Subregional RTEP Committee - Western
DEOK Supplemental Projects

May 17, 2024

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

DEOK Transmission Zone M-3 Process
Mitchell

Need Number: DEOK-2023-003

Process Stage: Solutions Meeting 05/17/2024

Previously Presented: Needs Meeting 04/21/2023

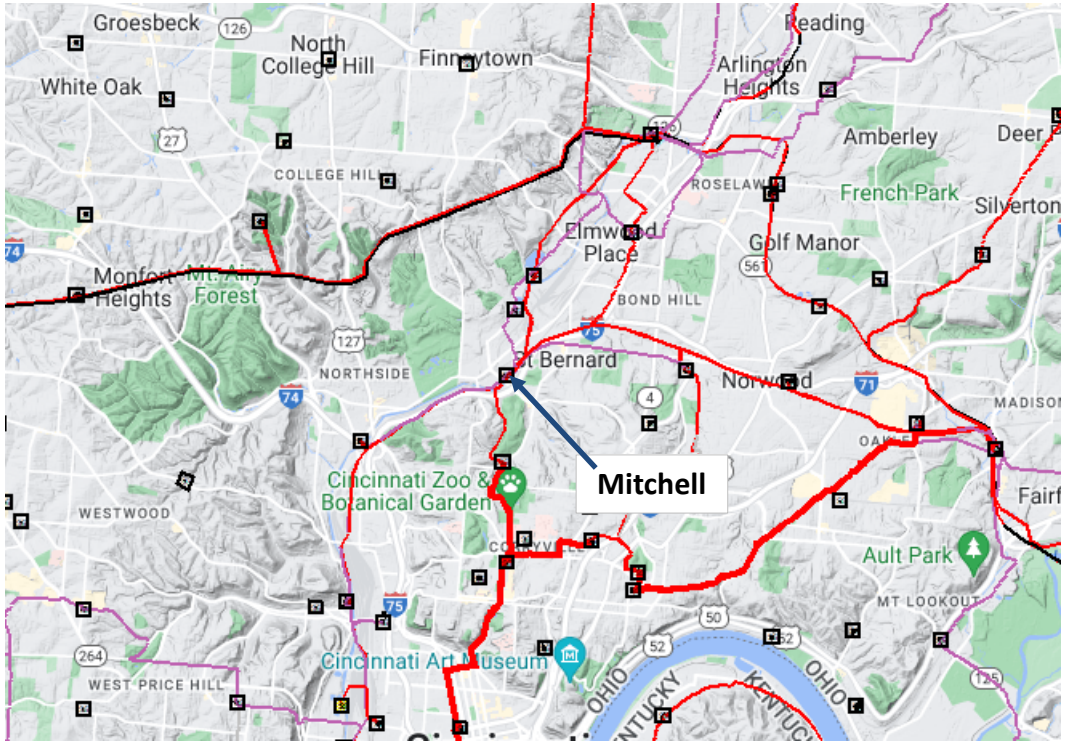
Project Driver: Customer Service

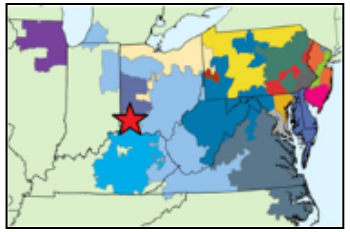
Specific Assumption Reference:

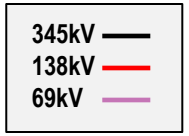
Duke Energy Ohio & Kentucky Local Planning Assumptions slide 5

Problem Statement:

Duke Energy Distribution has requested additional capacity delivery through Mitchell substation. There is only one 138/13 kV, 22MVA transformer which connects to all three distribution feeders. The transformer is expected to start exceeding nameplate in 2025.







