

Transmission Expansion Advisory Committee FirstEnergy Supplemental Projects

December 5, 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: ME-2023-022

Process Stage: Needs Meeting 12/05/2023

Project Driver:

Operational Flexibility and Efficiency

Specific Assumption Reference:

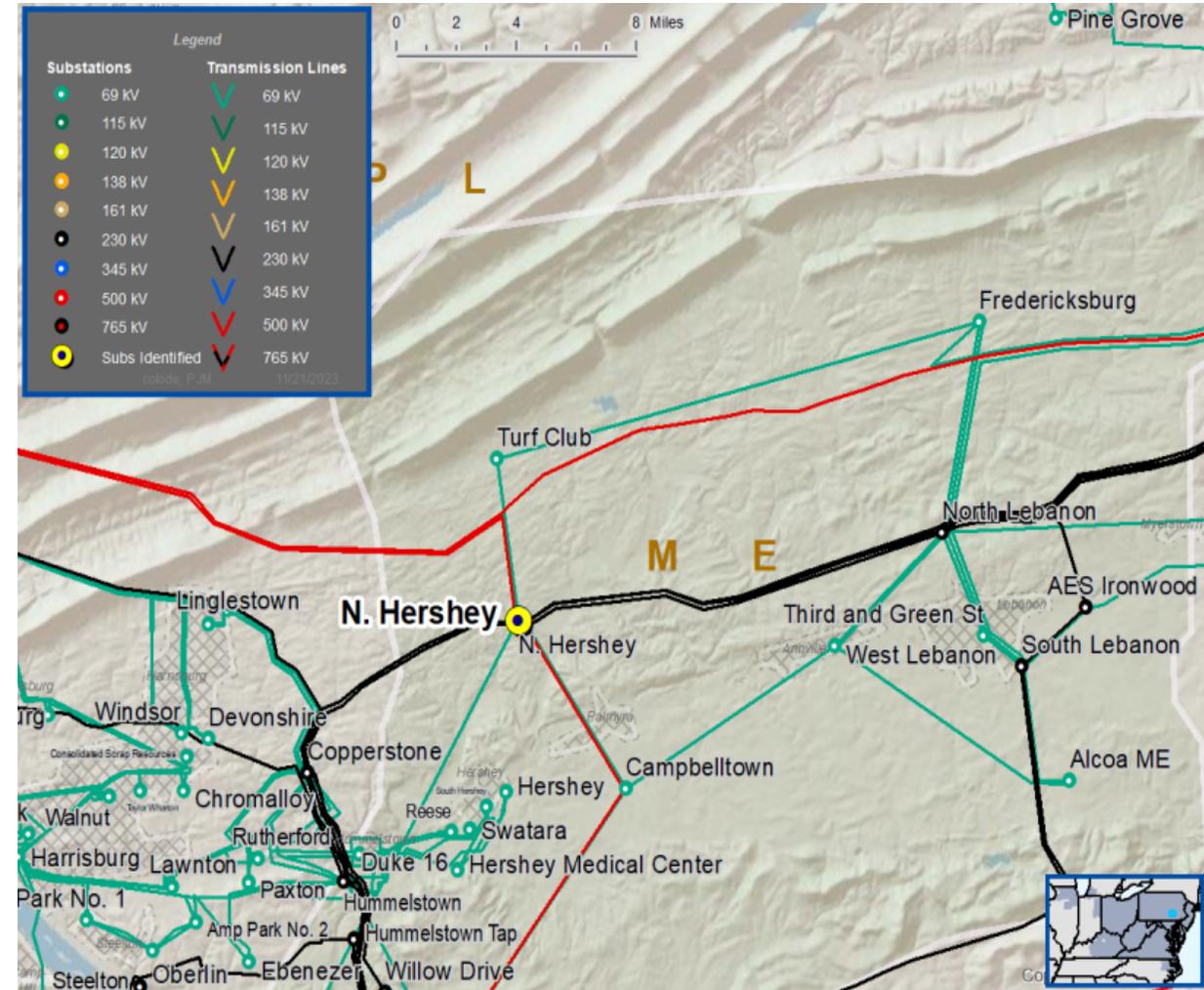
System Performance Projects

- Add/Expand Bus Configuration
- Load at risk in planning and operational scenarios
- Reduce the amount of exposed potential local load loss during contingency conditions
- Eliminate simultaneous outages to multiple networked elements

Problem Statement:

Multiple stuck breaker contingencies at North Hershey Substation or a fault on the 69 kV bus at North Hershey Substation results in the loss of two 69 kV networked elements and one 230-69 kV transformer.

