

# Subregional RTEP Committee - Western FirstEnergy (ATSI) Supplemental Projects

April 20, 2020

# 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



# ATSI Transmission Zone M-3 Process Magellan New Customer-Need

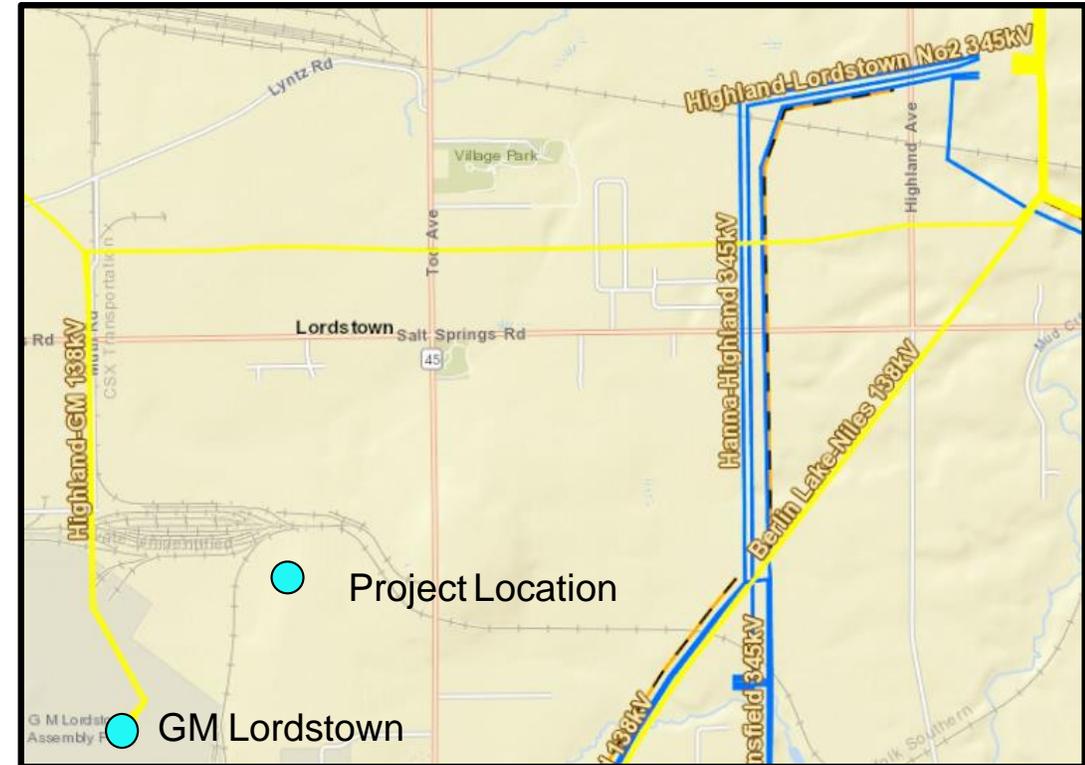
**Need Number:** ATSI-2020-003  
**Process Stage:** Need Meeting – 04/20/2020

**Supplemental Project Driver(s):**  
*Customer Service*

**Specific Assumption Reference(s):**  
Modification of existing customer connection request evaluated per FirstEnergy’s “Requirements for Transmission Connected Facilities” document and “Transmission Planning Criteria” document.

**Problem Statement:**  
New Customer Connection – A customer requested 138 kV transmission service for approximately 95 MVA of total load near the Highland-GM Lordstown 138 kV Line.

