Transmission Expansion Advisory Committee FirstEnergy Supplemental Projects

April 30, 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

Met-Ed Transmission Zone M-3 Process
Hosensack Substation

Need Number: ME-2024-006

Process Stage: Needs Meeting – 4/30/2024

Project Driver:

Operational Flexibility and Efficiency

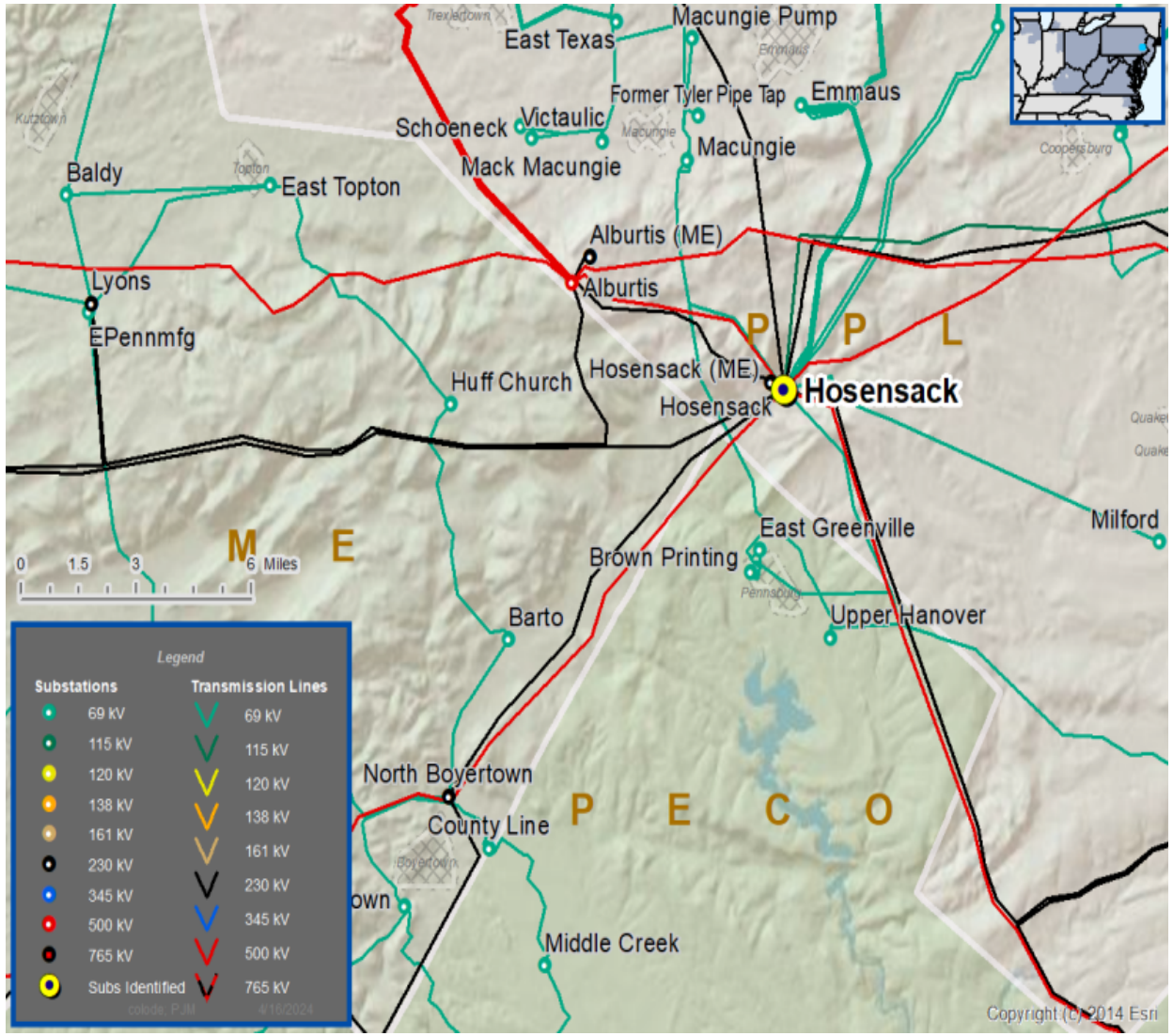
Specific Assumption Reference:

System Performance Projects Global Factors

- 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:

Hosensack Substation has a 230 kV straight bus configuration with terminals to five transmission lines, one 230/115 kV transformer, two 230 kV capacitor banks, and two 230 kV bus ties to PPL's Hosensack Substation. A faulted breaker would result in an outage to the entire station. Bus faults or a transformer fault would result in an outage to the majority of the substation.



