AMP Questions for AEP Projects Presented at 11-3-2017 STEAC-Western Meeting

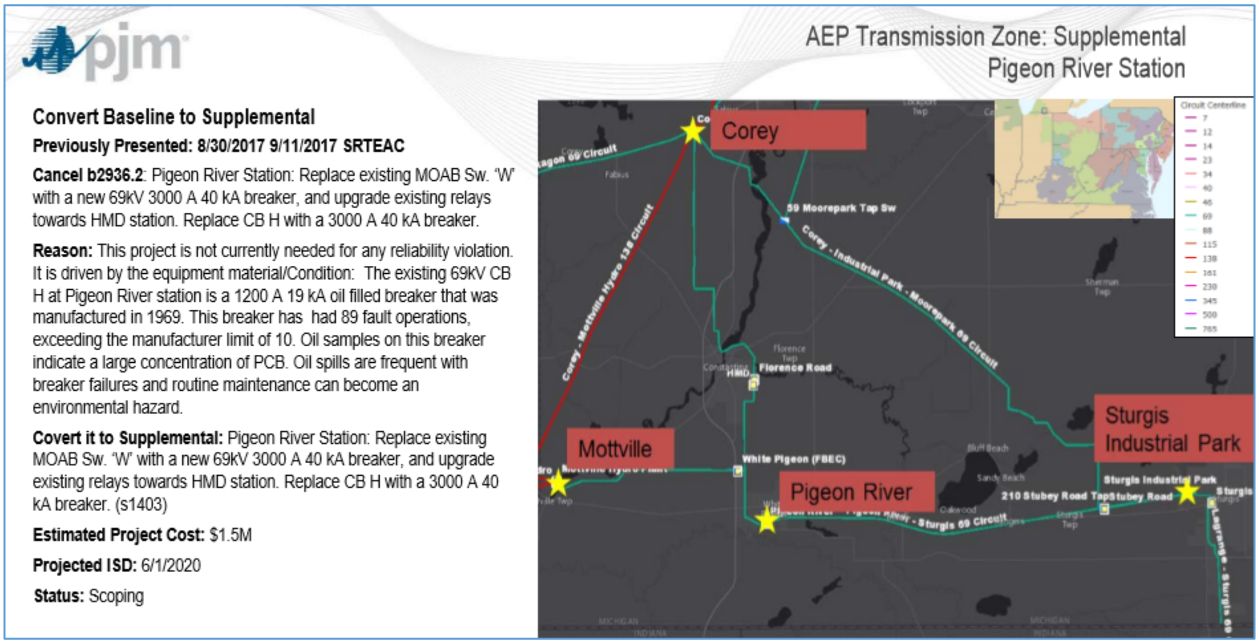
Question for all projects:

-What will each project's monthly cost impact be for 1,000 kWh taken from AEP's system?

For all project currently in construction:

-Do these project proposals adhear to FERC's show cause order with requires to allowing adequate time for stakeholder input?

Pigeon River Area Project:



Q: What is the justification for replacing MOAB SW. 'W' with a circuit breaker?

Q: Does AEP's MPOI Calculation support the installation of CB W?

Q: What are the PCB concentration levels of the 69kV CB H?

Q: What is the Pigeon River overall priority ranking when compared to all other stations in AEP's eastern footprint?

Q: What was the reason for converting the baseline project to supplemental?

Q: If the baseline project is not needed why is the supplemental project needed?

Q: Please provide a oneline of the current system configuration.

Q: Please provide a oneline of the proposed configuration.

Q: What is the benefit to cost ratio for the proposed project?

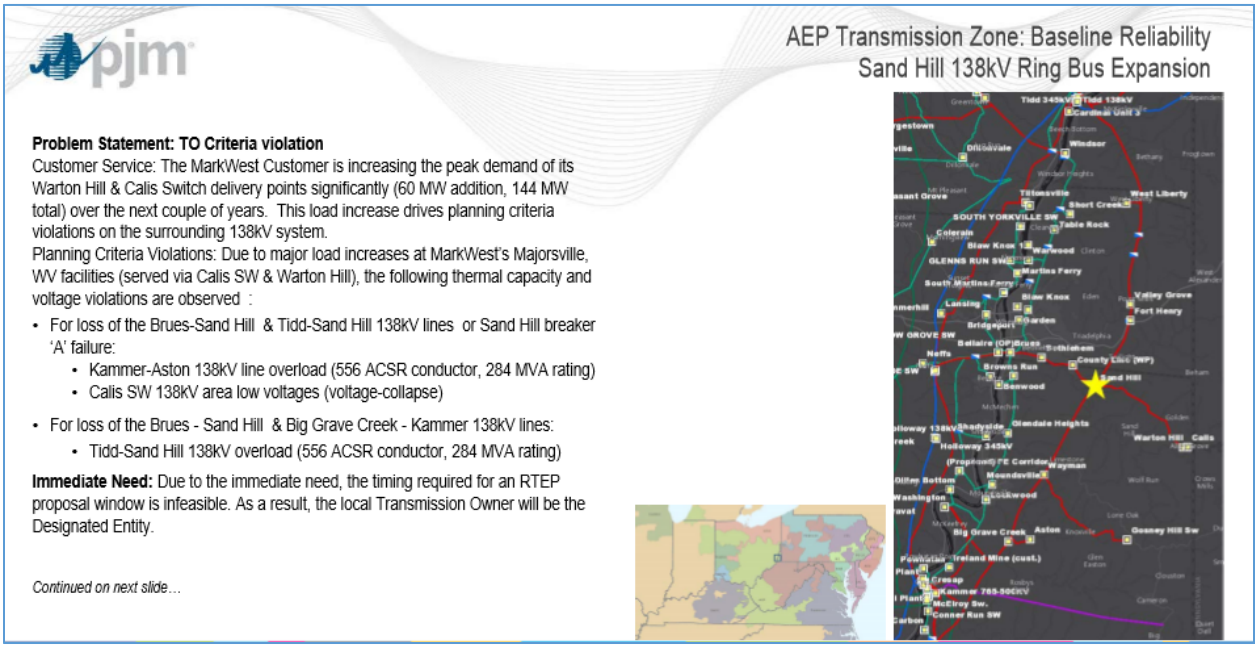
Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed project?

Q: What will be the most limiting series element for each of the impacted through paths?

Q: For all equipment being replaced, please inform stakeholders of the follow:

- Has the asset being replaced failed?
- Is the asset currently in-service?
- What will AEP do with the asset once it is removed from service?
- Will AEP make this asset available for purchase by an outside organization?
- Do all proceeds of asset sales or scrap sales get applied as a credit to the project cost?

<u>Sand Hill 138kV Project:</u>



Q: Why was this overload not identified by PJM?

Q: Please identify the PJM contingency definitions used to justify the projects. I am interested in either the PJM contingency "Name" or a line by line definition of the two contingencies used to identify this project.

Q: What is the status of this project? (scoping, engineering, construction, in-service)?

Q: Please provide a oneline of the exsiting system configuration.

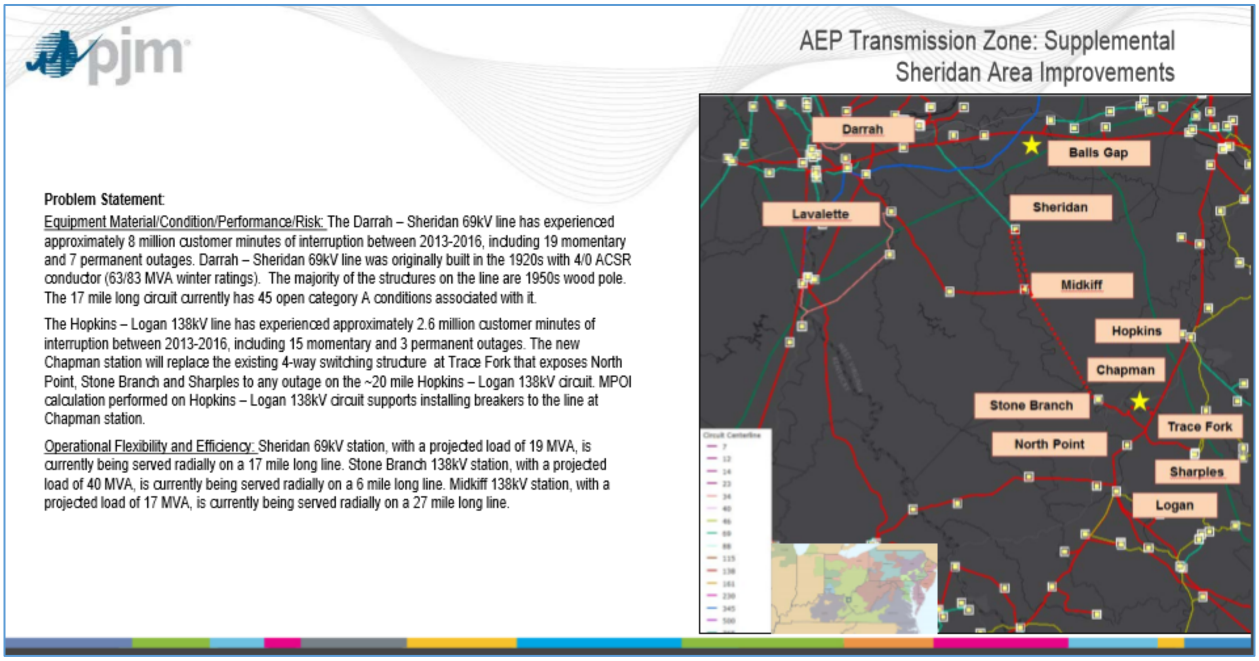
Q: Please provide a oneline of the proposed configuration.

Q: Have the outages been scheduled?

Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed project?

Q: What will be the most limiting series element for each of the impacted through paths?

<u>Sheridan:</u>



Q: AEP's preferred solution is the retirement of the Sheridan station. Will this retirement be a distribution or transmission cost?

Q: Is the existing radial Darrah – Sherdian 69kV line a transmission rate base asset?

Q: Is it AEP's practice to include radial lines assets into their rates base?

Q: Please provide a detailed outage performance breakdown for all the impacted transmission lines. Including but not limited to the 19 momentary and 7 permanent outages for Darrah – Sherdian 69kV line, 15 momentary and 3 permanent outages on the Hopkins – Logan 138kV line.

- Number of outages
- Outage durations
- Initiating and sustaining outage causes
- Date of outage
- Customers impacted by each outage
- Recorded CMI's for each outage
- Load Impacted by each outage
- Location of failed component or fault

Q: Please provide a detailed breakdown of all condition issues for all impacted transmission lines. Including the Darrah – Sherdian 69kV and Hopkins – Logan 138kV

- Structure number and location of all noted conditions.
- Description of each noted condition
- Severity of each noted condition.
- Date each condition was first identified

- Maintenance task completed when the condition was first identified.

Q: Please provide the T-SAIDI, T-SAIFI, T-SAIFI-S, T-MAIFI for the corresponding voltage category that the line/s fall into.

Q: For each impacted facility, what is that facilities performance, condition, risk ranking when compared to all other facilities in AEP' eastern footprint?

- Stations:
  - Sheridan, Darrah, Lavalette, Midkiff, Stonebranch, Trace Fork, North Point, Logan, Sharples
- Transmission lines:
  - Darrah – Sherdian 69kV, Hopkins – Logan 138kV, West Huntington 138kV

Q: For the proposed "Sheridan" replacement station, who is paying for the property purchase? Who is paying for the 138/34.5kV transformers? Who is paying for the distribution breakers?

Q: What is the maximum number of MOAB's that will be installed in series for any circuit associated with this proposed project scope?

Q: What is to be done with the Sheridan CB's H, M and Sheridan 69/12kV Transformer once the station is retired?

Q: Please provide a detailed cost breakdown of the proposed alternative.

Q: Please provide a detailed line mileage, circuit configuration, circuit design (Single/Double circuit, Steel Lattice/Wood/Steel Monopole/Wood H-frame/etc.) and estimated cost breakdown for each line section outlined for the alternative proposal?

Q: What are the primary drivers for the cost deltas between the two proposals?

Q: Why is AEP choosing to not reuse ROW by forgoing the alternative solution?

Q: Will this line be constructed on steel or wood structures?

Q: Why is 1033 ACSR being used rather than 795 ACSR or some other smaller conductor?

Q: Does the Alternative solution described include any cost associated with the proposed Balls Gap project?

Q: Please provide a oneline diagram for the AEP preferred proposal?

Q: Please provide a oneline diagram for the alternative proposal?

Q: What is the benefit to cost ratio for preferred proposal and the alternative proposal?

Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed and alternative project?

