

Subregional RTEP Committee – Western FirstEnergy Supplemental Projects

May 19, 2022

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: ATSI-2022-009
Process Stage: Need Meeting – 05/19/2022

Supplemental Project Driver(s):
*Equipment Material Condition, Performance and Risk
 Infrastructure Resilience*

Specific Assumption Reference(s):

Global Factors

- Aged or deteriorated wood pole transmission line structures
- Negatively impact customer outage frequency and/or durations
- Demonstrate an increasing trend in maintenance findings and/or costs
- Transmission line ratings are limited by terminal equipment.
- End of Life

Problem Statement

The Maple-Pine 69 kV (~19 miles) Transmission Line:

- The 69 kV line section from Maple through structure 110 (~10 miles) including taps and switches (119 structures in total) is over 50 years old.
- A recent aerial CVI found 71 structures (60%) had 136 defects including rotten poles, cracked poles, woodpecker damage and other misc. hardware deficiencies.
- 5 switches along the stretch are aged and obsolete (A-6041, A-6042, A-194, A-195, A-219).
- There have been eight (8) total unscheduled interruptions since 2017: three sustained and five momentary outages.



Need Number: ATSI-2022-010
Process Stage: Need Meeting – 05/19/2022

Supplemental Project Driver(s):
*Equipment Material Condition, Performance and Risk
 Infrastructure Resilience*

Specific Assumption Reference(s):

Global Factors

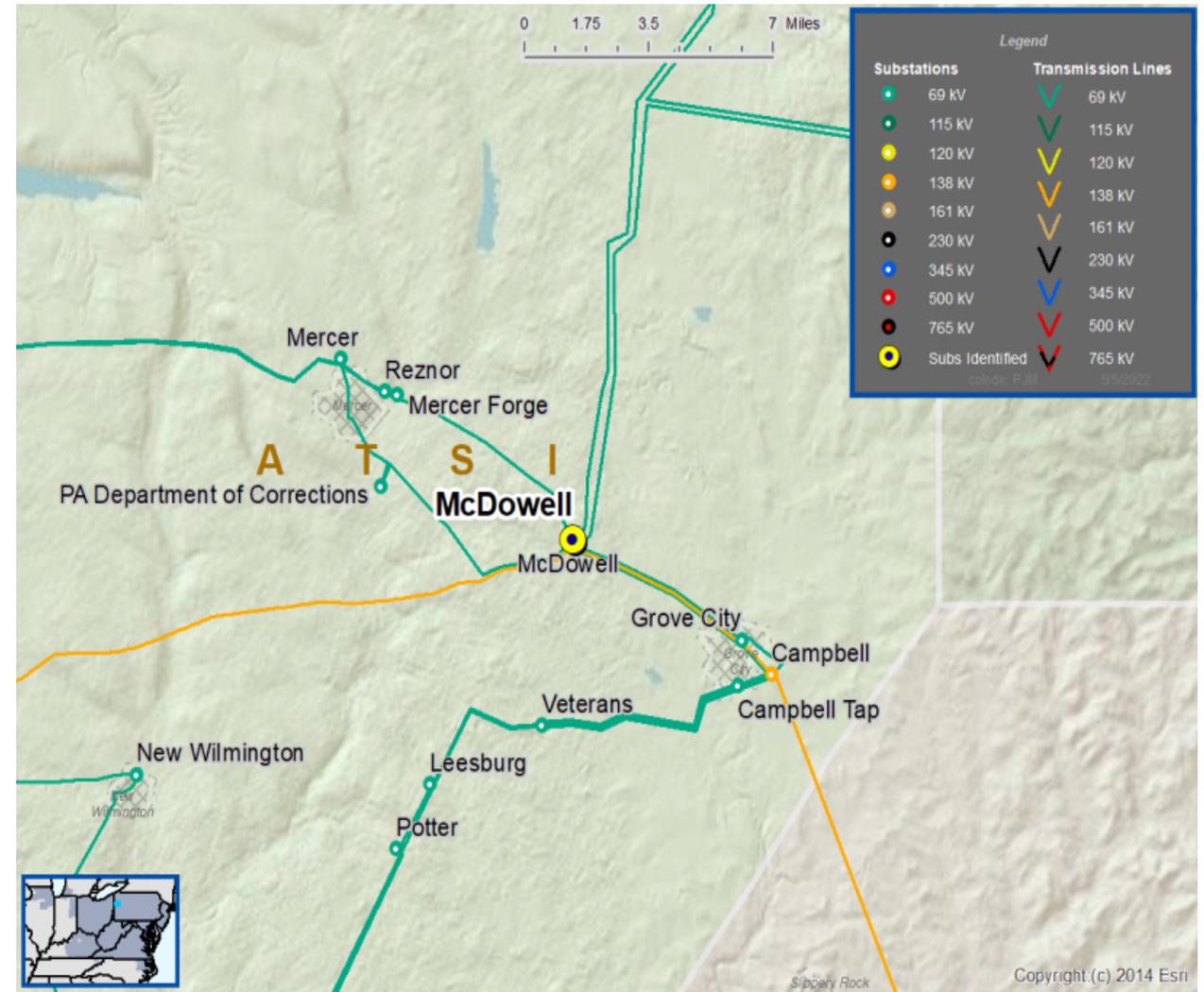
- System Reliability and Performance
- Increasing negative trend in maintenance findings and/or costs
- Expected service life (beyond) or obsolescence
- Costs for repair approach cost for replacement
- Substation/line Equipment Limits

