Transmission Expansion Advisory Committee – Penelec 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

Penelec Transmission Zone M-3 Process

Need Number: PN-2023-004

Process Stage: Need Meeting 06/06/2023

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

Substation Condition Rebuild/Replacement

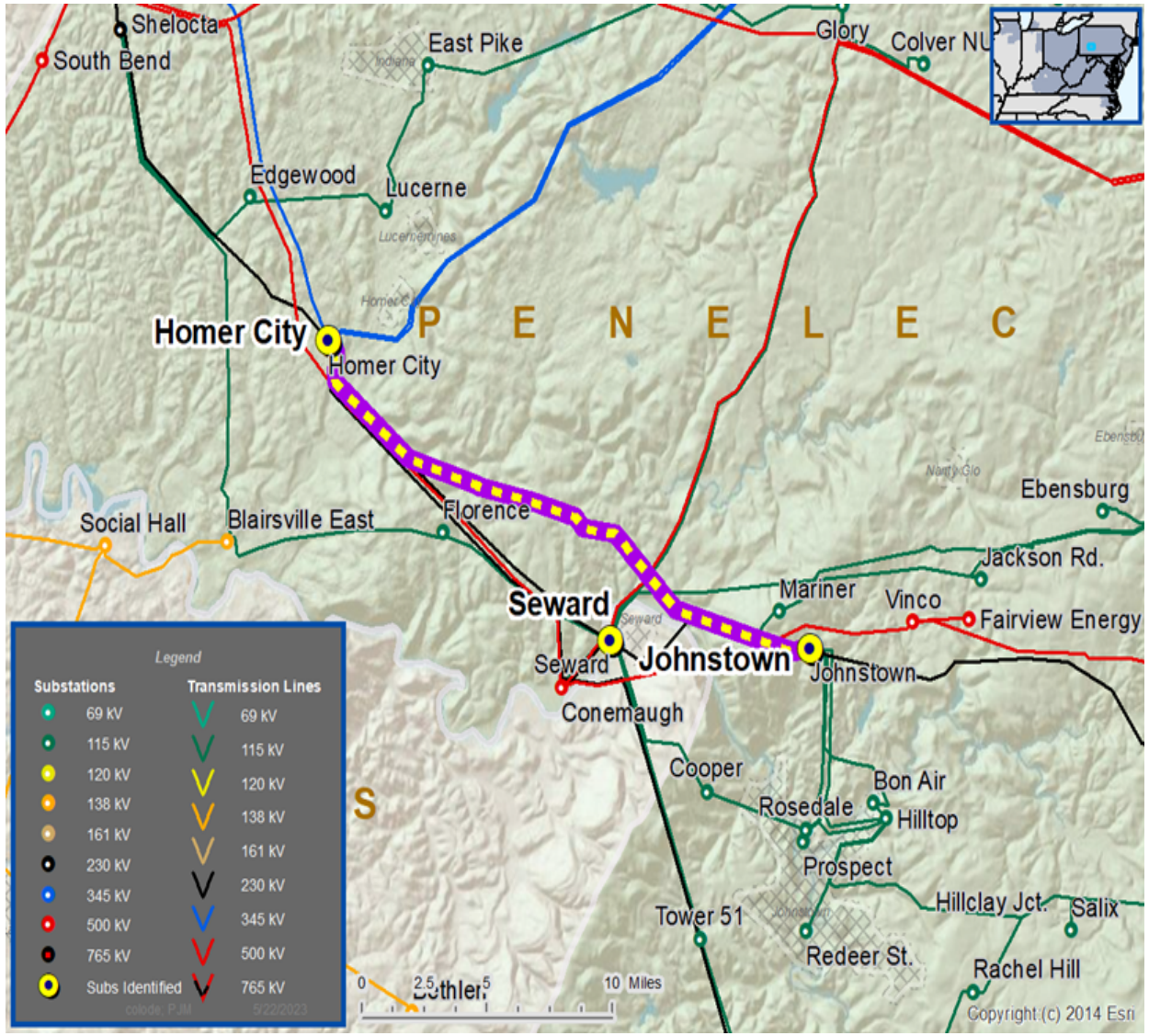
- Age/condition of substation breakers and disconnect switches

System Performance Project Global Factors

- Failure risk, age and condition, obsolescence, operational or design limitations
- System reliability and performance

Problem Statement:

- FirstEnergy identified degraded bus disconnect switches to the Seward breaker at Johnstown 230 kV Substation. The disconnect switches to the Seward breaker do not completely close and are difficult to operate.
- FirstEnergy also identified other degraded equipment at Johnstown Substation, including:
  - 230 kV bus tie breaker disconnect switches
  - Fiddler's Green 230 kV Breaker and disconnect switches
  - 115 kV bus tie breaker disconnect switches
- Transmission line ratings are limited by terminal equipment.
- Johnstown – Homer City 230 kV Line
  - Existing line rating: 627 / 698 MVA (SN / SE)
  - Existing Transmission Conductor Rating: 709 / 869 MVA (SN / SE)



