Transmission Expansion Advisory Committee
FirstEnergy Supplemental Projects

JCPL Transmission Zone

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
Leisure Village 230 kV Substation

Need Number: JCPL-2024-001

Process Stage: Solution Meeting - 10/08/2025

Previously Presented: Need Meeting - 01/09/2024

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

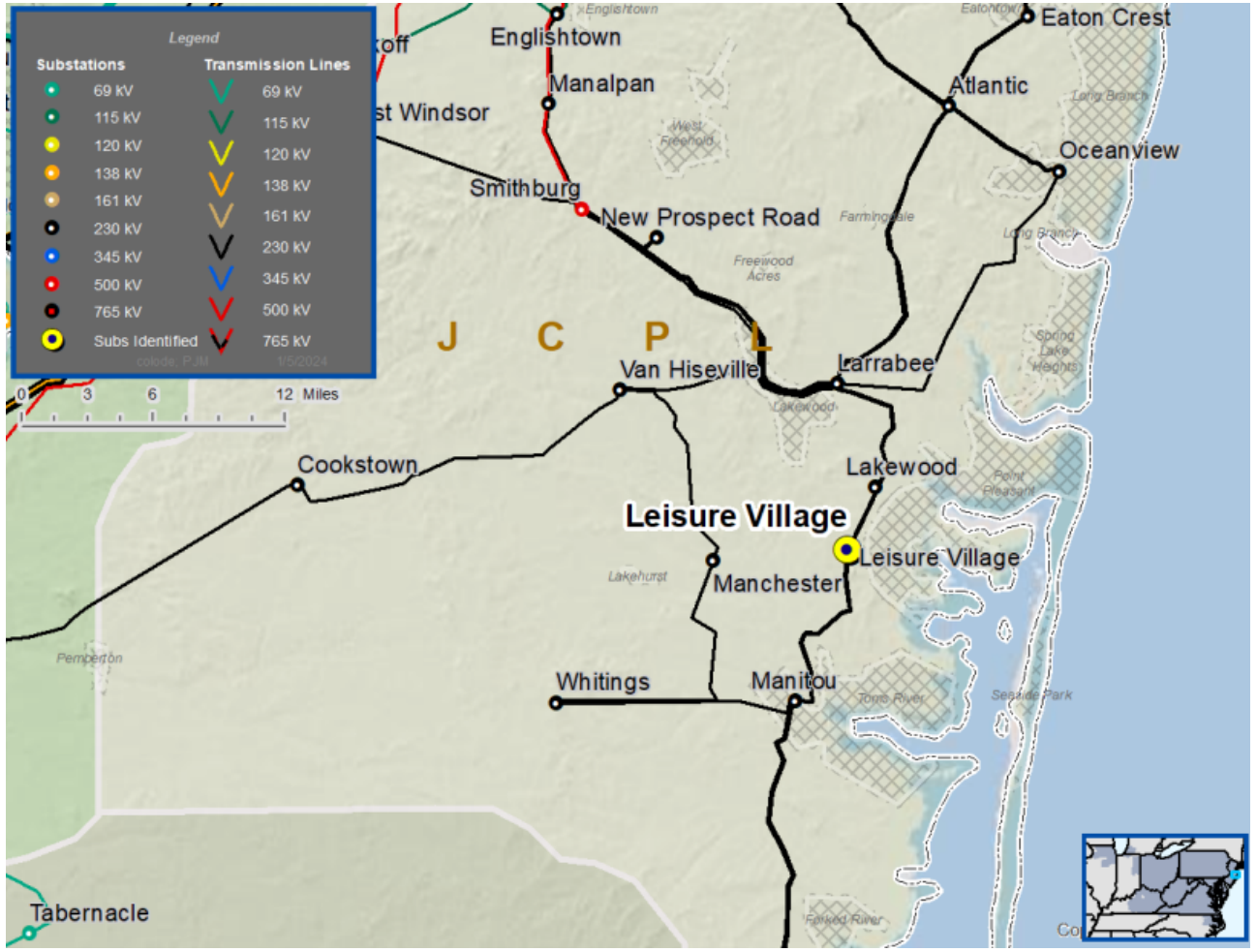
Specific Assumption Reference:

- System reliability and performance
- 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

Problem Statement:

- The existing Leisure Village Substation is a 230-34.5-12.47 kV substation and has four 230 kV lines, two 230-34.5 kV transformers, and two 230-12.47 kV distribution transformers.
- Leisure Village Substation serves approximately 52 MW and 10,787 customers.
- The existing Leisure Village Substation configuration removes multiple facilities from service including the 230 kV circuits and step-down transformers under different N-1 contingency scenarios due to overlapping protection zones. Overlapping protection zones create challenges when attempting to clear a fault and can lend more equipment to be out of service than necessary when a fault occurs.

Continued on next page



JCPL Transmission Zone M-3 Process
Leisure Village 230 kV Substation

Need Number: JCPL-2024-001

Process Stage: Solution Meeting - 10/08/2025

Previously Presented: Need Meeting - 01/09/2024

Problem Statement:

Continued from previous page

- Multiple N-1-1 contingency results in approximately 52 MW of consequential load loss, loss of 230 kV sources to the station, and multiple 34.5 kV lines to be loaded >90% and >100% of their SE rating in the Leisure Village Substation area.
- Since 2018, the following lines out of Leisure Village Substation had the following outages:
    - Lakewood-Leisure Village D2030 230 kV Line experienced two outages: one momentary and one sustained.
    - Lakewood-Leisure Village U2021 230 kV Line experienced three outages: one momentary and two sustained.
    - Leisure Village – Manitou A2027 230 kV Line experienced two outages: one momentary and one sustained.
    - Leisure Village – Manitou C2029 230 kV Line experienced three outages: three sustained.

JCPL Transmission Zone M-3 Process
Leisure Village 230 kV Substation

Need Number: JCPL-2024-001
Process Stage: Solution Meeting - 10/08/2025

Proposed Solution:

At Leisure Village Substation:

- Rebuild the 230 kV station as a breaker and a half configuration utilizing nine new 230 kV breakers.
- Install a third 230-34.5 kV transformer with two new 34.5 kV breakers on the low side.
- Install high side breakers on the two 230-13.2 kV transformers.

At Manitou Substation:

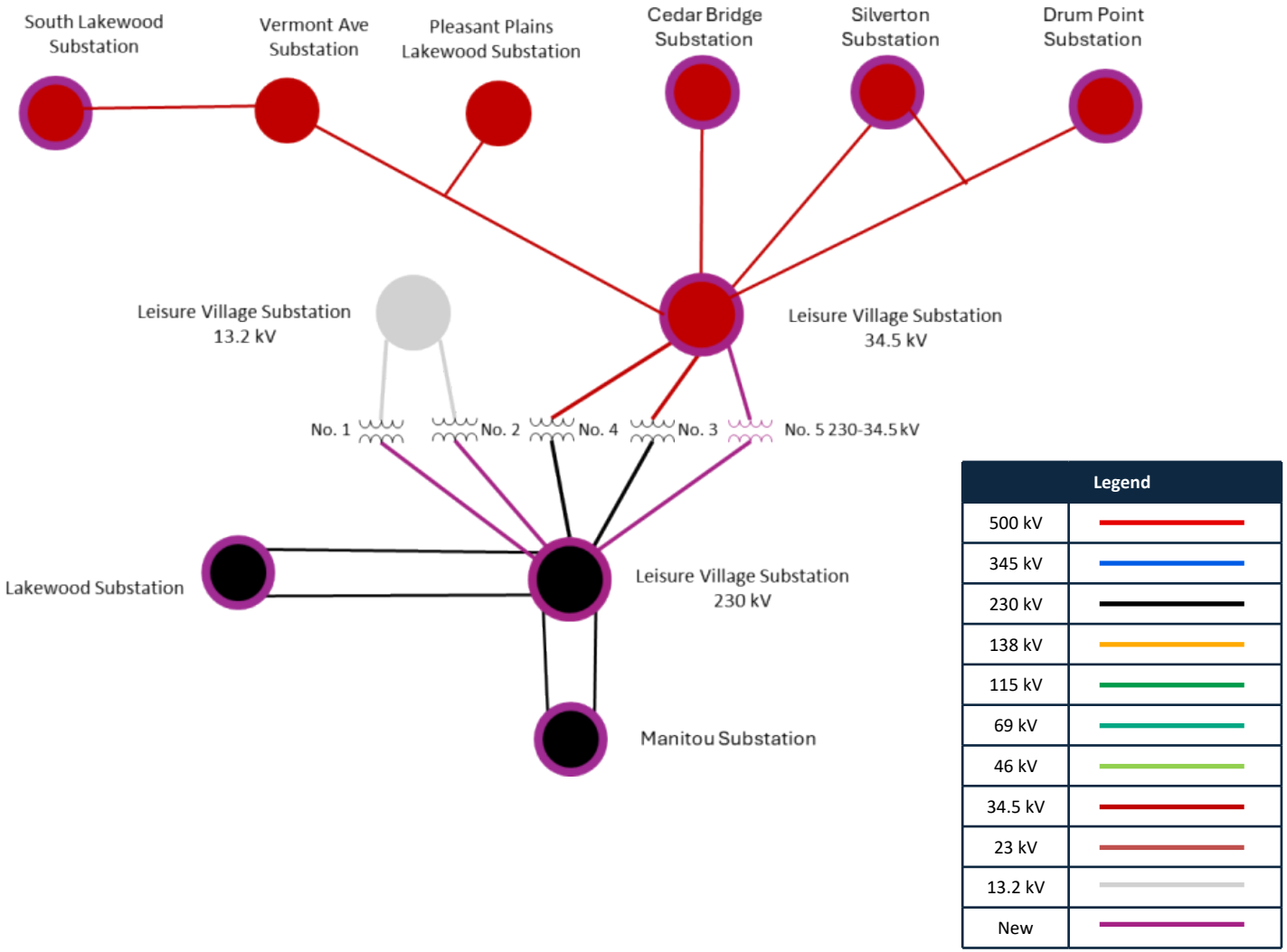
- Replace switches, line trap and line relaying.

At Lakewood Substation:

- Replace circuit breakers, switches, surge arresters, line traps and relaying.

Adjust line relaying at South Lakewood, Silverton, Drum Point, Cedar Bridge substations.

Continued on next page



Need Number: JCPL-2024-001
Process Stage: Solution Meeting - 10/08/2025

Ratings:

Facility	Ratings Before Proposed Solution (SN/SE/WN/WE)	Ratings After Proposed Solution (SN/SE/WN/WE)
Lakewood-Leisure Village D2030 230 kV Line	678 / 813 / 833 / 929 MVA	709 / 869 / 805 / 1031 MVA
Lakewood-Leisure Village U2021 230 kV Line	709 / 869 / 805 / 1031 MVA	709 / 869 / 805 / 1031 MVA
Leisure Village – Manitou A2027 230 kV Line	678 / 813 / 833 / 929 MVA	709 / 869 / 805 / 1031 MVA
Leisure Village – Manitou C2029 230 kV Line	709 / 869 / 805 / 1031 MVA	709 / 869 / 805 / 1031 MVA
Leisure Village No. 5 230-34.5 kV Transformer	N/A	150 / 195 / 188 / 234 MVA
Leisure Village No. 3 230-34.5 kV Transformer	144 / 157 / 163 / 198 MVA	157 / 157 / 198 / 200 MVA
Leisure Village No. 4 230-34.5 kV Transformer	144 / 155 / 163 / 193 MVA	152 / 155 / 191 / 194 MVA

JCPL Transmission Zone M-3 Process
Leisure Village 230 kV Substation

Need Number: JCPL-2024-001
Process Stage: Solution Meeting - 10/08/2025

Alternatives Considered:

Maintain existing condition with elevated risk of failure and customer outages.

Estimated Project Cost:	$ 50.23M
Projected In-Service:	06/01/2029
Project Status:	Conceptual
Model:	2024 RTEP - 2029 Summer 50/50

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

09/26/2025 – V1 – Original version posted to pjm.com
09/29/2025 – V2 – Corrected Substation name in slide title - posted to pjm.com