Met-Ed Transmission Zone M-3 Process
Foxhill Substation

Need Number: ME-2024-007

Process Stage: Needs Meeting – 4/30/2024

Project Driver:

Operational Flexibility and Efficiency

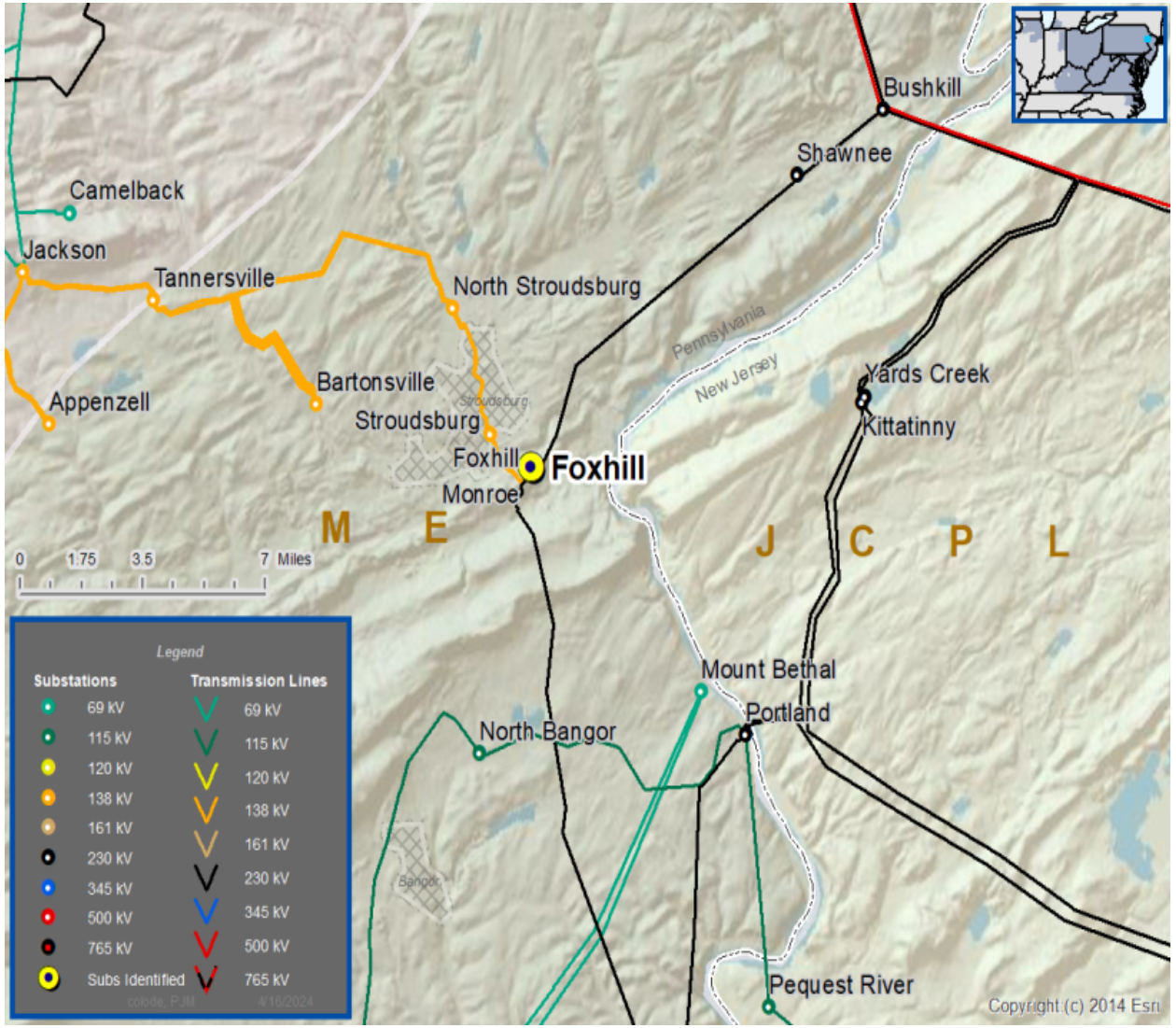
Specific Assumption Reference:

System Performance Projects Global Factors

- 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:

Foxhill Substation has a 230 kV straight bus configuration with terminals to two 230 kV transmission lines and two 115-34.5 kV transformers. A faulted breaker would result in an outage to the entire station. Foxhill Substation serves approximately 50 MW of load and 5,100 customers.



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

Met-Ed Transmission Zone M-3 Process
South Reading Substation

Need Number: ME-2023-021

Process Stage: Solution Meeting – 4/30/2024

Previously Presented: Need Meeting – 12/05/2023

Project Driver:

Operational Flexibility and Efficiency

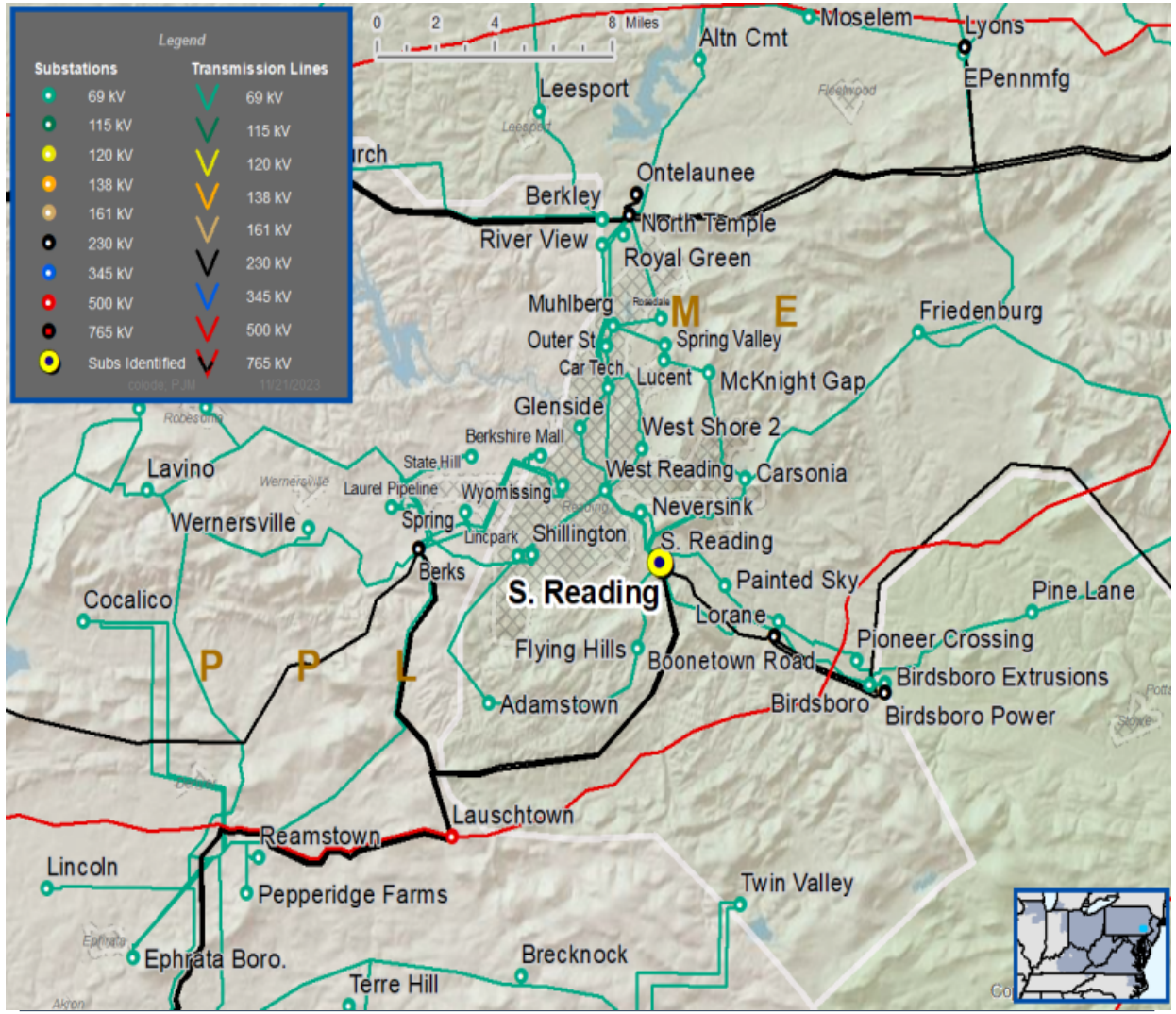
Specific Assumption Reference:

System Performance Projects Global Factors

- 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.



Met-Ed Transmission Zone M-3 Process
South Reading Substation

Need Number: ME-2023-021

Process Stage: Solution Meeting – 4/30/2024

Proposed Solution:

- Convert the South Reading 230 kV bus into a ten breaker, double-breaker double-bus configuration.
- At South Reading Substation:
  - Replace the existing 230 kV bus conductor
  - Install eight 230 kV circuit breakers and associated disconnect switches
  - Re-terminate the existing transmission lines and transformers
  - Install new control house and relay panels

Transmission Line Ratings:

- Boonetown – South Reading 230 kV Line
  - Before Proposed Solution: 445 / 531 / 529 / 607 MVA (SN/SE/WN/WE)
  - After Proposed Solution: 546 / 666 / 619 / 790 MVA (SN/SE/WN/WE)
- Lauschtown – South Reading 230 kV Line
  - Before Proposed Solution: 494 / 621 / 569 / 703 MVA (SN/SE/WN/WE)
  - After Proposed Solution: 546 / 666 / 619 / 790 MVA (SN/SE/WN/WE)
- Berks – South Reading 230 kV Line
  - Before Proposed Solution: 520 / 621 / 619 / 710 MVA (SN/SE/WN/WE)
  - After Proposed Solution: 546 / 666 / 629 / 790 MVA (SN/SE/WN/WE)

Alternatives Considered:

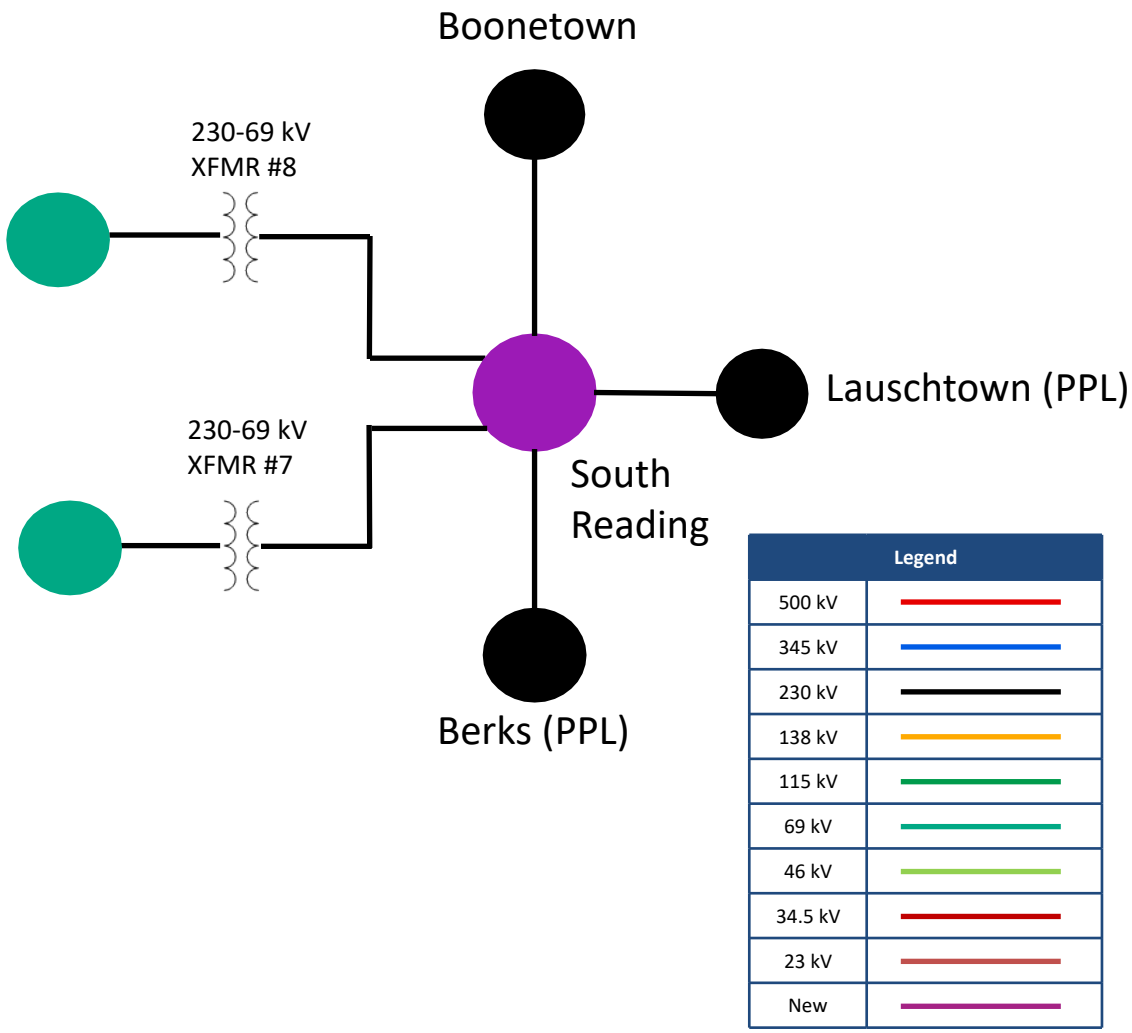
- Maintain existing condition with risk of simultaneous outages to multiple networked elements.

Estimated Project Cost: $35.00M

Projected In-Service: 12/31/2026

Status: Engineering

Model: 2023 RTEP model for 2028 Summer (50/50)