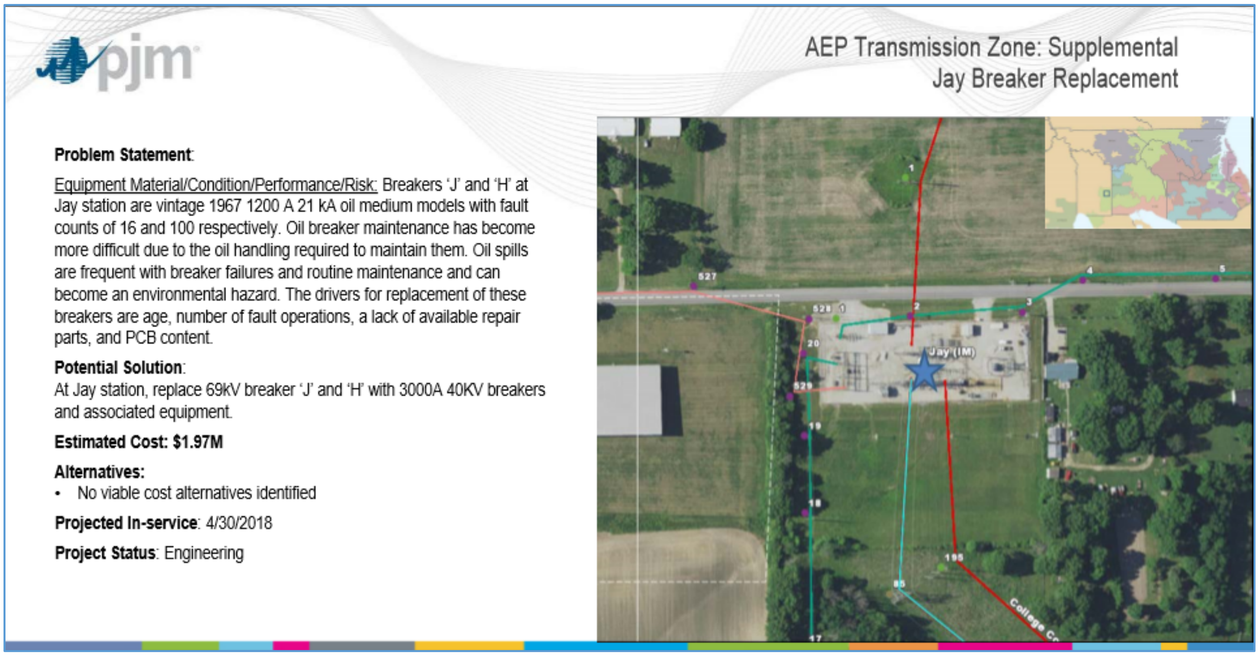
Q: What will be the most limiting series element for each of the impacted through paths?

Q: For all equipment being replaced, please inform stakeholders of the follow:

- Has the asset being replaced failed?
- Is the asset currently in-service?

- What will AEP do with the asset once it is removed from service?
- Will AEP make this asset available for purchase by an outside organization?
- Do all proceeds of asset sales or scrap sales get applied as a credit to the project cost?

Jay Breaker Replacement:



Q: How many oil breakers does AEP have on their Eastern system?

Q: How many breakers does AEP have on their Eastern system?

Q: What is the average number of fault interruptions per breaker and what is the average number of switching operations per breaker on AEP's eastern system?

Q: Over the last 3,5,10 years how many breaker failures has AEP had on their system?

Q: For each failed breaker, what was the design of these breakers (SF6, Airblast, Oil, Other)?

Q: Of these failures how many resulted in AEP reporting an oil spill?

Q: How does AEP report oil spills?

Q: To what organization does AEP report oil spills when they occur?

Q: Please provide a oneline diagram for the AEP preferred proposal?

Q: Is there any additional sectionalizing being installed at the station?

Q: What is the benefit to cost ratio associated with this project?

Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed project?

Q: What will be the most limiting series element for each of the impacted through paths?

Q: For all equipment being replaced, please inform stakeholders of the follow:

- Has the asset being replaced failed?

- Is the asset currently in-service?
- What will AEP do with the asset once it is removed from service?
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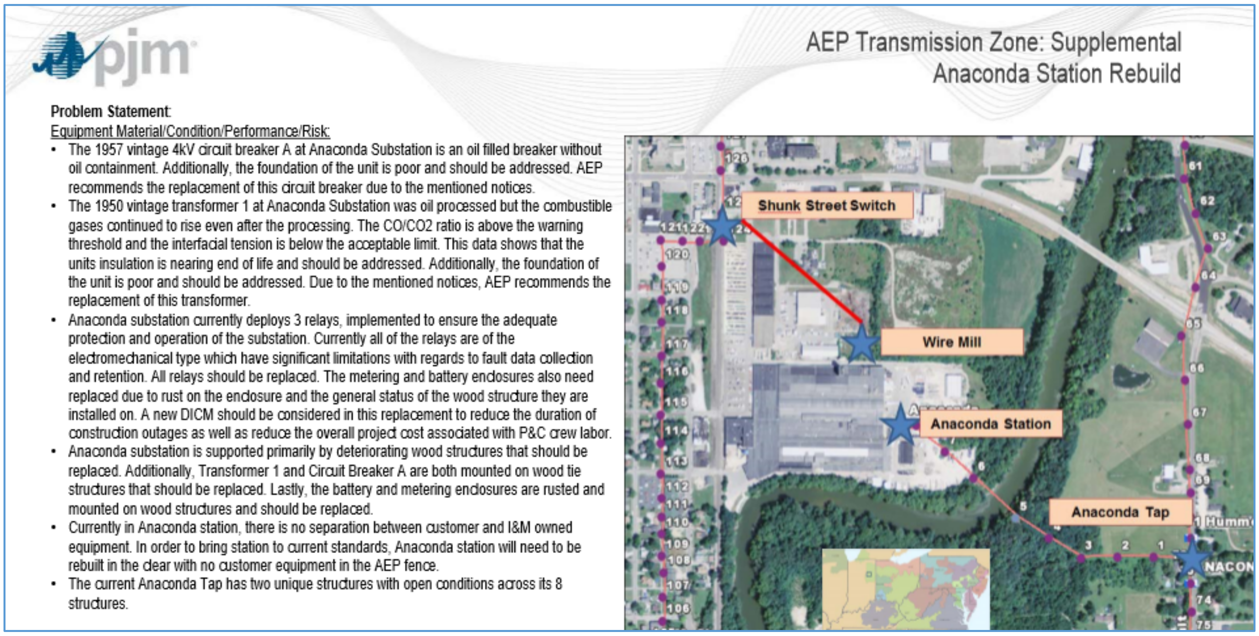
Anaconda Station Rebuild



Q: Who is paying for the retirement of the Anaconda station?

Q: Who is paying for the retirement of the Anaconda tap switch?

Q: Who is paying for the installation of the new transformer and circuit breaker?

Q: Is the current customer paying transmission rates or distribution rates?

Q: For all customers on AEP's system that take their service at 34.5kV, are they paying transmission or distribution rates?

Q: Why is the line being built to 69kV standards and operated at 34.5kV?

Q: What is the conductor rating of the 556.5 ACSR?

Q: Is a DICM being installed per the recommendation in the project description? If so, how many new relays will be installed in this DICM?

Q: Why is AEP choosing to complete a project that cost more than their proposed alternative?

Q: What is the performance, condition, risk breakdown for the Hummel Creek – Deer Creek and the Deer Creek – Marion 34.5kV lines.

Q: Please provide a detailed outage performance breakdown for all the impacted transmission lines. Including but not limited to the all outages impacting the Hummel Creek – Deer Creek 34.5kV and Deer Creek – Marion 34.5kV lines.

- Number of outages
- Outage durations
- Initiating and sustaining outage causes
- Date of outage

- Customers impacted by each outage
- Recorded CMI's for each outage
- Load impacted by each outage
- Location of failed component or fault

Q: Please provide a detailed breakdown of all condition issues for all impacted transmission lines. Including the Hummel Creek – Deer Creek 34.5kV and Deer Creek – Marion 34.5kV

- Structure number and location of all noted conditions.
- Description of each noted condition
- Severity of each noted condition.
- Date each condition was first identified
- Maintenance task completed when the condition was first identified.

Q: Please provide the T-SAIDI, T-SAIFI, T-SAIFI-S, T-MAIFI for the corresponding voltage category that the line/s fall into.

Q: What is the performance, condition, risk break down for the Anaconda station?

Q: What is Anaconda's prioritized ranking relative to all other stations on AEP's Eastern footprint?

Q: What is the age profile for the Hummel Creek - Deer Creek line?

Q: Please provide a oneline diagram for the AEP preferred proposal?

Q: Please provide a larger area map that shows all the complete Hummel Creek – Deer Creek, Deer Creek – Marion lines as well as the noted Gas City station.

Q: What is the benefit to cost ratio associated with this project?

Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed project?

Q: What will be the most limiting series element for each of the impacted through paths?

Q: For all equipment being replaced, please inform stakeholders of the follow:

- Has the asset being replaced failed?
- Is the asset currently in-service?
- What will AEP do with the asset once it is removed from service?
- Will AEP make this asset available for purchase by an outside organization?
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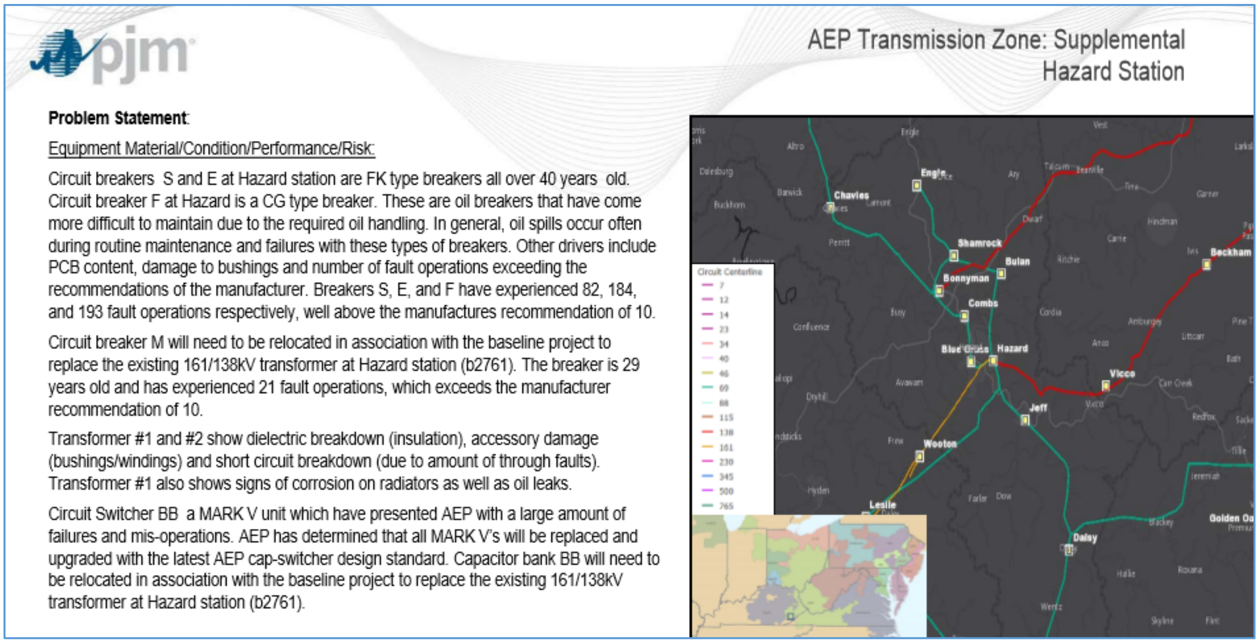
Hazard Station:



Q: What is the performance, condition, risk break down for the Hazard station?

- Number of outages
- Outage durations
- Initiating and sustaining outage causes
- Date of outage
- Customers impacted by each outage
- Load impacted
- Recorded CMI's for each outage
- Location of failed component or fault

Q: Please provide a detailed breakdown of all condition issues for Hazard station.

- Structure number and location of all noted conditions.
- Description of each noted condition
- Severity of each noted condition.
- Date each condition was first identified
- Maintenance task completed when the condition was first identified.

Q: What is its prioritized ranking relative to all other stations on AEP's Eastern footprint?

Q: Please provide the average number of operations per breaker in AEP's eastern footprint.

Q: What is the current rating of all equipment being proposed for replacement?

Q: Circuit breaker M has very little detail describing its issues. Please provide more details about this circuit breaker that has led AEP to determine the breaker has reached its End of Life?

Q: What is breaker M's design SF5, Airblast PK, Puffer, Oil?

Q: Is breaker M fully depreciated?

Q: Has breaker M failed to operate?

Q: Please explain the justification for installing a 138kV low-side and a high side circuit breaker on the 161/138kV transformer? Why was a circuit switcher not used for the high side instead? Is the proposed configuration common on AEP's system for line-TF terminated arrangements?

Q: Transformer #1 & #2, Please provide details about how AEP quantifies the contributions from each of the items noted in AEP's justifications and how are these items prioritized against one another:

- Dielectric Breakdown (Insulation)
- Accessory Damage (Bushing/Windings)
- Short Circuit breakdown (Amount of through faults)
- Photos of oil leaks and corrosion

Q: What is the age of the two transformer units?

Q: Have they both been full depreciated?

Q: Why is AEP requiring the installation of two 130 MVA units when one of the units is a 130MVA and one is a 50MVA unit?

Q: What will be done with these units once they are replaced? Will they be repaired, rebuilt and returned back into inventory?

