First Energy (MetEd)
Local Plan Submission for the 2021 RTEP

Met-Ed Transmission Zone M-3 Process
Misoperation Relay Projects

Need Number: ME-2019-047 and ME-2019-048

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan 9/20/2021

Previously Presented:

Need Meeting 07/31/2019

Solution Meeting 1/14/2021

Project Driver:

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

Specific Assumption Reference:

System Performance Projects Global Factors

- System reliability and performance
- Substation/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

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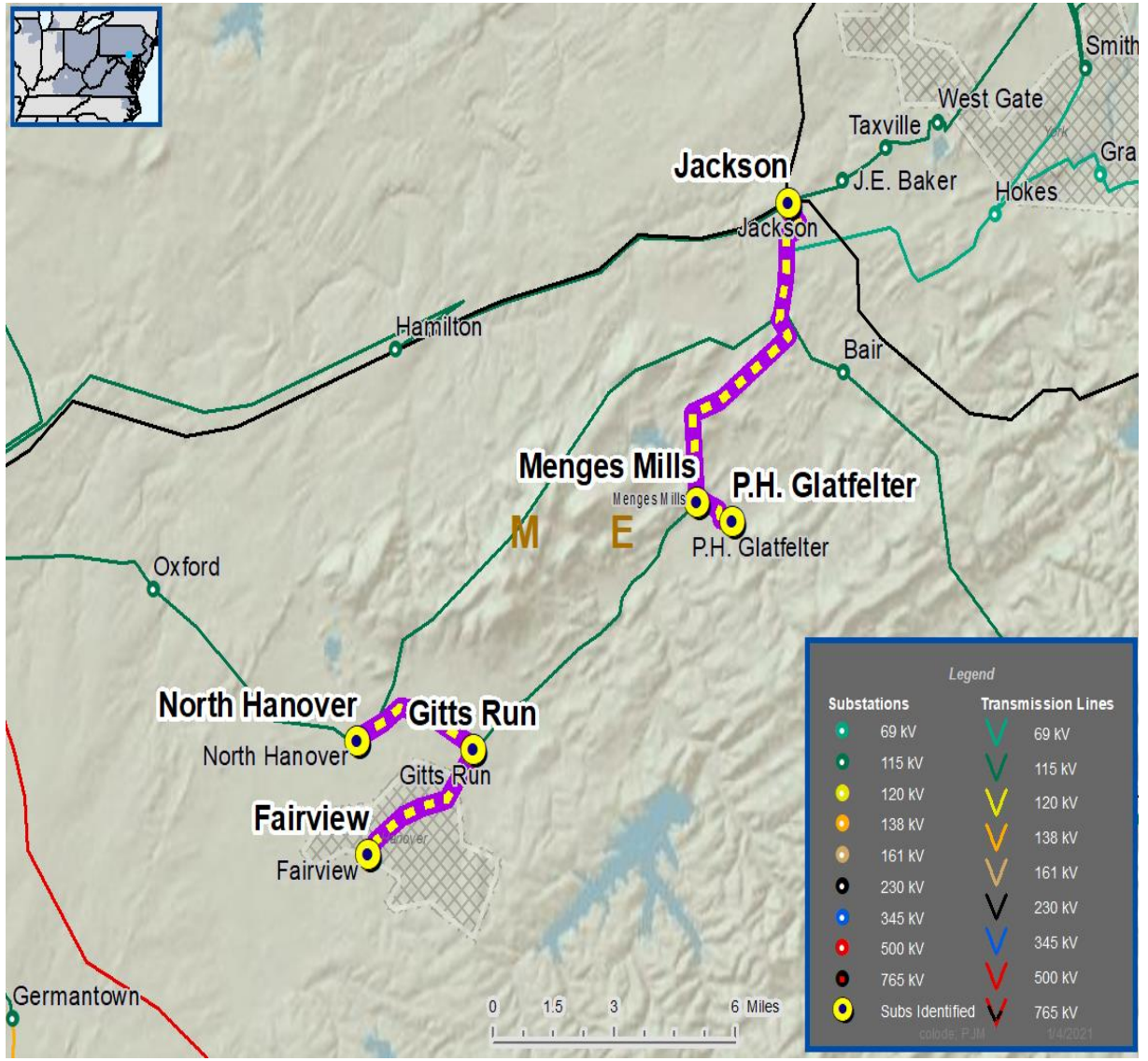


Met-Ed Transmission Zone M-3 Process
Misoperation Relay Projects

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cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology.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.

Need Number	Transmission Line / Substation Locations	Existing Line Rating (SN / SE)	Existing Conductor Rating (SN / SE)	Limiting Terminal Equipment
ME-2019-047	North Hanover – Gitts Tap 115 kV Line Gitts Tap – Fairview 115 kV Line	221/263 232/282	232/282 232/282	Substation Conductor -
ME-2019-048	Jackson – Menges Mills 115 kV Line Menges Mills – PH Glatfelter 115 kV Line	163/185 221/263	184/223 232/282	Line Trap Substation Conductor

Met-Ed Transmission Zone M-3 Process
Misoperation Relay Projects

Selected Solution:

Need Number	Transmission Line / Substation Locations	Supplemental Project ID	New MVA Line Rating (SN / SE)	Scope of Work	Estimated Cost ($ M)	Target ISD
ME-2019-047	North Hanover – Gitts Tap 115 kV Line Gitts Tap – Fairview 115 kV Line	s2480	232/282 232/282	• At North Hanover – Replace substation conductor, and line relaying.	$0.7	12/31/2022
ME-2019-048	Jackson – Menges Mills 115 kV Line Menges Mills – PH Glatfelter 115 kV Line	s2481.1 s2481.2	184/223 232/282	• At Jackson – Replace line trap, and line relaying • At PH Glatfelter – Replace substation conductor, line trap, disconnect switches, circuit breaker, and line relaying.	$1.0	12/31/2022

Model: 2020 RTEP model for 2025 Summer (50/50)

Need Number: ME-2020-005

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan 9/20/2021

Previously Presented:
Need Meeting 4/16/2020
Solution Meeting 10/15/2020

Project Driver:

Customer Service

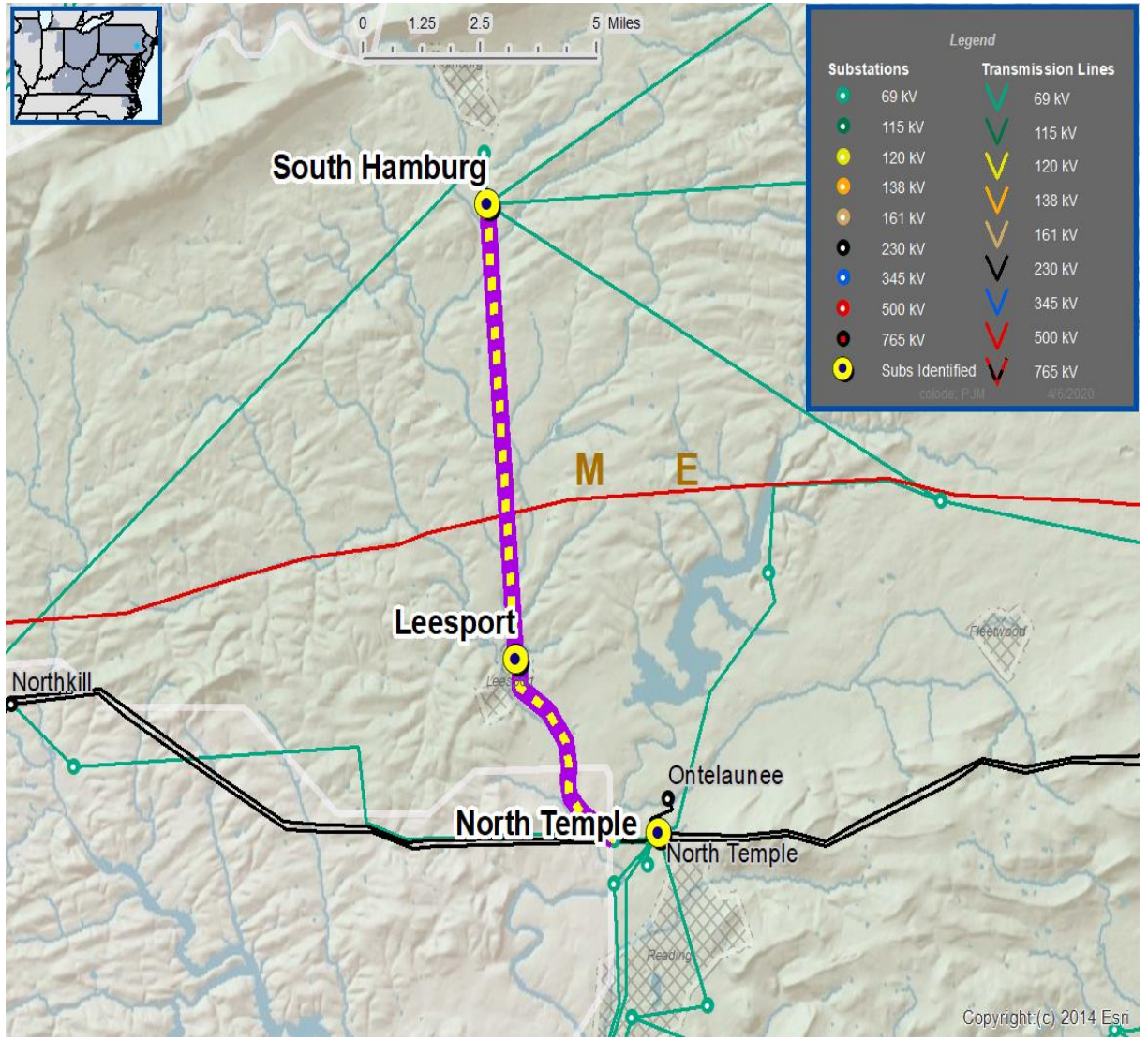
Specific Assumption Reference:

Customer 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 requested 69 kV service; anticipated load is 17 MVA; location is near the South Hamburg – Leesport – North Temple 69 kV line.

Requested in-service date is 6/1/2021



Met-Ed Transmission Zone M-3 Process
New Customer Substation

Need Number: ME-2020-005

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan 9/20/2021

Selected Solution:

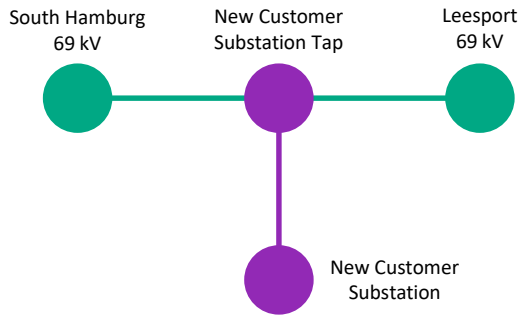
- Tap the South Hamburg-Leesport-North Temple 69 kV line
- Install 69 kV switches
- Construct ~1 span of 69 kV to customer substation

Estimated Project Cost: $1.9M

Projected In-Service: 06/01/2021

Supplemental Project ID: s2379

Model: 2020 RTEP model for 2025 Summer (50/50)



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

Need Number: ME-2020-006

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan 9/20/2021

Previously Presented:

Need Meeting 4/16/2020

Solution Meeting 11/18/2020

Project Driver:

