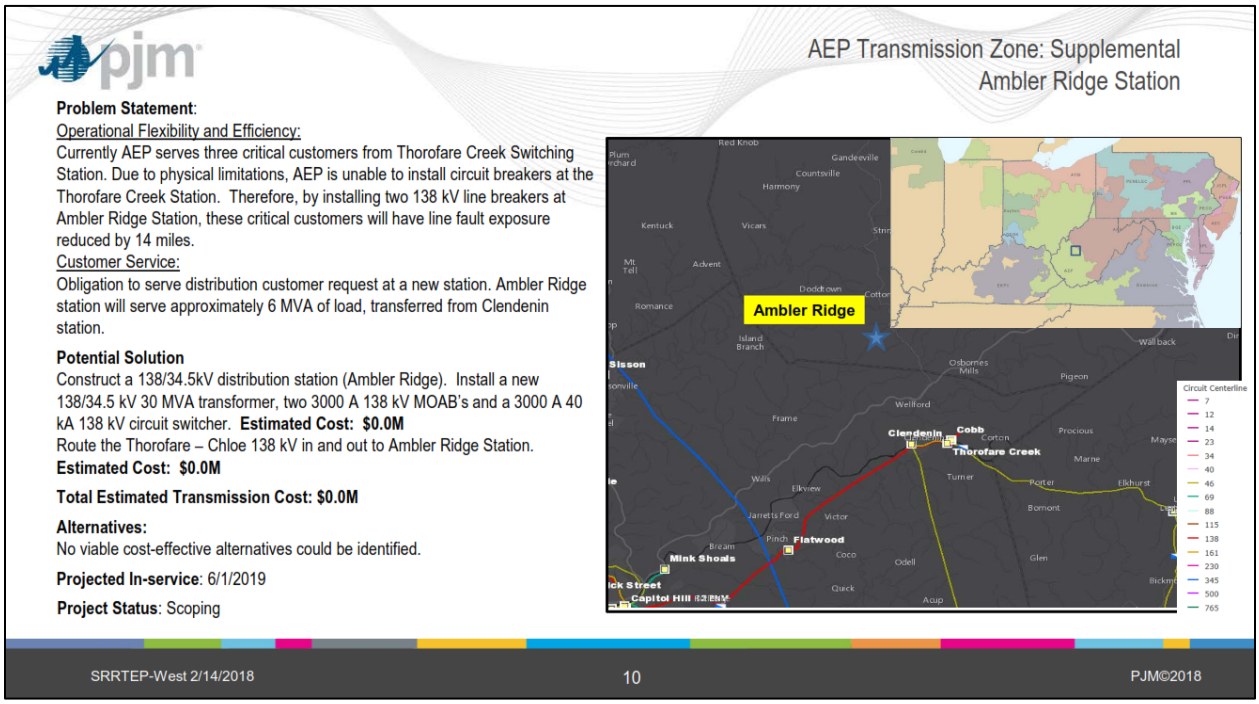
PJM SRTEP Meeting
2-13-2018
Questions Pertaining to Proposed Projects & Scopes

AEP: Ambler Ridge:

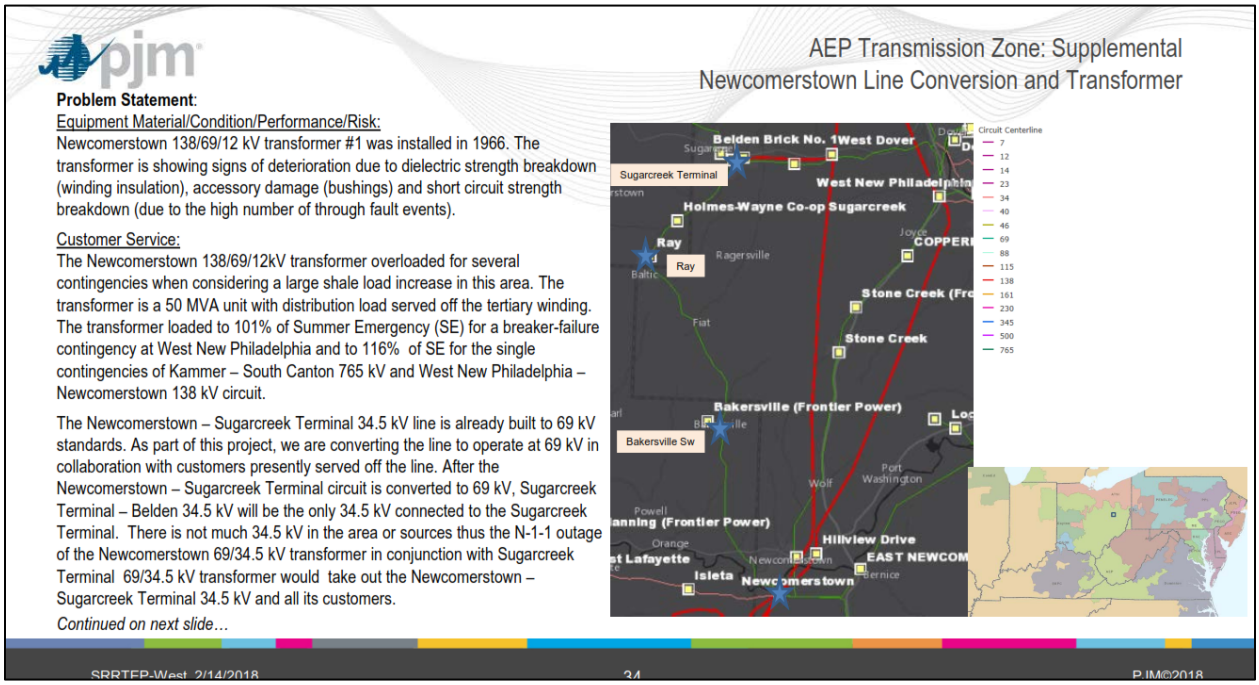


- **The problem statement states two 138kV CB's will be installed at Ambler Ridge, however the potential solution says two 138kV MOABS. Which statement is correct?**
- **Who will own these breakers or MOAB's, and circuit switcher?**
- **Is this project owned by TranSource?**
- **Why is there no transmission cost associated with this project? AEP has presented multiple projects where AEP has included 138kV circuit breakers at distribution stations as transmission cost. Why is the same**

methodology not being applied here? Is this AEP's standard practice?

- **Why does the map for this project not show the Transource proposed project?**
- **Transource originally proposed a ~17 mile 138kV line extending from the Thorofare area and tying into the FE system via the Chloe station.**
    a. **Did this project's scope change to accommodate this proposal? If so, has Transource presented their scope change and the cost associated with this change?**
    b. **Whose customers will be incurring the cost of this reroute, FE's, APCO's, AEP Transmission?**
- **How can AEP establish a 138kV station and CB's with no transmission cost and why isn't AEP applying this same methodology to all of its transmission projects?**

