Transmission Expansion Advisory Committee FirstEnergy Supplemental Projects

April 1, 2025

Transmission Expansion Advisory Committee – FirstEnergy Supplemental 04.01.2025

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



APS Transmission Zone M-3 Process Elko 230/138 kV Transformer



Need Number: APS-2025-012

Process Stage: Need Meeting 04/01/2025

Project Driver: Equipment Material Condition, Performance & Risk

Specific Assumption References:

System Performance Projects Global Factors

System reliability and performance

Add/Replace Transformers

Past System Reliability/Performance

Problem Statement:

The Elko No. 1 230/138 kV Transformer is approximately 56 years old and is approaching end of life.

The transformer has exhibited high levels of dissolved gasses in oil and high nitrogen consumption.

Existing transformer ratings:

- 230 / 286 MVA (SN/SSTE)
- 280 / 325 MVA (WN/WSTE)

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



APS Transmission Zone M-3 Process Pruntytown No. 1 500/138 kV Transformer



Need Number: APS-2024-077 Process Stage: Solution Meeting TEAC - 04/01/2025

Previously Presented: Need Meeting 12/03/2024

Project Driver: Equipment Material Condition, Performance & Risk

Specific Assumption References:

- System Performance Projects Global Factors
- System reliability and performance
- Add/Replace Transformers
- Past System Reliability/Performance

Problem Statement:

The Pruntytown No. 1 500/138 kV Transformer is approximately 54 years old and is approaching end of life.

The transformer has increased moisture content which indicates presence of polar contaminants.

Replacement components are difficult to source leading to non-standard repairs.

Existing transformer ratings:

- 467 / 484 MVA (SN/SSTE)
- 549 / 565 MVA (WN/WSTE)

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Need Number: APS-2024-077

Process Stage: Solution Meeting TEAC - 04/01/2025

Proposed Solution:

Replace No. 1 500/138 kV Transformer at Pruntytown Substation

Replace (1) - 500 kV Disconnect Switch

Alternatives Considered:

Maintain transformer in existing condition with elevated risk of failure.

Estimated Project Cost: \$18.8 M

Projected In-Service: 06/13/2031

Project Status: Conceptual

Model: 2024 RTEP model for 2029 Summer (50/50)

APS Transmission Zone M-3 Process Pruntytown No. 1 500/138 kV Transformer





Need Number: APS-2024-078

APS Transmission Zone M-3 Process Pruntytown No. 2 500/138 kV Transformer



Specific Assumption References:

• System Performance Projects Global Factors

Process Stage: Solution Meeting TEAC - 04/01/2025

Project Driver: Equipment Material Condition, Performance & Risk

Previously Presented: Need Meeting 12/03/2024

- System reliability and performance
- Add/Replace Transformers
- Past System Reliability/Performance

Problem Statement:

The Pruntytown No. 2 500/138 kV Transformer is approximately 56 years old and is approaching end of life.

The transformer has increased moisture content which indicates presence of polar contaminants.

Replacement components are difficult to source leading to non-standard repairs.

Existing transformer ratings:

- 469/ 486 MVA (SN/SSTE)
- 551 / 567 MVA (WN/WSTE)

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Need Number: APS-2024-078

Process Stage: Solution Meeting TEAC - 04/01/2025

Proposed Solution:

Replace No. 2 500/138 kV Transformer at Pruntytown Substation

Replace (2) - 138 kV Circuit Breakers

Replace (1) - 500 kV Disconnect Switch

Replace Substation Conductor

Alternatives Considered:

Maintain transformer in existing condition with elevated risk of failure.