Customer Service

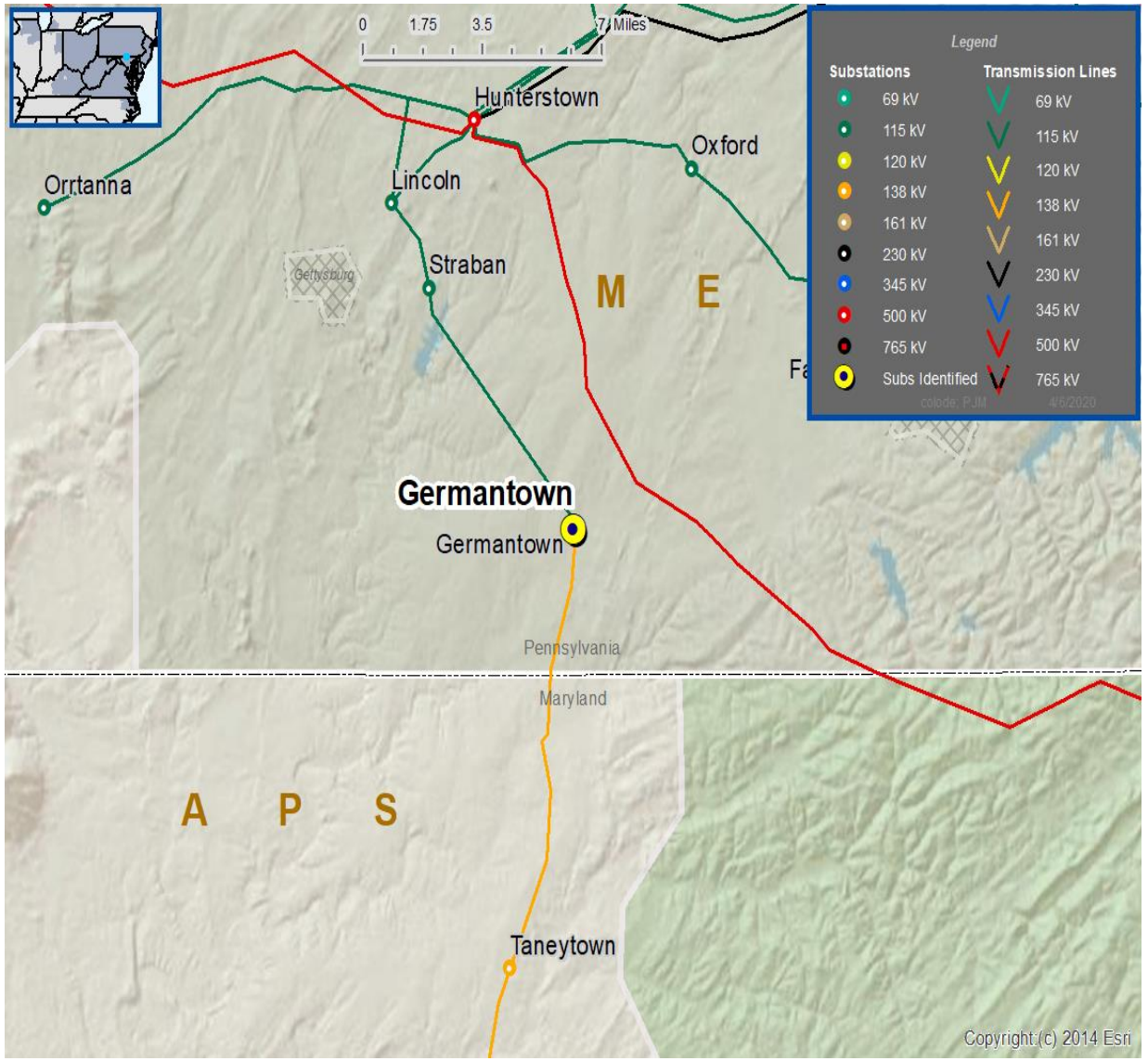
Specific Assumption Reference:

Customer 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 requested 115 kV service; anticipated load is 12 MVA; location is near the Germantown 115 kV substation

Requested in-service date is 6/1/2021



Met-Ed Transmission Zone M-3 Process
New Customer Substation

Need Number: ME-2020-006

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan 9/20/2021

Selected Solution:

- Add a new 115 kV line terminal to the Germantown 115 kV substation.
- Construct approximately 3.5 miles of 115 kV line to the customer substation.

Estimated Project Cost: $10.8M

Projected In-Service: 12/31/2022

Supplemental Project ID: s2409

Model: 2020 RTEP model for 2025 Summer (50/50)

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

Need Number: ME-2020-007

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan 9/20/2021

Previously Presented:
Need Meeting 4/16/2020
Solution Meeting 10/15/2020

Project Driver:

Customer Service

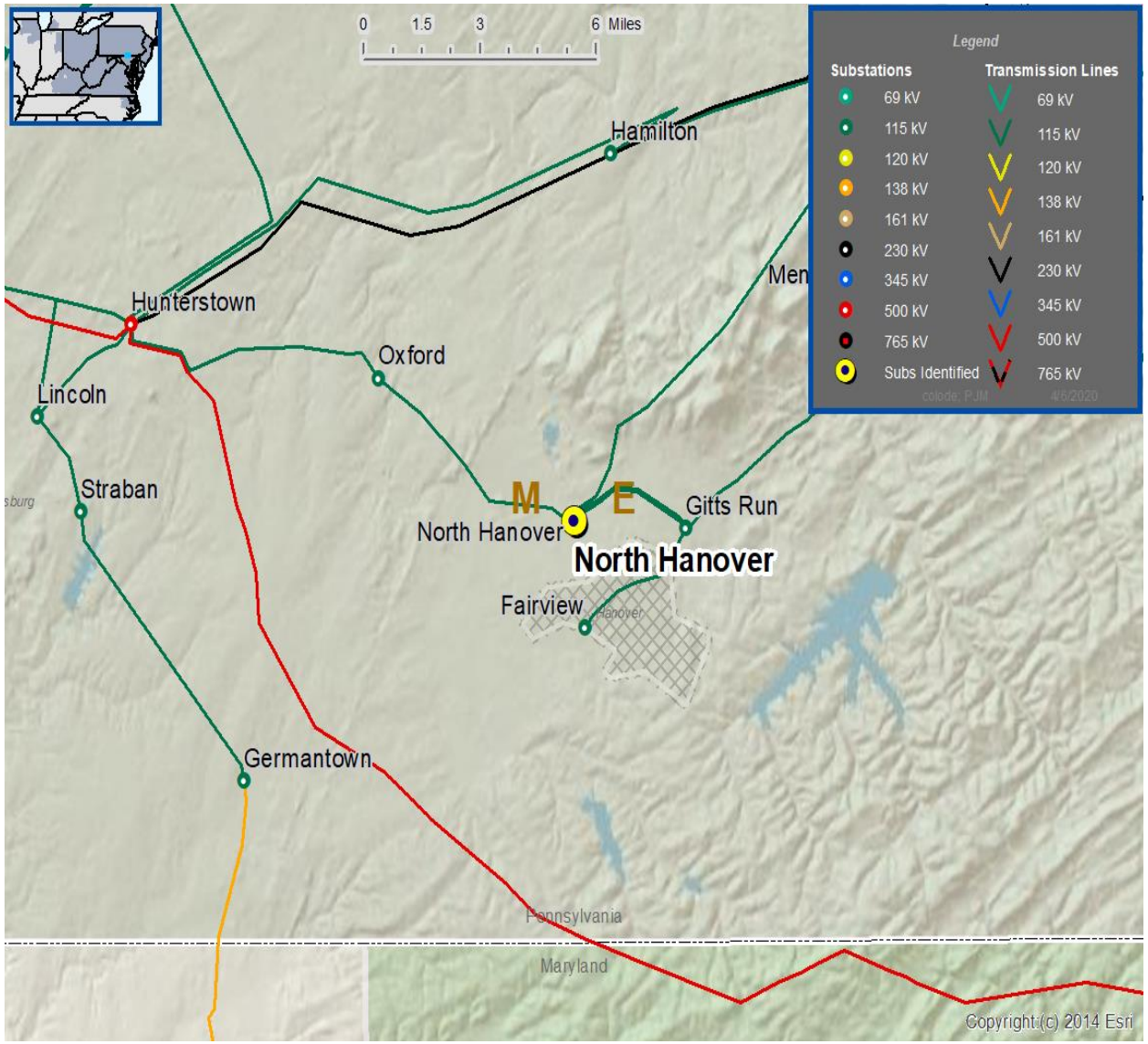
Specific Assumption Reference:

Customer 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 requested 115 kV service; anticipated load is 21 MVA; location is near the North Hanover 115 kV substation

Requested in-service date is 6/1/2021



Met-Ed Transmission Zone M-3 Process
New Customer Substation

Need Number: ME-2020-007

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan 9/20/2021

Selected Solution:

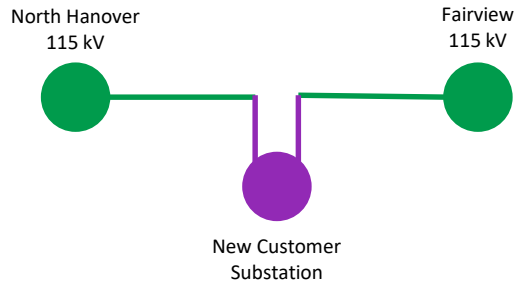
- Loop the North Hanover – Fairview 115 kV line into the customer substation. (Approx. 1 span)
- Install 115 kV switches with SCADA control and Auto-Sectionalizing

Estimated Project Cost: $0.8M

Projected In-Service: 06/01/2021

Supplemental Project ID: s2380

Model: 2020 RTEP model for 2025 Summer (50/50)



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

Need Number: ME-2020-009

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan 9/20/2021

Previously Presented:

Need Meeting 06/16/2020

Solution Meeting 10/15/2020

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

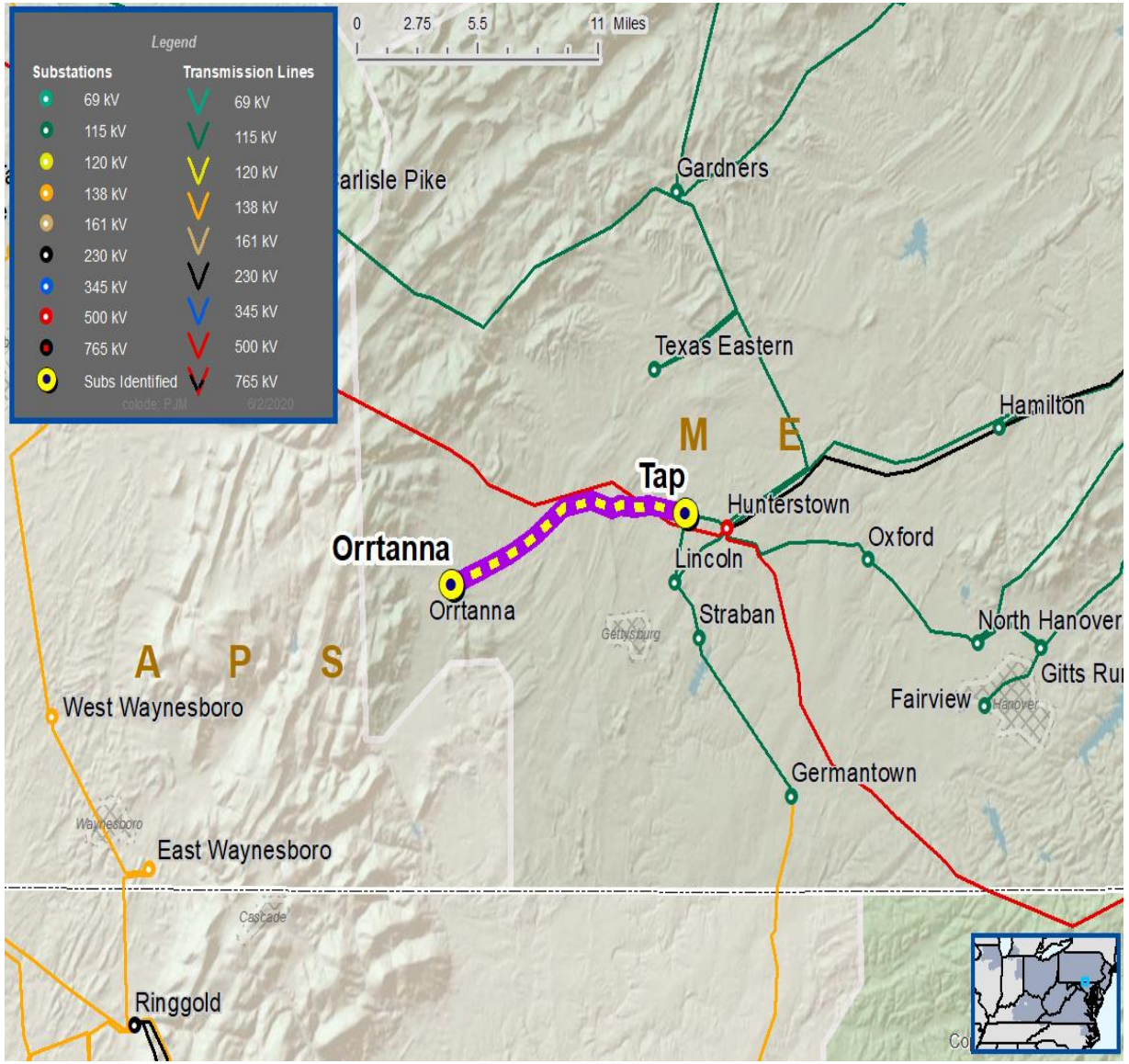
Line Condition Rebuild/Replacement

- Age/condition of wood pole transmission line structures

Problem Statement:

The Orrtanna tap – Orrtanna section of the Hunterstown – Lincoln – Orrtanna 115 kV 963 line is exhibiting deterioration.

- Total line distance is approximately 9 miles.
- 73 out of 74 structures failed inspection (99% failure rate).
- Failure reasons include age, top rot, woodpecker holes, and cut and missing grounds.



Met-Ed Transmission Zone M-3 Process
Hunterstown – Orrtanna – Lincoln (963) 115 kV Line

Need Number: ME-2020-009

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan 9/20/2021

Selected Solution:

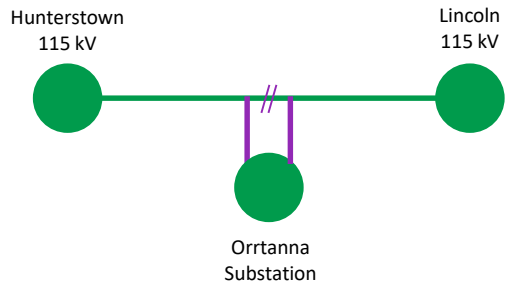
- Cancel supplemental upgrade s1725.1
    - Loop the Hunterstown – Lincoln 115 kV line, approximately 9 miles, into Orrtanna substation by constructing a single circuit 115 kV line adjacent to the existing radial 963 line.
    - S1725.1 Estimate Cost - $30.9 M
- Loop the Hunterstown – Lincoln 115 kV line, approximately 9 miles, into Orrtanna substation by constructing a double circuit 115 kV line adjacent to the existing radial 963 line.
- Remove the existing radial 963 line from Orrtanna tap to Orrtanna (approximately 9 miles).

Estimated Project Cost: $38.5M

Projected In-Service: 12/31/2021

Supplemental Project ID: s2381

Model: 2020 RTEP model for 2025 Summer (50/50)



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

Need Number: ME-2020-010

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan 9/20/2021

Previously Presented:

Need Meeting 8/13/2020

Solution Meeting 10/15/2020

Project Driver:

Customer Service

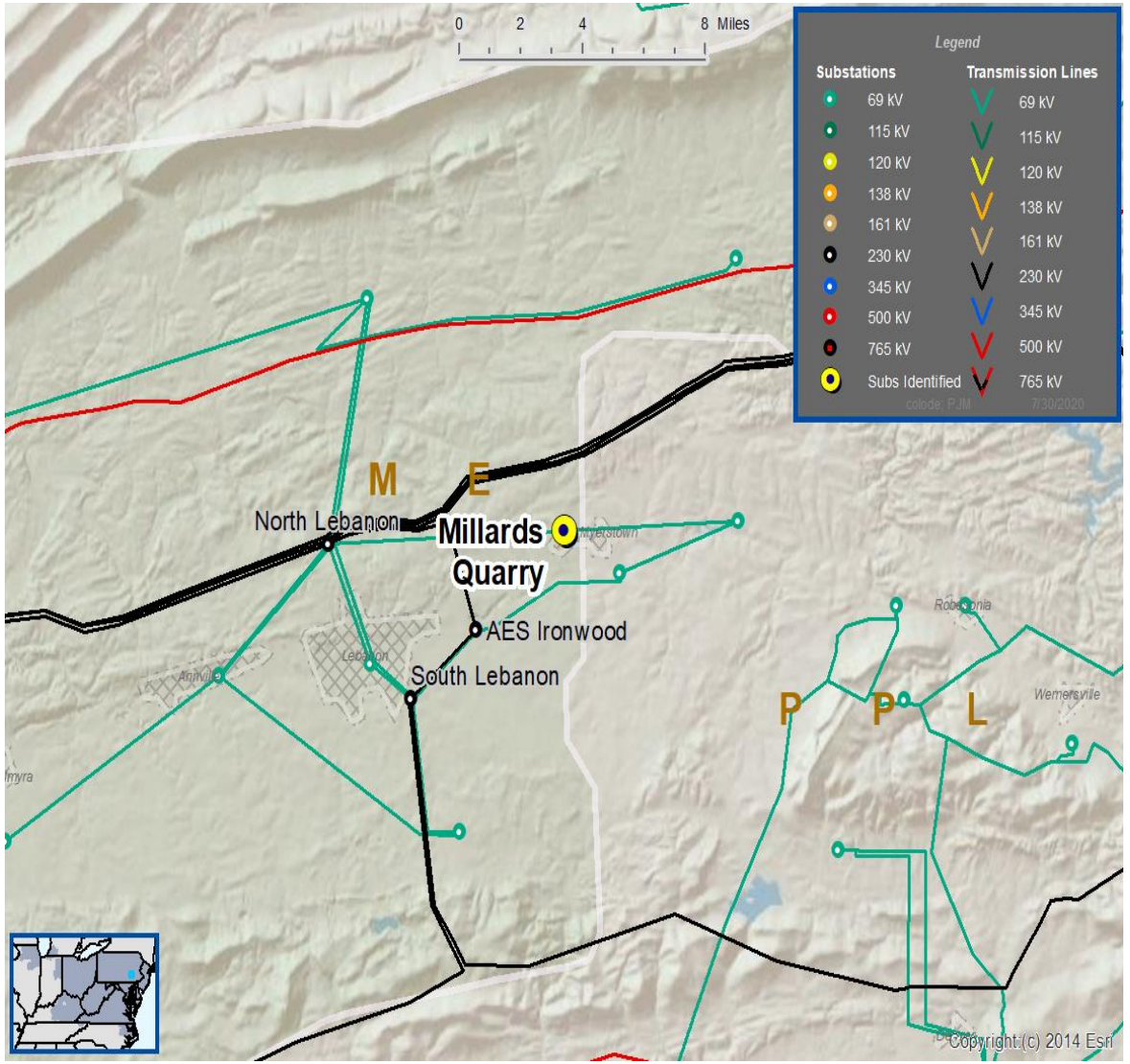
Specific Assumption Reference:

Customer 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 requested 69 kV service; anticipated load is 9.5 MVA; location is near the Millards Quarry 69 kV substation

Requested in-service date is 1/31/2021



Met-Ed Transmission Zone M-3 Process
New Customer Substation

Need Number: ME-2020-010

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan 9/20/2021

Selected Solution:

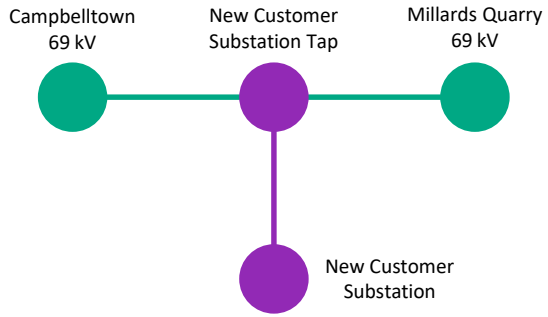
- Tap the Campbelltown - Millards Quarry section of the Campbelltown - North Lebanon 69 kV line
- Install 69 kV switches
- Construct 0.6 miles of 69 kV to customer substation

Estimated Project Cost: $2.7M

Projected In-Service: 01/31/2021

Supplemental Project ID: s2382

Model: 2020 RTEP model for 2025 Summer (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

Need Number: ME-2020-011

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan 9/20/2021

Previously Presented:

Need Meeting 8/13/2020

Solution Meeting 10/15/2020

Project Driver:

Customer Service

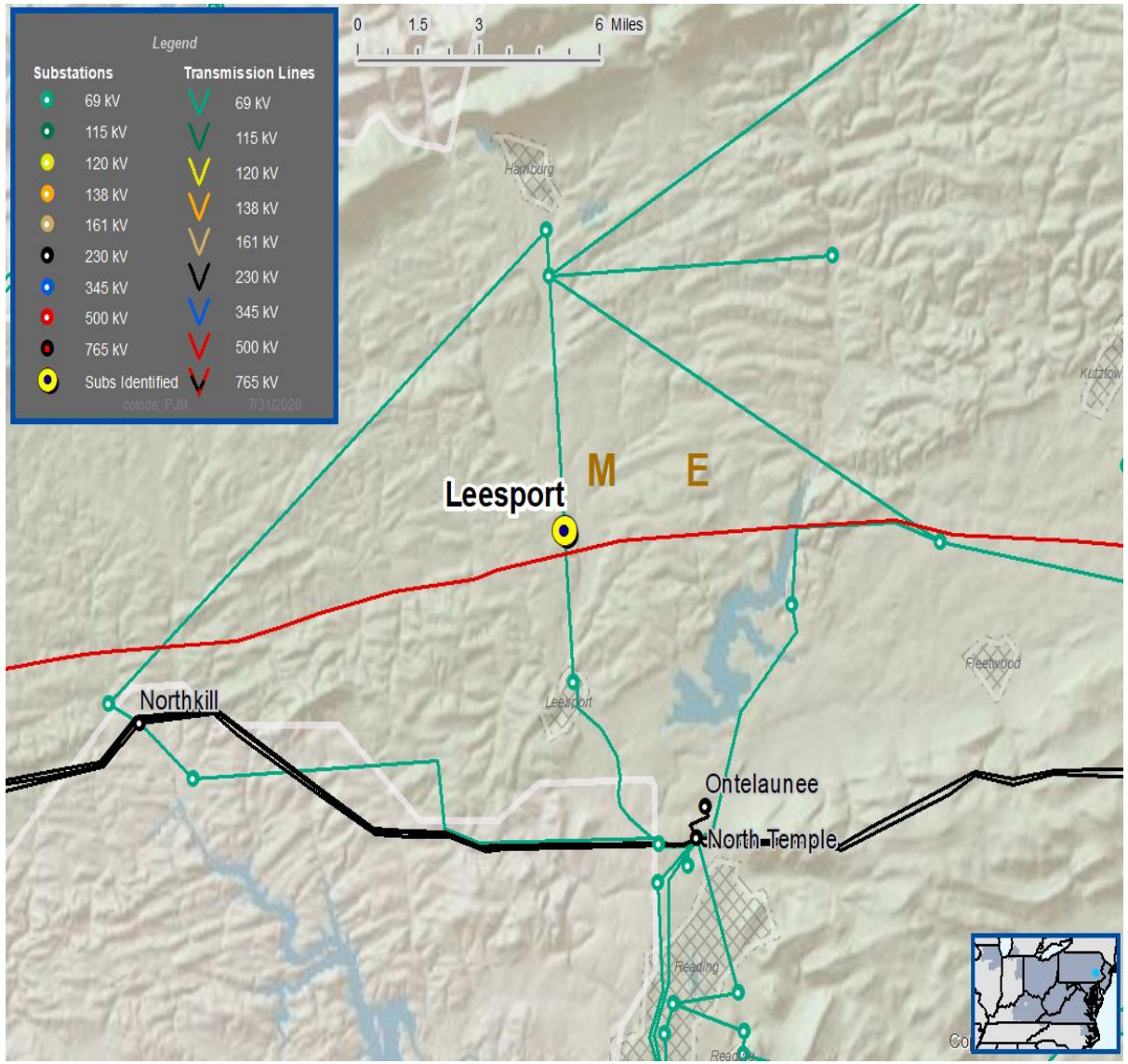
Specific Assumption Reference:

Customer 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 requested 69 kV service; anticipated load is 10 MVA; location is near the Leesport 69 kV substation

