

Transmission Expansion Advisory Committee: AEP Supplemental Projects

October 31, 2023

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

AEP Transmission Zone M-3 Process New Carlisle Customer Needs

Need Number: AEP-2023-IM023

Process Stage: Needs Meeting 10/31/2023

Supplemental Project Driver: Customer Service

Specific Assumptions Reference: AEP Interconnection Guidelines (AEP Assumptions Slide 12)

Problem Statement:

- A customer has requested new service for 1500MW data center in New Carlisle, IN area. Initial service is requested by 12/15/2026.



Legend

- Station
- 12 kV
 - 14 kV
 - 23 kV
 - 34 kV
 - 40 kV
 - 46 kV
 - 69 kV
 - 88 kV
 - 115 kV
 - 138 kV
 - 161 kV
 - 230 kV
 - 345 kV
 - 500 kV
 - 765 kV



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

AEP Transmission Zone M-3 Process Central Ohio

Need Number: AEP-2023-OH072
Process Stage: Solutions Meeting 10/31/2023
Previously Presented: Need Meeting 05/09/2023

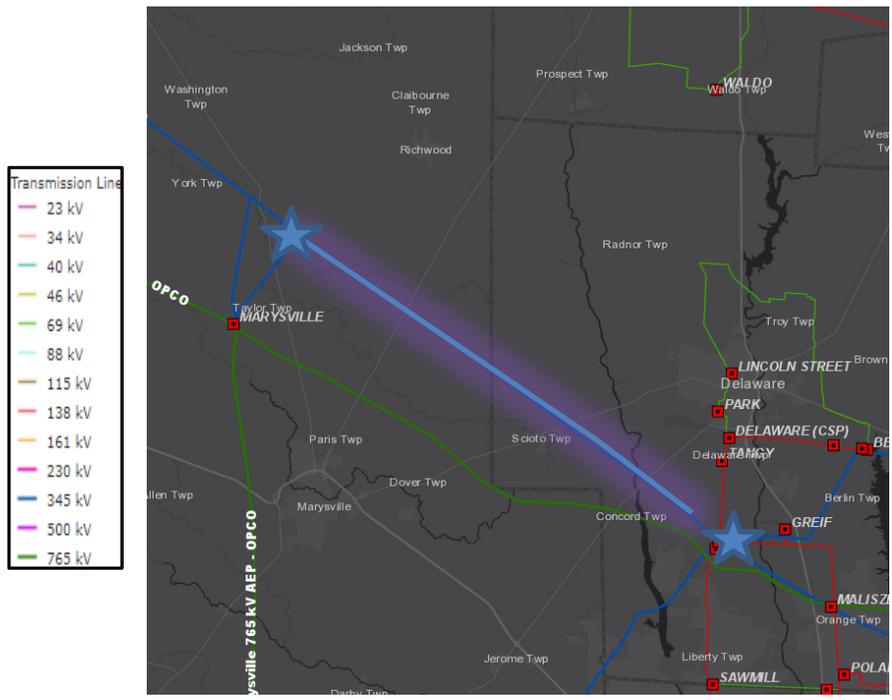
Supplemental Project Driver: Equipment Material/Condition/Performance/Risk

Specific Assumption Reference: AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 13)

Problem Statement:

Paper Expanded/Air Expanded (PE/AE) Lines in AEP

- The specific conductors of concern are as follows:
 - 1,275,000 CM ACSR/PE 54/19
 - 1,414,000 CM ACSR/AE 62/19
 - 1,414,000 CM ACSR/PE 62/19 (Falbo)
 - 1,708,000 CM ACSR/AE 66/19
 - 1.75 ACSR AE
- There are approximately 570 miles of PE/AE lines throughout AEP’s 345kV footprint. Many of the PE/AE lines are built on double circuit towers making the conductor miles approximately 1,114 miles on the AEP system
- The Centre for Energy Advancement through Technological Innovation (CEATI) Report No. T144700-3257: Statistical Data and Methodology for Estimating the Expected Life of Transmission Line Components provides a timeframe of anticipated useful life of the various transmission line equipment as guided by industry experience. The CEATI estimated expected life of conductor is 40-80 years. AEP focuses on evaluating the condition and performance of each asset and the risk that the failure of each poses to the system, connected customers, personnel, and the public.
- The PE/AE conductor types are no longer standard conductor types used by AEP and the general utility industry.
 - Vendors do not have this conductor type readily available for purchase. This conductor type requires specialized splices and assemblies, which are not readily available for purchase from vendors. Special orders are required to obtain this equipment, causing long lead times for materials.
- AEP has concerns of increased core corrosion on the PE/AE conductor fleet. These concerns are based on the review of conductor samples following recovery events.



