# Transmission Expansion Advisory Committee FirstEnergy Supplemental Projects

December 03, 2024

Transmission Expansion Advisory Committee – FirstEnergy Supplemental 12/03/2024

## 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



Need Number: JCPL-2024-051 Process Stage: Need Meeting – 12/03/2024

#### Project Driver(s):

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

#### **Specific Assumption Reference:**

- System Performance Global Factors
- System reliability and performance
- Substation/line equipment limits
- Load at risk in planning and operational scenarios

#### Add/Expand Bus Configuration

- Loss of substation bus adversely impacts transmission system performance
- Eliminate simultaneous outages to multiple networked elements under N-1 analysis
- Capability to perform system maintenance

#### **Problem Statement**

**Equipment Material Conditions:** 

- A breaker fault at East Flemington Substation will cause approximately 31 MW of consequential loss of load and interrupts approximately 6,800 customers
- Since 2019, the East Flemington Substation has experienced a total of ten unscheduled, sustained outages.
- East Flemington Substation currently contains obsolete 230 kV equipment including ground switches, line CCVTs, surge arresters and a line trap.

### JCP&L Transmission Zone M-3 Process East Flemington Substation





### JCPL Transmission Zone M-3 Process East Flemington 230 kV Ring bus

Need #	Transmission Line / Substation Locations	Existing Line Rating (SN / SE / WN / WE)	Existing Conductor Rating (SN / SE / WN / WE)
JCPL-2024-051	East Flemington- Pleasant Valley 230 kV Line	548 / 688 / 716 / 797	709 / 869 / 805 / 1031
	Branchburg- East Flemington 230kV Line	548 / 688 / 721 / 826	709 / 869 / 805 / 1031

## 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



## JCPL Transmission Zone M-3 Process Windsor No. 3 230-34.5 kV Transformer



Need Number: JCPL-2024-020 Process Stage: Solution Meeting – 12/03/2024 Previously Presented: Need Meeting – 04/30/2024 Project Driver:

Equipment Material Condition, Performance and Risk

#### **Specific Assumption Reference:**

System Performance Projects Global Factors

- System reliability and performance
- Substation/line equipment limits
  Add/Replace Transformers
  Past System Reliability/Performance

#### **Problem Statement:**

- The Windsor No. 3 230-34.5 kV Transformer is approximately 47 years old and is approaching end of life.
- The transformer is experiencing issues with oil leaks.
- The transformer has elevated methane, ethane and carbon monoxide gas in the transformer oil.
- The transformer is limited by terminal equipment.
- Existing Transformer Ratings:
  - 83 / 104 MVA (SN/SSTE)
  - 101 / 118 MVA (WN/WSTE)



### JCPL Transmission Zone M-3 Process Windsor No. 3 230-34.5 kV Transformer

Need Number: JCPL-2024-020 Process Stage: Solution Meeting – 12/03/2024

#### **Proposed Solution:**

- Replace the Windsor No. 3 230-34.5 kV Transformer with a larger unit.
- Replace 230 kV circuit switcher with MOAB.
- Replace two 34.5 kV circuit breakers.
- Replace the transformer relaying.

#### **Transformer Ratings:**

- Windsor No. 3 230-34.5 kV Transformer:
  - Before Proposed Solution: 83 / 104 / 101 / 118 MVA (SN/SSTE/WN/WSTE)
  - After Proposed Solution: 150 / 195 / 180 / 234 MVA (SN/SSTE/WN/WSTE)

#### **Alternatives Considered:**

Maintain transformer in existing condition with elevated risk of failure.

Estimated Project Cost: \$9.7M Projected In-Service: 12/22/2028 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

Activity	Timing
TOs and Stakeholders Post Needs Meeting slides	10 days before Needs Meeting
Stakeholder comments	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**

11/22/2024 – V1 – Original version posted to pjm.com