Transmission Expansion Advisory Committee –FirstEnergy (Penelec) Supplemental Projects

July 7, 2020

Solution

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
Hooversville #3 230/115 kV Transformer Replacement

Need Number: PN-2020-001

Process Stage: Solution Meeting 07/07/2020

Previously Presented:

Need Meeting 05/12/2020

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

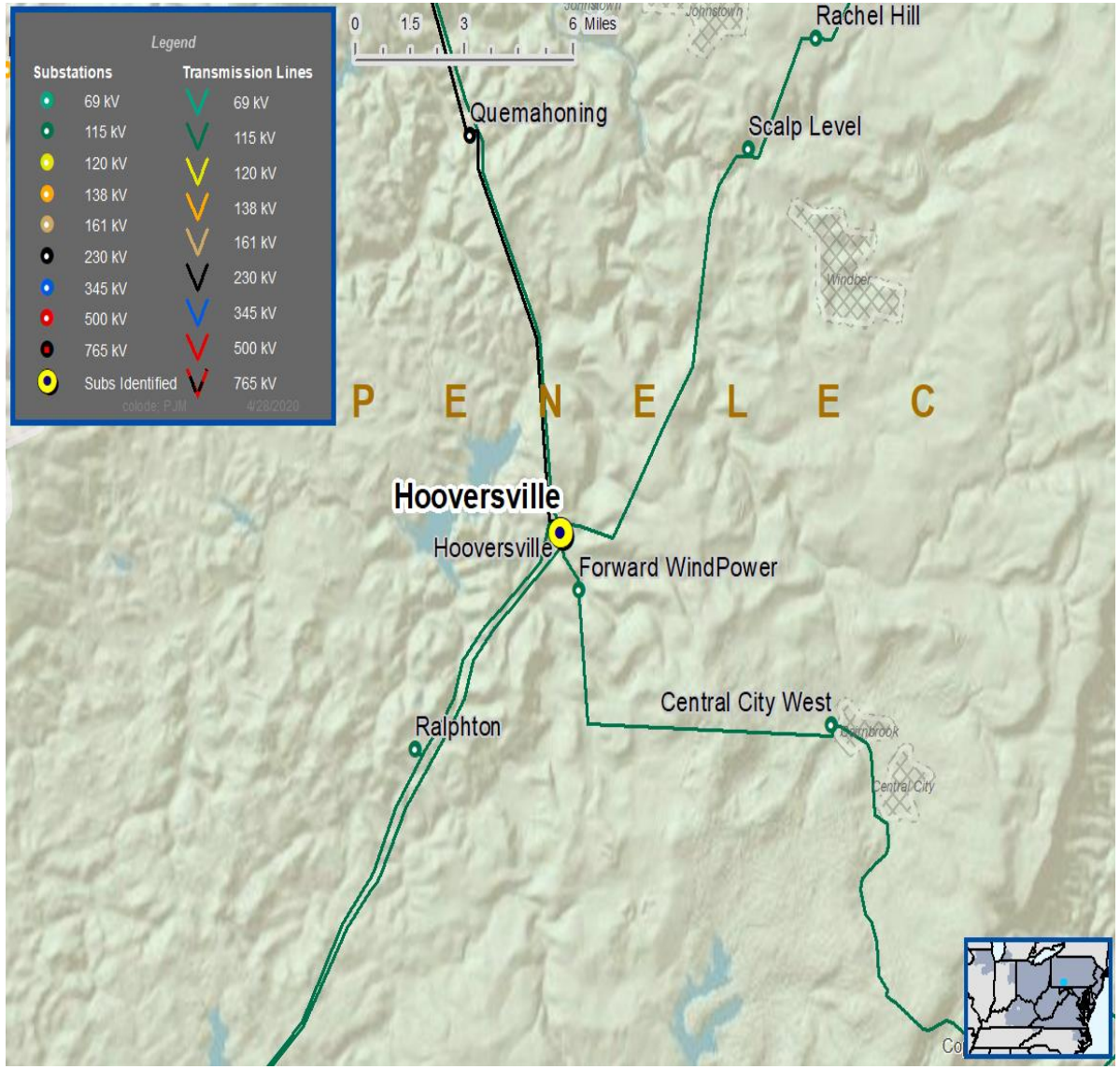
Substation Condition Rebuild/Replacement

Problem Statement:

Hooversville #3 230/115 kV Transformer

- Transformer has increased failure probability due to:
  - Transformer is 43 years old.
  - Type “U” bushings
  - High level heating gases and moisture
  - Obsolete parts
  - Nitrogen and oil leaks

Transformer circuit rating is the existing transformer rating of 245/306 MVA (SN/SE).



