Sub Regional RTEP Committee
PJM Mid-Atlantic
First Energy MAAC

January 25, 2019

Solutions

Supplemental Reliability Upgrades

Met-Ed Transmission Zone

Need Number: ME-2018-019

Need Presented: 11/28/2018

Meeting Date: 1/25/2019

Process Stage: Solution Meeting

Project Driver(s):

Equipment Material Condition, Performance and Risk

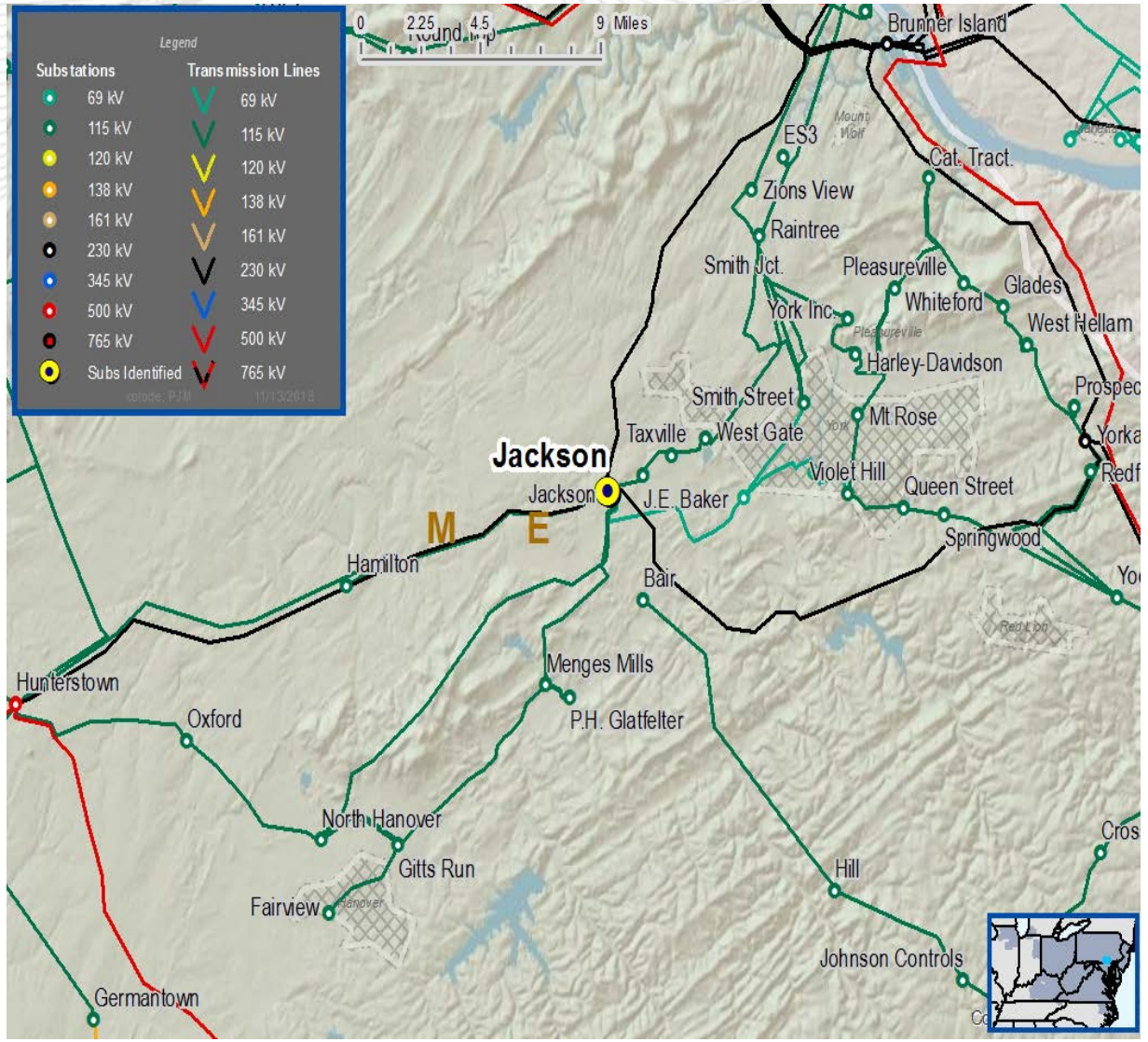
Specific Assumption Reference(s)