The N-1-1 loss of the 230-69 kV transformer at North Hershey Substation followed by a 69 kV outage causes low voltage at multiple 69 kV buses.



Need Number: ME-2023-021

Process Stage: Need Meeting 12/05/2023

Project Driver:

Operational Flexibility and Efficiency

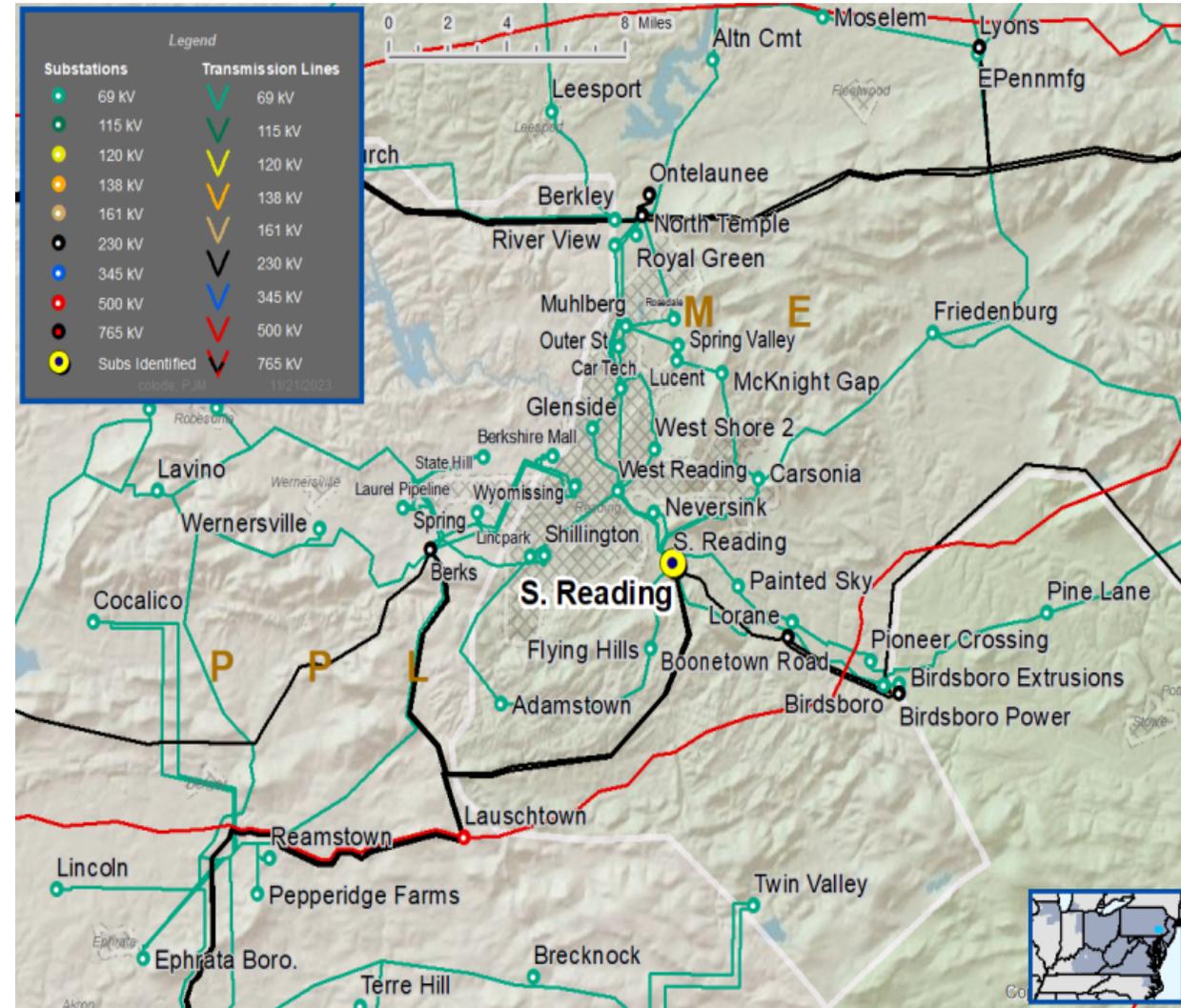
Specific Assumption Reference:

System Performance Projects

- Add/Expand Bus Configuration
- Load at risk in planning and operational scenarios
- Reduce the amount of exposed potential local load loss during contingency conditions
- Eliminate simultaneous outages to multiple networked elements

Problem Statement:

South Reading Substation contains multiple 230 kV networked elements and two 230 – 69 kV transformers. Multiple stuck breaker contingencies or a fault on the 230 kV bus at South Reading results in the loss of South Reading Substation and multiple networked elements.