Substation Condition Rebuild/Replacement

- Circuit breakers and other fault interrupting devices
- Switches and relays

Problem Statement

- Oil Circuit Breakers B-16 and B-30 and associated disconnect switches at McDowell are showing increasing maintenance concerns; compressor issues, valve issues, trip coil failure, pilot valve failure deteriorated operating mechanisms, timing issues, and increasing maintenance trends.
 - Breaker B-16 is 44 years old; Breaker B-30 is 72 years old;
- Similar breaker B-26 recently failed



Need Number: ATSI-2022-011
Process Stage: Need Meeting – 05/19/2022

Supplemental Project Driver(s):
Operational Flexibility and Efficiency
Equipment Material Condition, Performance and Risk
Infrastructure Resilience

Specific Assumption Reference(s):

Global Considerations

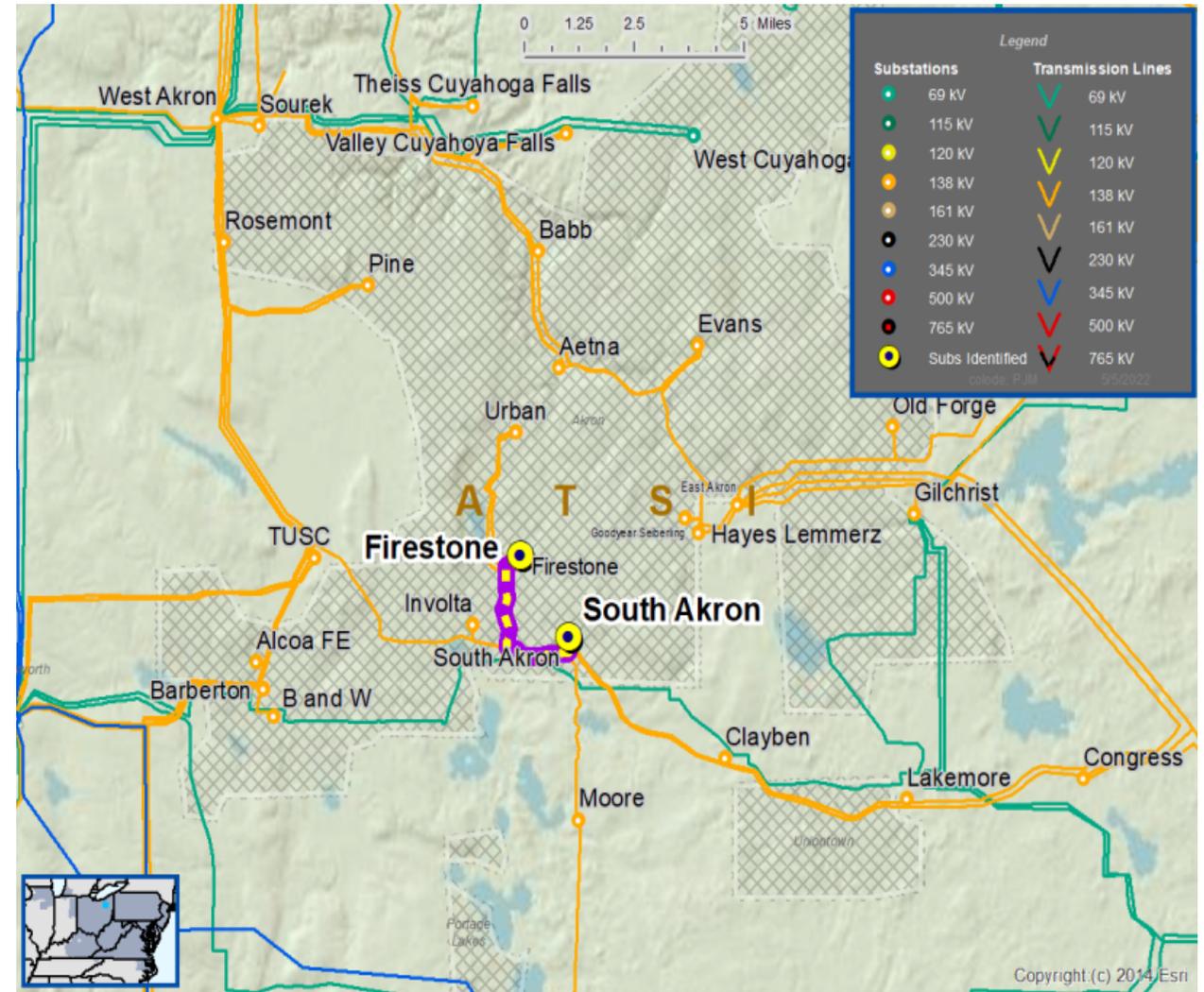
- System reliability and performance
- Substation / line equipment limits