**Requested In-Service Date:** 07/01/2021



Legend	
345 kV	
138 kV	
69 kV	

**Need Number:** ATSI-2020-004  
**Process Stage:** Need Meeting – 04/20/2020

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

**Specific Assumption Reference(s)**

**Global Considerations**

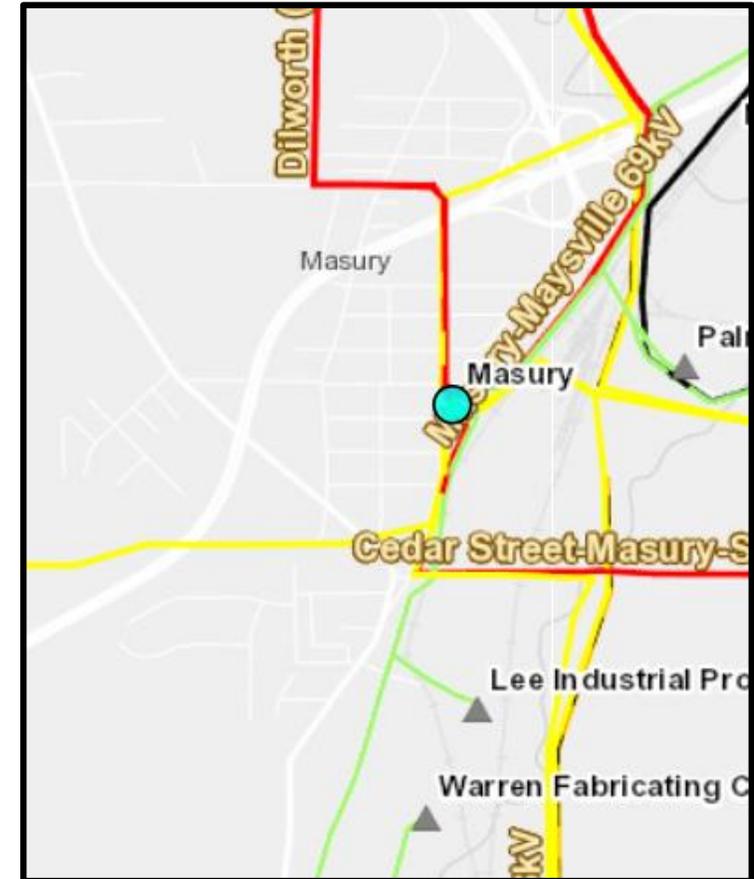
- System Reliability and Performance
- Load at risk in planning and operational scenarios

**Substation Condition Rebuild/Replacement**

- Increasing negative trend in maintenance findings and/or costs.
- Expected service life (at or beyond) or obsolescence

**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



Legend	
345 kV	
138 kV	
69 kV	

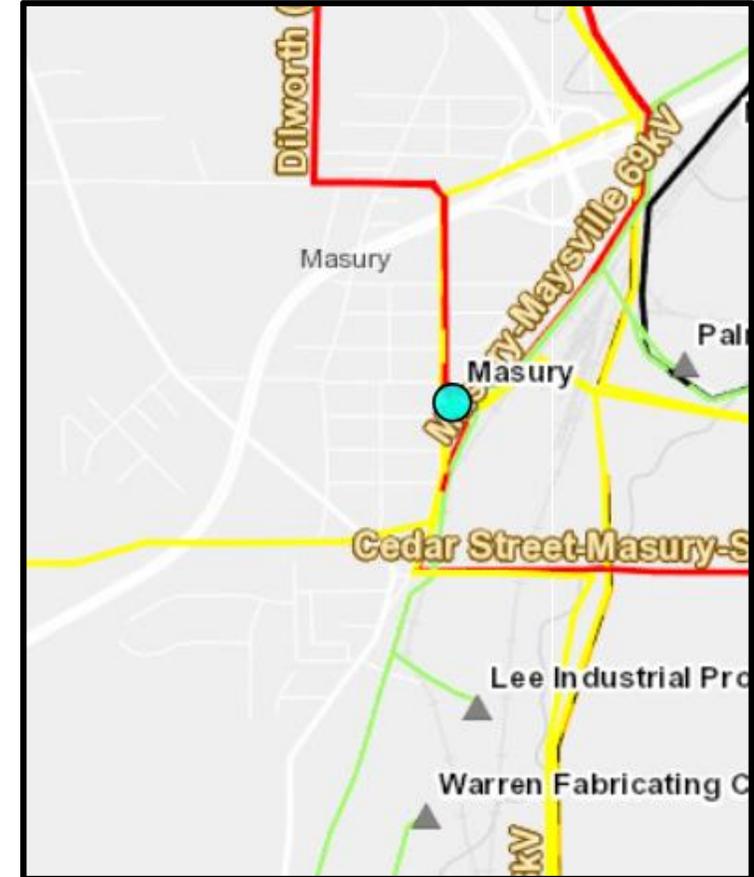
**Need Number:** ATSI-2020-004  
**Process Stage:** Need Meeting – 04/20/2020

**Problem Statement**

Masury 138 kV Substation

- System analysis shows that after a Masury 138 kV bus fault, a substantial amount of load is at risk (~42 MW)
- Masury 138 kV bus fault ATSI-P1-2-OEE-138-024 outages five 138 kV lines, two 138/69 kV transformers, and two 138-23 kV transformers
- There have been five pre-contingency switching events in the past year for the Masury 23 kV area
- Five (5) 138 kV OCB breakers (B2, B85, B101, B87, and B6) at Masury are showing end of life characteristics;
  - Deteriorated bushings
  - Deteriorated mechanism
  - Oil leaks
  - Age (>30 years) with increasing maintenance
  - Obsolescence of equipment and spare parts
- Masury 138 kV bus protection currently employs a bus blocking scheme which is not the FE standard protection scheme