Q: Please provide the detailed explanation of the three dissimilar zones of protection used to justify the new circuit breaker on the Beckham line?

Q: How many situations/stations does AEP have on their system that exceed 3 zones of protection?

Q: The Bonnyman – Soft Shell 138kV line was just installed into the area. Does this installation reduce or prevent the need to have two transformers at the Hazard station? Could only one unit be replaced and the second be retired?

Q: Please describe the safety and drainage issues being address at the station?

Q: Please provide details about how those issues came to exist?

Q: Please provide a oneline diagram of the preferred solution?

Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed project?

Q: What will be the most limiting series element for each of the impacted through paths?

Q: For all equipment being replaced, please inform stakeholders of the follow:

- Has the asset being replaced failed?
- Is the asset currently in-service?
- What will AEP do with the asset once it is removed from service?
- Will AEP make this asset available for purchase by an outside organization?

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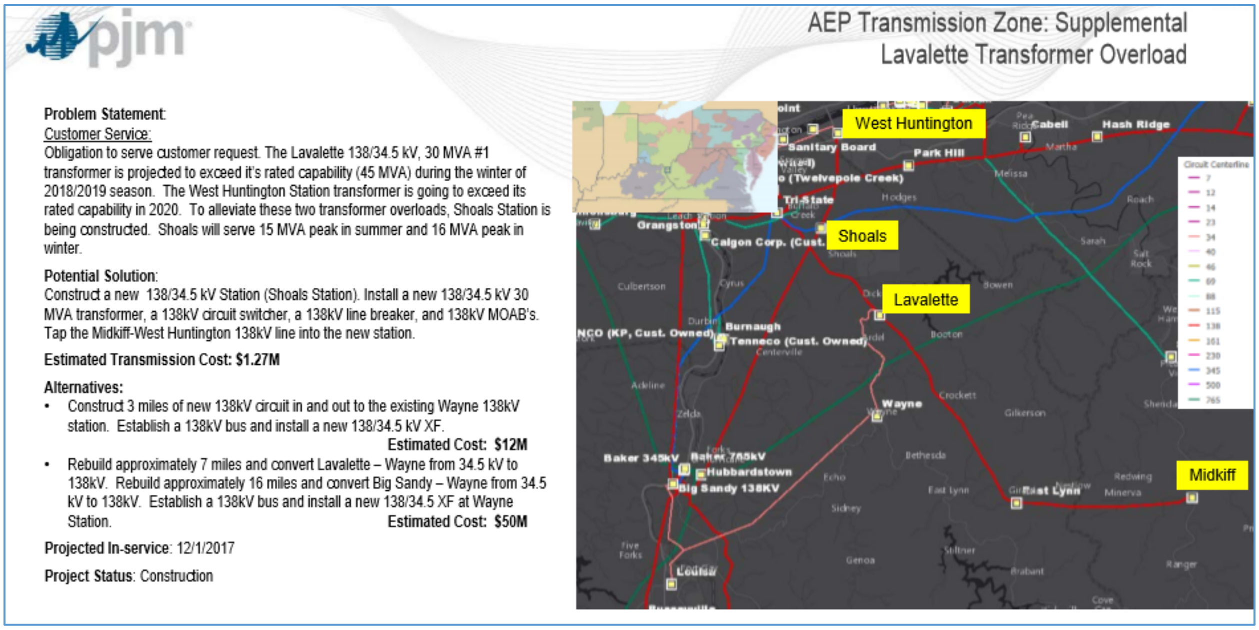
Lavalette Transformer Overload



Q: Is the Shoals land being purchased by Transmission or Distribution?

Q: What is scope and cost noted is covered by transmission?

Q: The Lavalette – Wayne line operates N.O. based on the current onelines. Also the Lavalette 138/34.5kV TF is directly serving load. Is the noted overload on a distribution or transmission transformer? If the unit is distribution, why is AEP addressing distribution overloads with transmission projects?

Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed project?

Q: What will be the most limiting series element for each of the impacted through paths?

Q: In AEP's onelines the 34.5kV line towards Wayne is operated normally open was, this line closed in AEP's study that determine the transformer was going to overload? Would this overload violate AEP FERC 715 criteria, if so, why isn't this project being proposed as a baseline upgrade?

Q: Is the transformer at West Huntington a distribution or transmission transformer?

Q: How does AEP determine if a transformer is a distribution transformer or a transmission transformer?

Q: How does AEP determine if a line is a distribution line or a transmission line?

Q: Are the Lavalette – Wayne and Wayne – Big Sandy lines distribution lines or a transmission lines? If the lines are transmission lines, and the Lavalette transformer is a distribution transformer, how can a distribution transformer be a source for a transmission line?

Q: Does AEP always plan their system in the same system normal configuration as they are normally operated in during real time? Does AEP ever plan their system differently than the way it is operated in real time?

Q: If a switch is normally open during normal system operations, would AEP plan its system with the switch normally close. This question is in regards to Wayne N.O. switch and its impact to the transformer loading.

Q: Did AEP consider upgrading transformation at both the West Huntington and Lavalette stations as an alternative? Upgrading the transformation could include either installing a second transformer or increasing the size of the current transformer in-service.

Q: Will the Wayne – Lavalette line and Wayne – Big Sandy 34.5kV lines need to be rebuilt in the near future (0-5 years) or in long term future (5-10 years)?

Q: What is the Wayne – Lavalette and Big Sandy – Wayne's Performance, Condition and Risk quantities as well as their corresponding AEP eastern system rankings relative to all other circuits on the system?

- Number of outages
- Outage durations
- Initiating and sustaining outage causes
- Date of outage
- Customers impacted by each outage
- Load impacted
- Recorded CMI's for each outage
- Location of failed component or fault

Q: Please provide a detailed breakdown of all condition issues for the Wayne – Lavalette and Big Sandy – Wayne 34.5kV lines.

- Structure number and location of all noted conditions.
- Description of each noted condition
- Severity of each noted condition.
- Date each condition was first identified
- Maintenance task completed when the condition was first identified.

Q: Please provide the T-SAIDI, T-SAIFI, T-SAIFI-S, T-MAIFI for the corresponding voltage category that the line/s fall into.

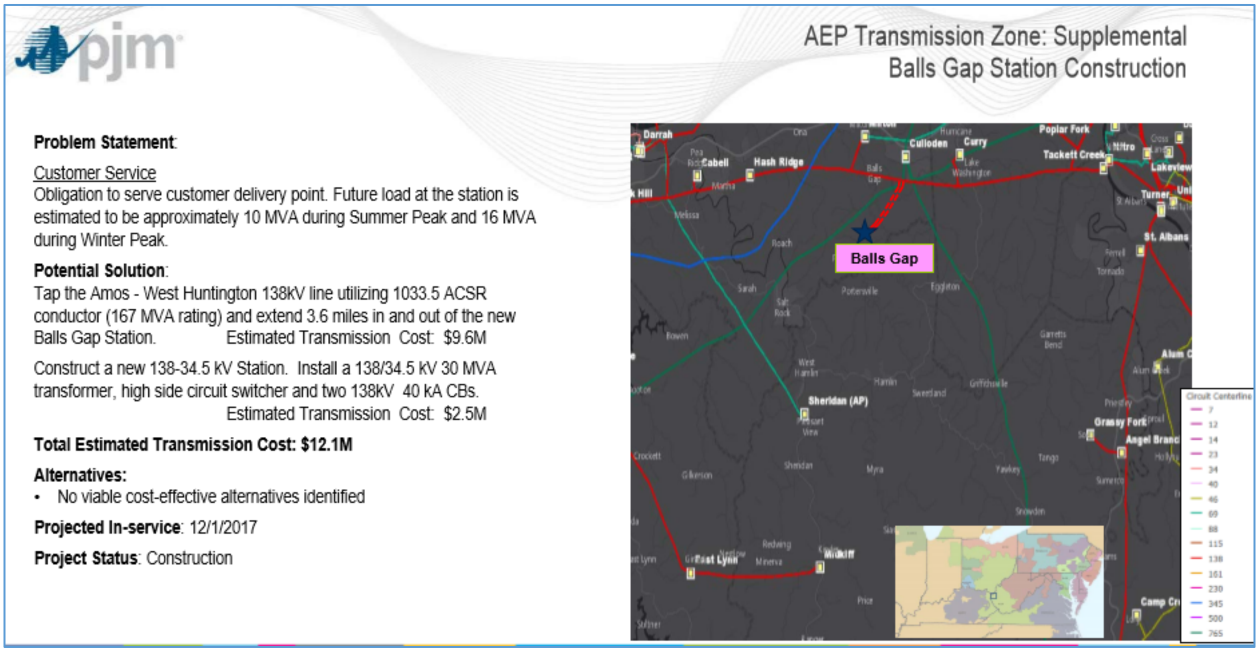
Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed project?

Q: What will be the most limiting series element for each of the impacted through paths?

Q: Why are we only seeing this project now since it is already in construction if not already in-service

Q: Is the project going to make its ISD?

Balls Gap Station:



Q: Is the projected load at this station going to be new load or existing system load that will be moved from another station to this station? Is this load taking distribution rates or transmission rates?

Q: If load is existing where will the load be moved from and was there a distribution or transmission overload requiring the installation of a new station?

Q: Who is paying for the station land?

Q: Please provide AEP's detailed reference documentation that outline how this MPOI and FOI calculation is completed?

Q: Does the MPOI justify the installation of two 138kV circuit breakers on the line and what is the score?

Q: If a none AEP distribution customer were to request a new station would AEP transmission provide that station two circuit breakers for protection?

Q: What is the FOI score for the line being tapped prior to the new tap and after the new tap?

Q: How many MOAB's are in series prior to this project going into service and after this project goes into service.

Q: Could this project's cost be optimized with the Sheridan project?

Q: Why are we only seeing this project now since it is already in construction, if not already in-service?

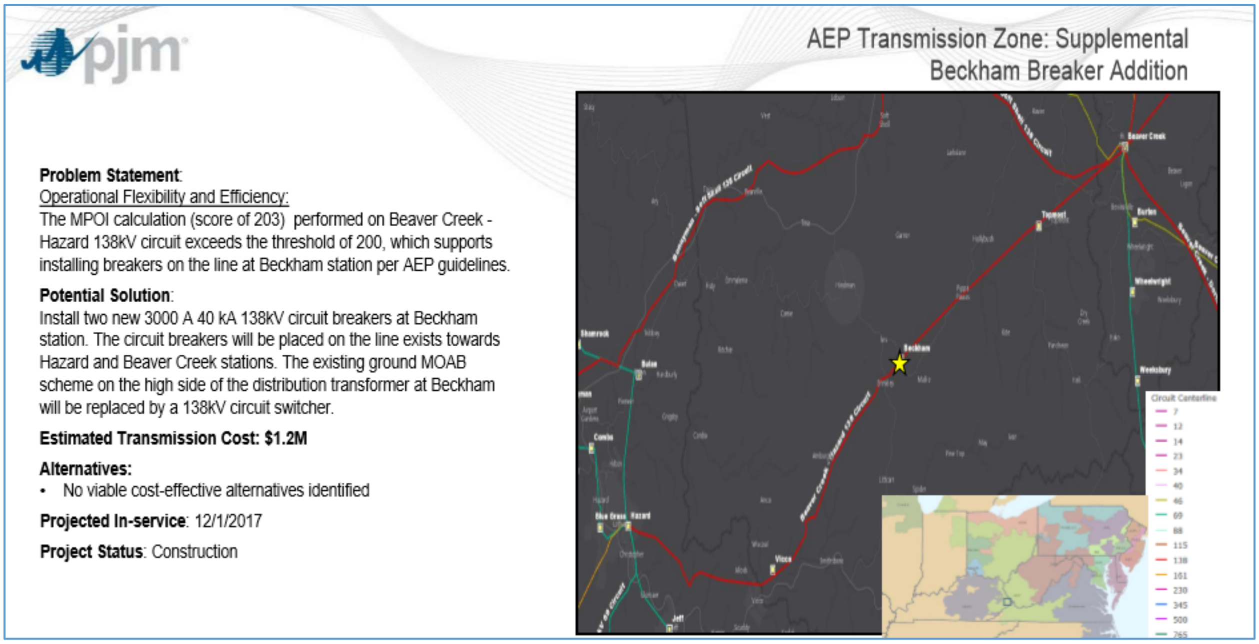
Q: Did the project make it into service?

Q: Please provide a oneline diagram for the AEP preferred proposal?

Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed project?

Q: What will be the most limiting series element for each of the impacted through paths?

Beckham Breaker Addition



Q: What is the performance, condition, risk break down for the Beckham station?

Q: What is Beckham's prioritized ranking relative to all other stations on AEP's Eastern footprint?

Q: Please provide the detailed calculation developed for the MPOI to justify for this breaker?

Q: If only one breaker were installed at Beckham, either towards Hazard or Beaver Creek, would the MPOI value for the subsequent configurations be below the 200 threshold?

Q: Would the MPOI value be reduced to below 200 with the installation of only one circuit breaker?

Q: Please provide AEP's detailed reference documentation that outline how this MPOI and FOI calculation is completed?

Q: Please provide the details about how this calculation and justification would be impacted with the installation of the 138kV circuit breaker at Hazard which was proposed in a previous slide.