Requested in-service date is 11/1/2020



Met-Ed Transmission Zone M-3 Process
New Customer Substation

Need Number: ME-2020-011

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan 9/20/2021

Selected Solution:

- Tap the Leesport – Berkley Tap section of the South Hamburg-North Temple 69 kV line
- Install 69 kV switches
- Construct 0.4 miles of 69 kV to customer substation

Alternatives Considered:

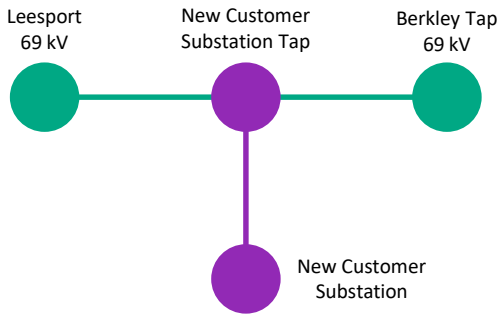
- None

Estimated Project Cost: $2M

Projected In-Service: 03/01/2021

Supplemental Project ID: s2383

Model: 2020 RTEP model for 2025 Summer (50/50)



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

Need Number: ME-2019-030

Process State: Submission of Supplemental Project for Inclusion in the Local Plan 9/20/2021

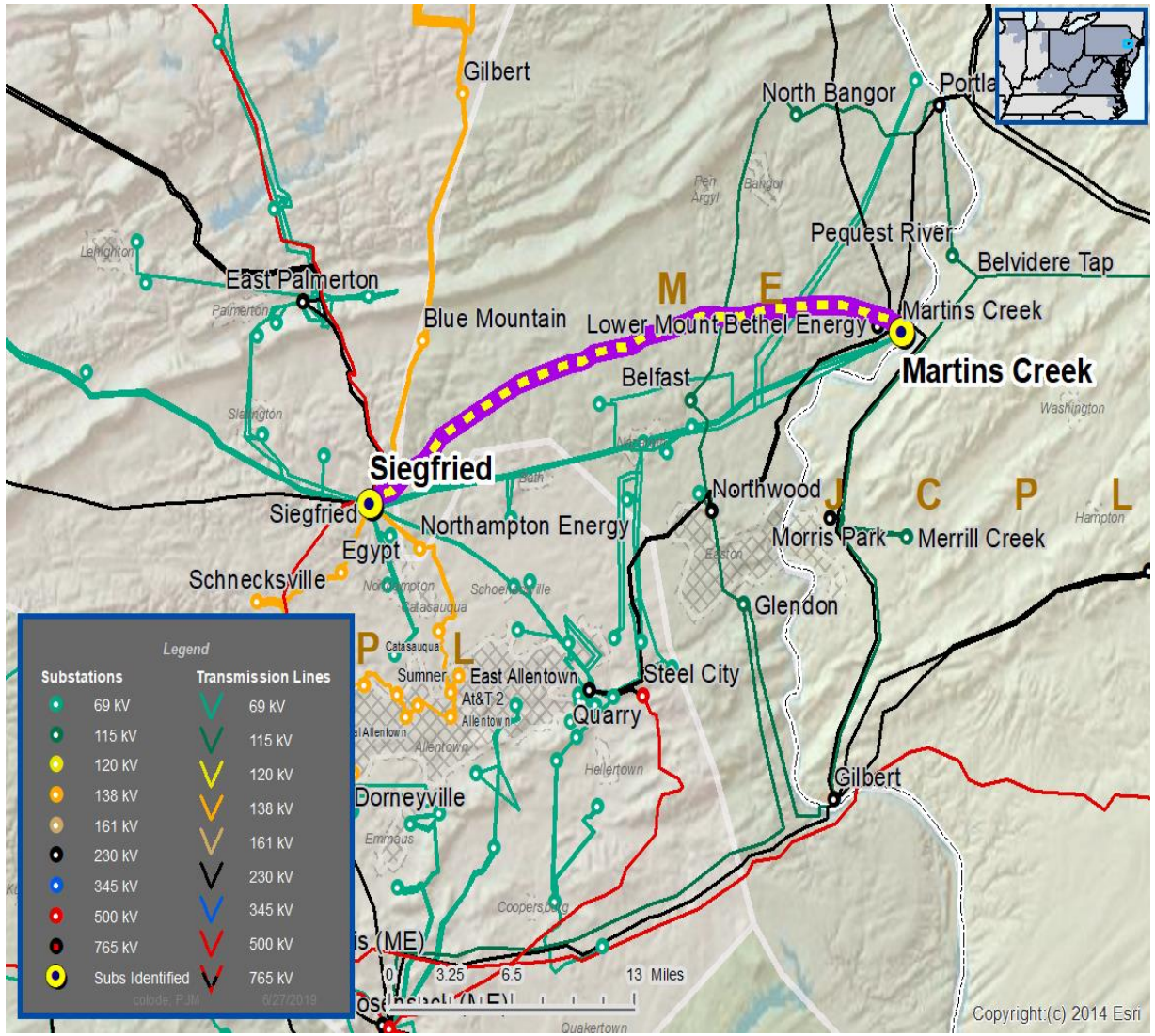
Previously Presented:
Need Meeting 7/11/2019
Solution Meeting 03/09/2021

Project Driver:
Customer Service

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

Problem Statement:
New Customer Connection – Met-Ed distribution has requested a new 230 kV service; anticipated load of approximately 27 MVA; location is near the PPL Martins Creek – Siegfried #2 230 kV line.