- Substation Condition Rebuild/Replacement

Problem Statement

Jackson #5 230/115 kV:

- Transformer is 48 years old
- Dissolved gas in oil
- History of oil leaks, compromising oil integrity



Met-Ed Transmission Zone

Need Number: ME-2018-019

Proposed Solution:

Jackson #5 230/115 kV transformer replacement

Replace the 230/115 kV 90/120/150 MVA transformer and associated equipment with new 230/115 kV 180/240/300 MVA transformer

Transformer Ratings:

Jackson #5 230/115 kV Transformer

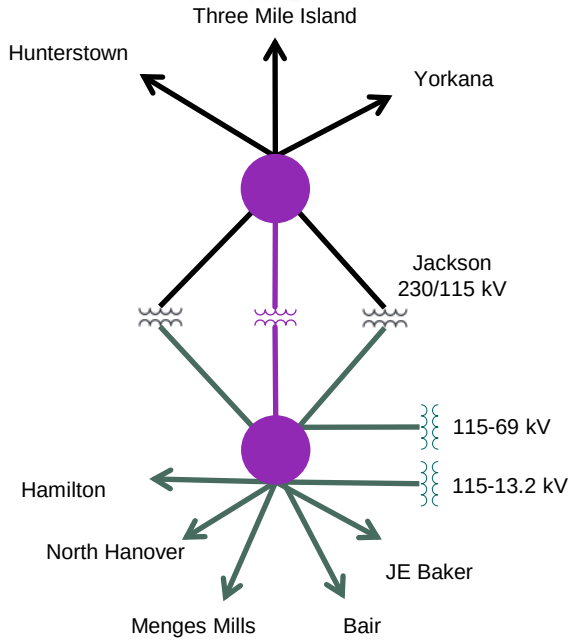
- Before Proposed Solution: 193 MVA SN / 244 MVA SE
- After Proposed Solution (anticipated): 361 MVA SN / 387 MVA SE

Alternatives Considered:

Maintain existing condition at elevated risk of failure

Estimated Project Cost: $4.9 M

Projected IS Date: 12/31/2020



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

Met-Ed Transmission Zone

Need Number: ME-2018-020

Need Presented: 11/28/2018

Meeting Date: 1/25/2019

Process Stage: Solution Meeting

Project Driver(s):