Estimated Project Cost: \$ 18.8 M

Projected In-Service: 12/13/2030

Project Status: Conceptual

Model: 2024 RTEP model for 2029 Summer (50/50)

APS Transmission Zone M-3 Process Pruntytown No. 2 500/138 kV Transformer







APS Transmission Zone M-3 Process Wylie Ridge No. 7 500/345 kV Transformer

Need Number: APS-2024-080

Process Stage: Solution Meeting TEAC - 04/01/2025

Previously Presented: Need Meeting 11/06/2024

Project Driver: Equipment Material Condition, Performance & Risk, Operational Flexibility and Efficiency

Specific Assumption References:

- System Performance Projects Global Factors
- System reliability and performance
- Add/Replace Transformers
- Past System Reliability/Performance

Problem Statement:

The Wylie Ridge No. 7 500/345 kV Transformer is approximately 48 years old and is approaching end of life.

The transformer has increased hydrogen and ethylene readings and low dielectric strength.

The transformer has increased moisture content which indicates presence of polar contaminants.

Replacement components are difficult to source leading to non-standard repairs.

Existing transformer ratings:

- 881 / 883 MVA (SN/SSTE)
- 883 / 883 MVA (WN/WSTE)

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APS Transmission Zone M-3 Process Wylie Ridge No. 7 500/345 kV Transformer

Need Number: APS-2024-080

Process Stage: Solution Meeting TEAC - 04/01/2025

Proposed Solution:

Replace No. 7 500/345 kV Transformer at Wylie Ridge Substation

Replace (1) - 500 kV Disconnect Switch

Replace (1) - 345 kV Disconnect Switch

Alternatives Considered:

Maintain transformer in existing condition with elevated risk of failure.

Estimated Project Cost: \$ 20 M

Projected In-Service: 12/13/2030

Project Status: Conceptual

Model: 2024 RTEP model for 2029 Summer (50/50)



 Legend

 500 kV

 345 kV

 230 kV

 138 kV

 138 kV

 115 kV

 69 kV

 46 kV

 34.5 kV

 23 kV



Need Number: APS-2025-001 Process Stage: Solution Meeting TEAC - 04/01/2025 Previously Presented: Need Meeting 02/04/2025

Project Driver: Equipment Material Condition, Performance & Risk

Specific Assumption References:

- System Performance Projects Global Factors
- Substation/line equipment limits
- System reliability and performance
- Substation Condition Rebuild/Replacement
- Circuit breakers and other fault interrupting devices

Problem Statement:

The Frederick A – Monocacy 230 kV Line circuit breakers, circuit switchers, associated disconnect switches and protective relaying at Frederick A and Monocacy substations are aging with increasing maintenance concerns. The equipment is over 45 years old.

Transmission line ratings are limited by terminal equipment.

- Existing line ratings: 548 / 688 / 699 / 797 MVA (SN/SE/WN/WE)
- Existing conductor ratings: 617 / 754 / 699 / 894 (MVA SN/SE/WN/WE)

APS Transmission Zone M-3 Process Frederick A – Monocacy 230 kV Line



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Transmission Expansion Advisory Committee – FirstEnergy Supplemental 04.01.2025



APS Transmission Zone M-3 Process Frederick A – Monocacy 230 kV Line

Need Number: APS-2025-001

Process Stage: Solution Meeting TEAC - 04/01/2025

Proposed Solution:

At Frederick A Substation:

- Replace existing Line Relaying, Replace (2) - 230 kV Disconnect Switches, Replace Substation Conductor

At Monocacy Substation:

- Replace (1) - 230 kV Circuit Breaker, Replace existing Line Relaying, Replace (2) - 230 kV Disconnect Switches, Replace Substation Conductor

Alternatives Considered:

Maintain equipment in existing condition with elevated risk of failure.

Estimated Project Cost: \$ 3.9 M

Projected In-Service: 11/24/2027

Project Status: Conceptual

Model: 2024 RTEP model for 2029 Summer (50/50)



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

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

Solutions

Submission of Supplemental Projects & Local Plan

Timing
10 days before Needs Meeting
10 days after Needs Meeting

Activity	Timing
TOs and Stakeholders Post Solutions Meeting slides	10 days before Solutions Meeting
Stakeholder comments	10 days after Solutions Meeting

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

03/21/2025–V1 – Original version posted to pjm.com 4/1/2025-V2- Updated 'Alternatives Considered' for APS-2025-001.