Solution)
- 329 MVA SN/413 MVA SE (After Proposed Solution)

Alternatives Considered:

- None

Estimated Project Cost: \$0.7M

Projected In-Service: 03/01/2025

Status: Project Initiation

Solution provided assumes the following project is completed:

- RTEP # b3772: Reconductor 27.3 miles of the Messick Rd – Morgan 138 kV Line (Projected In-Service date 6/1/2027)



Legend	
500 kV	
230 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	

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

7/27/2023 - V1 – Original version posted to pjm.com