**Model:** 2019 Series 2024 Summer RTEP 50/50



Legend	
345 kV	
138 kV	
69 kV	

**Need Number:** ATSI-2020-005  
**Process Stage:** Need Meeting – 04/20/2020

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

**Specific Assumption Reference(s)**

**Global Considerations**

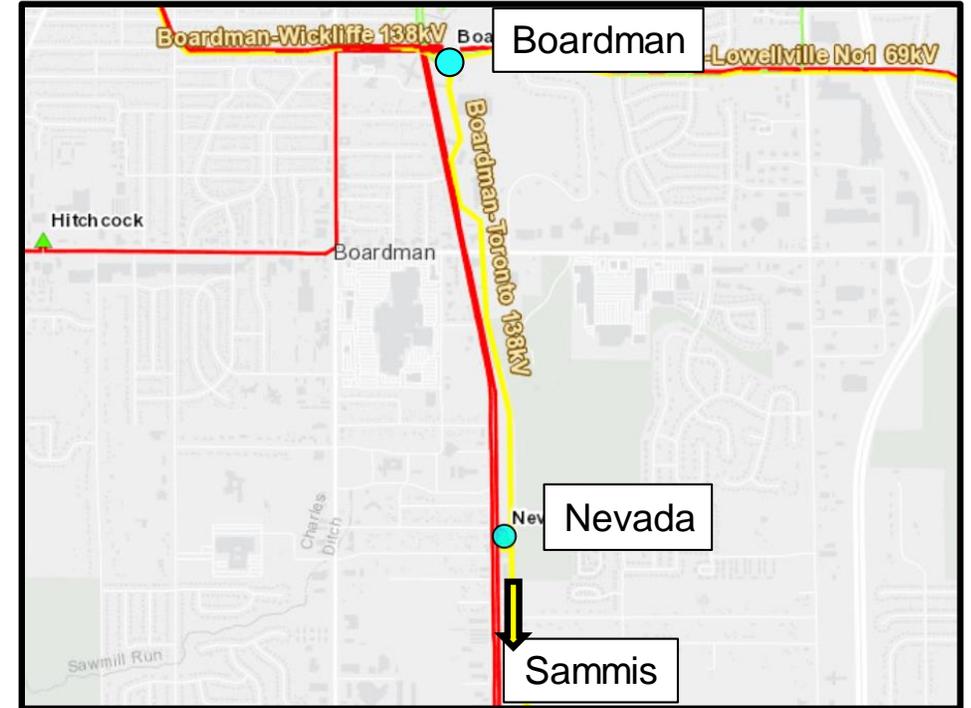
- System Reliability and Performance
- Substation/line equipment limits
- Reliability of Non-BES Facilities
- Load at risk in planning and operational scenarios.
- Load and/or customers at risk on single transmission lines

**Add/Expand Bus Configuration**

- Loss of substation bus adversely impacts transmission system performance

**Automatic Sectionalizing Scheme**

- Projects are developed under this methodology by evaluating load at risk and/or customers impacted



Legend	
345 kV	
138 kV	
69 kV	

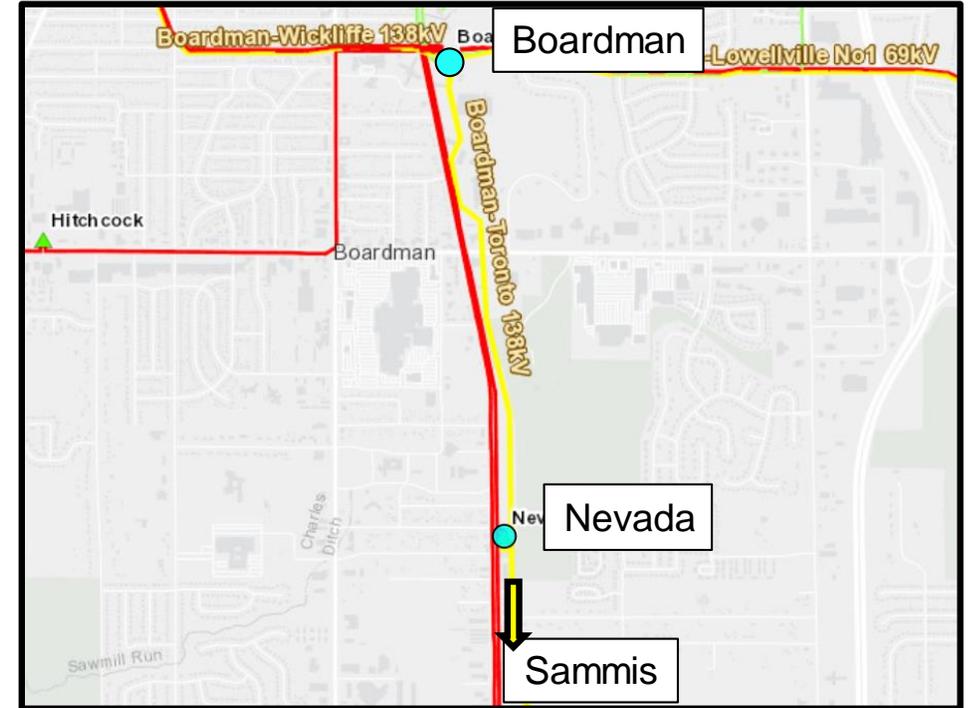
**Need Number:** ATSI-2020-005  
**Process Stage:** Need Meeting – 04/20/2020