Equipment Material Condition, Performance and Risk

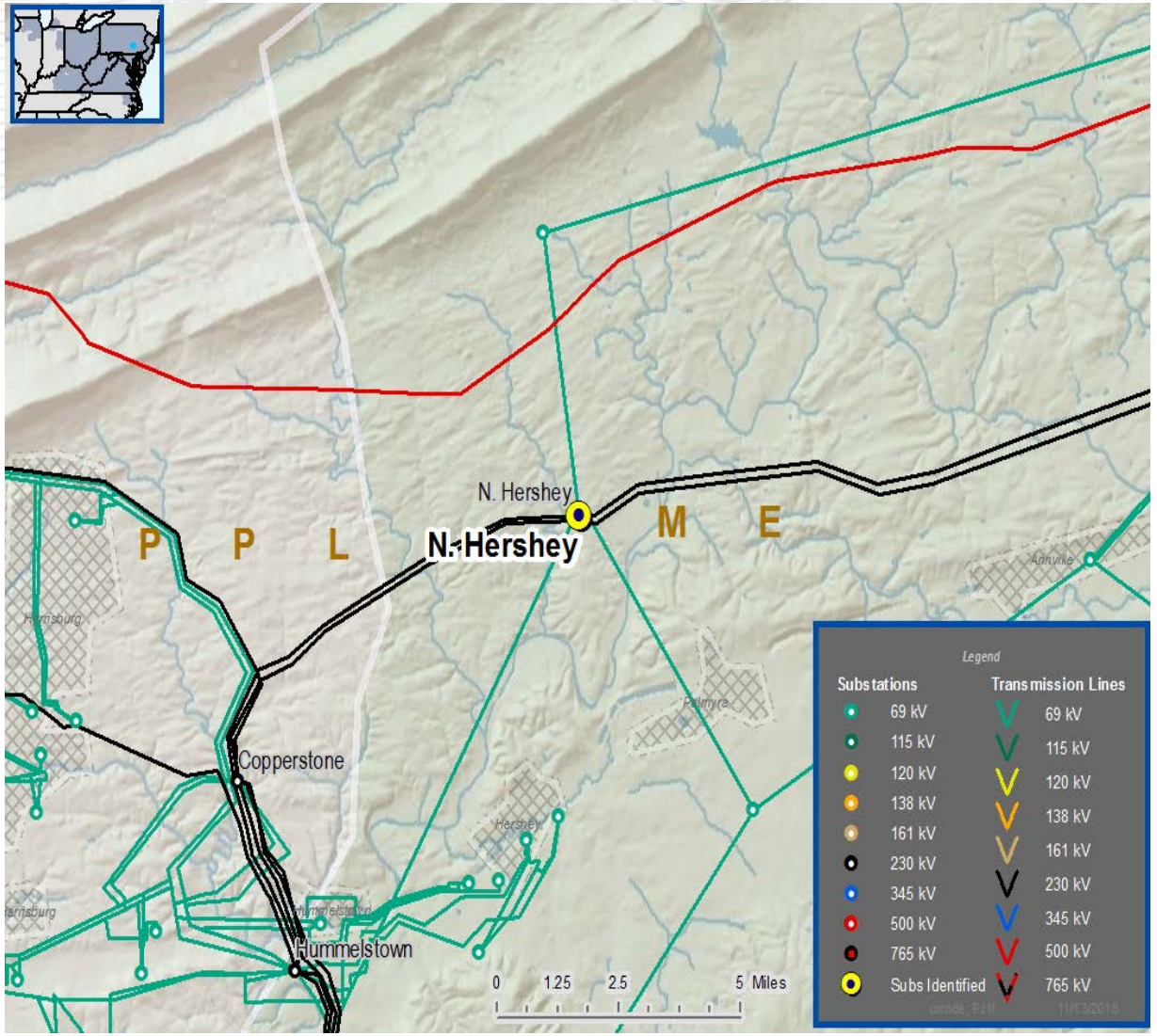
Specific Assumption Reference(s)

- Substation Condition Rebuild/Replacement

Problem Statement

North Hershey #1 230-69 kV:

- Transformer is over 40 years old
- Critical role in operation of 69 kV
- Transformer leaking



Met-Ed Transmission Zone

Need Number: ME-2018-020

Proposed Solution:

North Hershey #1 230-69 kV transformer replacement and 230 kV ring bus

- Replace the 230-69 kV 60/80/100 MVA transformer and associated equipment with new 230-69 kV 100/134/168 MVA transformer
- Expand the North Hershey 230 kV bus into a three breaker ring bus.

Transformer Ratings:

North Hershey #1 230-69 kV transformer

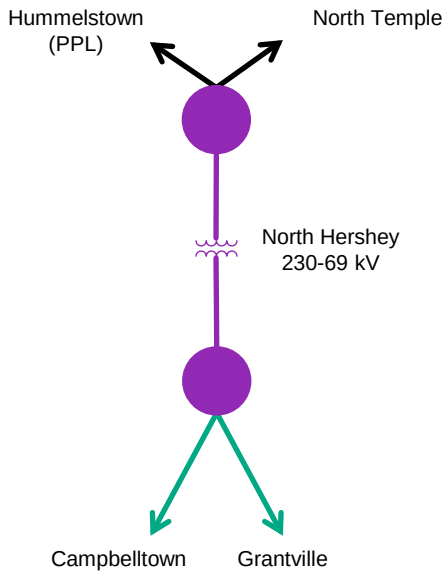
- Before Proposed: 123 MVA SN / 137 MVA SE
- After Proposed Solution (anticipated): 211 MVA SN / 232 MVA SE

