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Poston-Harrison 138 kV Rebuild

Operating Company: AEP Ohio TransCo/AEP Ohio Power

Project Type: Supplemental, CODE – DRETH – Asset Replacement Proactive
Project Category: Equipment Material/Condition/Performance/Risk
Project Location: Lockbourne, OH and Athens, OH
Estimated Supplemental Trans Cost: \$61.88M
Estimate Type: Class IV
Current Status: Under Construction
Projected ISD: 12/31/2019
AEP Project Number(s): TA2011012, A11012367, A11012368
PLMP Risk Level: Low

Project Sponsor: Sharlene Rivera - Gonzalez

Revision Date: 12/6/2017

Revision Number: 0

PJM Submission Date: 12/11/2017

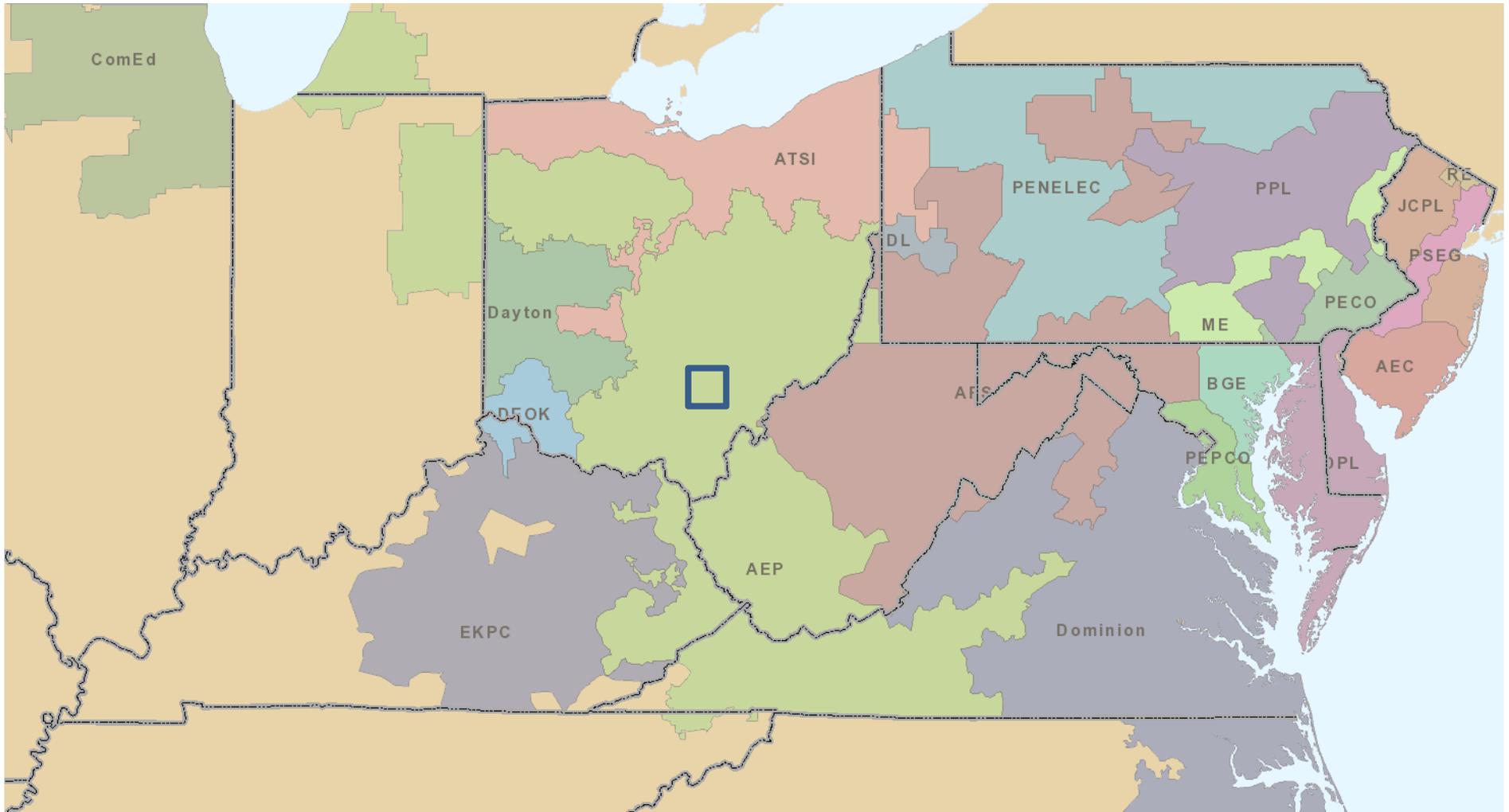
SRRTPE/TEAC Date: 01/08/2017

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Project Location



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Project Justification

Equipment Material/Condition/Performance/Risk:

The Poston - Harrison 138 kV Line is 54.4 miles long and was built in 1953 utilizing wood pole H-Frame structures. The existing 138 kV line is in need of a complete rebuild. The poles and line components are deteriorated so severely that they have become a hazard to effective maintenance practices. This line was built with rounded cross arms (spar arms) which are prone to cracks, allowing moisture to penetrate and rot from the inside out. A few of the images included in this presentation show vegetation growing from the rotting crossarms. Line Patrols have revealed heart rot in the wood poles leading to loss of pole strength. Broken and bird caged shield wires and stolen down leads across the entire 54.4 miles do not provide adequate lightning protection leading to momentary power interruptions. Split pole tops discovered during patrols allow moisture to seep in to the center of the pole, rotting the pole from the inside out. With the shield wire attached to the split pole tops, outages due to shield wire failure are expected to increase. The pictures included in this presentation are indicative of the condition of the entire line.

Customer Service:

South Central Power recently established a new delivery point off the line and has asked AEP to retain the line. In addition, both AEP and South Central Power has received several requests from prospects over the past 3 years.

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Alternates Considered

Alternate #1

No viable cost-effective transmission alternative was identified for rebuilding a section of this line for resolution of hazardous open conditions in the field.