**Problem Statement**

Boardman-Sammis 138 kV Line

- The Nevada substation serves 42 MW and 5,729 customers via the Boardman-Sammis 138 kV Line.
- The P1-2 contingency (ATSI-P1-2-OEE-138-024) for the loss of the Boardman-Sammis 138 kV Line will outage roughly 42 MW and 5,729 customers.
- Boardman-Sammis 138 kV Line has experienced seven outages in the past five years (two sustained)
- Circuit limiting substation conductor located at Nevada substation for both the Boardman-Nevada and Nevada-Sammis 138 kV circuit

**Model:** 2019 Series 2024 Summer RTEP 50/50



Legend	
345 kV	
138 kV	
69 kV	

**Need Number:** ATSI-2020-006  
**Process Stage:** Need Meeting – 04/20/2020

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

**Specific Assumption References:**

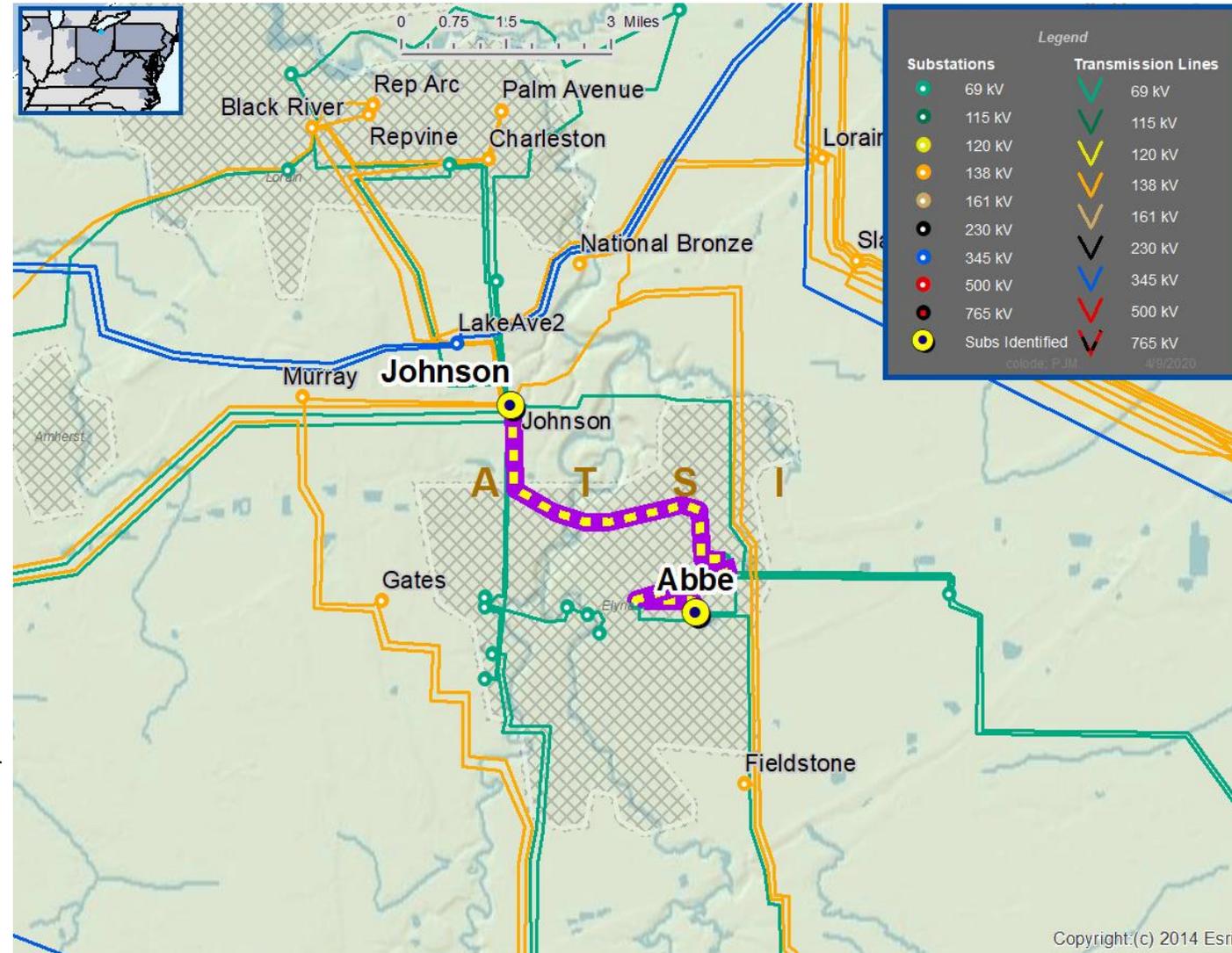
**Global Considerations**

- System reliability and performance
- Substation / line equipment limits

**Problem Statement:**

Abbe – Johnson #1 69 kV switch (A-47)

- Switch originally installed in 1982
- Corrosion on operating mechanism
- Existing KPF switch is obsolete and no longer supported by the manufacturer