Alternatives Considered:

Maintain existing condition at elevated risk of failure

Estimated Project Cost: $9.1 M

Projected IS Date: 12/31/2021



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

Met-Ed Transmission Zone

Need Number: ME-2018-021

Need Presented: 11/28/2018

Meeting Date: 1/25/2019

Process Stage: Solution Meeting

Project Driver(s):

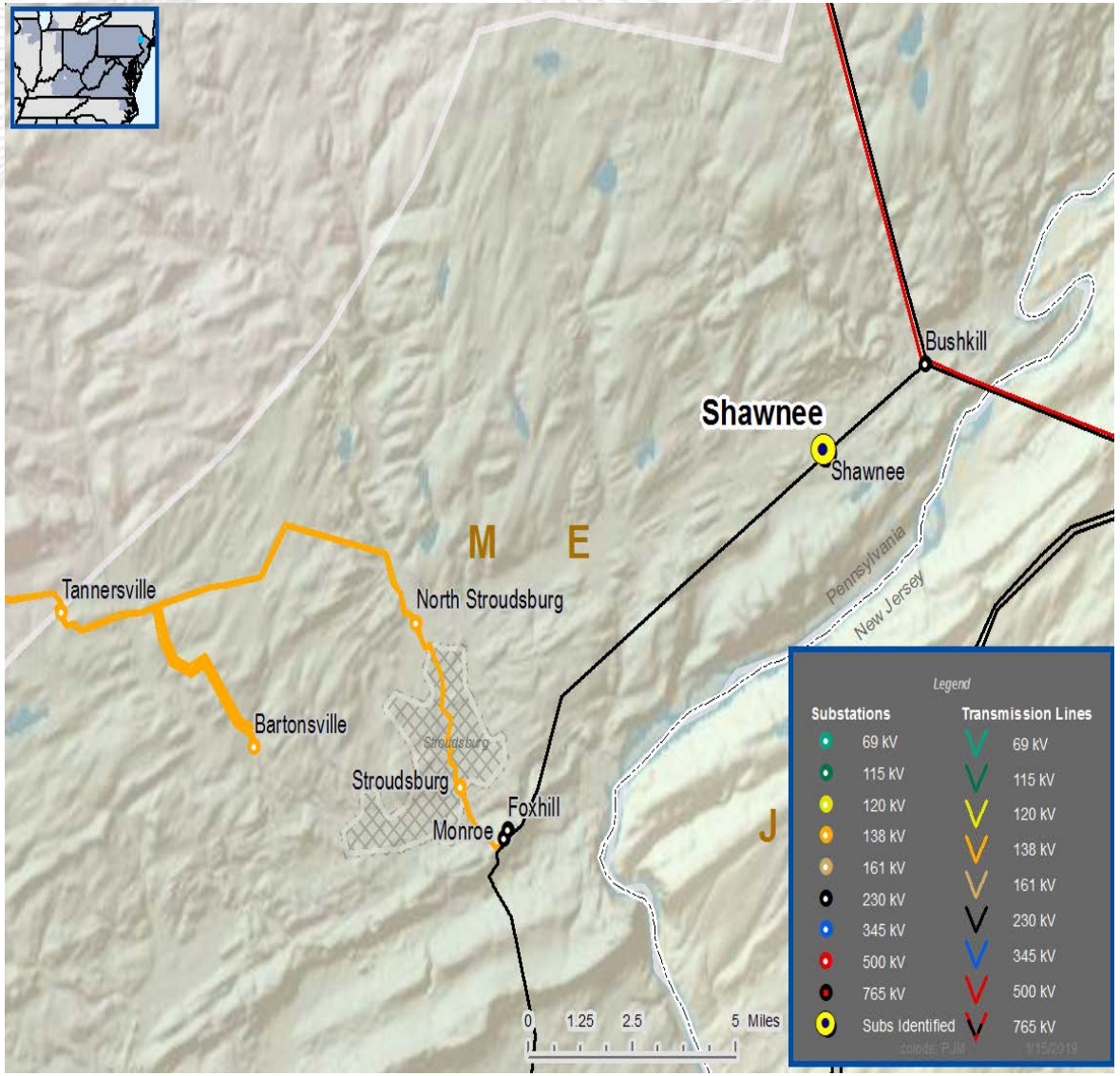
Customer Service (Reliability)