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

Penelec Transmission Zone M-3 Process

Need Number: PN-2023-001

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

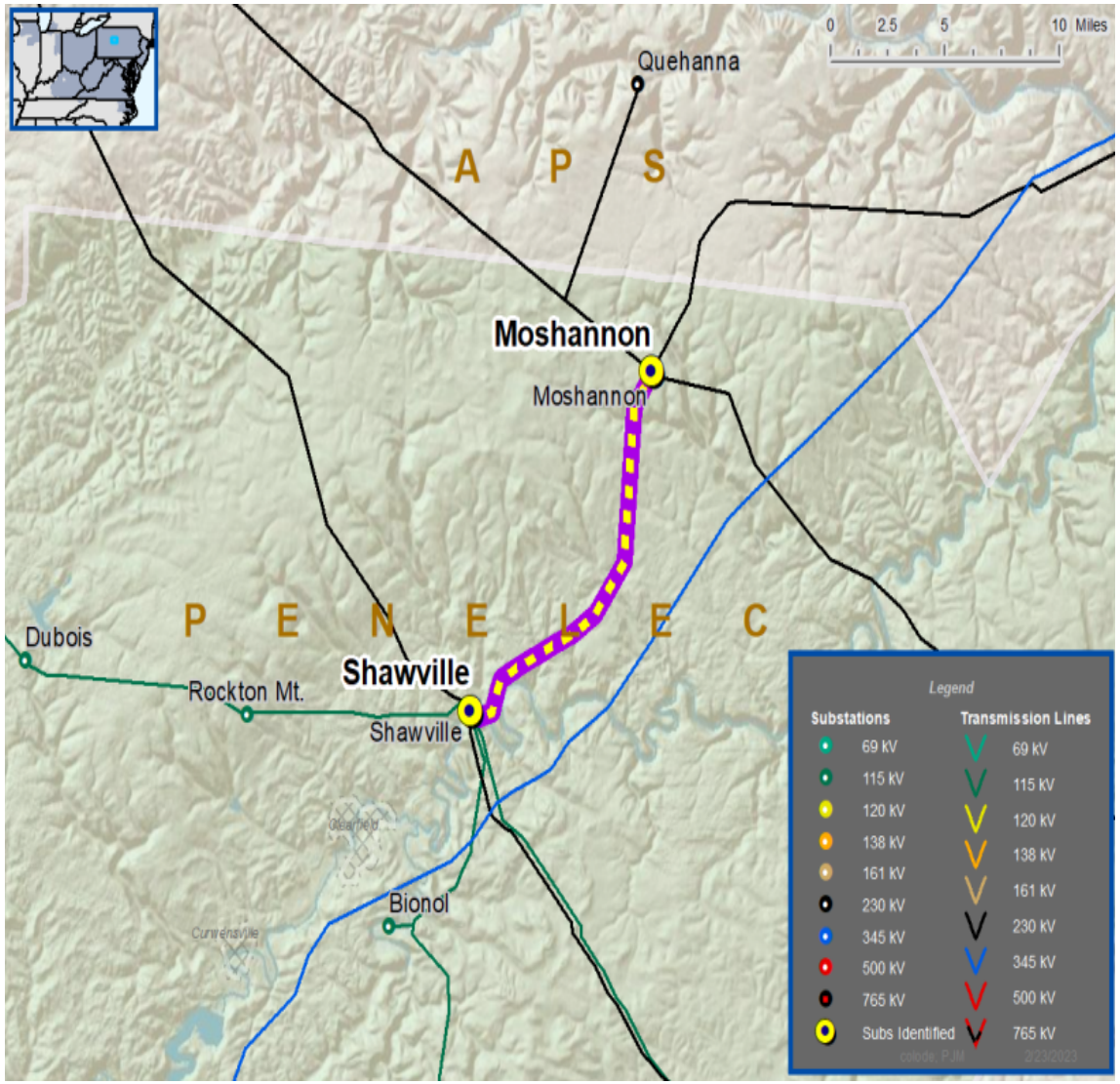
- System reliability and performance
- Substation and line equipment limits
- Upgrade Relay Schemes
    - Relay schemes that have a history of misoperation
    - Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
    - Communication technology upgrades
    - Bus protection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



Penelec Transmission Zone M-3 Process

Need Number: PN-2023-001

Process Stage: Solution Meeting 06/06/2023

Proposed Solution:

- Replace circuit breaker, wave trap, and relaying at Shawville

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:

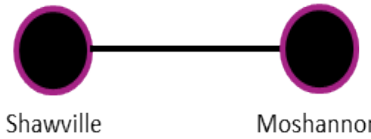
- Maintain line and vintage relay schemes in existing condition

Estimated Project Cost: $ 1.05M

Projected In-Service: 12/8/2023

Project Status: Engineering

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



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 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

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