DEOK Transmission Zone M-3 Process
Mitchell

Need Number: DEOK-2023-003

Process Stage: Solutions Meeting 05/17/2024

Previously Presented: Needs Meeting 04/21/2023

Project Driver: Customer Service

Specific Assumption Reference:

Duke Energy Ohio & Kentucky Local Planning Assumptions slide 5

Potential Solution:

Relocate 138/69 kV TB 4 to make room for a 2nd 22 MVA distribution transformer, TB 6. Install a circuit breaker on the high side of TB 4 to reconnect it to 138 kV Bus 4. Install a circuit switcher on the high side of TB 6 to connect it to 138 kV Bus 4. Rework distribution feeders transferring some load from the existing distribution transformer to TB 6.

Alternatives: none

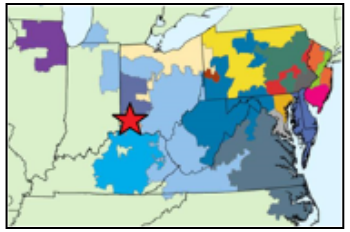
Estimated Transmission Cost: $1,870,984

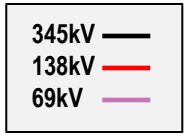
Proposed In-Service Date: 12/26/2025

Project Status: Engineering

Model: 2023 RTEP

Bubble Diagram Not Applicable
Station Modifications Only





DEOK Transmission Zone M-3 Process
Merrel

Need Number: DEOK-2023-006

Process Stage: Solutions Meeting 05/17/2024

Previously Presented: Needs Meeting 04/21/2023

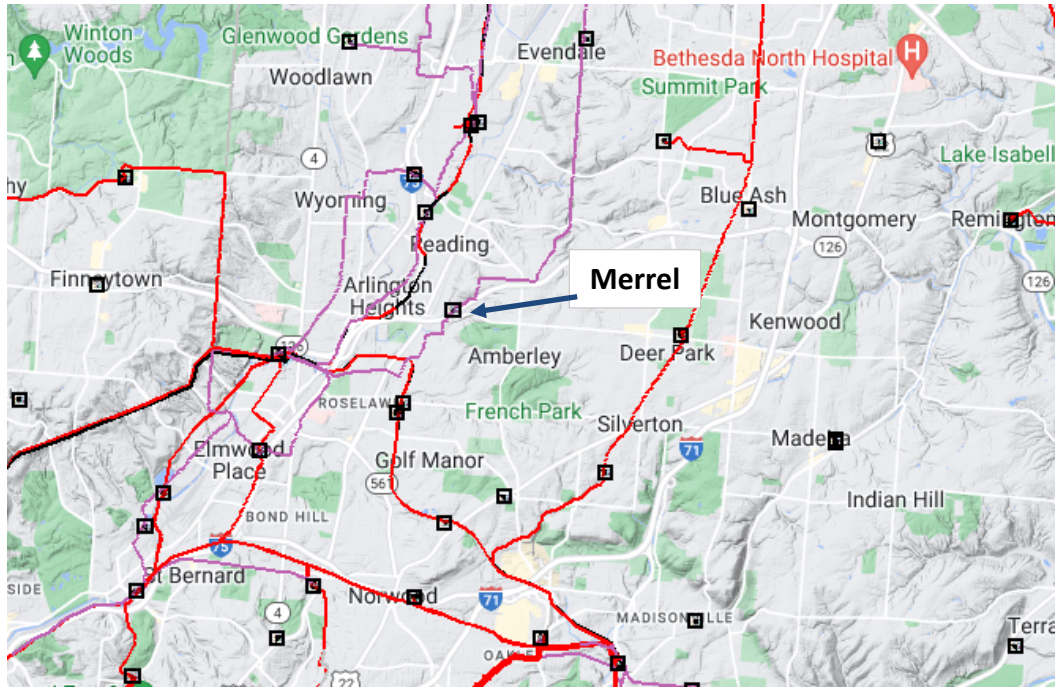
Project Driver: Customer Service

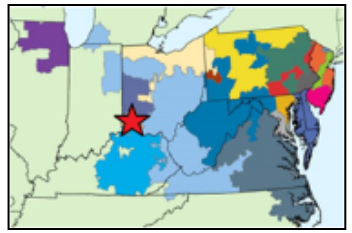
Specific Assumption Reference:

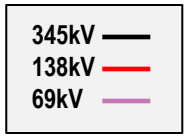
Duke Energy Ohio & Kentucky Local Planning Assumptions slide 5

Problem Statement:

Merrel substation has two 69/13 kV, 10 MVA transformers that feed mostly industrial load. TB1 is loaded to 85% and TB2 has exceed nameplate capacity several times in the last few summers. An industrial customer is expanding and has asked for and additional 5 MVA of service by the first quarter of 2027, with an expectation that 14 MVA may eventually be needed. The substation is land locked and lacks adequate safety clearances such that a complete substation outage is needed for maintenance. There are no options in the area to tie out customer load, or isolate substation equipment without the customer opening their switches.







DEOK Transmission Zone M-3 Process
Merrel

Need Number: DEOK-2023-006

Process Stage: Solutions Meeting 05/17/2024

Previously Presented: Needs Meeting 04/21/2023

Project Driver: Customer Service

Specific Assumption Reference:

Duke Energy Ohio & Kentucky Local Planning Assumptions slide 5

Potential Solution:

Retire the existing substation. Expand the substation area to allow for new equipment installation meeting adequate safety clearances. Install new 69 kV bus, switch separated into two sections. Reconnect the 69 kV feeders to the bus with motorized switches and transmission line sectionalizing. Install two 69/13 kV, 22 MVA transformers, each connected to the 69 kV bus with circuit switchers. Install two new open air breaker sections of 13 kV bus to reconnect distribution feeders.

Alternatives: none

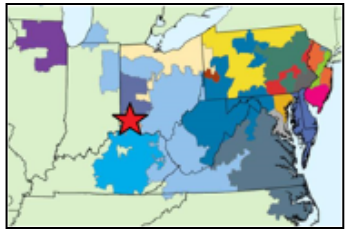
Estimated Transmission Cost: $2.553M

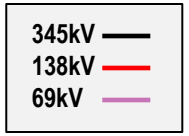
Proposed In-Service Date: 04/23/2027

Project Status: Engineering

Model: 2023 RTEP

Bubble Diagram Not Applicable
Station Modifications Only





DEOK Transmission Zone M-3 Process
Millville - Layhigh

Need Number: DEOK-2024-001

Process Stage: Solutions Meeting 05/17/2024

Previously Presented: Needs Meeting 01/19/2024

Project Driver: Equipment Condition, Performance and Risk

Specific Assumption Reference:

Duke Energy Ohio & Kentucky Local Planning Assumptions slides 7-8

Problem Statement:

A 69 kV feeder section that runs from Millville (Duke) to Layhigh (Butler Rural Electric Cooperative) is in deteriorating condition. Inspections have recorded 38 structure rejects due to ground line rot, pole top rot and bird holes. There are ten open ground lines. Since 2018 there have been 36 interruptions on the line, 14 sustained and 22 momentary, with an average of 274 minutes/outage and 96,000 CMI/outage. The outage causes vary, consisting of broken or damaged insulators, conductors, or crossarms, vegetation encroachment, lightning, and vehicle impacts. The entire feeder, end to end, serves 25,561 customers and connects Butler Rural Electric Cooperative substations: Colerain, Ross, Layhigh, Stillwell-Beckett, Oxford, and Reily.