Central Ohio

AEP Transmission Zone M-3 Process Central Ohio

Need Number: AEP-2023-OH072

Process Stage: Solutions Meeting 10/31/2023

Previously Presented: Need Meeting 05/09/2023

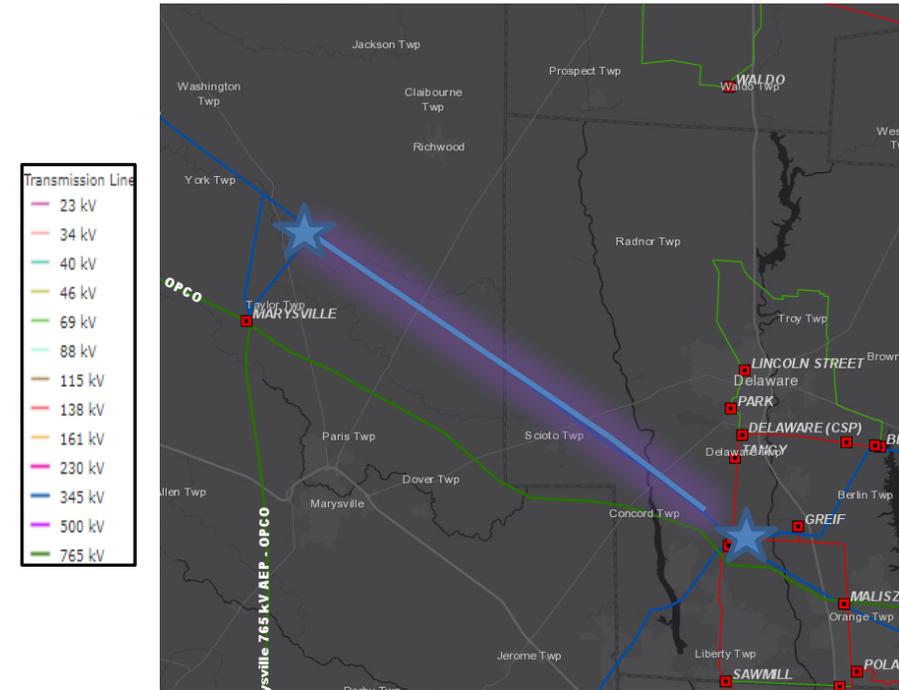
Supplemental Project Driver: Equipment Material/Condition/Performance/Risk

Specific Assumption Reference: AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 13)

Problem Statement:

Paper Expanded/Air Expanded (PE/AE) Lines in AEP

- Corrosion related conditions are an indicator of the elevated risk of conductor or equipment failure.
- The degraded state of corroded conductor cores result in significant loss of tensile strength and potential risk to the public if the conductor were to fail and fall to the ground. This can also lead to unplanned outages on the 345kV circuits.
- Due to the lack of conductor availability, standard conductor is spliced in when needed. Each conductor type has different weights, which can affect ratings and structure overloads. When the weight of the wire is increased, the existing structures can be overloaded.
- AEP anticipates a timeline of over 20 years to address the imminent needs of the 570 line miles of 345kV. This timeline was created assuming best scenario and could be impacted if there are any ROW concerns, material acquisition concerns or operational limitations. Limitations of 345kV outages in the summers are expected
 - If AEP addresses 2 of these lines at a time this could impact 4x 345kV circuits. Taking several outages on the 345kV system at once could have operational challenges
- In order to address these needs within the next 20+ years, AEP needs to begin planning solutions for PE/AE lines today
- Even though the conductor needs to be evaluated for each line, it is possible that we will be able to use existing structures where feasible. Each of these circuits will need to be evaluated individually and recommended solutions will be shared with stakeholders in accordance with M-3 provisions



Central Ohio

AEP Transmission Zone M-3 Process Central Ohio

Need Number: AEP-2023-OH072

Process Stage: Solutions Meeting 10/31/2023

Previously Presented: Need Meeting 5/9/2023

Supplemental Project Driver: Equipment Material/Condition/Performance/Risk

Paper Expanded conductor samples were observed following the 2019 Memorial Day Tornadoes in the Indiana and Michigan footprint. Corrosion of the cores can be seen in the pictures below.