Met-Ed Transmission Zone M-3 Process
South Reading 230-69 kV Transformer #7

Need Numbers: ME-2023-023

Process Stage: Solution Meeting – 04/30/2024

Previously Presented: 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

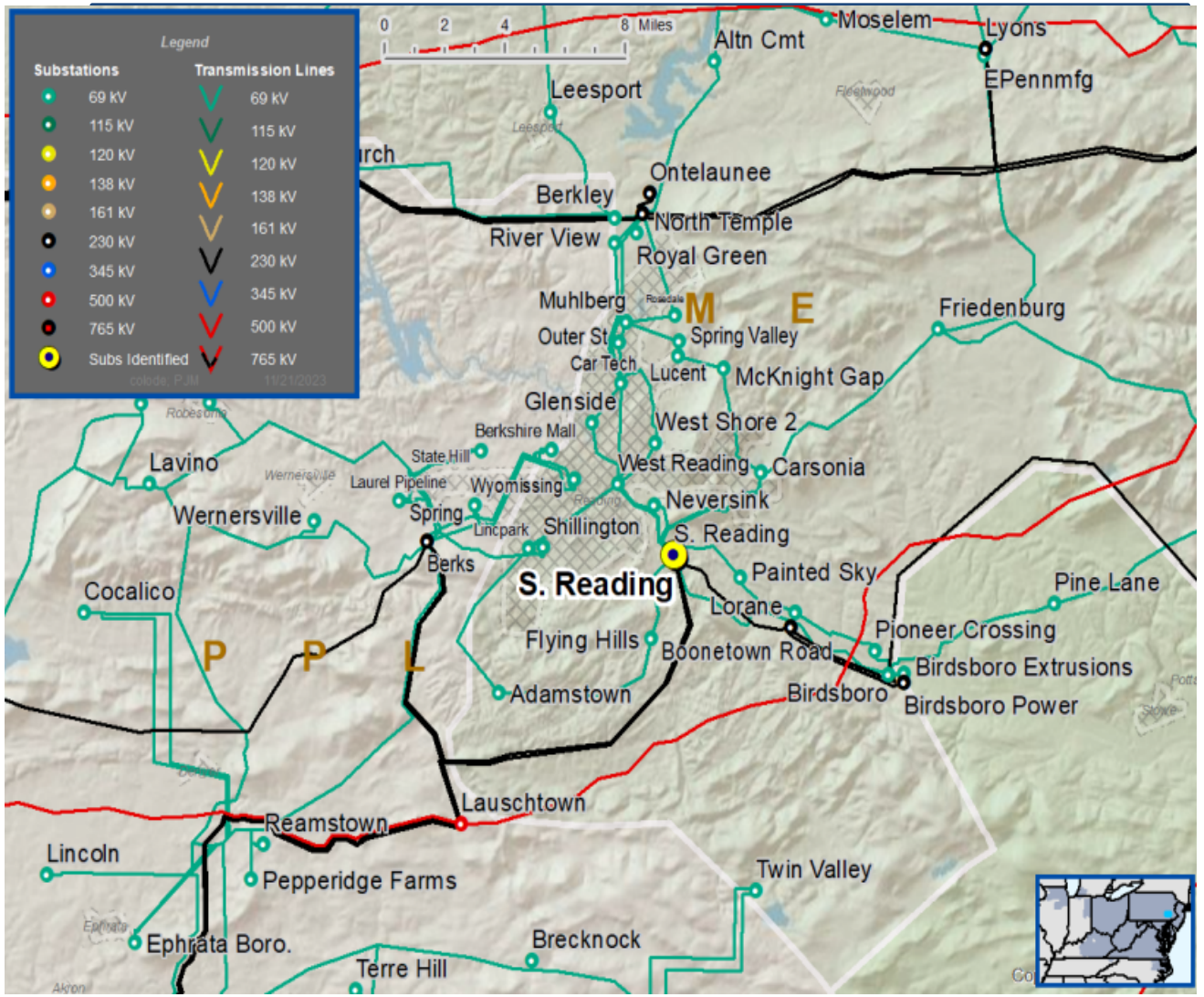
- System reliability and performance

Add/Replace Transformers

Past System Reliability/Performance

Problem Statement:

- The South Reading 230-69 kV Transformer #7 is approximately 50 years old.
- The transformer has elevated methane and ethane gases above IEEE limits
- Existing ratings:
  - 249 / 300 / 344 MVA SN/SSTE/SLD
  - 312 / 333 / 344 MVA WN/WSTE/WLD



Met-Ed Transmission Zone M-3 Process
South Reading 230-69 kV Transformer #7

Need Numbers: ME-2023-023

Process Stage: Solution Meeting – 02/15/2024

Proposed Solution:

- Replace the existing South Reading 230-69 kV #7 Transformer
- Replace limiting conductor and disconnect switches
- Replace relaying at South Reading Substation

Transformer Ratings:

- Before Proposed Solution: 249 / 300 / 312 / 333 MVA (SN/SSTE/WN/WSTE)
- After Proposed Solution: 273 / 343 / 340 / 398 MVA (SN/SSTE/WN/WSTE)

Alternatives Considered:

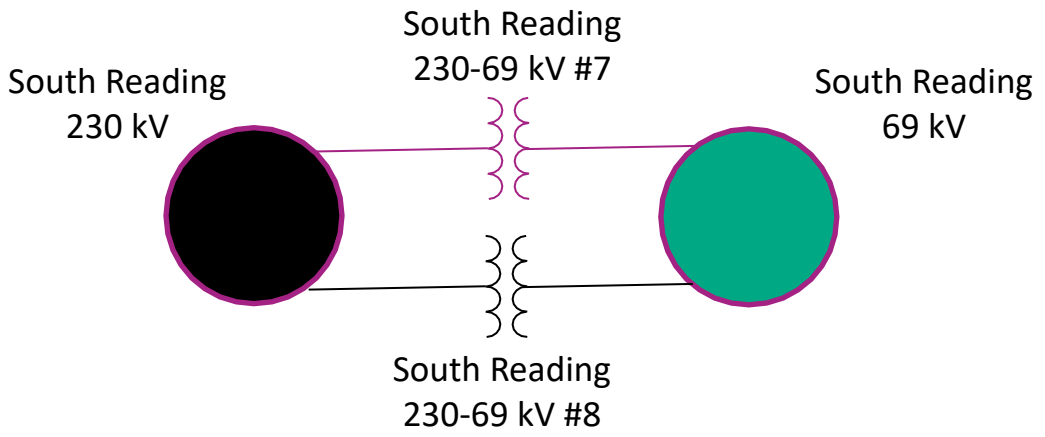
- Maintain existing condition with elevated risk of failure.

Estimated Project Cost: $8.80M

Projected In-Service: 12/31/2025

Project Status: Engineering

Model: 2023 Series 2028 RTEP Summer Case (50/50)



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Met-Ed Transmission Zone M-3 Process
South Reading 230-69 kV Transformer #8