Specific Assumption Reference(s)

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

Problem Statement

- Customer requested transmission service in the Stroudsburg, PA area due to multiple outages over past several years.
- Limited outage restoration options in the area.
- The area north of Shawnee substation has no transmission system
- Customers in this area are served by three 34.5 kV circuits from Shawnee or from Walker substation which is radial 69 kV.
- 6000 customers directly served by the 34.5 kV circuits
- 7600 customers fed from substations sourced by the 34.5 kV system
- Territory is a narrow corridor bounded by the Delaware river to the east



Met-Ed Transmission Zone

Need Number: ME-2018-021

Proposed Solution:

Construct a new 69 kV transmission line from Shawnee Substation to Walker Substation (approximately 31.1 miles)

Shawnee Substation

- Expand 230 kV bus into a six breaker ring bus
- Install a new 100/134/168 MVA 230-69 kV transformer and associated equipment

Birchwood Lakes Substation

- Provide new 69 kV delivery point
- Install a new 69 kV 9.6 MVAR capacitor.

Bushkill Falls Substation

- Provide new 69 kV delivery point
- Install a new 69 kV 9.6 MVAR capacitor.

Walker Substation

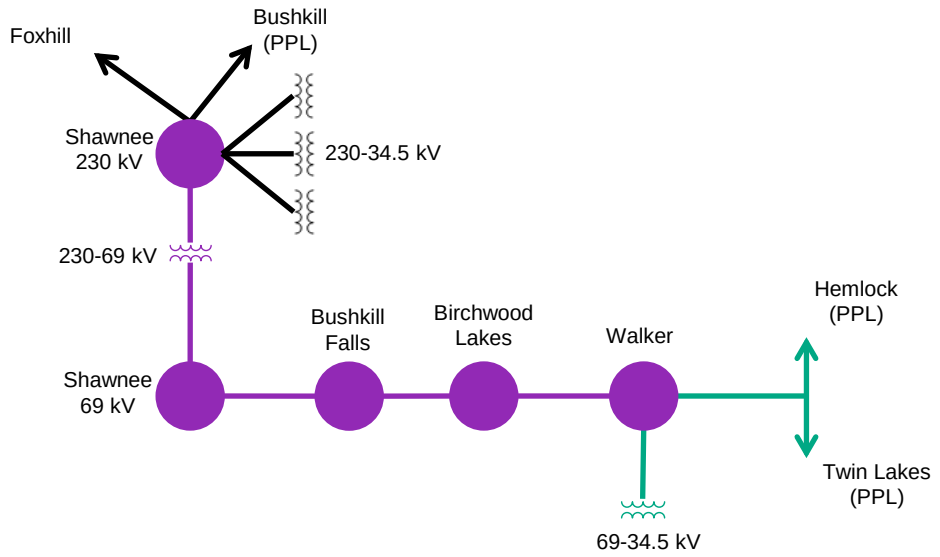
- Expand 69 kV bus into a three breaker ring bus.

Alternatives Considered:

- New 115 kV transmission line from Shawnee to a new 230/115 kV substation
- New 230 kV transmission line from Shawnee to Blooming Grove

Estimated Project Cost: $60 M

Projected IS Date: 12/31/2023



Legend	
500 kV	
230 kV	
138 kV	
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69 kV	
46 kV	
New	

Questions?

Revision History

1/15/2019 – V1 – Original version posted to pjm.com

1/24/2019 – V2 - All Need slides #9 - #30 removed