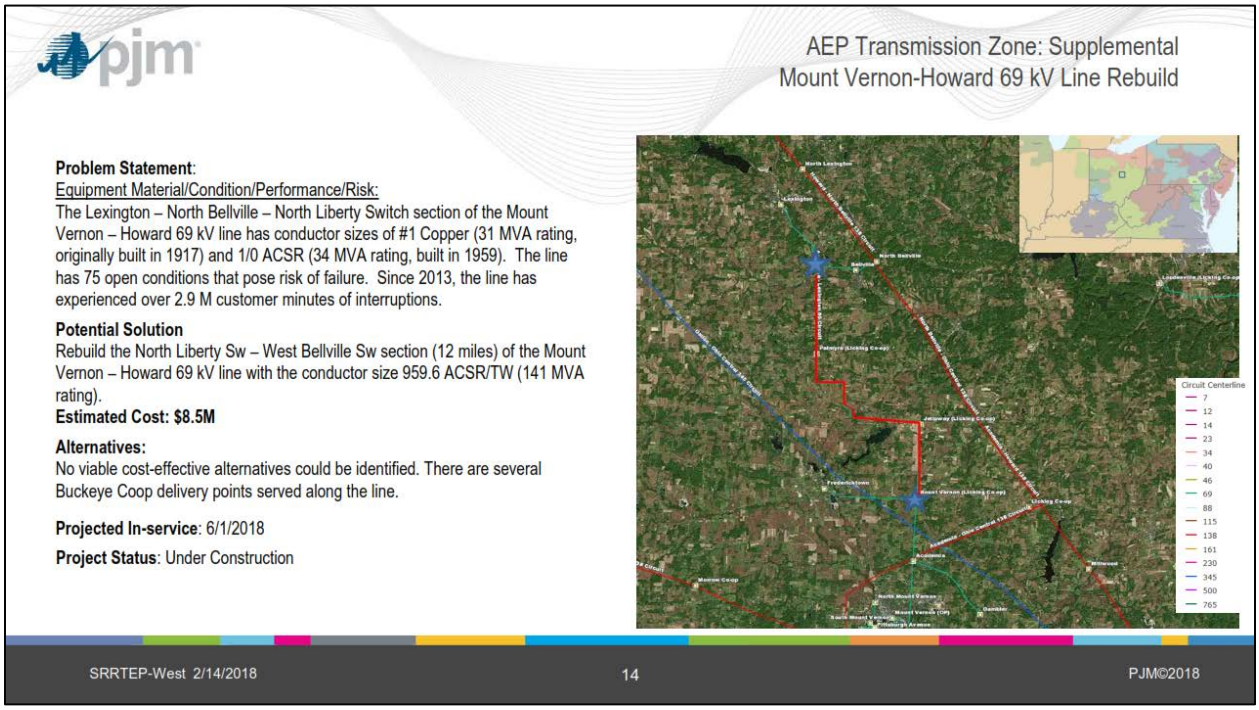
AEP: Newcomerstown Line Conversion and Transformer



- **Was AEP's FERC Form 715 data used in this analysis or was some other data used?**
- **Did AEP use the PJM 50/50 load forecast to determine this overload? What was the limiting element being overloaded? Was it the transformer?**
- **Was a load profile other than the profile in PJM's 2017 RTEP case used?**
- **What case was used for this study?**
- **Were there any new loads in the case used for the study that were not in the 2017 PJM RTEP case? If so, what were the changes in load levels and at what stations were these changes applied?**
- **Please provide the number of through faults recorded on the transformer.**

- **Would the N-1-1 outage of the Newcommerstown – Bakersville and the Sugercreek Terminal –Sugar Creek also result in an outage to all customers served from the Newcomerstown – Sugarcreek Terminal?**

AEP: Mount Vernon – Howard 69kV Rebuild:



1. **Why is AEP installing Suwannee Trapwire (TW)?**
2. **Please confirm this upgrade will increase the lines capability by 4.5 times the lines current rating.**
3. **Is this conductor an AEP standard conductor size? What is the cost difference between the proposed conductor and AEP's stated standard conductors, 1033 ACSR, 795 ACSR and 556 ACSR? Why wasn't an AEP standard conductor used?**
4. **Will all station elements in series with the line have the same capability as the Suwannee?**
5. **What is the highest loading projected for this line?**
    a. **Please provide the contingency conditions under which this loading was identified**

b. Please provide the power flow case to PJM, so stakeholders can request the case and review the power flow analysis.
c. Did AEP use PJM's 50/50 load forecast?
d. Was there any adjustments to the area generation and/or loads?

6. Why wasn't this project presented to stakeholders prior to going into construction?
7. Is this line being built to accommodate future 138kV conversion?
8. Would AEP consider an adjustment to the wire size as an alternative for the project?