AEP Transmission Zone M-3 Process Central Ohio

Need Number: AEP-2023-OH072

Process Stage: Solutions Meeting 10/31/2023

Previously Presented: Need Meeting 5/9/2023

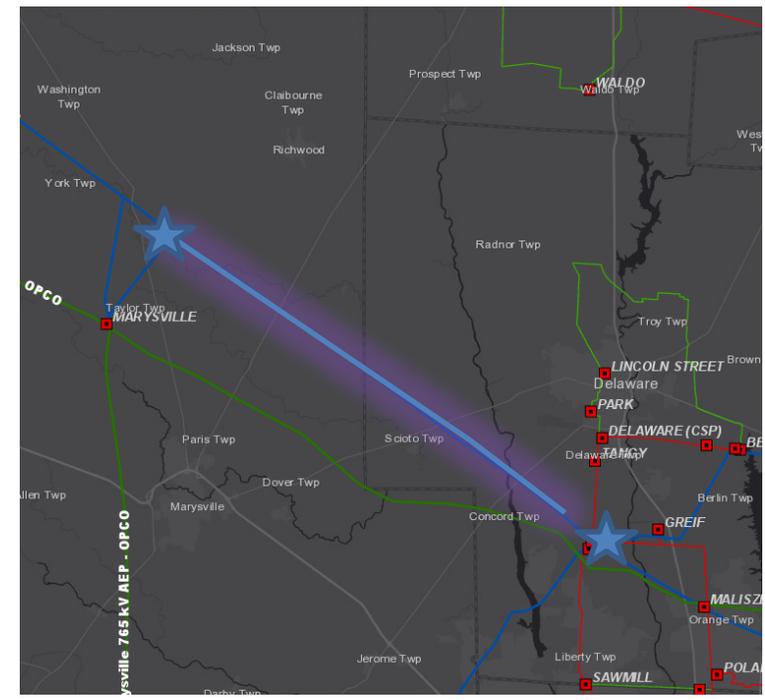
Supplemental Project Driver: Equipment Material/Condition/Performance/Risk

Specific Assumption Reference: AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 13)

Problem Statement: Paper Expanded/Air Expanded (PE/AE) Lines in AEP

Marysville- Hyatt 345kV Line PE Conductor Need

- Marysville-Hyatt is a 345kV double circuit line. The majority of structures (78%) are 1955 vintage lattice steel type. Conductors on the Marysville-Tangy-Hyatt 345kV line:
 - 14.05 miles of 1,275,000 CM ACSR/PE Conductor
 - 5.14 miles of 1,414,000 CM ACSR/PE Conductor
 - 0.04 miles of 1,414,000 CM ACSR/PE Conductor
- Since 2018, there have been 3 momentary and 2 permanent outages on the Marysville – Tangy 345kV circuit.
- Currently, there are 16 structures with at least one open hardware condition, which relates to 20% of the structures on the line segment. There are currently 18 open hardware conditions specifically affecting dead end insulators, suspension insulators, and a corona ring including burnt, broken, and chipped.



Central Ohio



BOUNDLESS ENERGY™

Need Number: AEP-2023-OH072

Process Stage: Solutions Meeting 10/31/2023

Proposed Solution:

Marysville – Hyatt 345 kV Line: Rebuild approximately 19.0 miles of the double circuit 345 kV line using 4-bundled 795 ACSR conductor BOLD construction.

Existing ratings: Marysville – Tangy (FE): 897/1301/1138/1452, Hyatt – Tangy (FE): 971/1419/1234/1585, Hyatt – Marysville: 1166/1376/1481/1639

Proposed ratings: Marysville – Tangy (FE): 1409/1887/1766/2078, Hyatt – Tangy (FE): 1560/1900/1766/1912, Hyatt – Marysville: 1409/1655/1781/1970

Total Estimated Transmission Cost: \$116.7M

Alternatives Considered:

- Reconductoring the line section was considered and evaluated. The engineering feedback received was that the 1950’s structures that make up the line could not support a more modern (bundled) conductor. The Marysville – Hyatt line is one of the primary sources into Central Ohio, an area that has continued to see significant amounts of load growth. Moving forward with the proposed rebuild in lieu of making a significant investment into the structures that will be over 70 years old by time the work is completed is the more prudent solution.