- Undesirable design with vertical operating rod
- Transmission line ratings are limited by the existing switch rating



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<b>ATSI-2020</b>	<b>Transmission Line / Substation Locations</b>	<b>Existing Line/Terminal Equipment MVA Rating (SN / SE)</b>	<b>Existing Conductor/Transformer MVA Rating (SN / SE)</b>	<b>Limiting Terminal Equipment</b>
-006	Abbe-Johnson #1 69 kV Line switch A-47	82 / 103	110/134	Switch A-47

# 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

**Need Number:** ATSI-2019-016  
**Process Stage:** Solution Meeting  
**Solutions Meeting:** 04/20/2020  
**Needs Meeting:** 01/11/2019

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

**Specific Assumption Reference(s):**

**Global Factors**

- At or beyond expected service life or obsolete
- Failure risk, to the extent caused by asset design characteristics, or historical industry/company performance data, or application design error
- Show a high level of criticality to system performance and operations

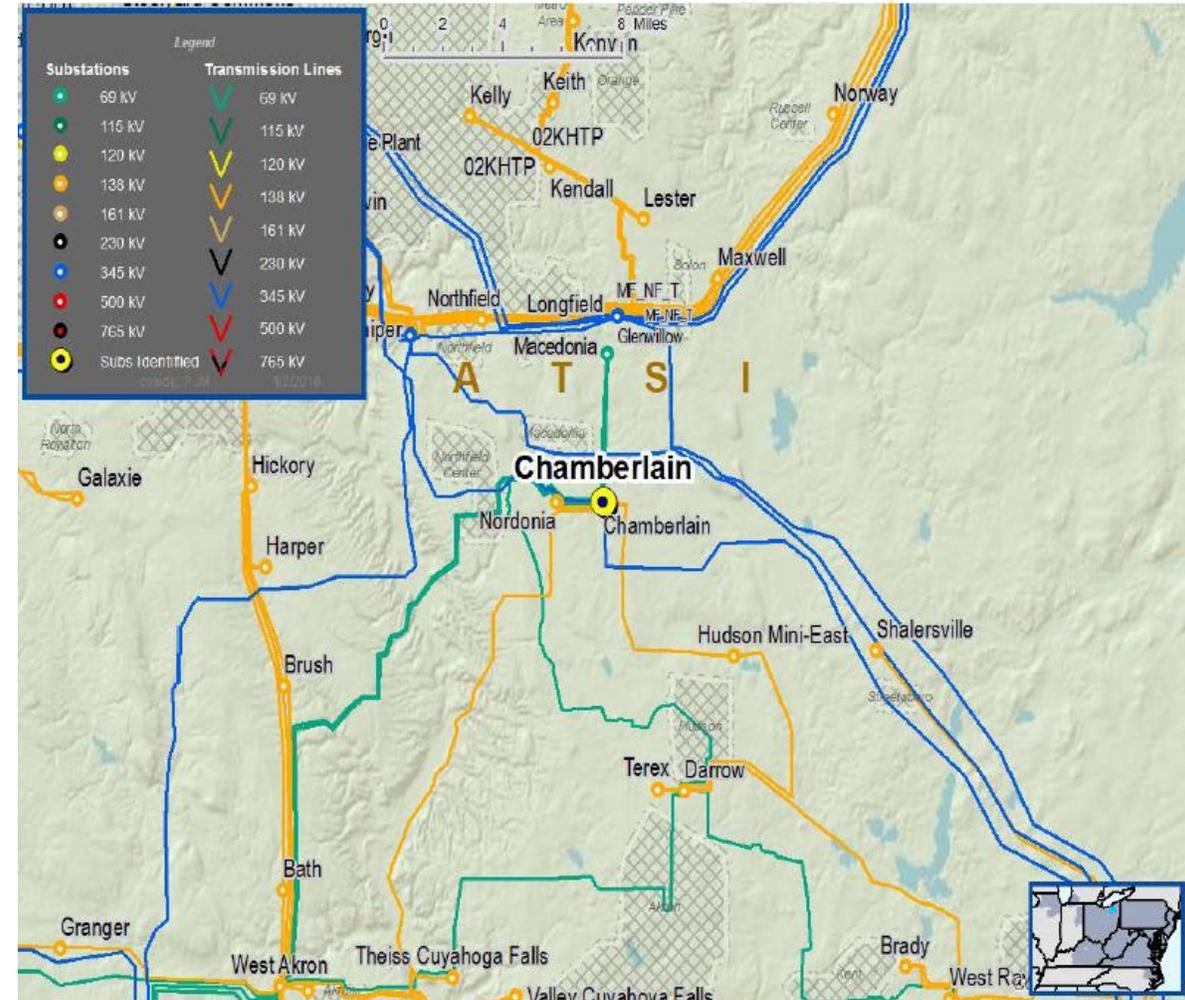
**Substation Condition Rebuild / Replacement**