AEP: Harpster – Waldo 69kV Rebuild

AEP Transmission Zone: Supplemental
Harpster – Waldo 69 kV Rehab

Continued from previous slide…

Potential Solution:
Rebuild ~27.7 miles from Harpster 69 kV Station to Waldo 69 kV Station utilizing 795 ACSR conductor (SN 129 MVA rating)
Estimated Trans Cost: $30.0M

Replace existing 600 A two way switch at Harpster Pump station with 1200 A three way switch.
Estimated Transmission Cost: $0.91M

Install a one way 1200 A phase over phase switch (Goodnow Road SW) just north of Ridgedale (Marion Rural Co-op)
Estimated Transmission Cost: $0.17M

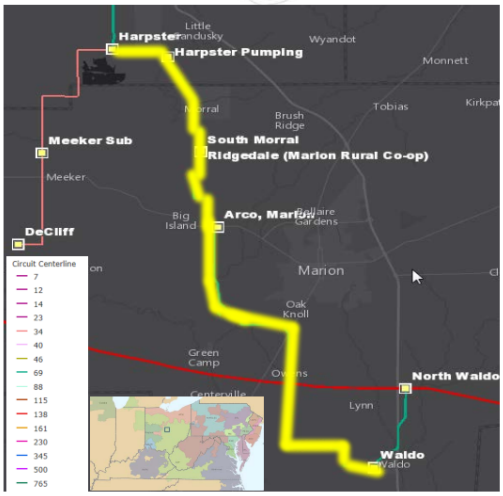
Remove station West Marion SW.
Estimated Transmission Cost: $0.08M