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Poston – Harrison 138kV Line Harrison (CSP) – Poston 138kV Circuit

- Since 2010, AEP has performed 7 emergency aerial patrols
 - 6 patrols resulted in emergency repairs needed
- We have had 18 work orders on this line over the past 7 years
 - Work Orders addressed issues including grounding for tree crews due to vegetation in the line, broken cross arms, broken x braces, split poles, and replacing grounding systems.
- There has been 14 momentary outages over the past 3 years
 - These are attributed to Weather/Lightning
- There has been 6 permanent outages over the past 3 years
 - 4 are attributed to Equipment/Line/Crossarm totaling in 100.7 hours of duration
 - 1 is attributed to vegetation with 10.93 hours of duration
 - 1 is attributed to Weather/Lightning with 49.7 hours of duration

TOTAL OUTAGE DURATION OVER 3 YEARS = 161.3 hours

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Examples of Condition Types Poston – Harrison 138 kV Line





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Examples of Condition Types Poston – Harrison 138 kV Line





Examples of Condition Types Poston – Harrison 138 kV Line



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Poston – Harrison 138kV Line Existing & Prospective Load

- Agreements are in place with a large customer to increase load at Tuscany station to 80 MW. Current consumption is 40 MW.
- Feedback from Buckeye Power representing South Central Power dated 1/11/2018 expressing the need to retain this line to provide adequate service.
- In the last two years, six separate spec loads ranging from 100 MW to 200 MW have been evaluated south of Harrison. This area is a prime location for manufacturing plants and data centers.
- 1000 MW of load has connected to the AEP Ohio system since 2015 – mostly manufacturing demand.

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Poston – Harrison 138kV Line Load Flow Analysis

- Agreements are in place for the load at Tuscany station to increase to 80 MW. With retirement of this line:
 - Beatty-Zuber 138 kV line overloads to 107% under N-1 conditions.
- When modeling 200 MW of spec loads in this area and retiring the Poston-Harrison line:
 - Lemaster-Strouds Run 138 kV overloads to 100% under N-1-1 conditions.
 - Beatty-White Road 138 kV lines overloads to 103% under N-1-1 conditions.



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Why Not Double Circuit the Poston – Bixby line?