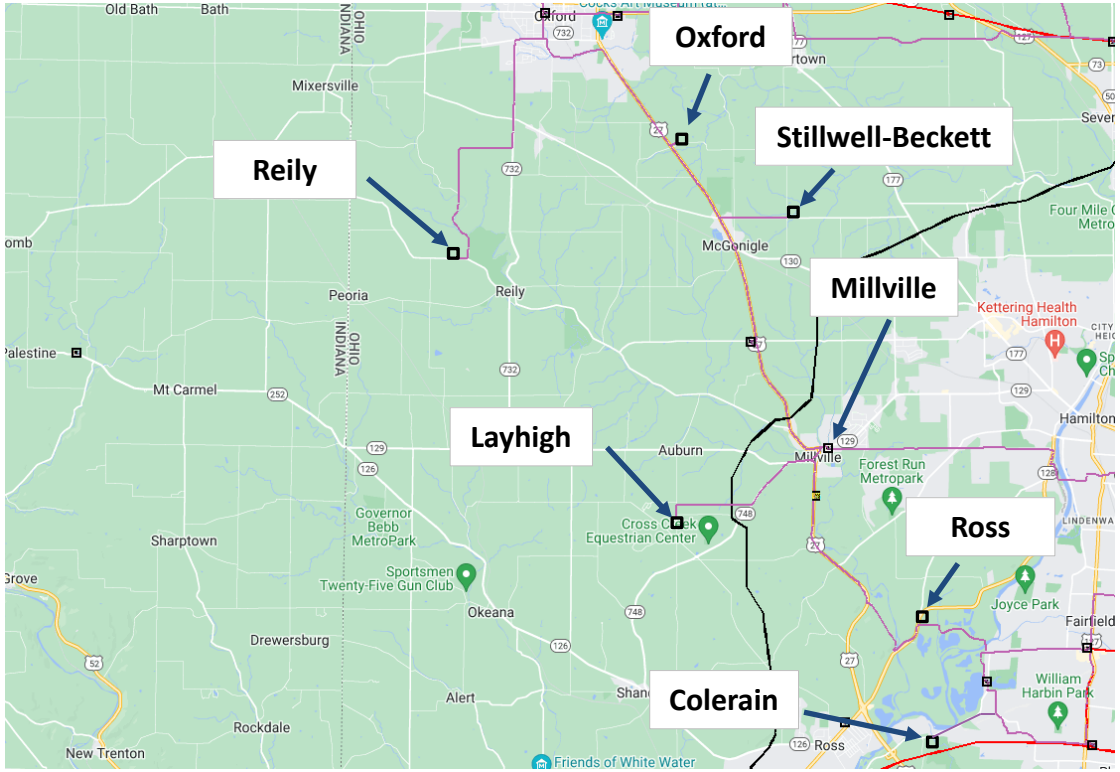
Line Characteristics:

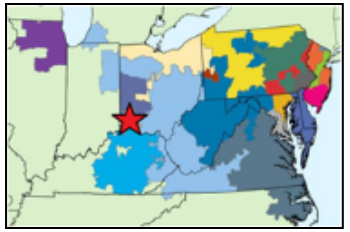
Original Install Date: 1955

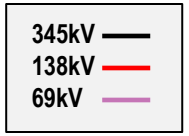
Length: 3.23 miles / 83 poles

Construction Type: Single wood pole with suspension insulators

Conductor Type: 4/0-6/1 ACSR







DEOK Transmission Zone M-3 Process
Millville - Layhigh

Need Number: DEOK-2024-001

Process Stage: Solutions Meeting 05/17/2024

Previously Presented: Needs Meeting 01/19/2024

Project Driver: Equipment Condition, Performance and Risk

Specific Assumption Reference:

Duke Energy Ohio & Kentucky Local Planning Assumptions slides 7-8

Potential Solution:

From Layhigh to the tap to Millville; replace wooden structures with steel pole structures, reconductor the line with 954ACSR, retire a switch between Layhigh and the tap. The new ratings increase to 150/150/174 MVA summer, 189/189/206 MVA winter.