- Circuit breakers and other fault interrupting devices
- Switches
- Risers and connections

**Problem Statement:**

Chamberlin 138 kV Substation

- *Two (2) 138 kV Oil Circuit Breaker (OCB) breakers (B86 & B69) and MOAB Switch A-19 at Chamberlin are showing degrading performance, increasing maintenance, age (> 30 years), and obsolescence of equipment and spare parts.*



**Need Number:** ATSI-2019-016  
**Process Stage:** Solution Meeting  
**Solutions Meeting:** 04/20/2020  
**Needs Meeting:** 01/11/2019

**Proposed Solution:**

Chamberlin 138 kV Breaker and Switch Upgrades

- Replace two (2) 138 kV Oil Circuit Breaker (OCB) breakers ( ) B86 & B69 that are part of the protection scheme for the two 138 / 69 kV transformers at Chamberlin substation, upgrade the transformer #2 relay, and replace MOAB Switch A-19.

**Transmission Line Ratings:**

- Chamberlin 138 / 69 kV Transformer #2
  - Before Proposed Solution: 163 MVA SN / 163 MVA SE
  - After Proposed Solution: 164 MVA SN / 174 MVA SE

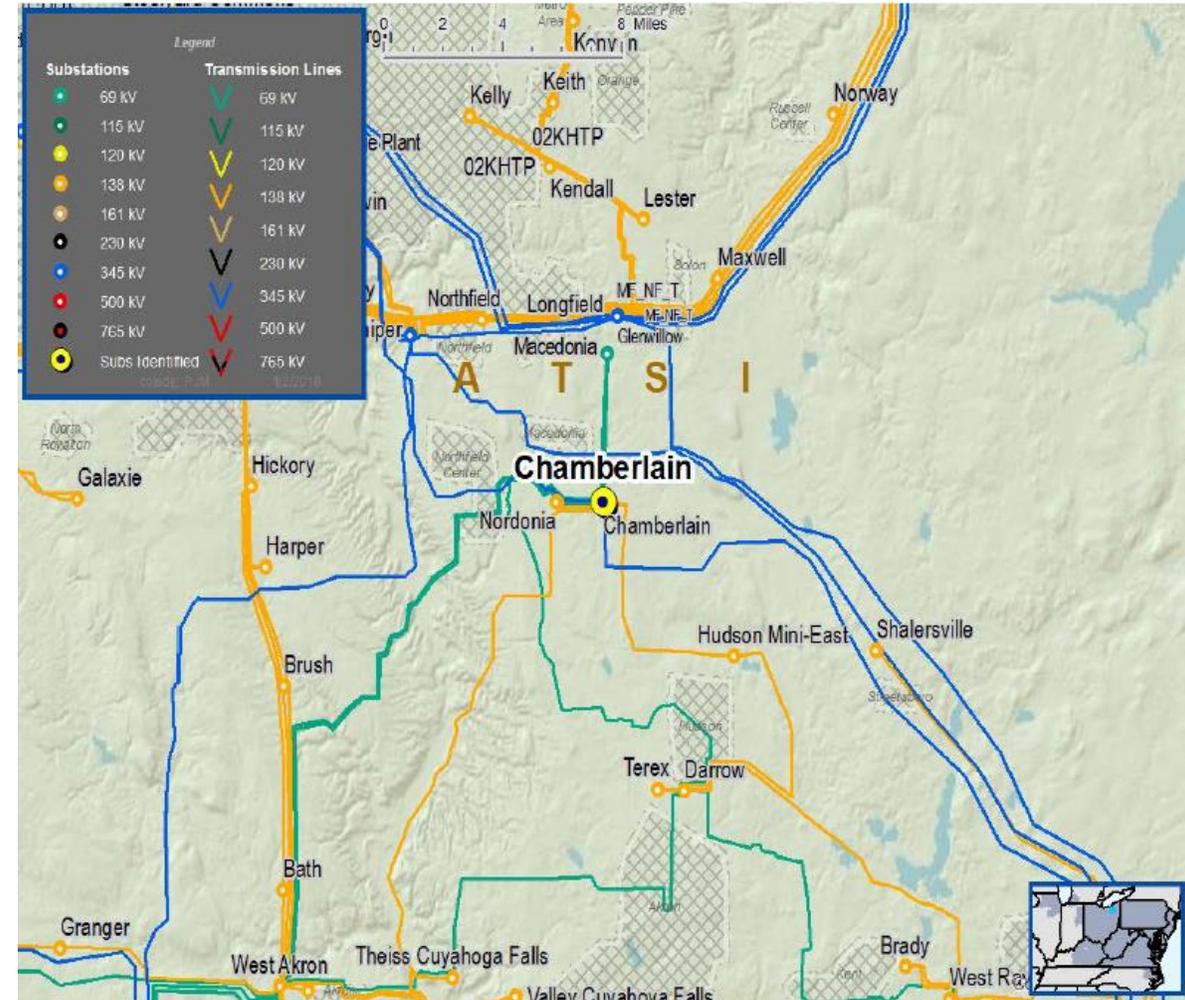
**Alternatives Considered:**

- Maintain existing condition and risk of failure.

**Estimated Project Cost:** \$0.5M

**Projected IS Date:** 03/31/2021

**Status:** Engineering



**Need Number:** ATSI-2020-002  
**Process Stage:** Solutions Meeting  
**Solutions Meeting:** 04/20/2020  
**Previously Presented:** 02/21/2020

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

**Specific Assumption Reference(s):**

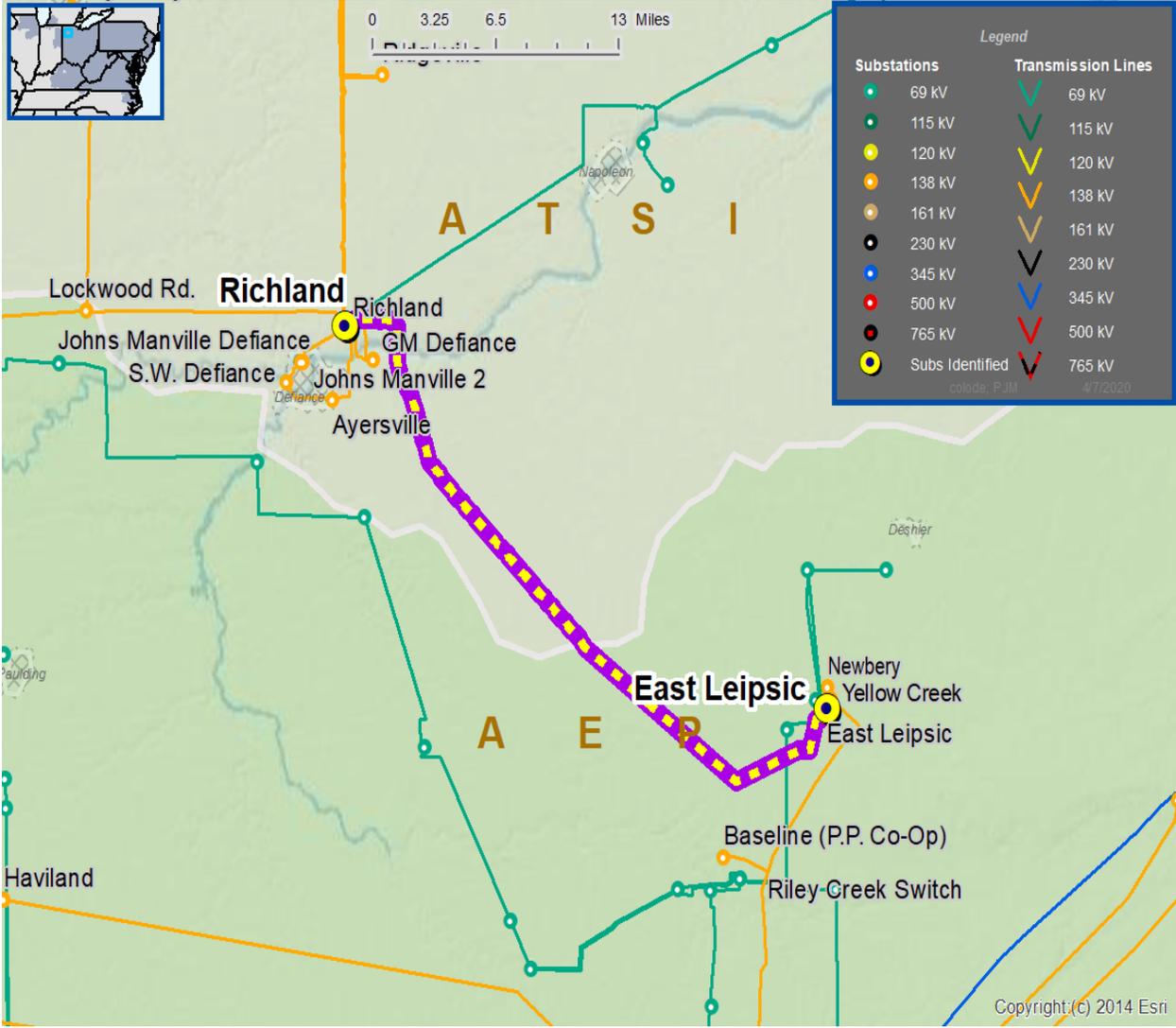
**Line Condition Rebuild / Replacement**