Penelec Transmission Zone M-3 Process
Hooversville #3 230/115 kV Transformer Replacement

Need Number: PN-2020-001

Process Stage: Solution Meeting 07/07/2020

Proposed Solution:

Replace Hooversville #3 230/115 kV Transformer

- Replace the #3 230/115 kV transformer and associated equipment with a 180/240/300 MVA transformer

Transformer Rating:

Hooversville #3 230/115 kV Transformer

- Before Proposed Solution: 245 / 306 MVA (SN/SE)
- After Proposed Solution (anticipated): 375 / 438 MVA (SN/SE)

Alternatives Considered:

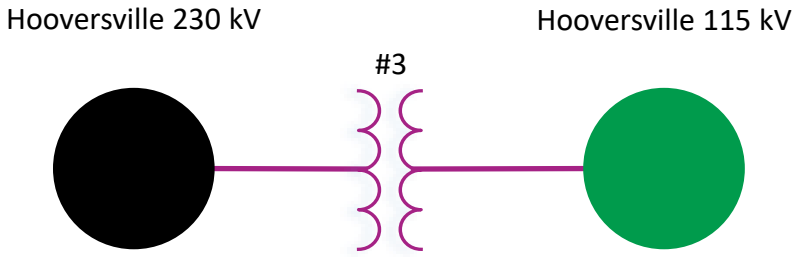
- Maintain existing condition

Estimated Project Cost: $4.2M

Projected In-Service: 12/10/2021

Project Status: Conceptual

Model: 2020 Series 2025 Summer RTEP 50/50



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

Penelec Transmission Zone M-3 Process
Erie West #1 345/115 kV Transformer Replacement

Need Number: PN-2020-002

Process Stage: Solution Meeting 07/07/2020

Previously Presented:

Need Meeting 5/12/2020

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

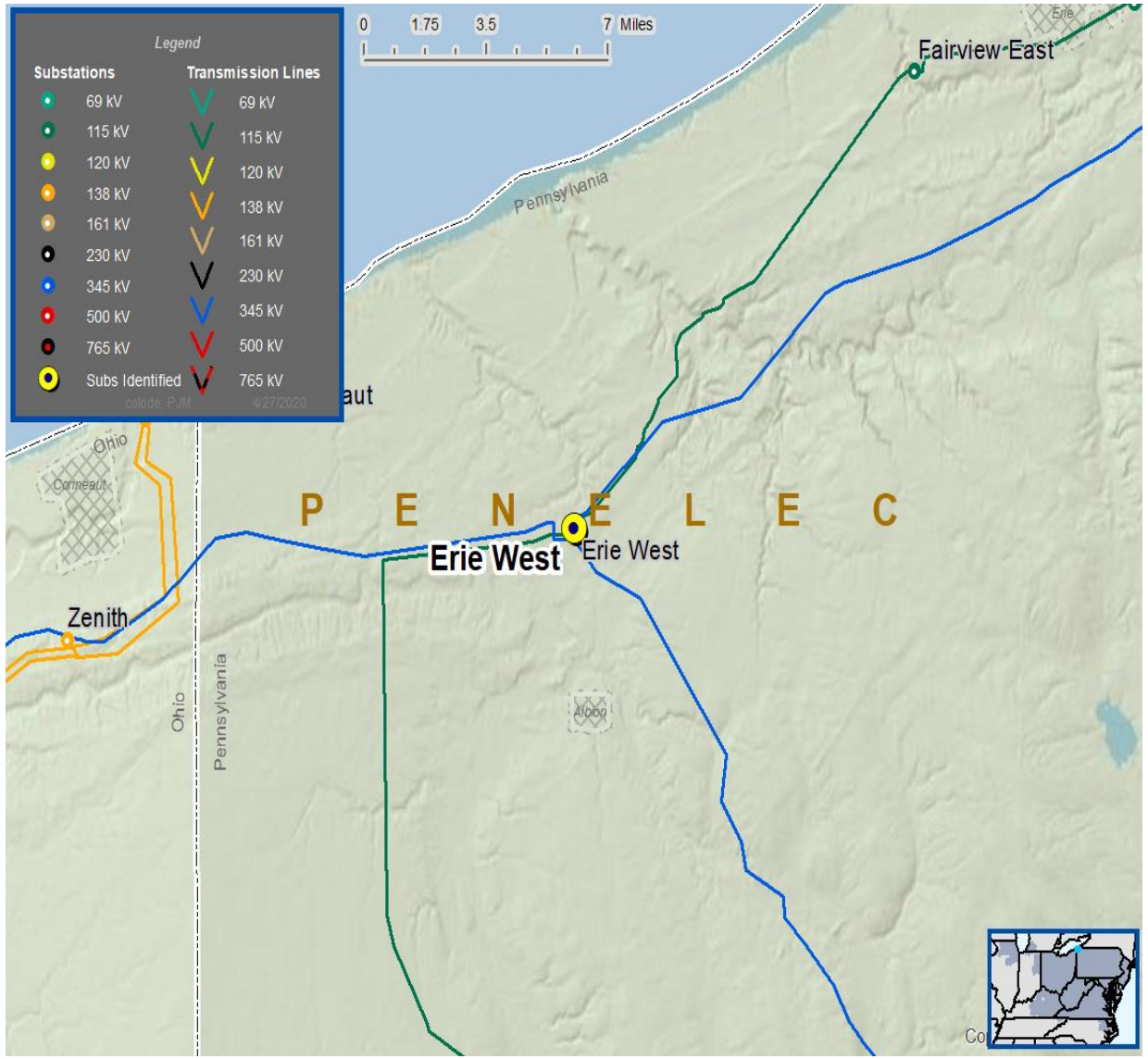
Substation Condition Rebuild/Replacement

Problem Statement:

Erie West #1 345/115 kV Transformer

- Transformer has increased failure probability due to:
  - Transformer is 47 years old.
  - High level heating gases and moisture
  - HV bushings have significant deterioration
  - Obsolete parts
  - Nitrogen and oil leaks

Transformer circuit rating is the existing transformer rating of 266/333 MVA (SN/SE).



Penelec Transmission Zone M-3 Process
Erie West #1 345/115 kV Transformer Replacement

Need Number: PN-2020-002

Process Stage: Solutions Meeting 07/07/2020

Proposed Solution:

Replace Erie West #1 345/115 kV Transformer

- Replace the #1 345/115 kV transformer and associated equipment with a 168/224 MVA transformer

Transformer Rating:

Erie West #1 345/115 kV Transformer

- Before Proposed Solution: 266 / 333 MVA (SN/SE)
- After Proposed Solution (anticipated): 280 / 341 MVA (SN/SE)

Alternatives Considered:

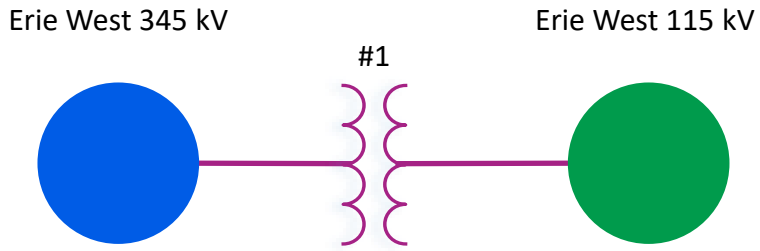
- Maintain existing condition

Estimated Cost: $3.3M

Projected In-Service: 12/31/2021

Project Status: Conceptual

Model: 2020 Series 2025 Summer RTEP 50/50



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

Penelec Transmission Zone M-3 Process
Altoona #1 230-46 kV Transformer Replacement