Q: Please provide a oneline diagram for the AEP preferred proposal?

Q: Please provide a oneline diagram for the alternative proposal?

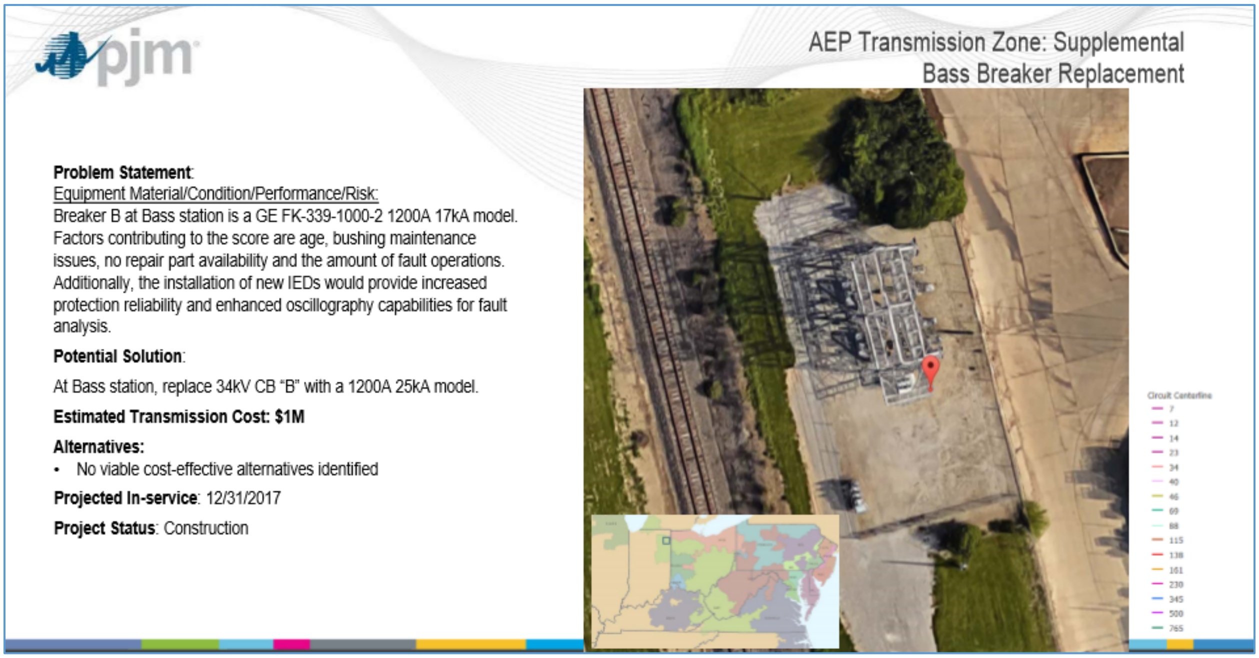
Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed project?

Q: What will be the most limiting series element for each of the impacted through paths?

Q: Again this project is in construction, why was the project not brought forward prior to going into construction?

Q: Did it make it into service?

<u>Bass Breaker Replacement:</u>



Q: What is the performance, condition, risk break down for the Bass station?

Q: What is Bass's prioritized ranking relative to all other stations on AEP's Eastern footprint?

Q: Please provide details about how AEP quantifies the contributions from age, bushing maintenance issues, no repair part availability and the amount of fault operations. How are these values or issues prioritized against one another?

Q: Please provide the number of fault operations for all breakers located at this station

Q: Please provide the age of all circuit breakers at this station.

Q: Is this project going to make the projected in-service date?

Q: Please provide a oneline diagram for the AEP preferred proposal?

Q: Please provide a oneline diagram for the alternative proposal?

Q: Is the customer served from this interconnection currently taking transmission or distribution service with regards to applicable rates?

Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed project?

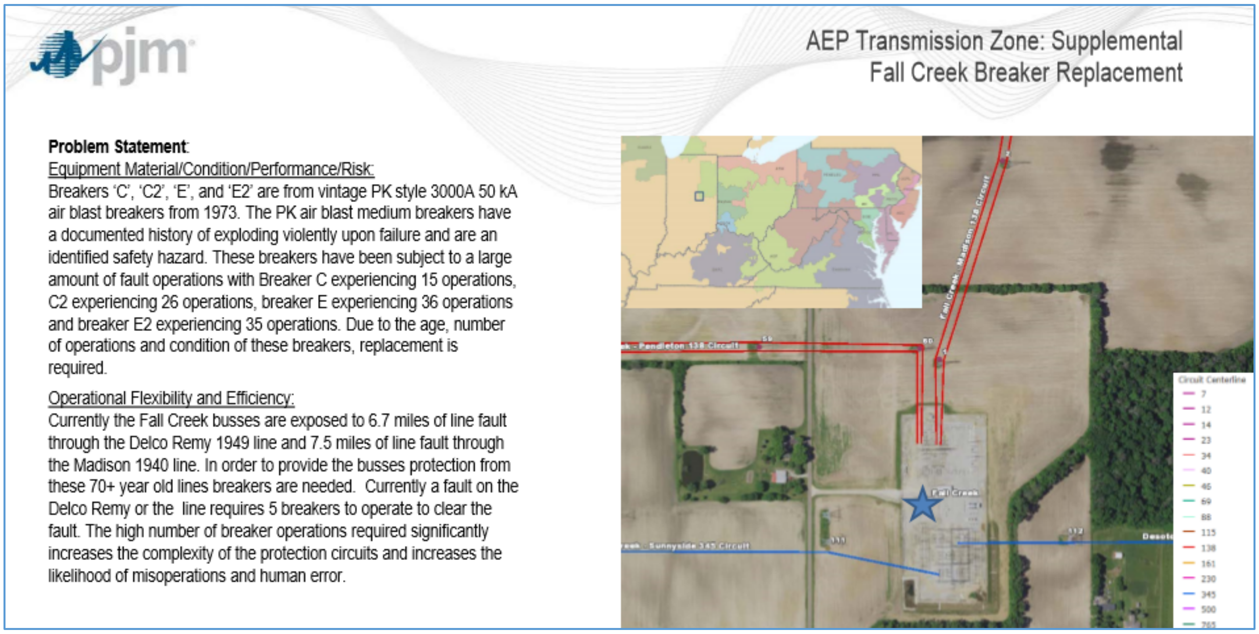
Q: What will be the most limiting series element for each of the impacted through paths?

Q: For all equipment being replaced, please inform stakeholders of the follow:

- Has the asset being replaced failed?
- Is the asset currently in-service?

- What will AEP do with the asset once it is removed from service?
- Will AEP make this asset available for purchase by an outside organization?
- Do all proceeds of asset sales or scrap sales get applied as a credit to the project cost?

Fall Creek Breaker Replacement



Q: Please provide a oneline diagram for the AEP preferred proposal?

Q: Please provide a oneline diagram for the alternative proposal?

Q: Has AEP proposed a supplemental project addressing either the Delco Remy – Fall Creek 138kV line or the Fall Creek – Madison 138kV line?

Q: Please provide the total number of breakers that would currently have to operate to isolate a fault on the Delco Remy – Fall Creek 138kV line.

Q: Please provide the total number of breakers that would have to operate to isolate a fault on the Delco Remy – Fall Creek 138kV line once the proposed project is implemented.

Q: Please provide the total number of breakers that would have to operate to isolate a fault on the Fall Creek - Madison 138kV line and once the proposed project is implemented

Q: Please provide the T-SAIDI, T-SAIFI, T-SAIFI-S, T-MAIFI for the corresponding voltage category that the line/s fall into.

Q: Please expand on what safety issues were of concern with replacing the breakers in place. Have these safety issues or concerns existed at other stations where AEP has chosen to replace CBs in place? If so, what measures did AEP take to reduce the risks of these safety concerns for those situations where breakers were replaced in the existing locations?

Q: Was there an expansion of land required to accommodate the breaker reconfigurations.

Q: Were protection relays upgraded with this project?

Q: If protection relays were replaced were they replaced in the existing control house? If not what is the estimated cost to install a new control house?

Q: Does AEP have process documentation describing the maximum number of circuit breakers allowed to clear to isolate a faulted piece of equipment or line? If so, please provide the documentation to stakeholders.

Q: What is the MPOI value associated with the Delco Remy – Fall Creek 138kV line?

Q: What is the MPOI value associated with the Fall Creek – Madison 138kV line?

Q: What is the FOI value associated with the Delco Remy – Fall Creek 138kV line?

Q: What is the FOI value associated with the Fall Creek – Madison 138kV line?

Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed project?

Q: What will be the most limiting series element for each of the impacted through paths?

Q: Please provide the breaker duty levels for the newly proposed 63kA breakers once the project is in-service.

Q: For all equipment being replaced, please inform stakeholders of the follow:

- Has the asset being replaced failed?
- Is the asset currently in-service?
- What will AEP do with the asset once it is removed from service?
- Will AEP make this asset available for purchase by an outside organization?
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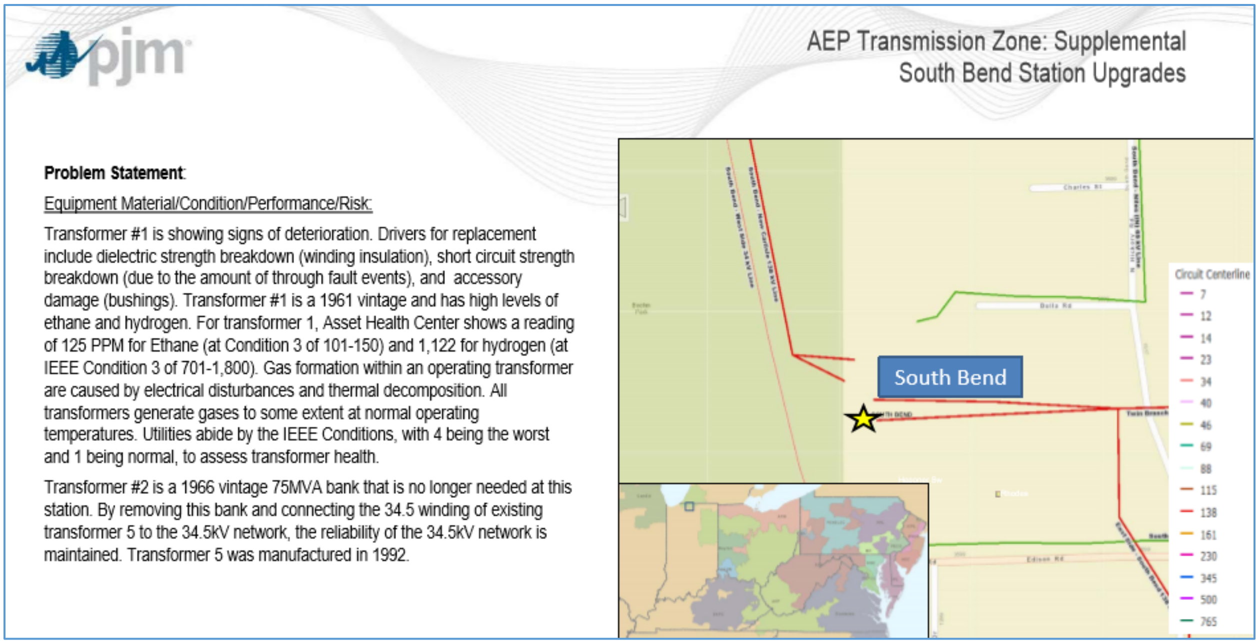
<u>South Bend Station Upgrades:</u>



Q: Please provide detailed descriptions of the maintenance AEP has performed, including dates, maintenance tasks and associated costs for all the transformers at the South Bend station?

Q: Please provide details about how AEP quantifies and prioritizes the contributions from dielectric strength breakdown, short circuit strength breakdown, and accessory damage noted in AEP's justifications and how are these items prioritized against one another.

Q: Please provide the gas concentration levels for all transformers at South Bend including all monitored gases AEP uses to assess transformers?

Q: Please provide the IEEE Condition thresholds noted for 1,2,3,4 and their corresponding risk levels as noted in the slide for condition 1.

Q: Do gas concentration levels change overtime? Could gas levels decrease overtime?

Q: Would gas concentration levels be impacted by the recent loadings of the transformer? If so, how does AEP account for these loadings changes and their impact or gas concentration levels in the transformer oil?

Q: Does AEP keep records of transformer heating relative to the transformer's loading?

Q: Has AEP processed or changed the oil in this transformer? If so when was this last completed?

Q: When was the last oil sample taken for this transformer and how does AEP determine if a new oil sample should be taken?

Q: Please provide the number of outages associated with each transformer's "Performance".

Q: How does AEP quantify a transformer's risk and what is the average risk for all similar transformers on AEP's system?

Q: Does transformer #2 have issues with gassing, dielectric break down, short circuit strength, and accessory damage? If so, please provide the corresponding details.

Q: Why is the 138/12kV transformer not receiving a high side circuit switcher? Is it AEP's standard to have a high side circuit switcher on transformers?

Q: How many breakers would be required to operate if this transformer were to experience an internal fault?