Need Numbers: ME-2023-023

Process Stage: Need Meeting 12/05/2023

Project Driver:

*Equipment Material Condition, Performance and Risk
Operational Flexibility and Efficiency*

Specific Assumption Reference:

System Performance Projects Global Factors

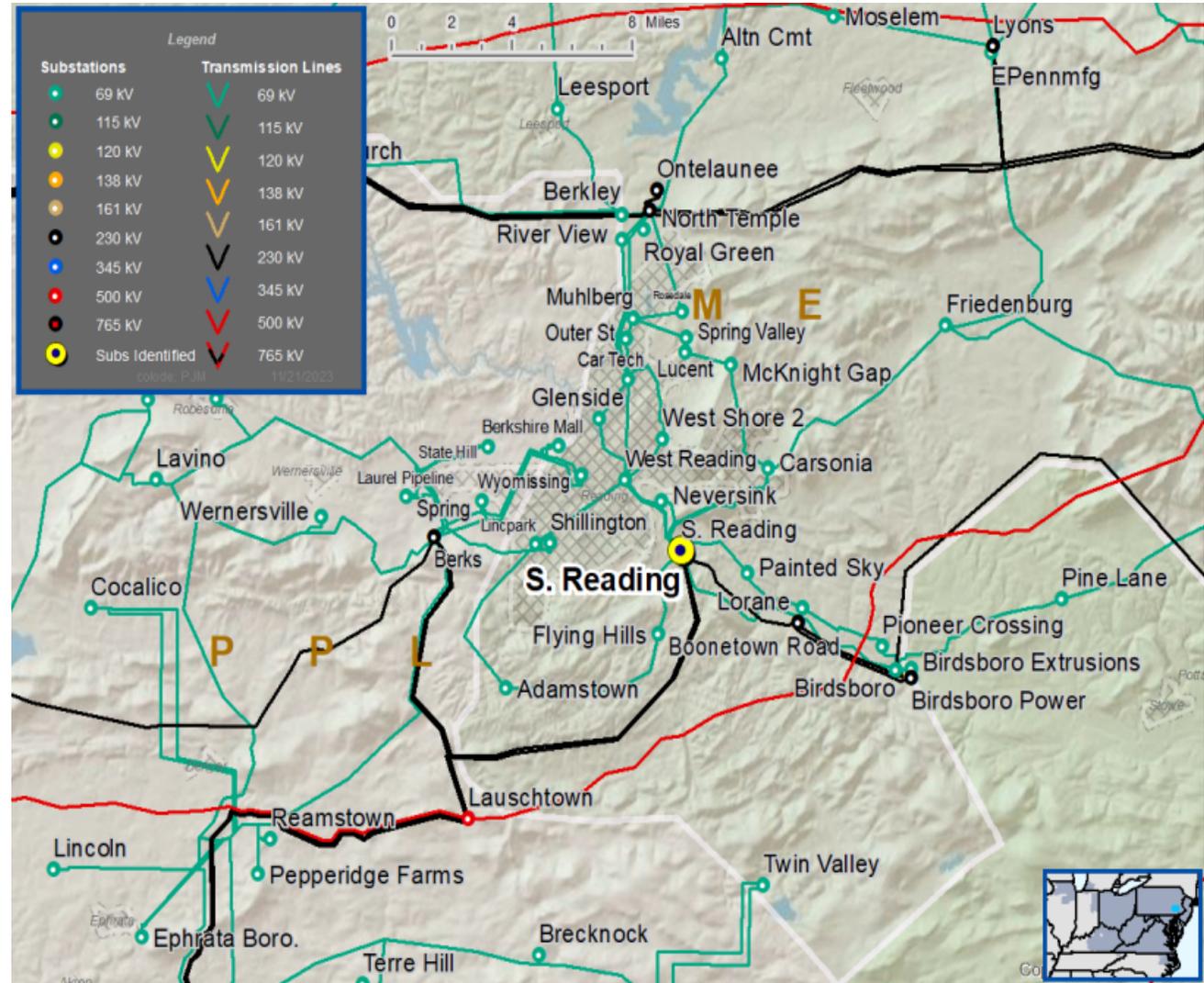
- System reliability and performance

Add/Replace Transformers

Past System Reliability/Performance

Problem Statement:

- The South Reading #7 230-69 kV Transformer is approximately 50 years old.
- The transformer has elevated methane and ethane gases above IEEE limits
- Existing transformer ratings:
 - 273/343/419 MVA SN/SE/SLD
 - 340/398/448 MVA WN/WE/WLD