Upgrade Relay Schemes

- Relay schemes that have a history of misoperation
- Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
- Communication technology upgrades
- Bus protection schemes

Problem Statement

- FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation.
- Proper operation of the protection scheme requires all the separate components perform adequately during a fault
- In many cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology.
- Transmission line ratings are limited by terminal equipment



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Need Number	Transmission Line / Substation Locations	Existing Line / Terminal Equipment MVA Rating (SN / SE)	Existing Conductor / Transformer MVA Rating (SN / SE)	Limiting Terminal Equipment
ATSI-2022-011	Firestone-South Akron 138 kV Line	195/209	233/282	Wavetrap, relay, and substation conductor

Need Number: ATSI-2022-012
Process Stage: Need Meeting – 05/19/2022

Supplemental Project Driver(s):

*FE's Requirement for Transmission Connected Facilities
 Operational Flexibility and Efficiency
 Equipment Material Condition, Performance and Risk
 Infrastructure Resilience
 Customer Service*

Specific Assumption Reference(s):

Global Considerations

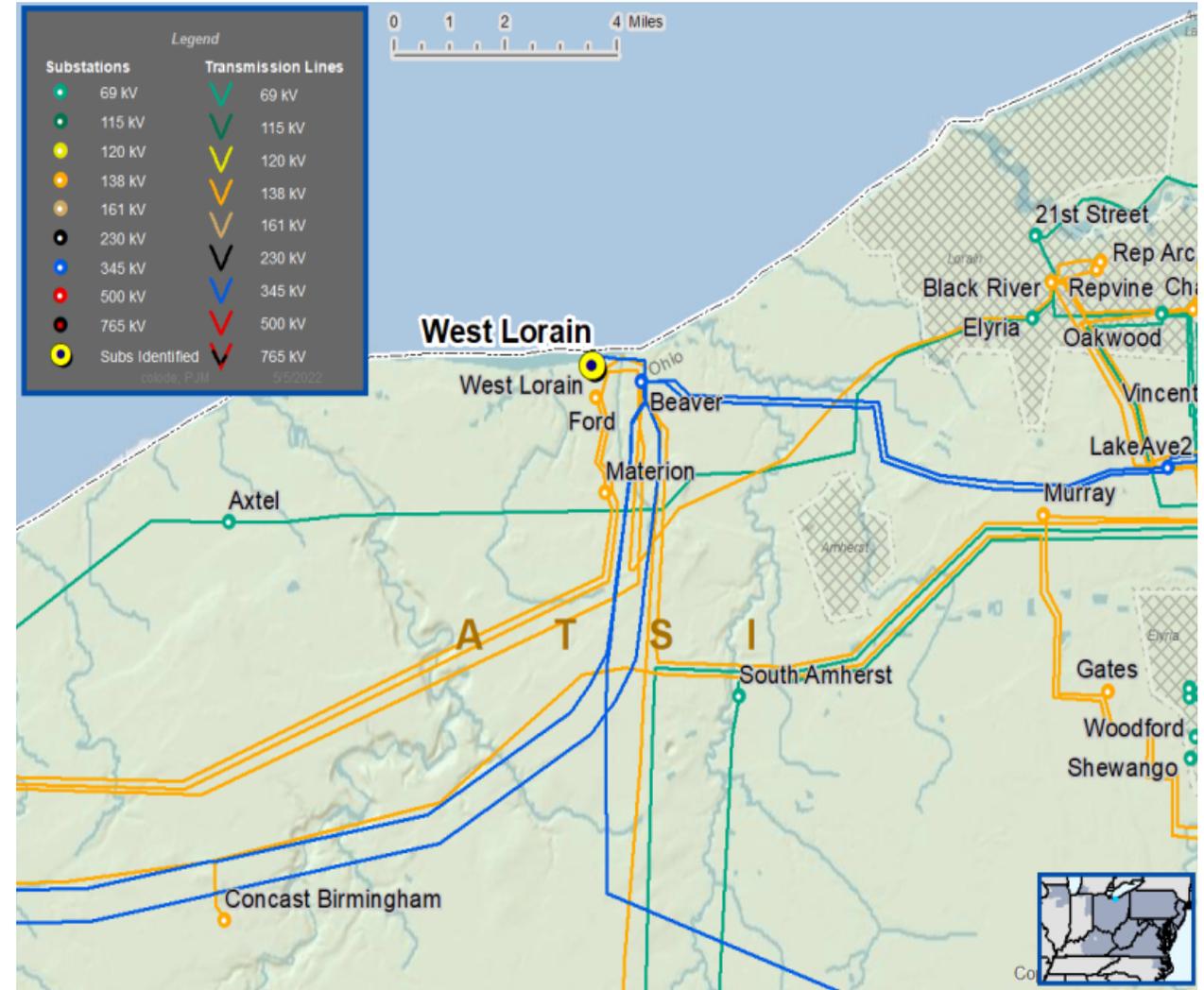
- System reliability and performance
- Substation/Line equipment limits
- Customer Service

Equipment/Technology/Design upgrades

- FirstEnergy-owned equipment located in non-FirstEnergy affiliated facilities.