Total Estimated Transmission Cost: $31.2 M

Alternatives:
No viable cost-effective alternatives could be identified

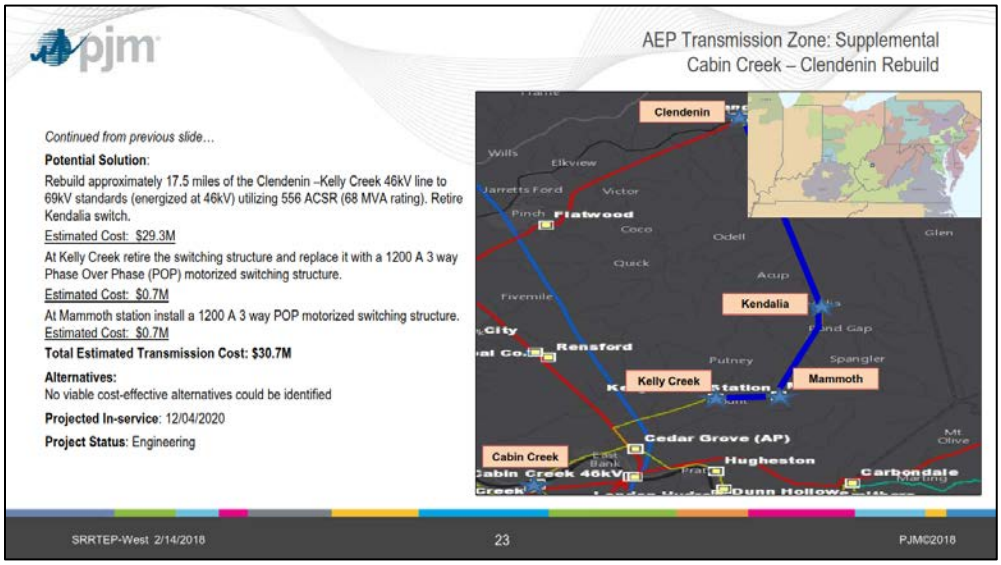
Projected In-service: 06/04/2021

Project Status: Engineering

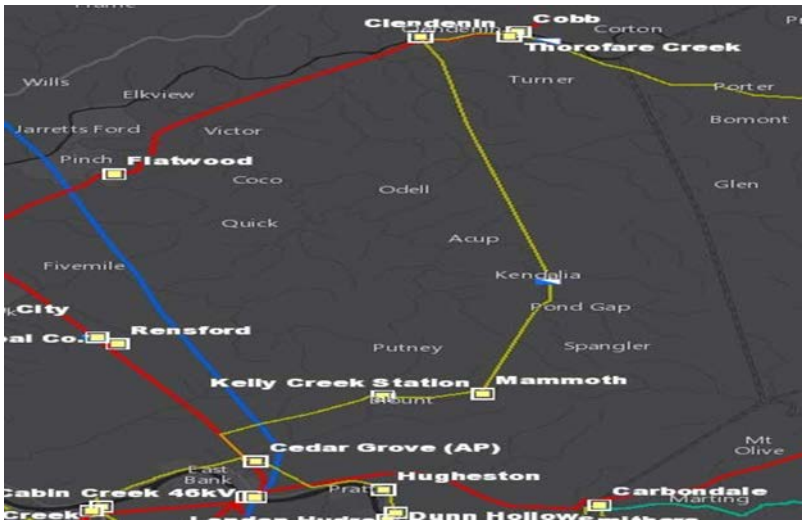


- **Will wood or steel being used for the rebuild?**
- **Why is such a large conductor required? Why would 336 ACSR, or 556 ACSR not be adequate?**
- **Will this line be designed to accommodate future conversion to 138kV**
- **Are wood structures adequate for this line?**
  - **Please provide AEP's cost determination for the wood construction design, if steel structures are being proposed.**

AEP: Cabin Creek – Clendenin Rebuild



- **Per AEP one line diagrams, Kendalia is bolted close. Is there load served from this station or has the station been retired?**
- **Per AEP one lines the proposed rebuild is ~17.5 miles**
    a. **All should note, a radial 138kV line will not be the only source serving the Clendenin station in the future. Transource is building a project that ties this radial line to APS system located east of the Clendenin station. This project is also associated with the Ambler ridge project previously presented**



Total circuit length = 26 miles

b. Cabin Creek – Kelly Creek =~8.5

c. Kelly Creek – Mammoth = ~2.1 Miles

d. Mammoth – Clendenin = ~15.4 Miles

i. (No Stations Between Mammoth & Clendenin)

- **Why has AEP chosen not to present any alternatives? Were alternatives investigated, if so what where they?**

Alternatives to Consider:

- **Alternative #1: Has AEP considered Carbondale – Mammoth by extending the 46kV circuit southeast towards Carbondale:**
  - **a. Distance: ~5.3 - 6.7 Miles**
  - **b. Possible reduction in line length: ~9-10miles**
- **Alternative #2: Has AEP considered Belva – Mammoth by extending the line east towards Belva station:**
  - **a. ~10.3 – 13.08 Miles**
  - **b. Possible reduction in line length: ~3-6 miles**
  - **c. Design line for 138kV for possible future conversion. Proposal would provide redundant, future 138kV**

path between Kanawha Area and the Belva Area when conversion is needed.