Q: Would there be a reliability violation if only the existing unit were to be connected to the 34.5kV system and the installation of the second unit did not move forward?

Q: If AEP already has plans to replace the 34.5kV system with 69kV then why is this not being done to avoid additional cost of three winding transformer/s?

Q: Please provide the details associated with the future conversion project including scope and onelines.

Q: Please provide a oneline diagram for the AEP preferred proposal?

Q: Please provide a oneline diagram for the alternative proposal?

Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed project?

Q: What will be the most limiting series element for each of the impacted through paths?

Q: For all equipment being replaced, please inform stakeholders of the follow:

- Has the asset being replaced failed?
- Is the asset currently in-service?
- What will AEP do with the asset once it is removed from service?
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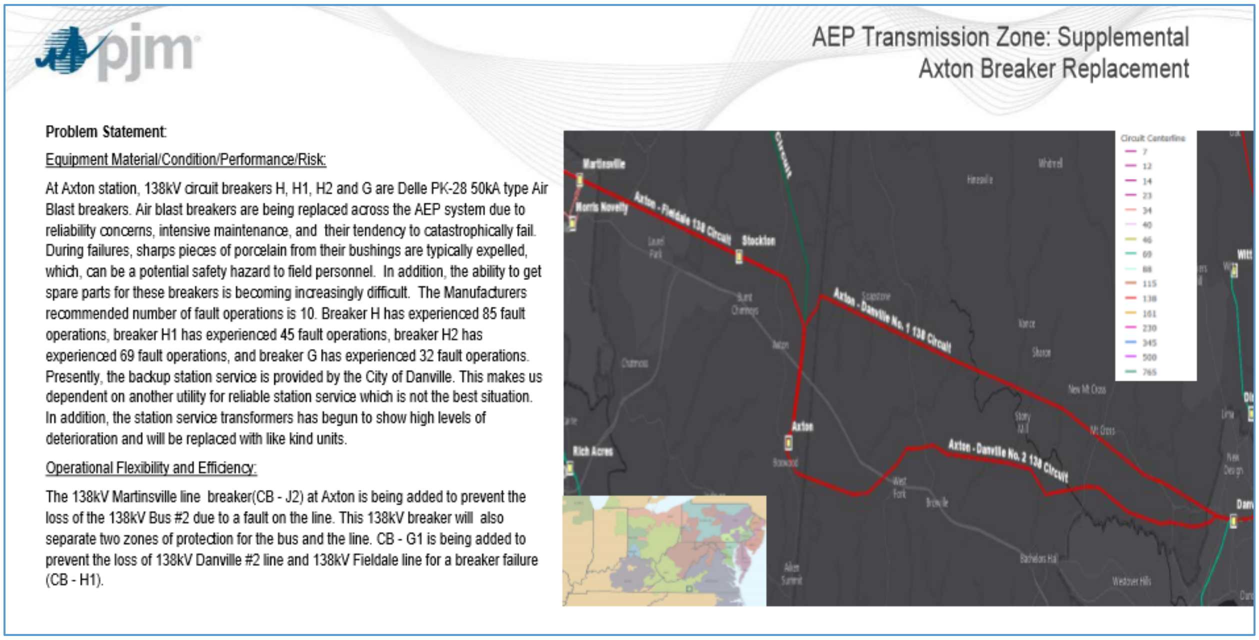
<u>Axton Breaker Replacement:</u>



Q: Is the City of Danville dependent on AEP for the power supply to their station?

Q: Why is it an issue for AEP to be dependent on another utility when other utilities are dependent of AEP? Should rate payers be required to pay cost to allow AEP not to be dependent on another utility? Would AEP agree that the interdependence of utilities interconnected systems are a function of operating within a synchronized system?

Q: If the reliability of AEP's system under contingency events, was dependent on adjacent utilities systems, would AEP support the construction of new transmission infrastructure (lines, stations, station equipment) to remove or address this dependency?

Q: Please describe the details around the issues with the station service transformer?

Q: Is there a reliability violation associated with the breaker failure H1? If not, then why is losing two lines due to a breaker failure an issue. You would lose two lines if break H were to fail.

Q: Is AEP really concerned that the breakers being replaced will fail once they have just been replaced with new breakers?

Q: Please provide the MPOI calculation for the Axton – Martinsville line?

Q: Please provide the MPOI calculation for the Axton – Danville #2 line?

Q: Please provide the T-SAIDI, T-SAIFI, T-SAIFI-S, T-MAIFI for the corresponding voltage category that the line/s fall into.

Q: Please provide a detailed onelines that depicts the relay zones of protection for the existing breaker configuration including details related to how bus #2, bus #1, and the lines they feed are protected?

Q: Please explain how the current bus protection is configured?

Q: Does Bus #1 or #2 currently have a separate relay protection zone or is it relayed as a line? Are these schemes differential, impedance, or overcurrent or all of the above?

Q: How many zones of protection will be associated with the 765/138kV transformer, reactor and line?

Q: Please provide a oneline diagram for the AEP preferred proposal?

Q: Please provide a oneline diagram for the alternative proposal?

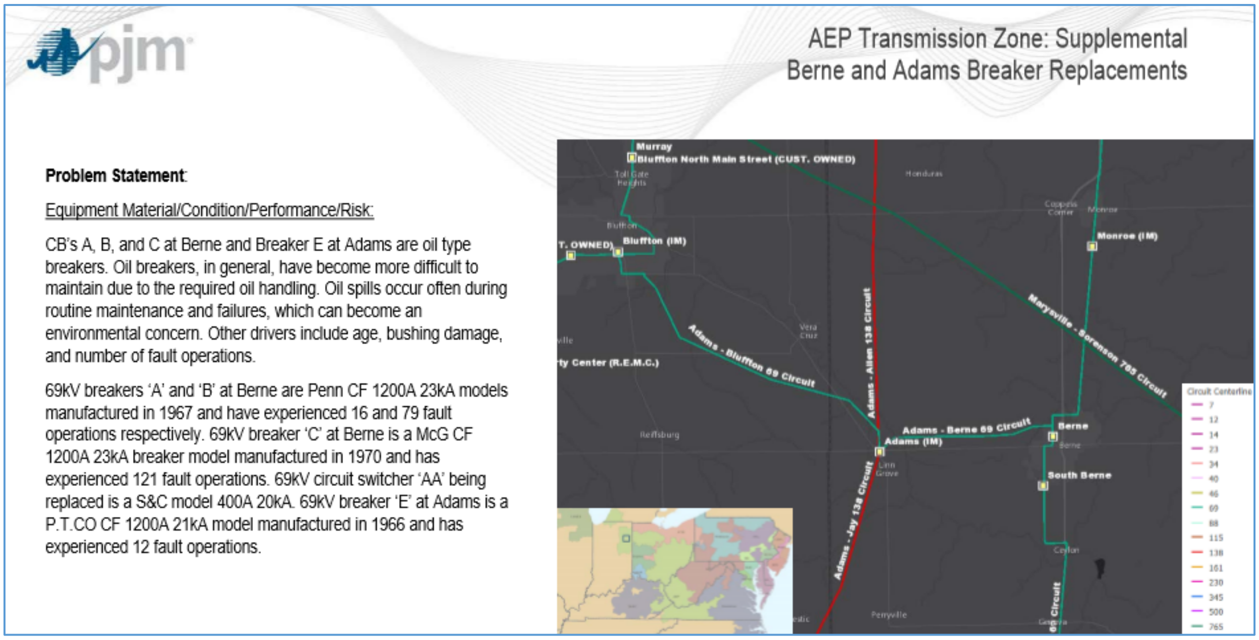
Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed project?

Q: What will be the most limiting series element for each of the impacted through paths?

Q: For all equipment being replaced, please inform stakeholders of the follow:

- Has the asset being replaced failed?
- Is the asset currently in-service?
- What will AEP do with the asset once it is removed from service?
- Will AEP make this asset available for purchase by an outside organization?
- Do all proceeds of asset sales or scrap sales get applied as a credit to the project cost?

<u>Berne and Adams Breaker Replacements:</u>



Q: How many breakers does AEP have on its Eastern System?

Q: How many breakers are below their current manufacture design thresholds?

Q: How many are above two times their manufacture design thresholds?

Q: How many are above three times their manufacture design thresholds?

Q: Are the manufacture design thresholds used for warranty purposes?

Q: It appears a lot of AEP breakers were able to operate far beyond their manufacture design thresholds. Why is this? Why have they not failed? What are AEP's mortality curves for circuit breakers?

Q: How many breakers failed in 2014, 2015, 2016, 2017 respectively. What type of breakers were they (Oil, Air Blast, SF6)? How many fault operations did they have at the time they failed?

Q: Please provide details about all reported oil spills associated with oil type circuit breakers since 2015?

Q: What will be done with all retired circuit breakers? Will they be entered back into spare stock?

Q: How many breakers would have to operate for the failure of the 69/12kV transformer?

Q: Is the transformer and the 69kV bus sharing zones of protection?

Q: Please provide a oneline diagram for the AEP preferred proposal?

Q: Please provide a oneline diagram for the alternative proposal?

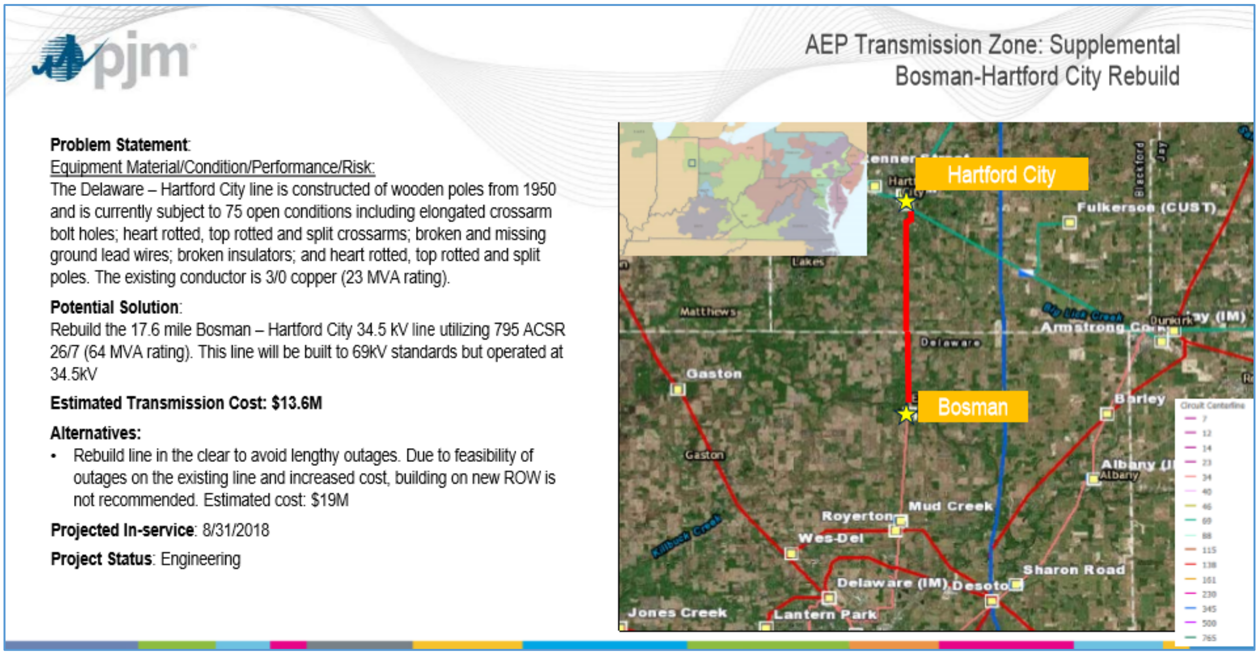
Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed project?

Q: What will be the most limiting series element for each of the impacted through paths?

Q: For all equipment being replaced, please inform stakeholders of the follow:

- Has the asset being replaced failed?
- Is the asset currently in-service?
- What will AEP do with the asset once it is removed from service?
- Will AEP make this asset available for purchase by an outside organization?
- Do all proceeds of asset sales or scrap sales get applied as a credit to the project cost?

Bosman – Hartford City Rebuild



Q: Please provide a detailed outage performance breakdown for all the impacted transmission line. Including but not limited to the momentary and permanent outages for Bosman – Hartford City 69kV and Bosman – Delaware lines.

- Number of outages
- Outage durations
- Initiating and sustaining outage causes
- Date of outage
- Customers impacted by each outage
- Recorded CMI's for each outage
- Load impacted by each outage
- Location of failed component or fault

Q: Please provide a detailed breakdown of all condition issues for the Bosman – Hartford City 69kV and the Bosman – Delaware transmission lines.

- Structure number and location of all noted conditions.
- Description of each noted condition
- Severity of each noted condition.
- Date each condition was first identified
- Maintenance task completed when the condition was first identified.

Q: How many structures comprise the Bosman – Hartford City line?

Q: What is the % of structures of the Bosman – Hartford City line with condition issues?

Q: How many structures comprise the Bosman – Delaware line?

Q: What is the % of structures of the Bosman – Delaware line with condition issues?

Q: For each impacted facility, what is that facilities performance, condition, risk ranking when compared to all other facilities in AEP's eastern footprint?