- Expected service life (at or beyond) or obsolescence

Add/Replace Transformer

- System concerns related to loss of an existing transformer or other contingency scenarios at a specific voltage level(s)



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Need Number: ATSI-2022-012
Process Stage: Need Meeting – 05/19/2022

Problem Statement:

- West Lorain plant was previously owned by FE. With the sale of the plant, FE must separate assets owned by FE from assets owned by the new plant owners.
- Station power for West Lorain is sourced from the tertiary windings of the two 345-138-13.2 kV transformers at Beaver Substation.
- The two 345-138-13.2 kV transformers at Beaver are reaching end of life and will be replaced with transformers that do not have tertiary windings. Refer to supplemental ID s1757.
- Independent station power is required to minimize faults on the West Lorain plant owned equipment from causing a transformer outage or failure on the transmission system.
- 138 kV circuit breaker B-23 is owned by FE. The breaker and breaker controls are located within the West Lorain plant property.
- 345 kV motor operated disconnect switch D-177 is owned by West Lorain but is inside FE's Beaver Substation.
- Relays that protect the 138 kV line from Beaver to West Lorain are owned by FE but are located within the West Lorain property.
- The 345 kV line and the 138 kV line to the West Lorain plant are protected by older electromechanical relays that require additional maintenance and skill to maintain.