Need Numbers: ME-2023-024

Process Stage: Need Meeting 12/05/2023

Project Driver:

*Equipment Material Condition, Performance and Risk
Operational Flexibility and Efficiency*

Specific Assumption Reference:

System Performance Projects Global Factors

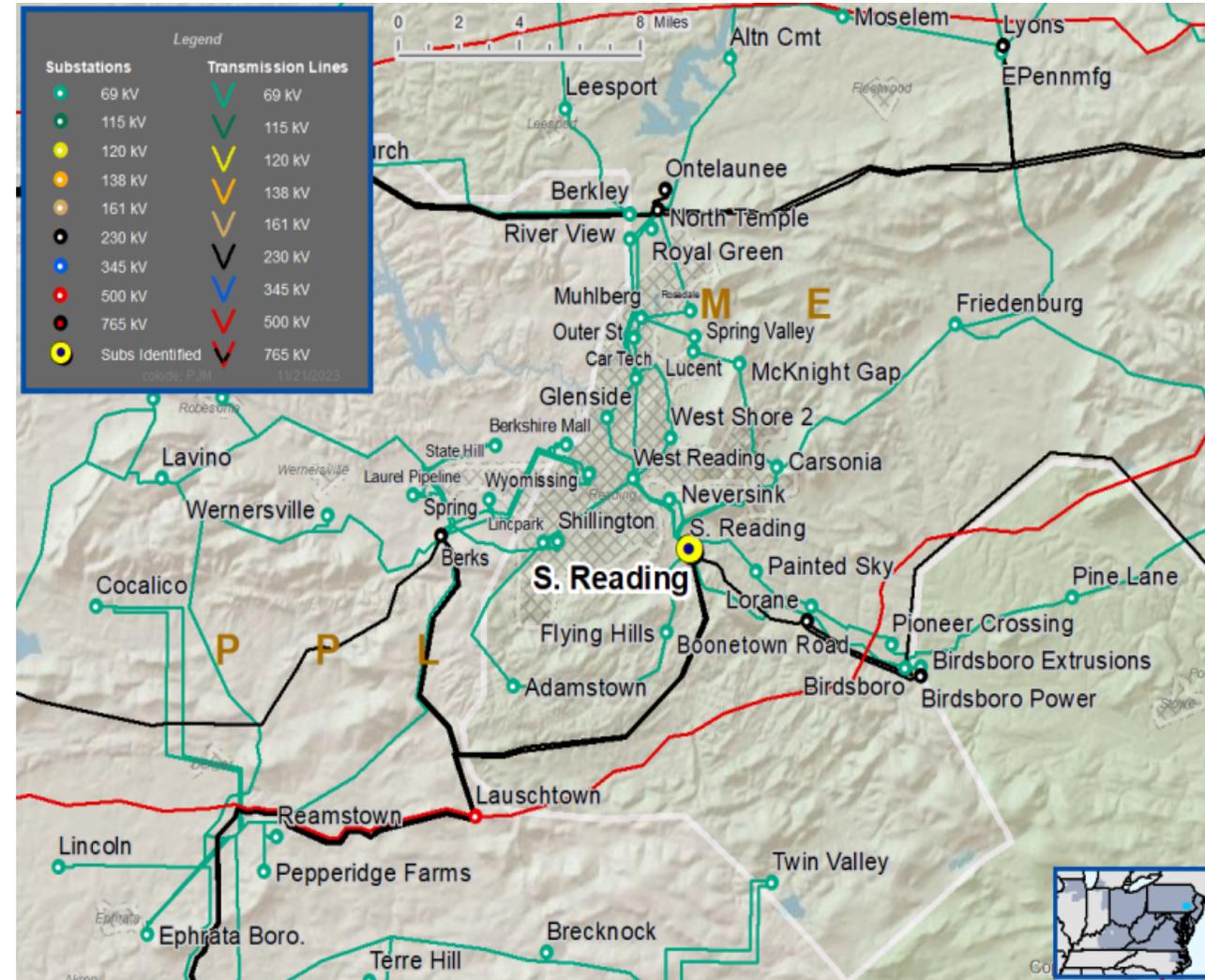
- System reliability and performance

Add/Replace Transformers

Past System Reliability/Performance

Problem Statement:

- The South Reading #8 230-69 kV Transformer is approximately 41 years old.
- The transformer is exhibiting issues with its cooling system, annunciator, oil leaks, and bushings.
- The transformer has elevated ethane gas levels above IEEE limits.
- Existing transformer ratings:
 - 278/358/423 MVA SN/SE/SLD
 - 345/401/448 MVA WN/WE/WLD