- Stations:
  - Hartford City, Bosman
- Transmission lines:
  - Bosman – Hartford City 34.5kV, Bosman – Delaware 34.5kV

Q: Please provide the T-SAIDI, T-SAIFI, T-SAIFI-S, T-MAIFI for the corresponding voltage category that the Bosman – Hartford 34.5kV line falls into.

Q: Is the Bosman – Delaware 34.5kV line constructed to 69kV standards?

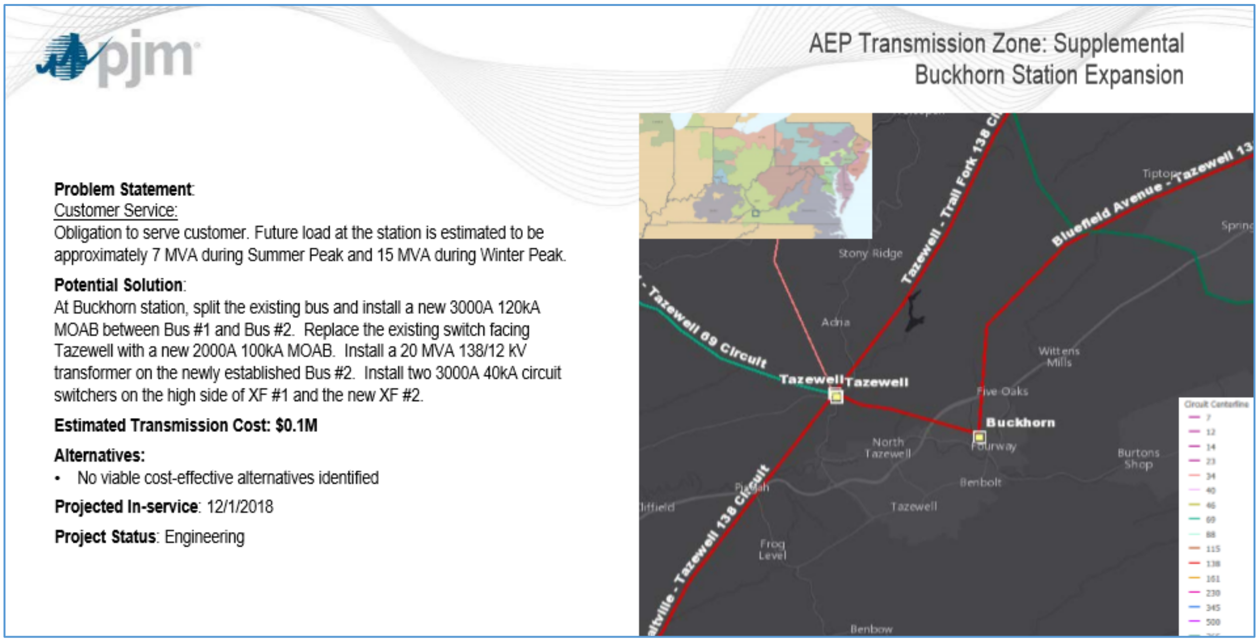
Q: Please provide a oneline diagram for the AEP preferred proposal?

Q: Please provide a oneline diagram for the alternative proposal? Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed project?

Q: What will be the most limiting series element for each of the impacted through paths?

Q: Why weren't the missing ground lead wires replaced when identified? Are missing ground lead wires a potential safety risk to the public?

Buckhorn Station Expansion:



Q: What portion of the project scope is covered by the $0.1 M in transmission cost?

Q: Does AEP's FOI calculation justify the installation of a MOAB switch towards Tazewell?

Q: Will this load be new load or is it existing load that will be transferred to Buckhorn?

Q: How much load will be served from Buckhorn?

Q: Is the 34.5kV transmission or distribution assets?

Q: Is the load currently paying distribution or transmission rate payments?

Q: How does AEP determine if a facility is distribution or transmission

Q: How much load will be served from Four Way station once the proposed project is in-service?

Q: Please provide a oneline diagram for the AEP preferred proposal?

Q: Please provide a oneline diagram for the alternative proposal?

Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed project?

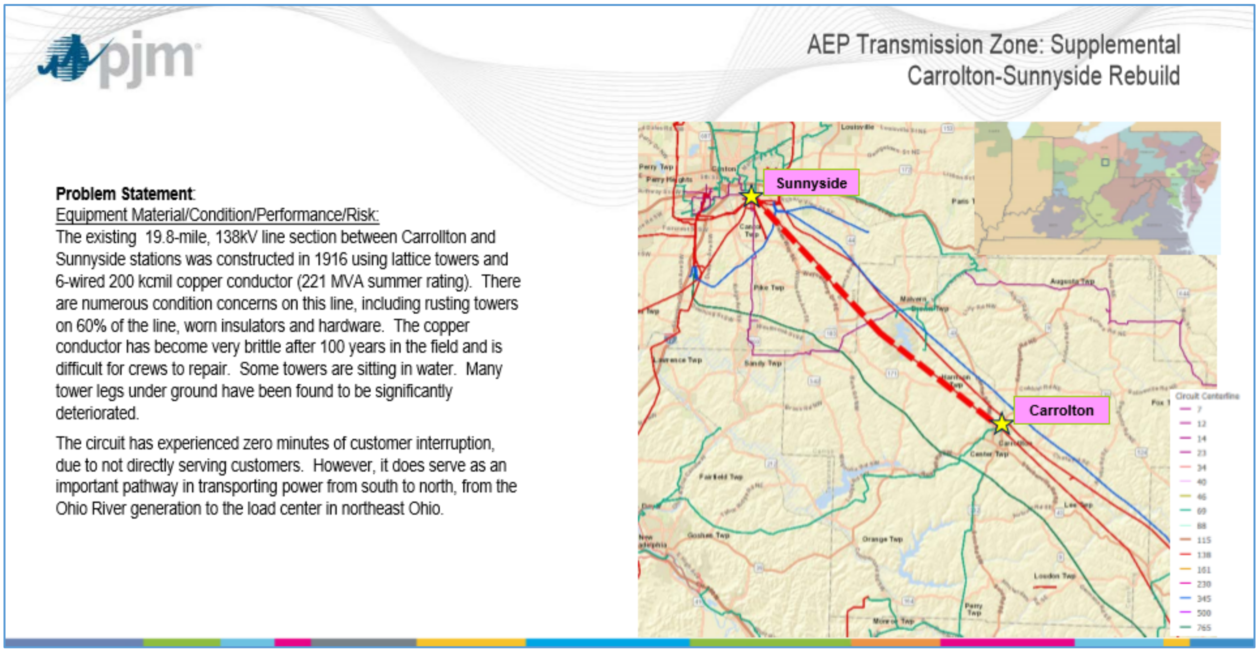
Q: What will be the most limiting series element for each of the impacted through paths?

Q: For all equipment being replaced, please inform stakeholders of the follow:

- Has the asset being replaced failed?
- Is the asset currently in-service?
- What will AEP do with the asset once it is removed from service?
- Will AEP make this asset available for purchase by an outside organization?

- Do all proceeds of asset sales or scrap sales get applied as a credit to the project cost?

<u>Carrolton – Sunnyside Rebuild:</u>



Q: It was noted in the meeting that there is a parallel line that runs adjacent to the Sunnyside – Carrolton 138kV line. Why can't the Sunnyside – Carrolton 138kV be retire and the parallel circuit be looped in and out of the Carrolton station? Cannot 100% determine which circuit this is but Amp believes it to be Tidd- Wagenhals?

Q: Would there be any violations if the Carrollton – Sunnyside line were to be retired?

Q: Please provide a detailed outage performance breakdown for all the impacted transmission line. Including but not limited to the momentary and permanent outages for Sunnyside – Carrolton 138kV and Tidd - Wagenhals 138kV lines.

- Number of outages
- Outage durations
- Initiating and sustaining outage causes
- Date of outage
- Customers impacted by each outage
- Recorded CMI's for each outage
- Load impacted by each outage
- Location of failed component or fault

Q: Please provide a detailed breakdown of all condition issues for the Sunnyside – Carrolton 138kV and Tidd - Wagenhals 138kV transmission lines.

- Structure number and location of all noted conditions.
- Description of each noted condition
- Severity of each noted condition.
- Date each condition was first identified

- Maintenance task completed when the condition was first identified.

Q: Please provide the T-SAIDI, T-SAIFI, T-SAIFI-S, T-MAIFI for the corresponding voltage category that the line/s fall into.

Q: What Ohio River generators are the primary contributors to the line's loading? What company owns these generators?

Q: In our STEAC discussion it was noted that this line is currently six wired. Did AEP investigate the retirement of the Carrolton – Sunnyside 138kV line and un-six wiring the Carrollton – Tidd 138kV line and looping it in and out of the Carrollton 138kV station? Un-six wiring the line would result in a two way 138kV service to the station. Would there be any violations associated with this configuration?

Q: AEP noted that the Carrolton – Sunnyside 138kV line was being built to double circuit standards so an optimized "holistic" solution could be developed. Please provide details about how this line being a double circuit line would allow for the area transmission infrastructure to be optimized for future projects?

Q: Does this line being built to double circuit prevent the need to rebuild the Tidd – Wagenhals 138kV line in the future? How will the load currently served by the Tidd-Wagenhals line be served by the rebuilt Sunnyside – Carrolton 138kV line?

Q: Does AEP expect to proposed the retirement of any area lines in the future. If so when does AEP expect to announce this retirement and/or project proposal?

Q: Please provide a oneline diagram for the AEP preferred proposal?

Q: Please provide a oneline diagram for the alternative proposal?

Q: Please provide a oneline diagram depicting how the parallel circuits load would be served from the rebuilt Sunnyside – Carrollton 138kV double circuit line.

Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed project?

Q: What will be the most limiting series element for each of the impacted through paths?

College Corner Rebuild:

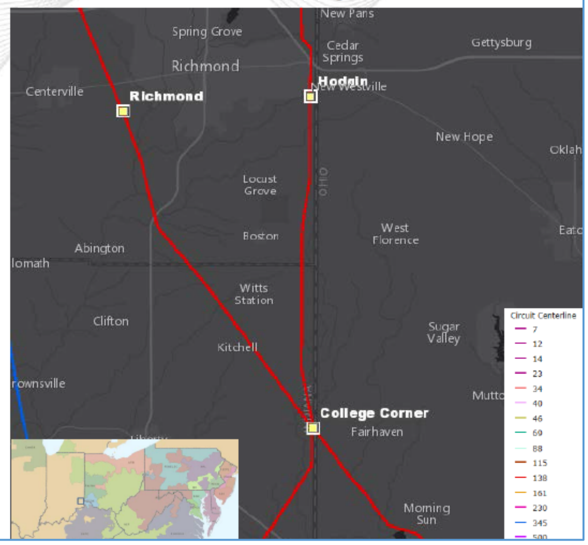
AEP Transmission Zone: Supplemental
College Corner Rebuild

Problem Statement:

Equipment Material/Condition/Performance/Risk:

The College Corner station breakers are 1950 manufactured FK-439 type Oil breakers. These breakers are currently experiencing leaking bushings, bushings leaking into the breaker tank, high C2 PF and steadily increasing contact resistance. Each breaker contains 2,400 gallons of oil for a total of 16,800 gallons and must be toped off twice a year. In addition to this, the breaker bushings are likely PCB and create a potential risk to the local environment. The leaking air tanks are resulting in high compressor run time which, in conjunction with the oil breaker maintenance, is causing higher O&M costs. The breaker switches are obsolete models with breaded shunts and cap and pin insulators. The current breaker switch and station service transformer bus selector switches are mechanically difficult to operate and need to be replaced.
The relay equipment with the exception of the Ohio line exits are electromechanical. The carrier protection schemes are now starting to exhibit repetitive problems.
The stations RTU is a legacy model that is no longer supported by our vendor which means if an issue would occur, repairs would be costly and timely if possible.

The control house is in very poor condition and needs replaced. The roof currently needs to be patched periodically to stop leaks that spring up, the walls are deteriorated to the point that wildlife is entering the control house, and current cable exits are full and have no room for expansion. In addition to this many of the yard cabinets are in very deteriorated condition and need replacement.



Q: What is the performance, condition, risk break down for the College Corner station?

Q: What is College Corner's prioritized ranking relative to all other stations on AEP's Eastern footprint?

Q: Please provide more details about all outage impacting the College Corner station. Including but not limited to forced and maintenance outages and their associated impacts to customers.

Q: The problem statement notes that there is a significant oil leak associated with these circuit breakers. What is the total amount of oil that has leak out of these circuit breakers? Has AEP report these oil leaks to any government organizations?

Q: Do these circuit breakers have oil containment? If so does this oil containment prevent the leaked oil from coming into contact with the soil thus preventing contamination of the area ground water?

Q: Please describe all maintenance activities conducted over the last 5 years that was directly associated with the circuit breakers at the impacted stations.

Q: Please provided the itemized amount of O&M including date, maintenance tasks, and cost incurred for these circuit breakers.

Q: How many operations has circuit breaker B, D experienced?

Q: Does AEP no longer allow oil filled circuit breakers on their system?