Need Number: PN-2020-007

Process Stage: Solution Meeting 07/07/2020

Previously Presented:

Need Meeting 05/12/2020

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

Substation Condition Rebuild/Replacement

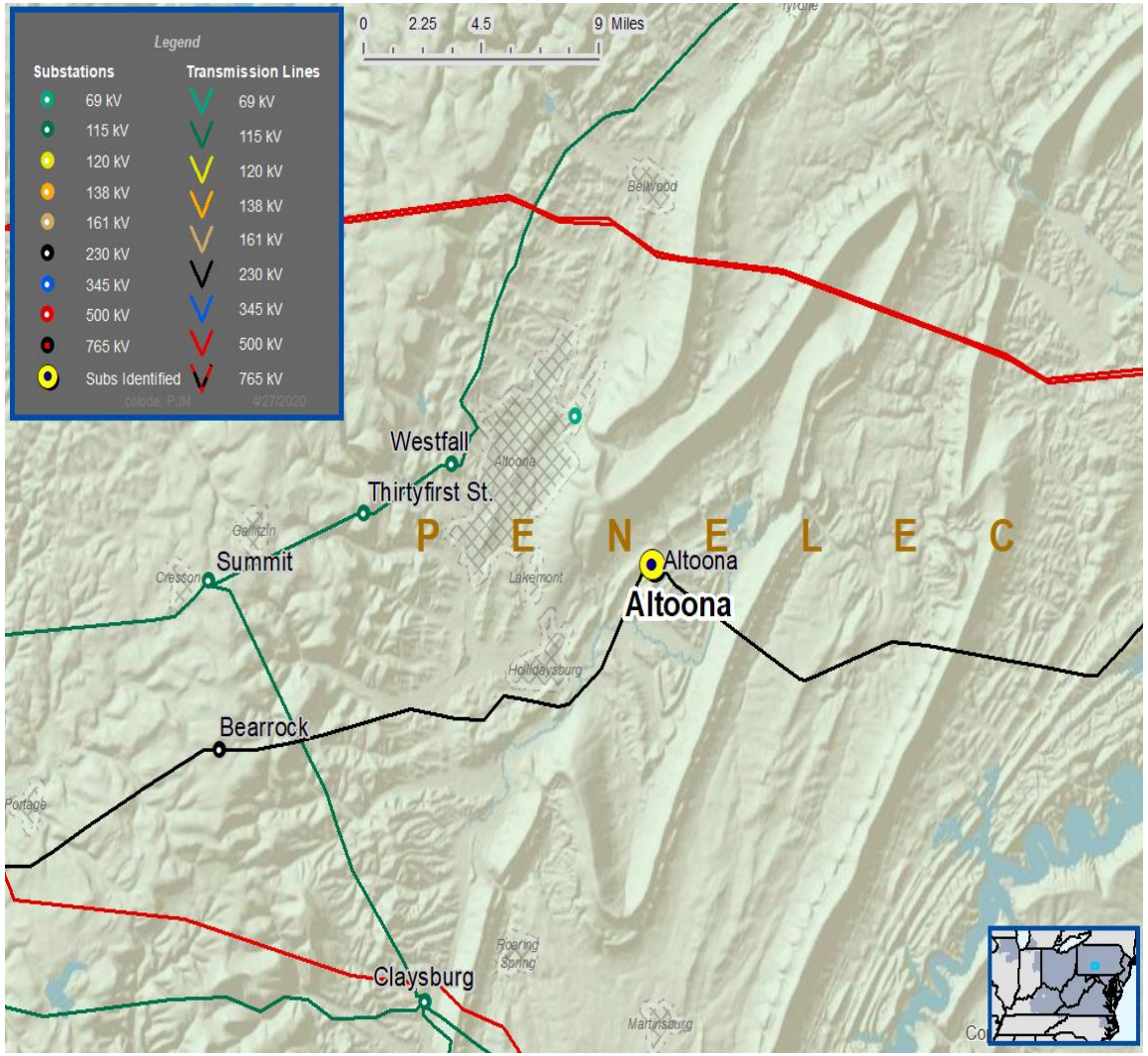
System Performance Projects Global Factors