Need Numbers: ME-2023-024

Process Stage: Solution Meeting – 04/30/2024

Previously Presented: 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

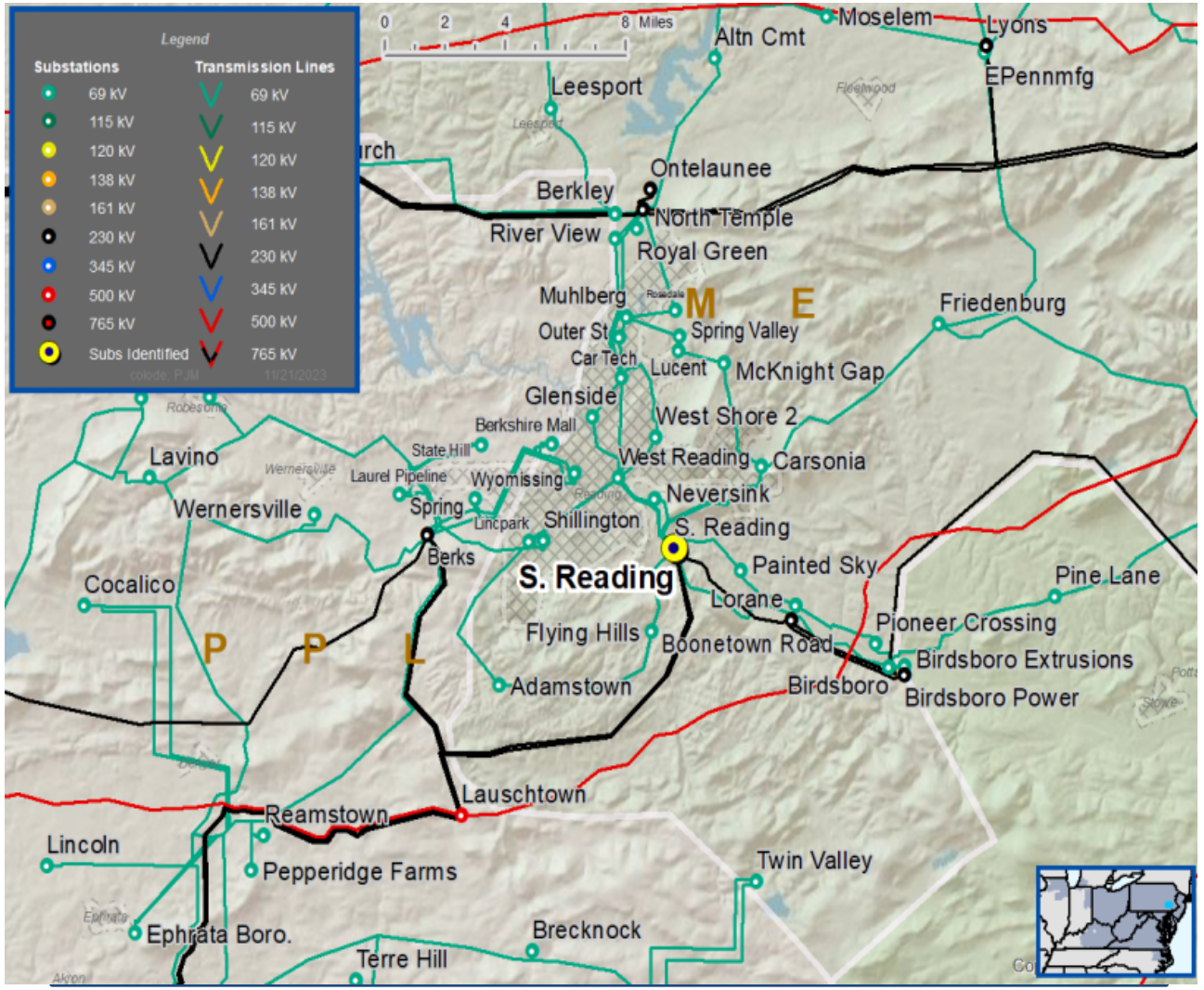
- System reliability and performance

Add/Replace Transformers

Past System Reliability/Performance

Problem Statement:

- The South Reading 230-69 kV Transformer #8 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 ratings:
  - 249 / 300 / 345 MVA SN/SSTE/SLD
  - 312 / 347 / 359 MVA WN/WSTE/WLD



Met-Ed Transmission Zone M-3 Process
South Reading 230-69 kV Transformer #8

Need Numbers: ME-2023-024

Process Stage: Solution Meeting – 04/30/2024

Proposed Solution:

- Replace the existing South Reading 230-69 kV #8 Transformer
- Replace limiting conductor and disconnect switches
- Replace relaying at South Reading Substation

Transformer Ratings:

- Before Proposed Solution: 249 / 300 / 312 / 347 MVA (SN/SSTE/WN/WSTE)
- After Proposed Solution: 328 / 400 / 371 / 474 MVA (SN/SSTE/WN/WSTE)

Alternatives Considered:

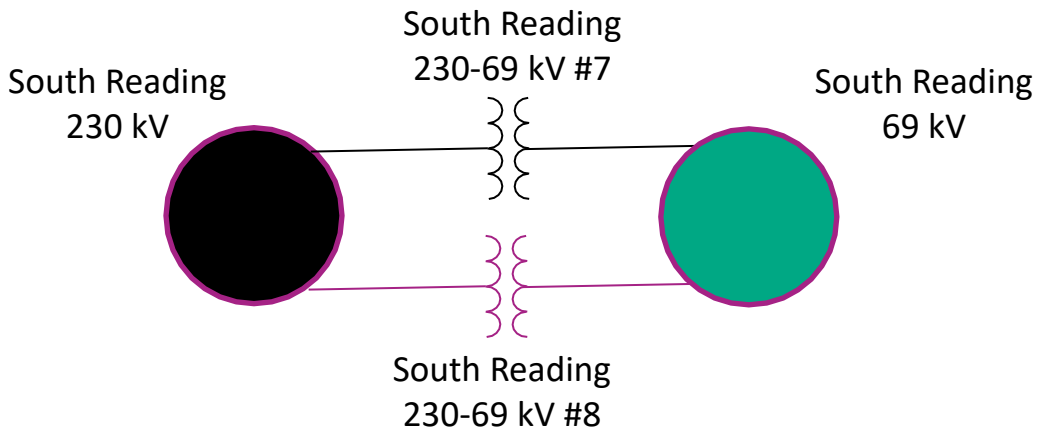
- Maintain existing condition with elevated risk of failure.

Estimated Project Cost: $8.80M

Projected In-Service: 6/1/2025

Project Status: Engineering

Model: 2023 Series 2028 RTEP Summer Case (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

04/19/2023 - V1 – Original version posted to pjm.com