Requested in-service date is 6/1/2021



Met-Ed Transmission Zone M-3 Process
New Customer Substation

Need Number: ME-2019-030

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan 9/20/2021

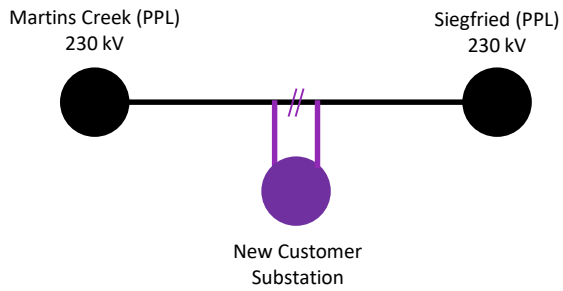
Selected Solution:

- Construct a new 230 kV ring bus adjacent to the existing Martins Creek – Siegfried #2 230 kV Line
- Loop the PPL Martins Creek – Siegfried 230 kV line into the New Customer Substation
- Provide new 230 kV delivery point for the customer

Estimated Project Cost: $9.2 M (includes MAIT and PPL cost)

Projected IS Date: 6/1/2022

Supplemental Project ID: s2557



Legend	
500 kV	
345 kV	
230 kV	
115 kV	
69 kV	
46 kV	
Other	
New	

Met-Ed Transmission Zone M-3 Process

Need Number: ME-2020-004

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan 9/30/2021

Previously Presented: Need Meeting: 4/16/2020

Solution Meeting: 5/21/2021

Project Driver:

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

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

- Relay schemes that have a history of misoperation
- Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
- Communication technology upgrades

Problem Statement:

North Boyertown – West Boyertown 69 kV line – Terminal equipment has an increased risk of failure (line relaying and circuit breaker) due to obsolescence of equipment. Limited spare parts are available.

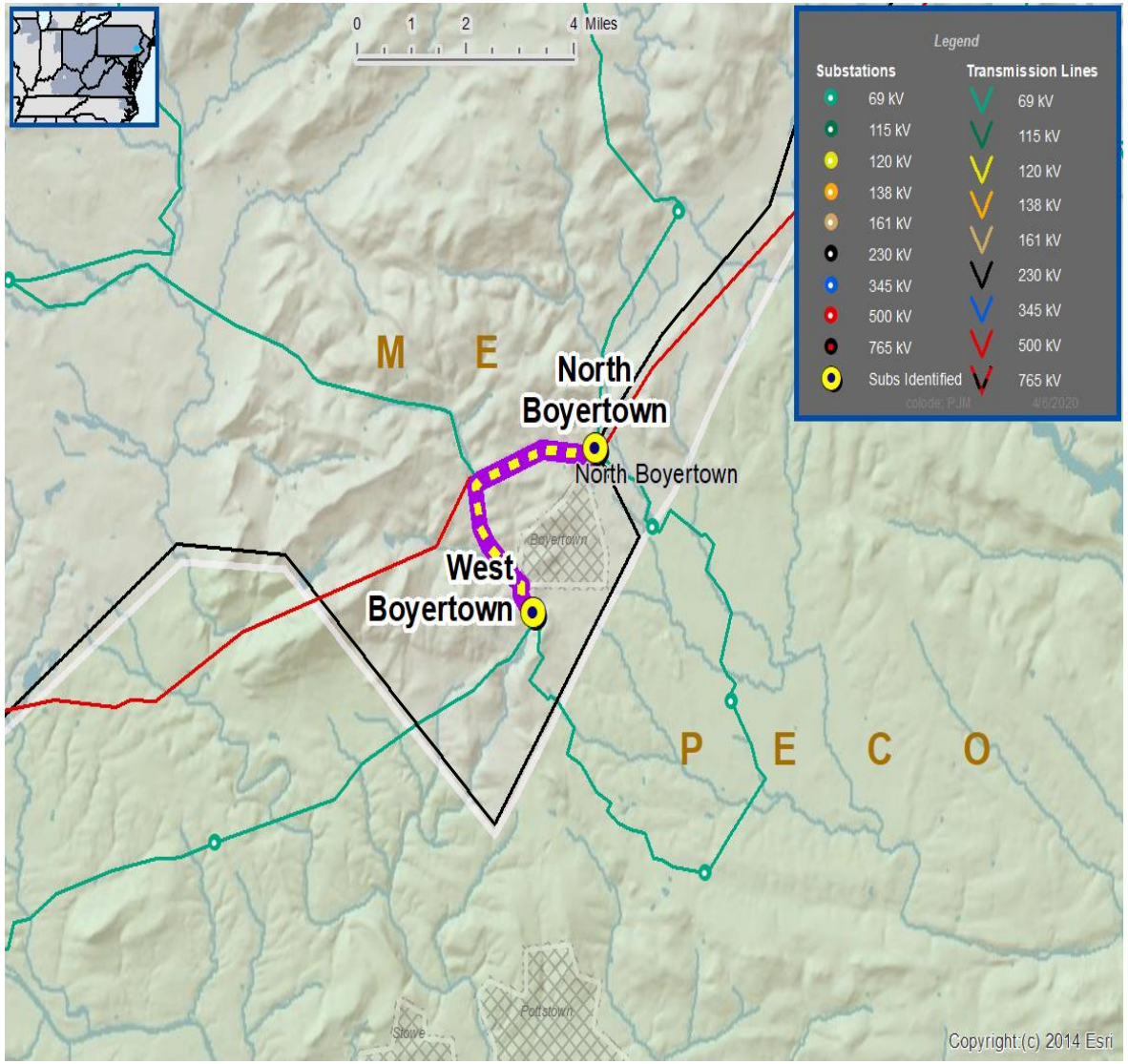
- FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation.
- Circuit breakers are 50+ years old with Type U bushings

Transmission line rating is limited by terminal equipment:

North Boyertown – West Boyertown 69 kV line (substation conductor, line relaying)

Existing line rating: 71/72 MVA (SN/SE)

Existing conductor rating: 80/96 MVA (SN/SE)



Selected Solution:

Need Number	Transmission Line / Substation Locations	New MVA Line Rating (SN / SE)	Scope of Work	Estimated Cost ($ M)	Target ISD
ME-2020-004	North Boyertown – West Boyertown 69 kV Line	80/96	• At North Boyertown – Replace substation conductor, circuit breaker, disconnect switches, and line relaying. • At West Boyertown – Replace substation conductor, circuit breaker, disconnect switches, and line relaying.	$1.6	11/20/2022

Supplemental Project ID: s2566, s2566.1

Questions?

Revision History

9/20/2021 – V1 – Original version posted to pjm.com. Included, s2480, s2481, s2379, s2409, s2380, s2381, s2382, s2383, and s2557

9/30/2021 – V2 – Added the s2566 local plan