Q: Please provide more details about why circuit breaker C and H at College Corner are being replaced.

Q: How many fault operations and switching operations has circuit breaker C experienced?

Q: Please provide the age of all circuit breakers located at the College Corner and Richmond stations.

Q: Have all of these circuit breakers been fully depreciated?

Q: What is the estimated cost associated with the alternative proposal that replaces the circuit breakers with new circuit breakers?

Q: Are all interconnections with other utilities operated as normal closed at both the adjacent utilities station and/or the AEP station?

Q: What line will not be included into the breaker and one-half configuration and will only be served via one 138kv line terminated circuit breaker.

Q: Please provide a oneline diagram for the AEP preferred proposal?

Q: Please provide a oneline diagram for the alternative proposal?

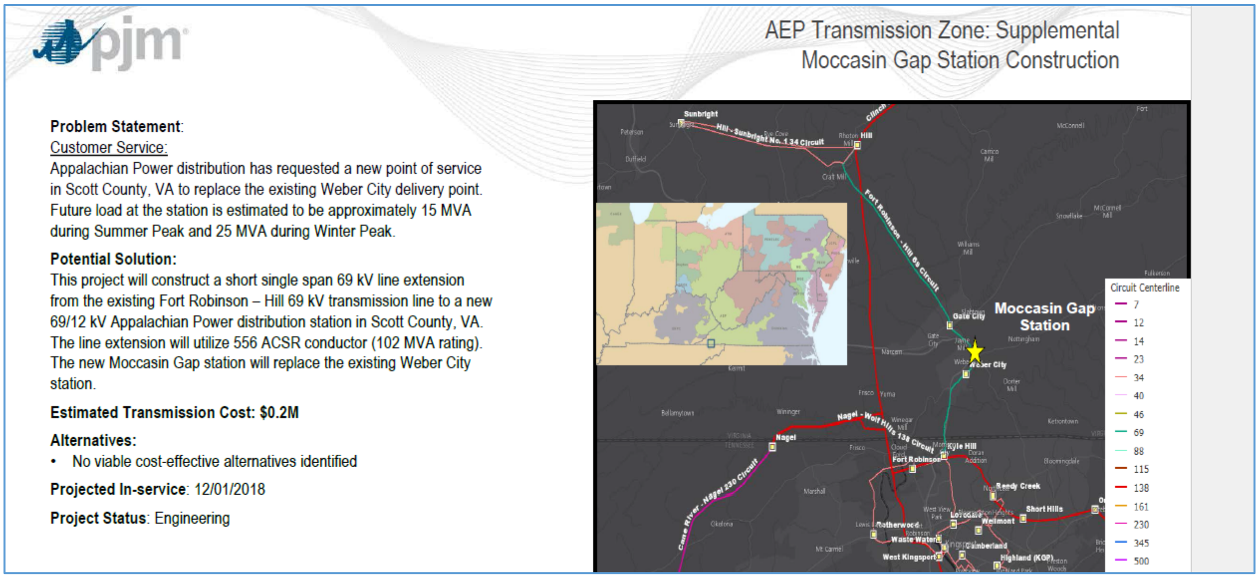
Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed project?

Q: What will be the most limiting series element for each of the impacted through paths?

Q: For all equipment being replaced, please inform stakeholders of the follow:

- Has the asset being replaced failed?
- Is the asset currently in-service?
- What will AEP do with the asset once it is removed from service?
- Will AEP make this asset available for purchase by an outside organization?
- Do all proceeds of asset sales or scrap sales get applied as a credit to the project cost?

Moccasin Gap Station:



Q: Please provide a oneline diagram for the AEP preferred proposal.

Q: Will the station land cost be transmission or distribution?

Q: Will transmission incur any cost associated with the station work including structural steal, switches, circuit breakers, relaying or any other equipment not listed?

Q: Will the line extension be an in and out looping into and terminating at the station? If no, will the single span line extension be radial?

Q: Will the cost to retire the Weber station be incorporated into transmission or distribution rates?

Q: Will the cost to construct the single span 69kV line be incorporated into transmission or distribution rates?

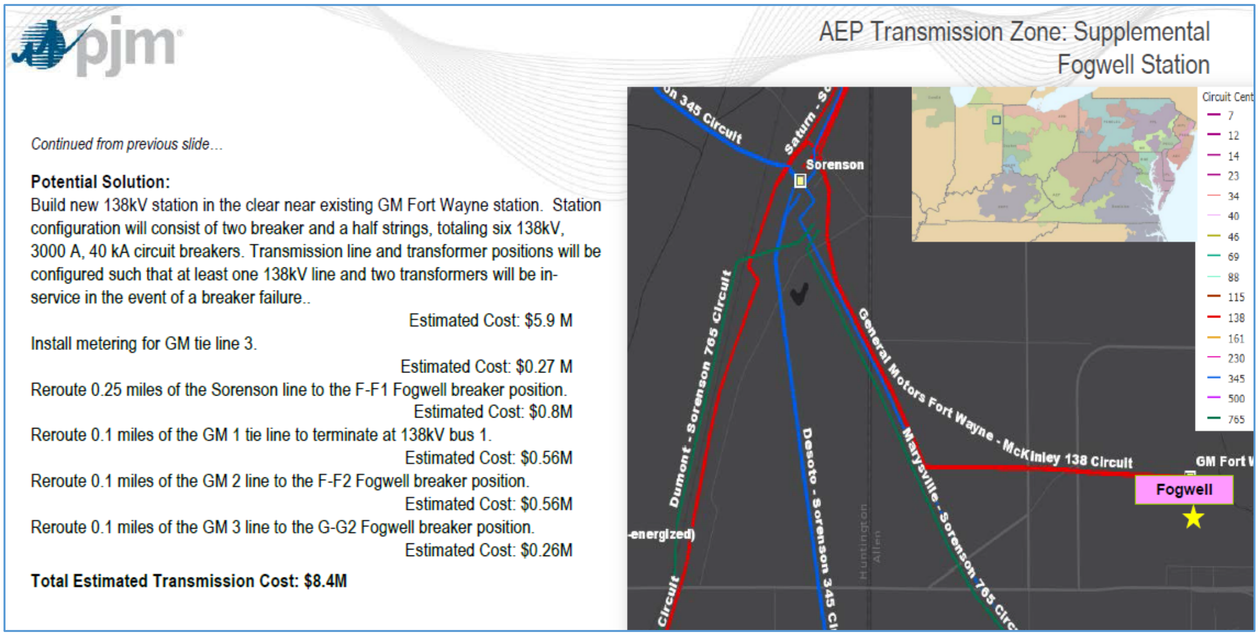
Q: Does AEP include all radial facilities greater than 23kV that are serving load in the AEP zone into their transmission rate base?

Q: How does AEP determine if a facility serving load in the AEP zone will be included into their rate base?

Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed project?

Q: What will be the most limiting series element for each of the impacted through paths?

Fogwell Station Project:



Q: Please provide the cost for the alternative proposal.

Q: Will the GM 1, GM 2, GM 3, line operate radially or will they function as a potential through path or will they be radial in nature?

Q: How many elements (138kV lines and/or transformers) will terminate into the station?

Q: From the description there will be four positions protected by the breaker and one half confirmation. Please describe how the elements not terminating between two breakers will electrically connect to the station.

Q: Will any elements be sharing a zone of protection either a with any of the 138kV buses at the Fogwell station?

Q: Will AEP be supplying the transformers for this project? If so what will be the voltage of these transformers and will they located at the Fogwell station?

Q: Who will be paying for the cost for the feeds between the existing customer station and the Fogwell station? Will these cost be included into AEP's transmission rates?

Q: Please provide a oneline diagram of the proposed project that displays the cost assignments (AEP, Customer) for each portion of the project.

Q: please provide a oneline diagram for the alternative proposal that displays the cost assignments (AEP, Customer) for each portion of the alternative project.

Q: If executed would the alternative proposal end up with more cost being incurred by WVPA vs. being shared with all other AEP rate payers when compared to the prefer project.

Q: Please provide details about the performance, condition, and risk associated with current 138kV circuit breaker A.

Q: What will be done with circuit breaker A once the new project is executed?

Q: If property is available directly adjacent to the customer station, why is room for expansion a driving reason not to proceed with the alternative proposal? Would this alternative require more cost to be incurred by WVPA? Who would have to pay for the expansion of the station?

Q: Was the addition of three new 138kV circuit breakers combined with the addition of the new transformer to create a four breaker ring configuration at the existing customer station considered?

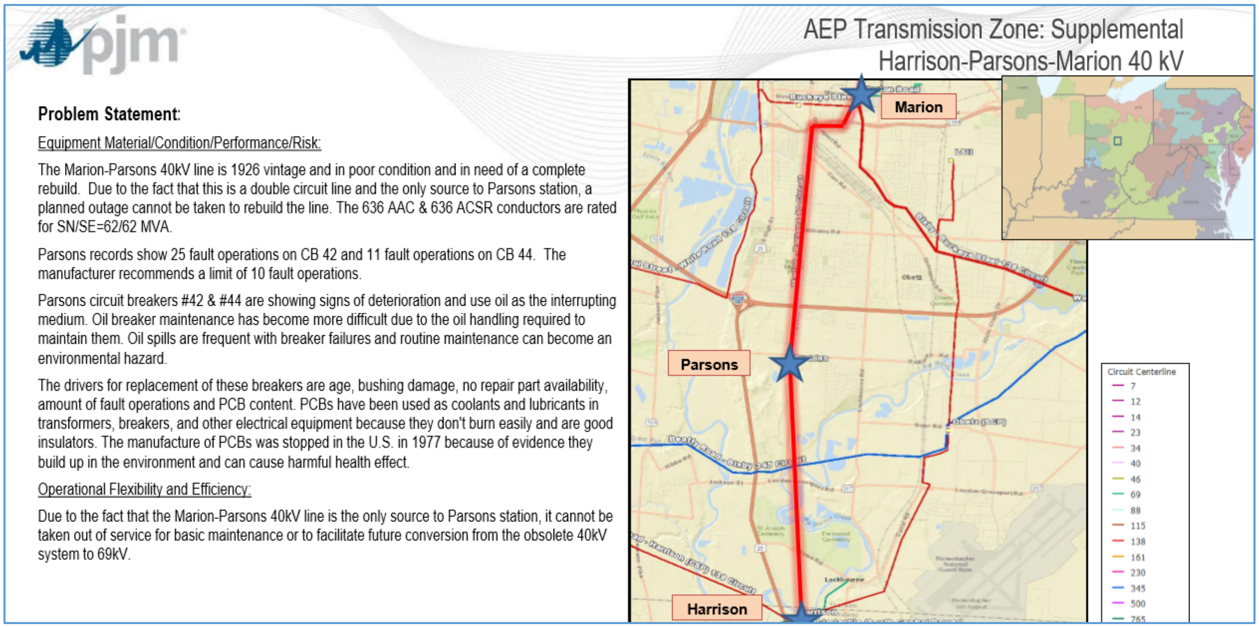
Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed project?

Q: What will be the most limiting series element for each of the impacted through paths?

Q: For all equipment being replaced, please inform stakeholders of the follow:

- Has the asset being replaced failed?
- Is the asset currently in-service?
- What will AEP do with the asset once it is removed from service?
- Will AEP make this asset available for purchase by an outside organization?
- Do all proceeds of asset sales or scrap sales get applied as a credit to the project cost?

Harrison – Parsons – Marion 40kV:



Q: Please provide a detailed outage performance breakdown for all the impacted transmission line. Including but not limited to the momentary and permanent outages for Marion - Parsons 40kV line.

- Number of outages
- Outage durations
- Initiating and sustaining outage causes
- Date of outage
- Customers impacted by each outage
- Recorded CMI's for each outage
- Load impacted by each outage
- Location of failed component or fault

Q: Please provide a detailed breakdown of all condition issues for the Marion - Parsons 40kV transmission line.

- Structure number and location of all noted conditions.
- Description of each noted condition
- Severity of each noted condition.
- Date each condition was first identified
- Maintenance task completed when the condition was first identified.

Q: Please provide the T-SAIDI, T-SAIFI, T-SAIFI-S, T-MAIFI for the corresponding voltage category that of the line/s fall into.

Q: Please provide the PCB concentration levels for each circuit breaker described in the problem statement.

Q: Please provide a oneline diagram for the AEP preferred proposal.

Q: Please provide a oneline diagram for the AEP alternative proposal.

Q: Is there adequate space at all the impacted stations to accommodate a future 69kV conversion?

Q: Is there adequate space at Parsons to accommodate a conversion to 138kV?

Q: Was looping the 138kV circuit into Parson's station considered? (Line seems to be located to North West of Parsons station).

Q: Was a double circuit extending from Harrison – Parsons combined with the retirement of the Marion – Parsons 40kV section considered?

Q: Was a double circuit extending from Marion – Parsons combined with the retirement of the Harrison – Parsons 40kV section considered?

Q: Would either of the above proposal result in system violations?

Q: What are the AEP ROW requirements for the noted 69kV rebuild options?