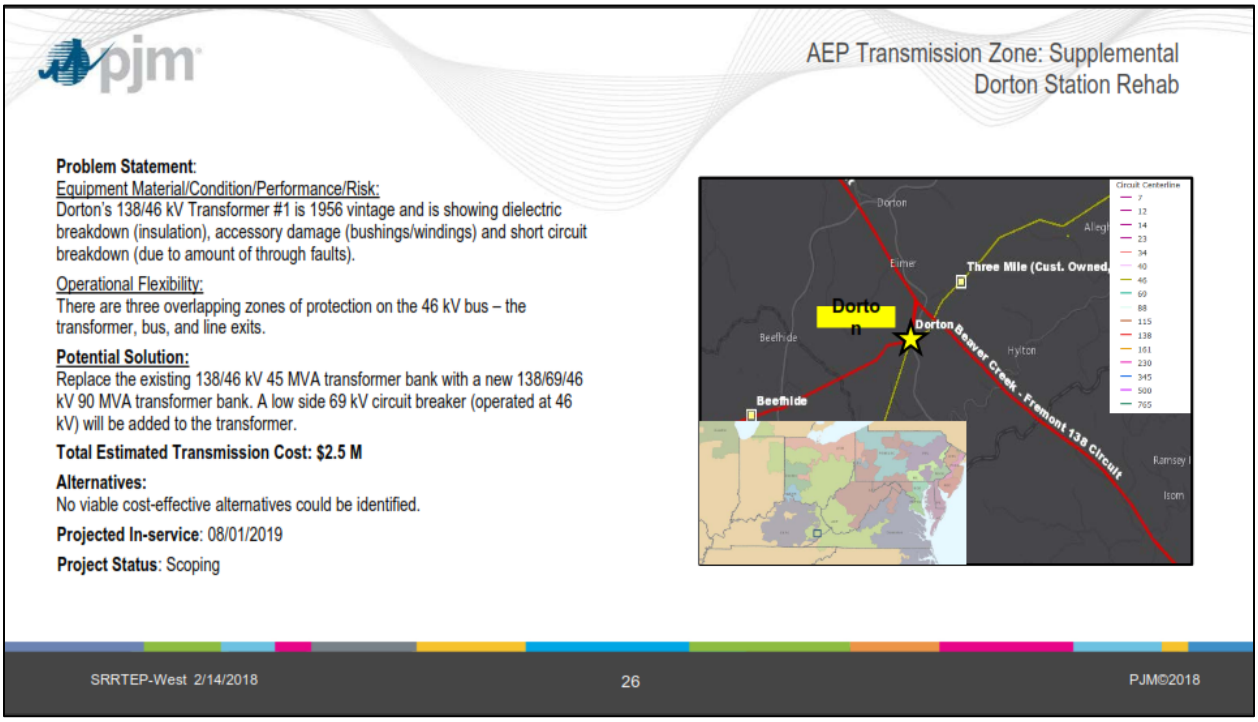
- Alternative #3: Has AEP considered building a double circuit extension to Kelly Creek and Mammoth?
    i. Addresses a much larger range of conditions issues.
    ii. Also eliminates future needs to address Kelly Creek – Cabin Creek 46kV path which connects into Cabin Creek.

Scope:

b. Tap the 6-wired Kanawha River – Chloe circuit, looping in and out of both Kelly Creek and Mammoth stations via a double circuit line
c. Convert Kelly Creek & Mammoth to 138kV stations?