Estimated Transmission Cost of Alternative: \$50M

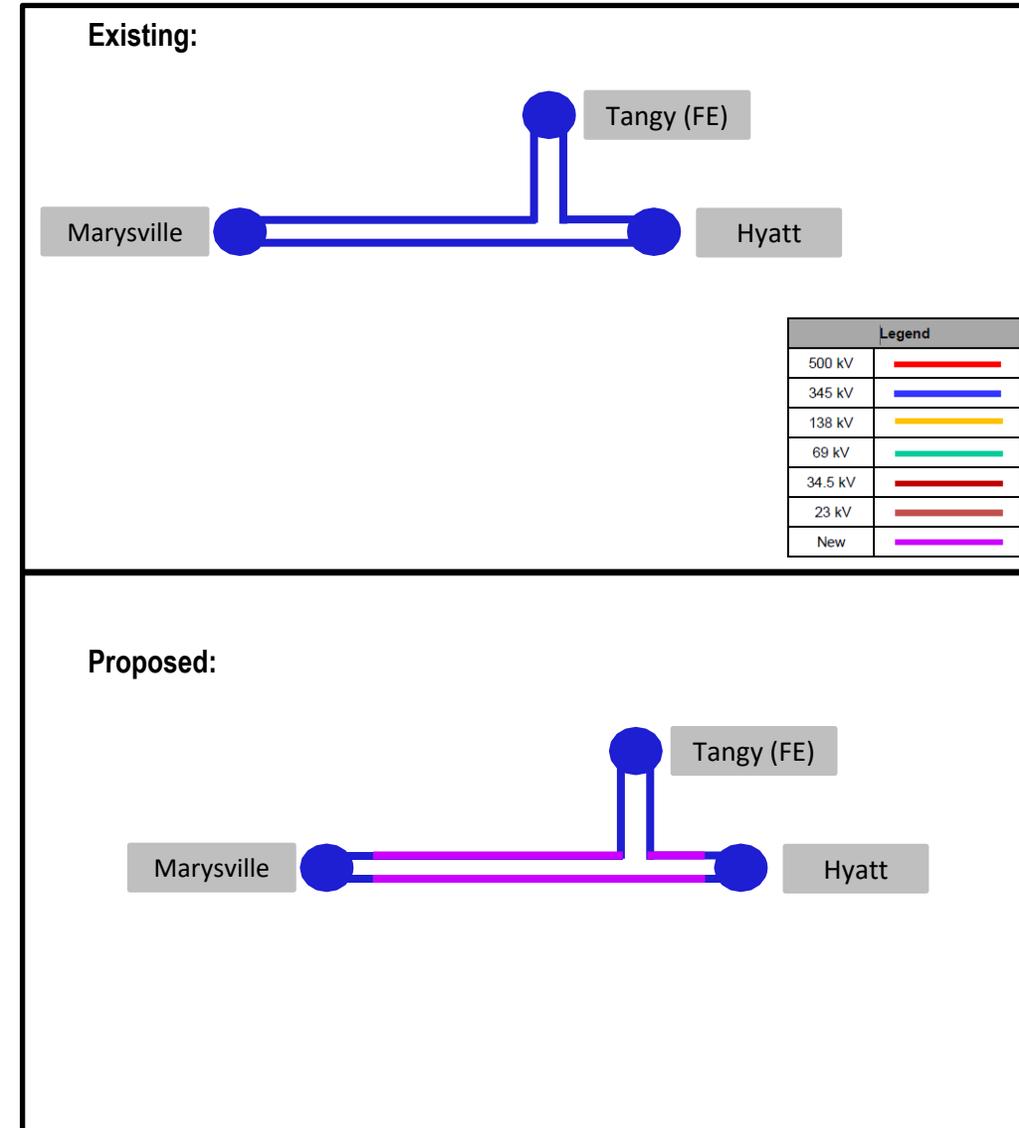
- Retiring the line was not deemed to be a viable alternative as the Marysville – Hyatt 345 kV line is one of the main sources from the 765 kV system into the Central Ohio area.

Projected In-Service: 6/1/2027

Project Status: Scoping

Model: 2027 RTEP

AEP Transmission Zone M-3 Process Central Ohio



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

10/21/2023– V1 – Original version posted to pjm.com