Problem Statement:

Altoona #1 230-46 kV Transformer

- Transformer has increased failure probability due to:
  - Transformer is 55 years old
  - Poor oil quality in LTC
  - Nitrogen leaks in tank
  - Bushing H3 oil leaks

Transformer circuit rating is 89/97 MVA (SN/SE) and the existing transformer rating is 90/97 MVA (SN/SE).
(substation conductor)



Penelec Transmission Zone M-3 Process
Altoona #1 230-46 kV Transformer Replacement

Need Number: PN-2020-007

Process Stage: Solution Meeting 07/07/2020

Proposed Solution:

Replace Altoona #1 230-46 kV Transformer

- Replace the #1 230-46 kV transformer and associated equipment with a 60/80/100 MVA transformer

Transformer Rating:

Altoona #1 230-46 kV Transformer

- Before Proposed Solution: 89 / 97 MVA (SN/SE)
- After Proposed Solution (anticipated): 120 / 129 MVA (SN/SE)

Alternatives Considered:

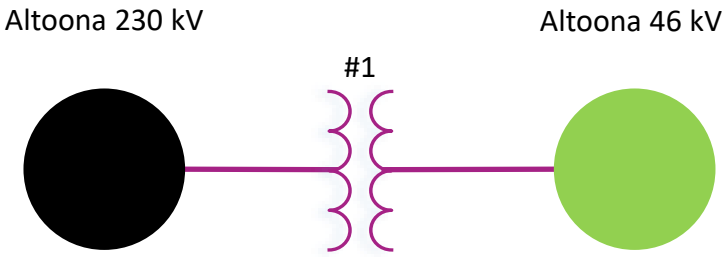
- Maintain existing condition

Estimated Project Cost: $3.5M

Projected In-Service: 06/01/2022

Project Status: Conceptual

Model: 2020 Series 2025 Summer RTEP 50/50



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

Penelec Transmission Zone M-3 Process
Altoona #2 230-46 kV Transformer Replacement

Need Number: PN-2020-008

Process Stage: Solution Meeting 07/07/2020

Previously Presented:

Need Meeting 05/12/2020

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

Substation Condition Rebuild/Replacement

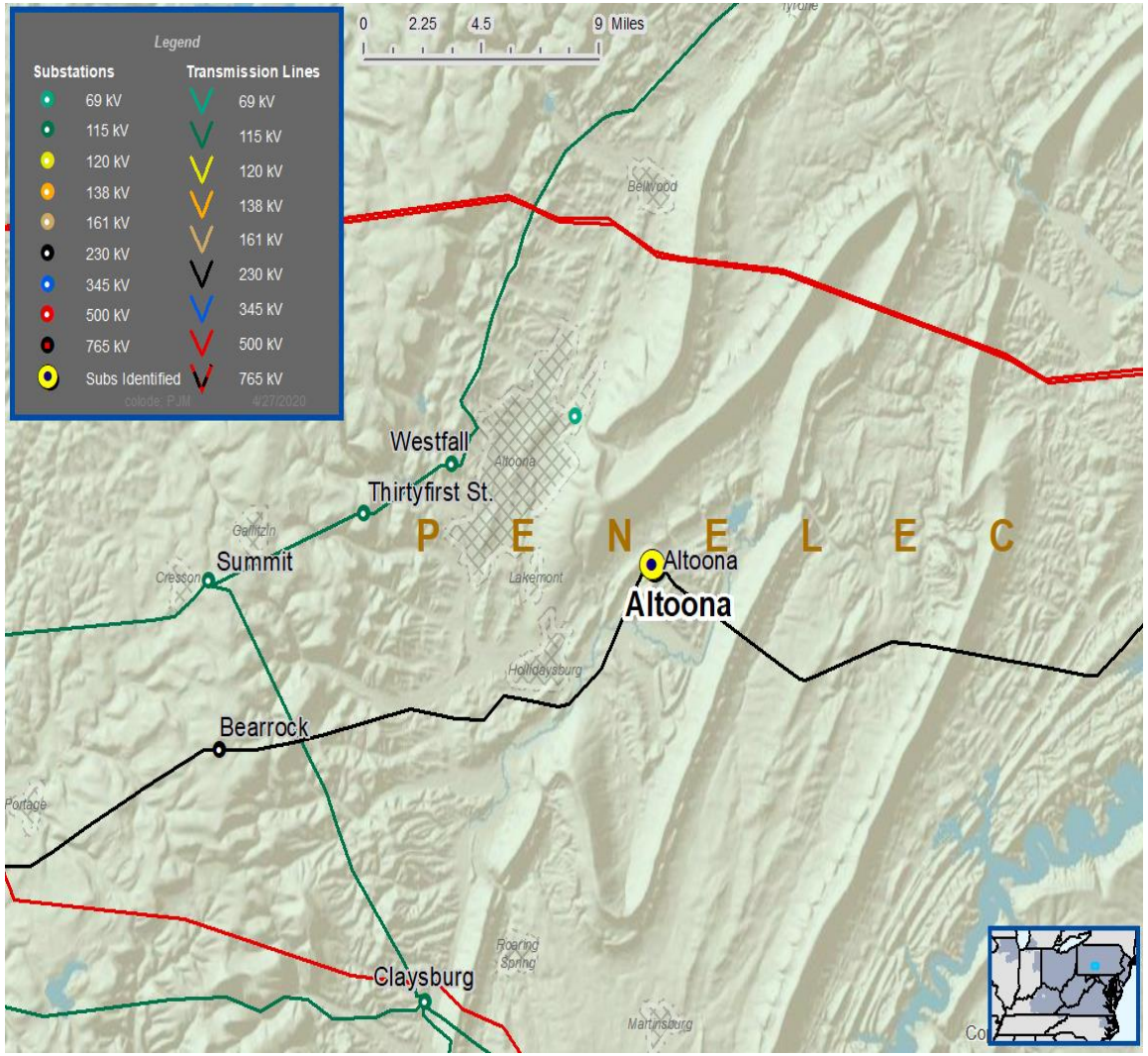
System Performance Projects Global Factors

Problem Statement:

Altoona #2 230-46 kV Transformer

- Transformer has increased failure probability due to:
  - Transformer is 47 years old
  - Nitrogen leak in tank
  - LTC oil leak
  - Pump flanges are leaking
  - SCADA alarms are not functional

Transformer circuit rating is 89/97 MVA (SN/SE) and the existing transformer rating is 91/97 MVA (SN/SE).
(substation conductor)



Penelec Transmission Zone M-3 Process
Altoona #2 230-46 kV Transformer Replacement

Need Number: PN-2020-008

Process Stage: Solution Meeting 07/07/2020

Proposed Solution:

Replace Altoona #2 Transformer 230-46 kV Unit

- Replace the #2 230-46 kV transformer and associated equipment with a 60/80/100 MVA transformer

Transformer Rating:

Altoona #2 230-46 kV Transformer

- Before Proposed Solution: 89 / 97 MVA (SN/SE)
- After Proposed Solution (anticipated): 120 / 129 MVA (SN/SE)

Alternatives Considered:

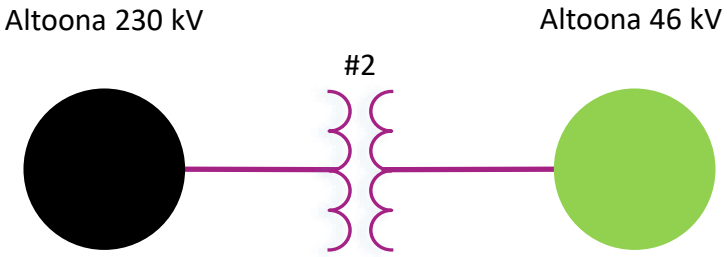
- Maintain existing condition

Estimated Project Cost: $3.6M

Projected In-Service: 12/31/2022

Project Status: Conceptual

Model: 2020 Series 2025 Summer RTEP 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

6/25/2020 – V1 – Original version posted to pjm.com