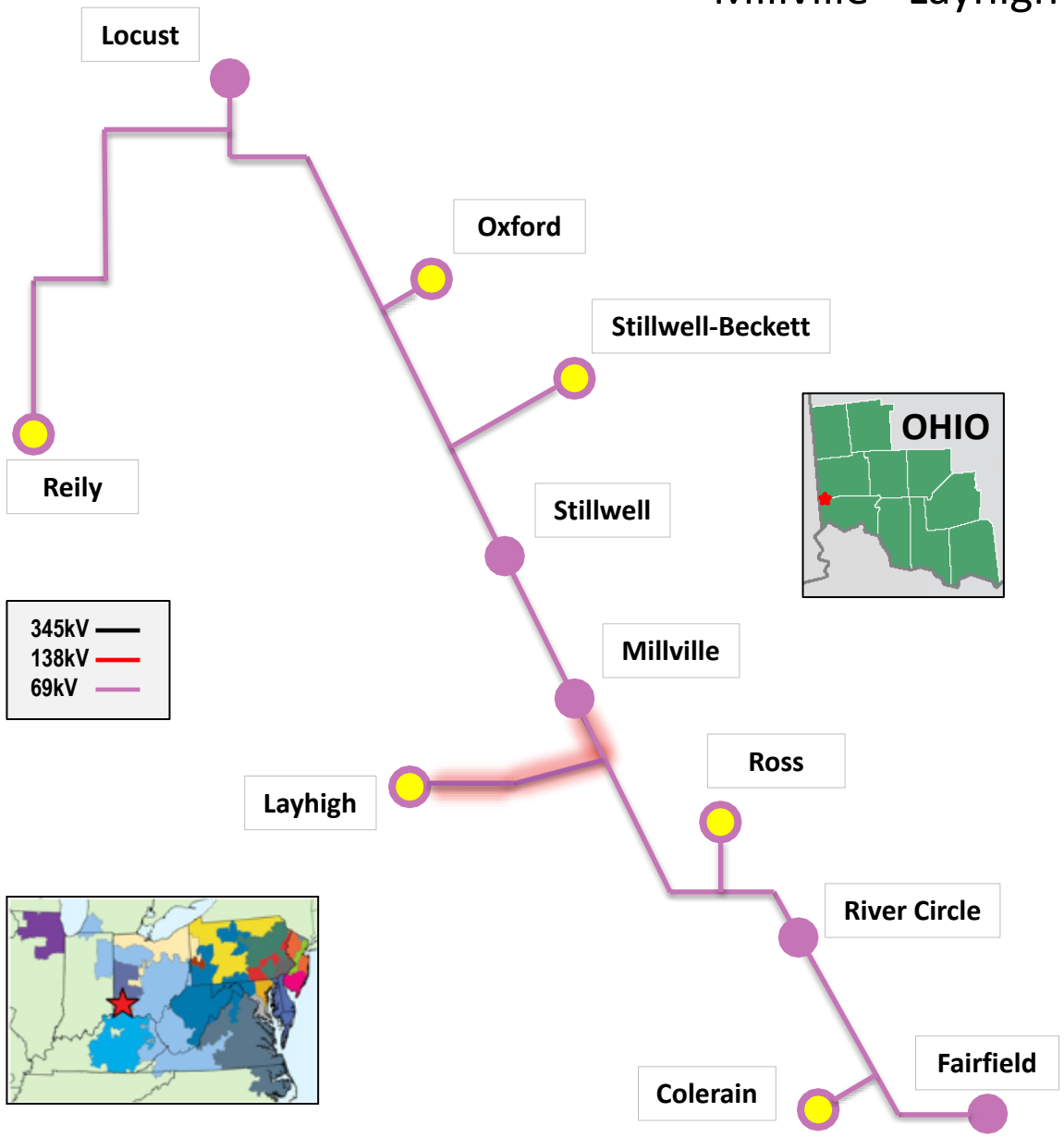
Alternatives: none

Estimated Transmission Cost: $8.496M

Proposed In-Service Date: 04/02/2026

Project Status: Engineering

Model: 2023 RTEP



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

5/7/2024 – V1 – Original version posted to pjm.com