- 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.

**Problem Statement:**

Richland-East Leipsic 138 kV (~15.8 miles) Transmission Line:

- The Richland-East Leipsic 138 kV Transmission Line was built in the 1960s. The average age of the structures on this line are 54 years old. FirstEnergy has historically experienced an average age of reject for wood poles to be 48.7 years.
- Line was surveyed in 2018 and showed a structure reject rate of 100% (126/126). The primary reasons for reject were structure age, woodpecker holes, pole top decay, and phase raised structures.
- There has been a growing trend in unscheduled interruptions on this line. There have been 11 total outages since 2011 for lightning, equipment failures, and other issues.
- There has been an increase in unplanned maintenance on this line. A recent aerial patrol found 90 active maintenance conditions requiring repair for wood pole rot, broken static wire and attachment hardware, and bent braces.





# ATSI Transmission Zone M-3 Process Richland-East Leipsic 138 kV Line - Solution

**Need Number:** ATSI-2020-002  
**Process Stage:** Solutions Meeting  
**Solutions Meeting:** 04/20/2020  
**Previously Presented:** 02/21/2020

**Proposed Solution:**

**Richland-East Leipsic 138 kV Line Rebuild**

- Rebuild entire 15.8 mile of the ATSI owned Richland-East Leipsic 138 kV line.
- Replace existing conductor (636 kcmil ACSR) with 795 kcmil ACSR.
- Install OPGW along the entire line.

**Upgrade Richland Line Terminal**

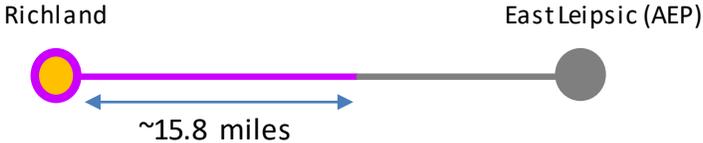
- Substation equipment for replacement includes: Breaker B13250, disconnect switches, line trap, CVT, tuner and COAX, substation conductor, relaying, and revenue metering.

- Existing line rating: 223 SN / 223 SE  
257 WN / 270 WE
- New line rating: 223 SN / 223 SE (Line rating limited by neighboring TO)  
281 WN / 281 WE (Line rating limited by neighboring TO)

**Alternatives Considered:**

- Maintain existing condition and elevated risk of failure and increasing maintenance costs

**Estimated Project Cost:** \$16.9 M  
**Projected IS Date:** 12/31/2021  
**Status:** Preliminary Engineering



Legend	
500 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	
Owned by Neighboring TO	

# 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

4/9/2020 – V1 – Original version posted to pjm.com