Need Number: ATSI-2022-013
Process Stage: Need Meeting – 05/19/2022

Supplemental Project Driver(s):
Operational Flexibility and Efficiency
Equipment Material Condition, Performance and Risk
Infrastructure Resilience

Specific Assumption Reference(s):

Global Considerations

- System reliability and performance
- Load at risk in planning and operational scenarios
- Load and/or customers at risk on single transmission lines
- Substation/line equipment limits

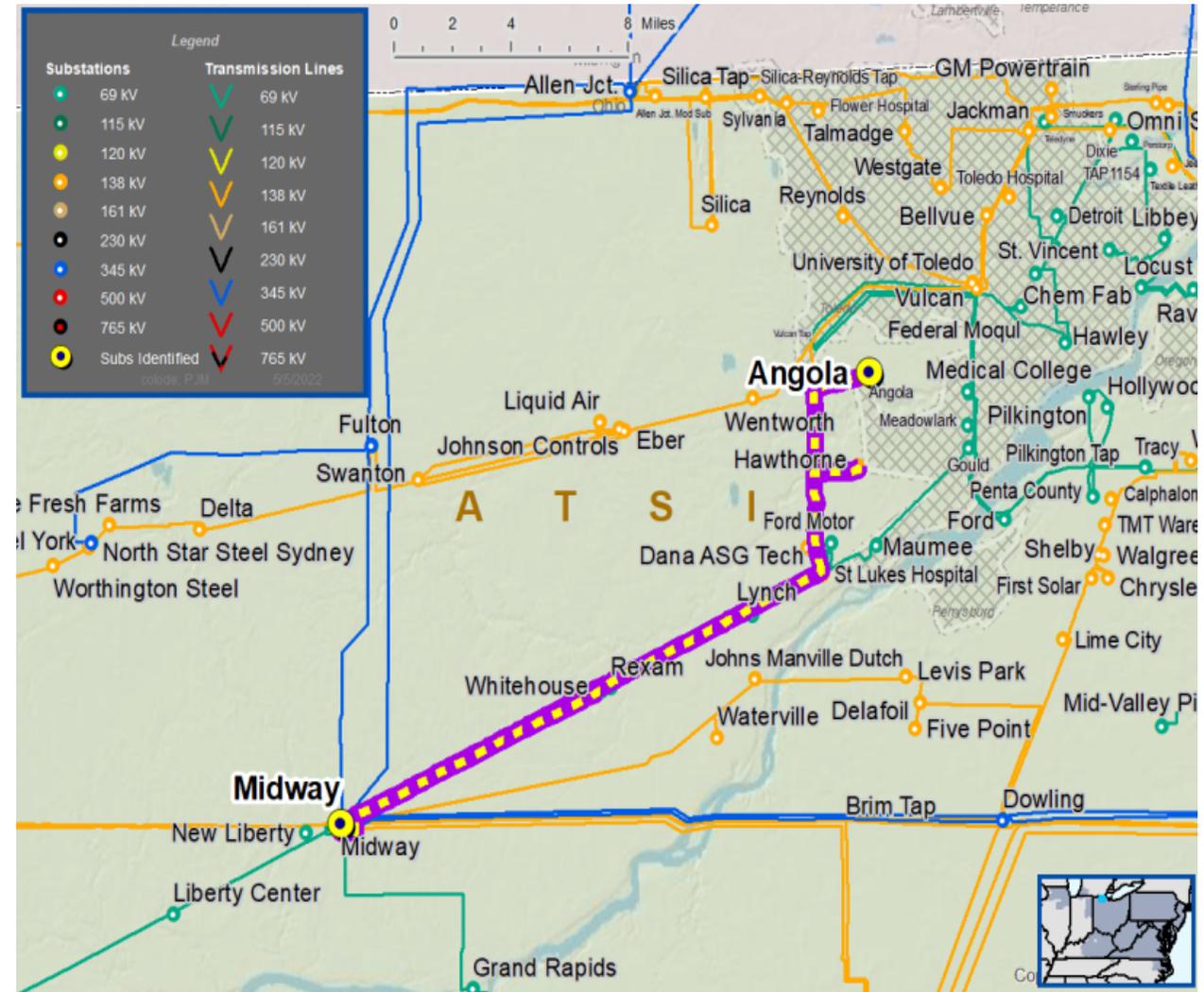
Add/Expand Bus Configuration

- Loss of substation bus adversely impacts transmission system performance

Problem Statement:

The loss of the Angola-Midway 138 kV Line results in the loss of approximately 38.5 MW and 7,400 customers at three delivery points.

Since 2017, the Angola-Midway 138 kV Line has experienced four unscheduled outages: two sustained and two momentary.



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

5/5/2022 – V1 – Original version posted to pjm.com