Preferred Solution	Cost (\$M)	Alternate Solution	Cost (\$M)
Rebuild 138kV Poston-Hocking Line	17.1	Rebuild Poston-Hocking as a double circuit (16.7 miles * \$1.3M/mile)	21.7
Rebuild 138kV Poston-Harrison Line	61.8	In order to terminate the four lines and distribution transformer a five breaker ring would need to be constructed at Hocking. Hocking substation does not have sufficient room for this and would need to be rebuilt in the adjacent property. Cost of building 138kV five-breaker ring bus at Hocking:	9.5
		Removal cost for old Hocking station	0.5
		New one-mile extension to connect the old Poston-Harrison line pole 83 to Hocking (1 mile * 1.1M/mile – assuming direct route & no ROW concerns):	1.1
		New Hocking-Harrison line single ckt construction (39.1 miles*1.1M/mile)	43.0
		Removal of Poston-Harrison line from Poston to Pole 83	0.5
Total Cost Preferred Solution:	78.9	Total Cost Alternate Solution:	76.3

- The alternate solution estimate does not account for increasing the Right of Way through Wayne National Forest for taller structures, which are required for this terrain.
- The alternate solution estimate does not take into consideration the cost to be reimbursed to South Central Power for moving Buena Vista Delivery Point. AEP estimates this cost to be in excess of \$5 million.
- Considering the overall cost, the increased reliability exposure, and the resiliency offered by separates Rights of Way through Wayne National Forest, the best value for customers is the AEP preferred solution.

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Email from Ohio Electric Cooperative

From: Tom Schmidt <tschmidt@ohioec.org> Sent: Thu 1/11/2018 2:15 PM
To: Kamran Ali
Cc: Jasmine L Moore; Daniel T Zambory; Craig Grooms; Mohan Sachdeva; Ben Wilson; Ryan Strom
Subject: [EXTERNAL] Stakeholder Input for Poston-Harrison Upgrade and Line Rebuilds in General

This is an EXTERNAL email. STOP. THINK before you CLICK links or OPEN attachments. If suspicious please forward to incidents@aep.com for review.

Kamran –

Below are our thoughts on AEP’s line rebuild projects across the state of Ohio:
Over the past 8-10 years, AEP has embarked on many rebuilds to aged lines across the state of Ohio. During this time period, reliability to Buckeye Power’s member cooperatives has improved. The last five years in particular represent the highest reliability we’ve experienced since we began statewide outage tracking in 1998. We feel that AEP’s process of identifying and replacing aged infrastructure is a contributing factor to the increase in reliability to Ohio’s Electric Cooperatives. We recognize the need for their proposed enhancements to the transmission system and appreciate the transparency AEP provides in the PJM stakeholder process.

And for the Poston-Harrison upgrade in particular:
If faced with the option to rebuild the line or abandon the line, Buckeye Power and its member South Central Power is in favor of rebuild. South Central Power established the Buena Vista delivery point on the Poston-Harrison 138kV circuit in 2012. Abandonment of the Poston-Harrison line would result in stranded costs to SCP as well as additional costs to establish a new delivery point on the 69kV line nearby.
When they were considering establishing the Buena Vista delivery point, SCP willingly sought to connect to the 138kV circuit rather than the nearby 69kV circuit for the following reasons: statewide outage figures indicate that service to delivery points at 138kV is much more reliable than those at 69kV, service via 138kV provides for backup service to SCP’s Gibisonville station connected to the nearby 69kV line. The likelihood of a simultaneous outages to both the 138kV and 69kV lines is very low.

Feel free to use this information as these projects are discussed at the RTEP meeting later this month. I plan to be attending the meeting and I’d be willing to share our thoughts with the group.

Thanks,
Tom

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Agreement to Increase Load at Tuscany

CIAC Addendum A

STATEMENT OF WORK

Addendum A to CIAC Agreement between Ohio Power Company ("AEP Ohio")

And [REDACTED]

Dated 11/04/2016

[REDACTED] ("Customer") has requested electric service [REDACTED] [REDACTED]. The drawing attached as Schedule 1 shows the proposed location of facilities on the site. Customer has requested delivery of service to the customer 138 KV steel receiving structure in customer owned station.

The projected peak demand at this delivery point is estimated at 80 MW.

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