Need Number: ME-2023-025

Process Stage: Need Meeting 12/05/2023

Project Driver:

Operational Flexibility and Efficiency

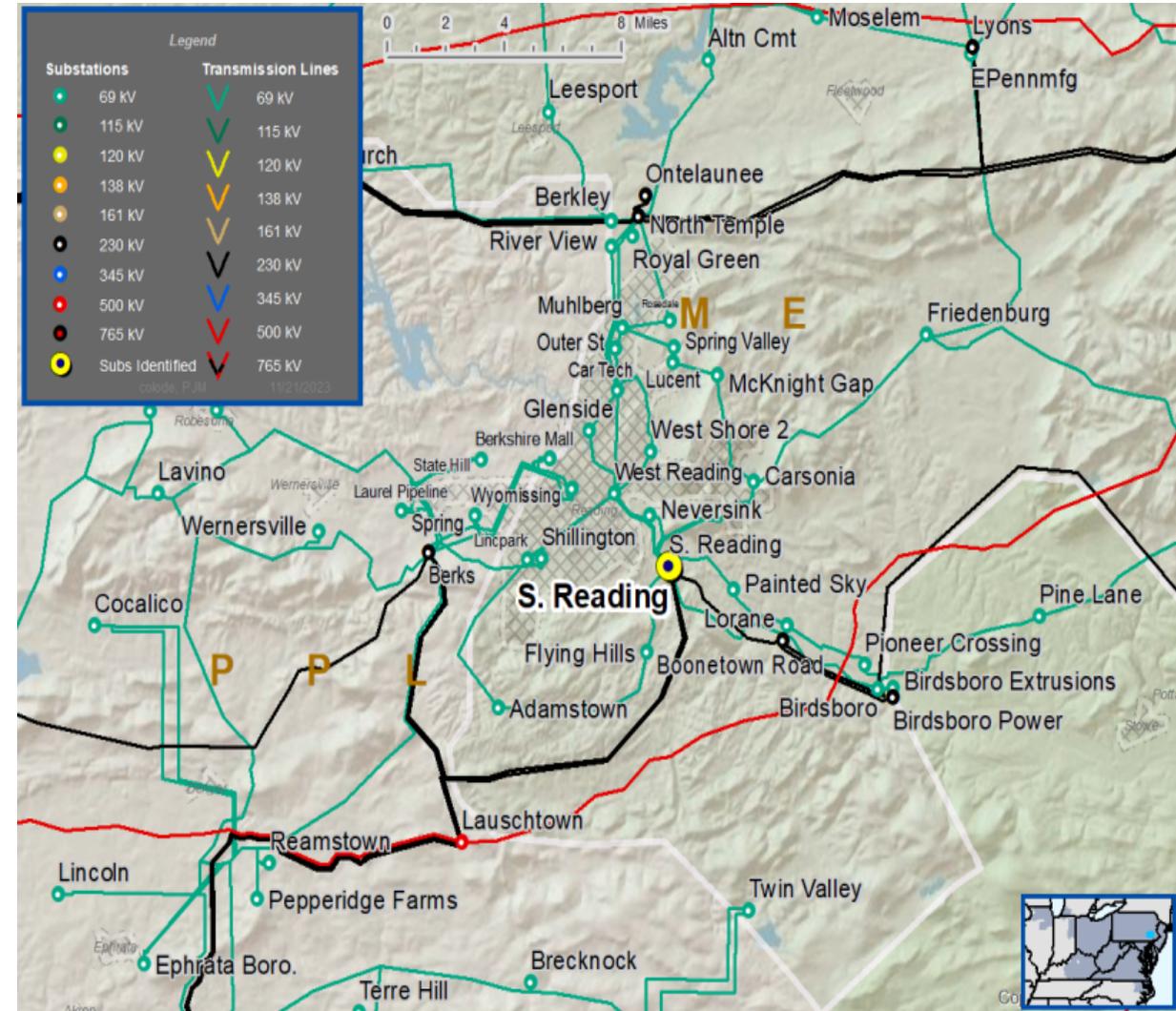
Specific Assumption Reference:

System Performance Projects

- Add/Expand Bus Configuration
- Load at risk in planning and operational scenarios
- Reduce the amount of exposed potential local load loss during contingency conditions
- Eliminate simultaneous outages to multiple networked elements

Problem Statement:

South Reading Substation contains two 230-69 kV transformers. Upon the N-1-1 loss of the 230-69 kV transformers, there is low voltage on the surrounding 69 kV network buses.



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

11/22/2023 - V1 – Original version posted to pjm.com