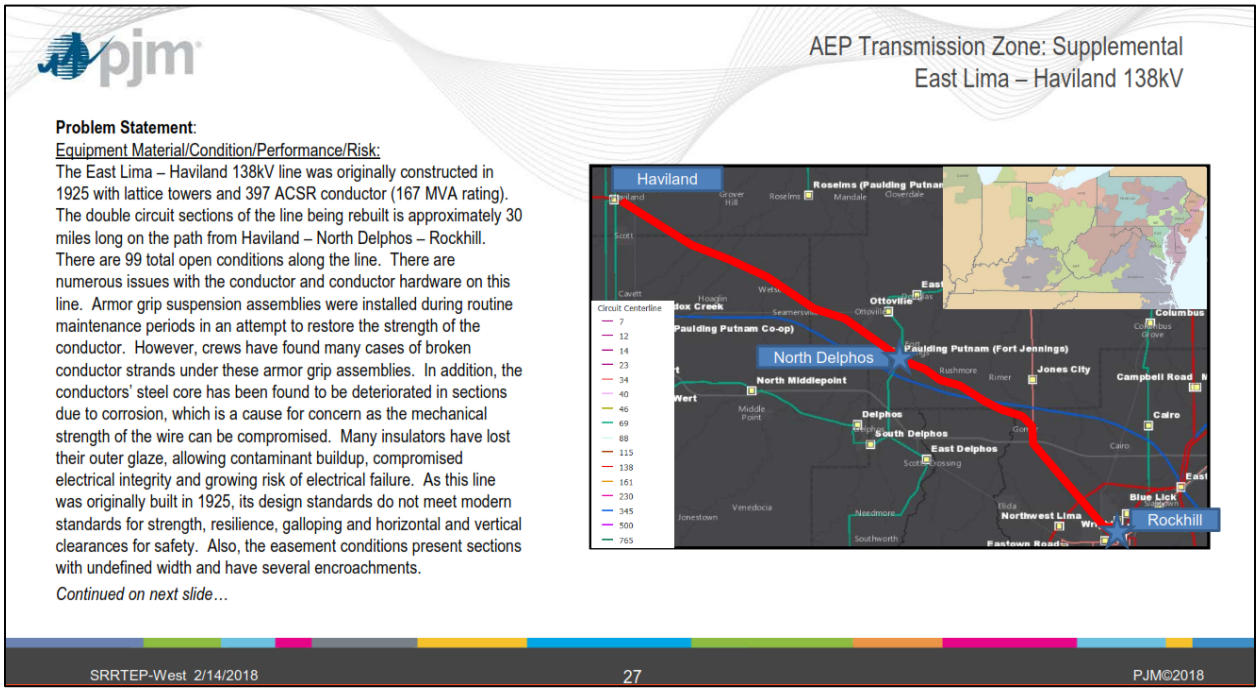
- **What is being done about the condition of the Mammoth Substation? Would this not be included into AEP's "Holistic Solution"? Same question for Kelly Creek station? Are these distribution stations? Is that the reason there condition issues are not being address?**

AEP: Dorton Station Rehab



- **Please provide the current rating of the transformer being replaced.**
- **Please provide the number of through fault events**
- **Please provide the CO/CO2 ratio value for this unit.**
- **Please provide an explanation about why this replacement was not complete as part of the Dorton circuit breaker installation project recently completed.**
- **Please provide projected dates for local area 69kV conversion and please provide the scope associated with this conversion.**
- **Describe, in detail, the three overlapping zones of protection noted above.**

AEP: East Lima – Haviland 138kV



- **Why are we rebuilding the entire line when only conductor and hardware issues have been presented?**
- **Please provide AEP photos for all of the structures proposed to be rebuilt. Do these structures in need to be rebuilt. Do they have condition issues?**
- **Please provide AEP's design "standards" for resilience noted. Are these provided in your "Requirements of New Facilities or Changes to Existing Facilities Connected to the AEP Transmission Systems" or in AEP TLES-10 documentation noted?**
  - **http://www.aep.com/about/codeofconduct/OASIS/TransmissionStudies/Requirements/AEP_Interconnection_Requirements_Rev1.pdf**

- **Are companies wishing to connect to AEP's grid required to meet these "Resilience Standards"?**
- **How would a developer wishing to "Self" construct a project in AEP's footprint know what AEP's resilience standards are?**
- **Are these standards public?**
- **Please provide your design standard for galloping noted and the referenced documentation that notes these standards.**
- **Please provide your design standard for strength noted and the referenced documentation that notes these standards.**
- **Please provide your design standards for horizontal and vertical clearances noted, and the referenced documentation that notes these standards. Have these changed recently?**
- **Does this line with its current clearances, violate NESC standards?**
- **Has AEP considered any alternatives, if so please provide those alternatives?**
- **Was a single circuit between either North Delphos – Rock Hill or North Delphos – Haviland considered? Why is a double circuit required? Please include a detail description of the justification.**
- **Please describe the termination points of these circuits. Do the circuits all terminate at Rockhill, North Delphos,**

and Haviland? If not, what are the names of the stations these circuits/branches and where do they terminate?

- **Please provide outage details associate with this line.**
  - **How many outages has this line experienced over the last 3,5,10 years?**
  - **How many CMIs (Customer Minutes of Interruption) have resulted from these outages?**
  - **Where there operating constraints during these outages? If so, PJM please confirm these constraints with dates, times and description of constraints.**