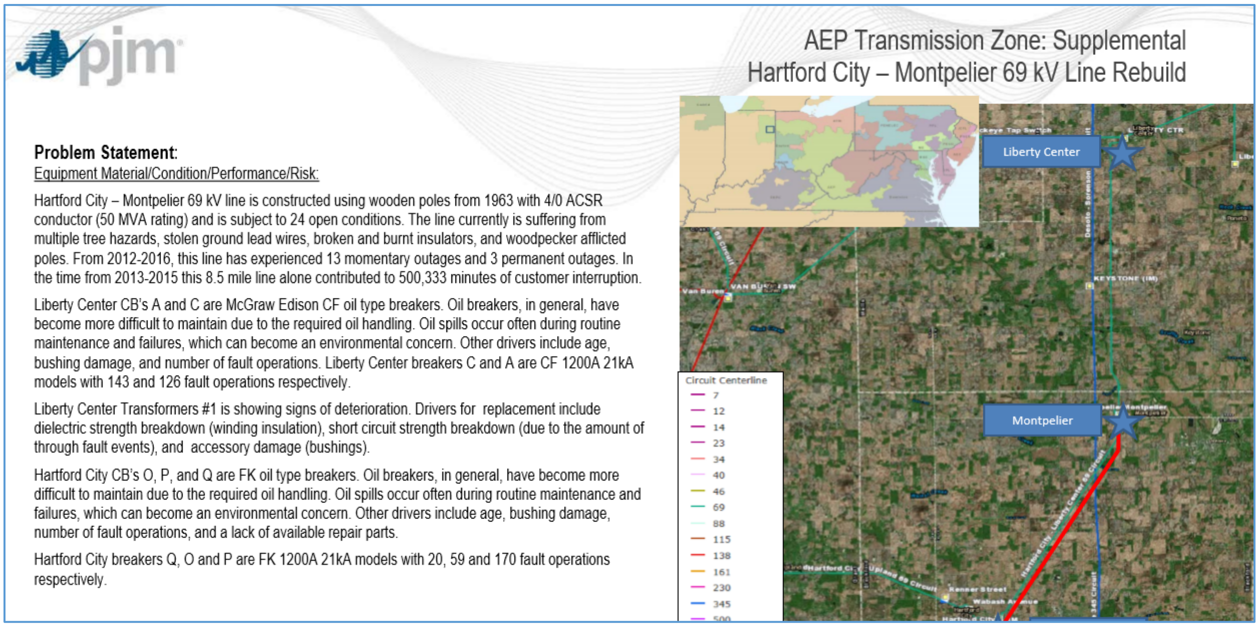
Q: What is the current ROW size utilized by the existing transmission line?

Q: What is AEP's standard ROW requirement for 69kV lines?

Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed project?

Q: What will be the most limiting series element for each of the impacted through paths?

<u>Hartford City – Montpelier 69kV rebuild</u>



Q: Please provide a detailed outage performance breakdown for all the impacted transmission line. Including but not limited to the momentary and permanent outages for Hartford City – Montpelier 69kV line.

- Number of outages
- Outage durations
- Initiating and sustaining outage causes
- Date of outage
- Customers impacted by each outage
- Recorded CMI's for each outage
- Load impacted by each outage
- Location of failed component or fault

Q: Please provide a detailed breakdown of all condition issues for the Hartford City – Montpelier 69kV transmission line.

- Structure number and location of all noted conditions.
- Description of each noted condition
- Severity of each noted condition.
- Date each condition was first identified
- Maintenance task completed when the condition was first identified.

Q: Please provide the T-SAIDI, T-SAIFI, T-SAIFI-S, T-MAIFI for the corresponding voltage category that of the line/s fall into.

Q: Does AEP typically use vegetation management issues as justification to rebuild a transmission line facility?

Q: This line seems to have a high rate of momentary outages. Where the vegetation issues a cause for these momentary outages? Has AEP addressed the vegetation issues?

Q: Does AEP replace broken or damaged insulators as part of their standard maintenance work plan?

Q: Does AEP not replace stolen or broken ground wires immediately once they are identified? Does having a broken or stolen ground wire place the public or AEP employees at an increased level of risk for injury?

Q: Based on AEP oneline there are two 69kV MOABs located at the Montpelier station. When the line had force operations did the MOAB sectionalizing scheme operate as intended?

Q: Why are there such high minutes of interruption associated with this section of line when the MOABs should have protected the Montpelier station from permanent outages?

Q: What is the performance, condition, risk breakdown for the Hartford City – Liberty Center 69kV line?

Q: What is Hartford City – Liberty Center prioritized ranking relative to all other lines on AEP's Eastern footprint?

Q: Please provide the T-SAIDI, T-SAIFI, T-SAIFI-S, T-MAIFI for the corresponding voltage category that of the line/s fall into.

Q: What is the performance, condition, risk breakdown for the Liberty Center, Montpelier, Hartford City stations?

Q: What is Liberty Center, Montpelier, Hartford City prioritized ranking relative to all other stations on AEP's Eastern footprint?

Q: Does the noted transmission cost for Liberty Center include the replacement of the 69/12kV transformer? Is the cost to remove the 69/12kV transformer from service included in the transmission cost of the proposed project?

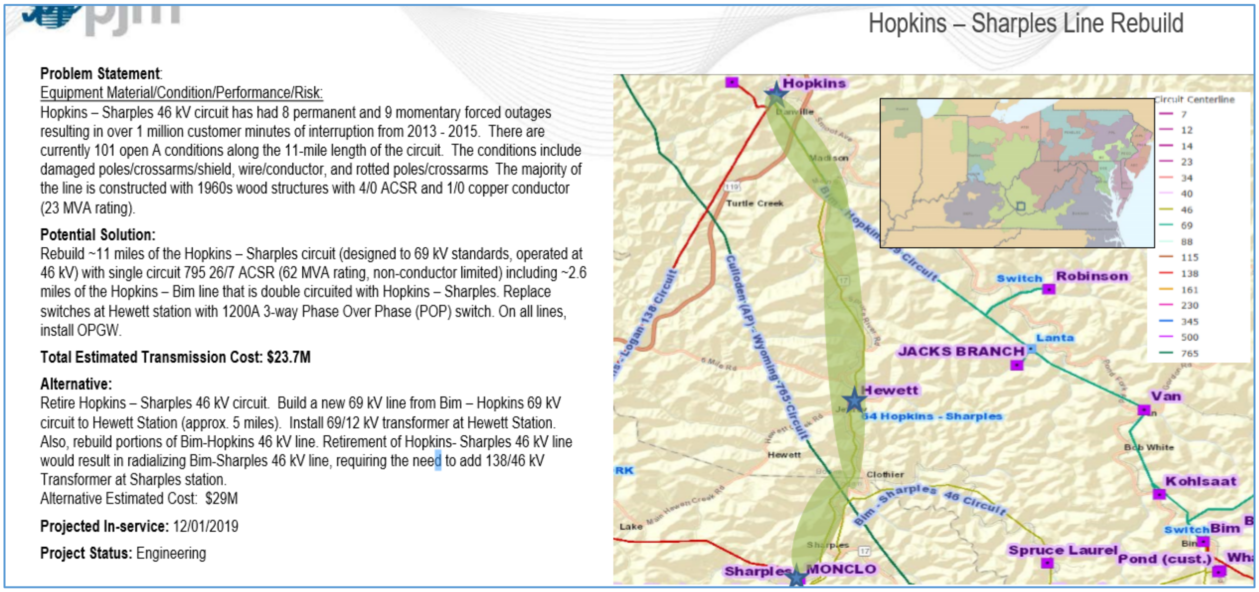
Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed project?

Q: What will be the most limiting series element for each of the impacted through paths?

Q: For all equipment being replaced, please inform stakeholders of the follow:

- Has the asset being replaced failed?
- Is the asset currently in-service?
- What will AEP do with the asset once it is removed from service?
- Will AEP make this asset available for purchase by an outside organization?
- Do all proceeds of asset sales or scrap sales get applied as a credit to the project cost?

Hopkins – Sharples Line Rebuild:



Q: Please provide a detailed outage performance breakdown for all the impacted transmission line. Including but not limited to the momentary and permanent outages for the Hopkins – Sharples 46kV, Hopkins – Bim and Bim - Sharples lines.

- Number of outages
- Outage durations
- Initiating and sustaining outage causes
- Date of outage
- Customers impacted by each outage
- Recorded CMI's for each outage
- Load impacted by each outage
- Location of failed component or fault

Q: Please provide a detailed breakdown of all condition issues for the Hopkins – Sharples 46kV, Hopkins – Bim, and the Bim - Sharples transmission lines.

- Structure number and location of all noted conditions.
- Description of each noted condition
- Severity of each noted condition.
- Date each condition was first identified
- Maintenance task completed when the condition was first identified.

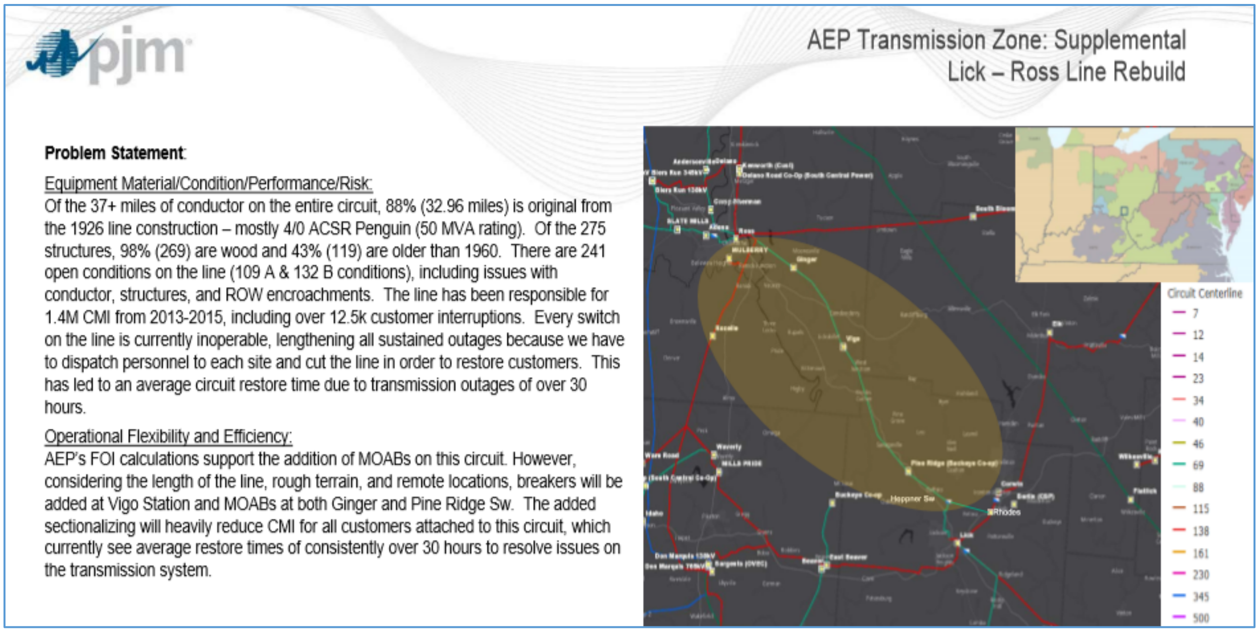
Q: Please provide the T-SAIDI, T-SAIFI, T-SAIFI-S, T-MAIFI for the corresponding voltage category that of the line/s fall into.

Q: Was cutting into the Bim – Sharples and extending a double circuit line to the Hewett station combined with the retirement of the Hewett – Hopkins line section considered? From AEP's oneline the Hopkins – Hewett line is ~8 miles and the Sharples – Hewett line is ~4 miles. The distance from the tap would also shorten this ~4 mile section as the tap point would be in closer proximity to the Hewett station. This option to also potentially reduce the duration of time that Hewett would be supplied radially during the rebuild of either line section currently feeding Hewett.

Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed project?

Q: What will be the most limiting series element for each of the impacted through paths?

<u>Lick – Ross Line Rebuild</u>



Q: Please provide a detailed outage performance breakdown for all the impacted transmission line. Including but not limited to the momentary and permanent outages for the Lick - Ross line.

- Number of outages
- Outage durations
- Initiating and sustaining outage causes
- Date of outage
- Customers impacted by each outage
- Recorded CMI's for each outage
- Load impacted by each outage
- Location of failed component or fault

Q: Please provide a detailed breakdown of all condition issues for the Lick - Ross transmission line.

- Structure number and location of all noted conditions.
- Description of each noted condition
- Severity of each noted condition.
- Date each condition was first identified
- Maintenance task completed when the condition was first identified.

Q: Please provide the T-SAIDI, T-SAIFI, T-SAIFI-S, T-MAIFI for the corresponding voltage category that of the line/s fall into.

Q: Why is AEP requiring rate payers to pay for additional incremental project cost that AEP has no. criteria violation to justify?

Q: There are three 138kV lines feeding the Ross station. Under the N-1-1 noted contingency conditions, what is the limiting element that loads to 90% on the Waverly – Ross circuit?

Q: What conductors comprise the Waverly – Ross 138kV circuit and what are their normal and emergency rated capabilities?

Q: Are these conductors sag derated? Has AEP completed a sag study on these line sections?

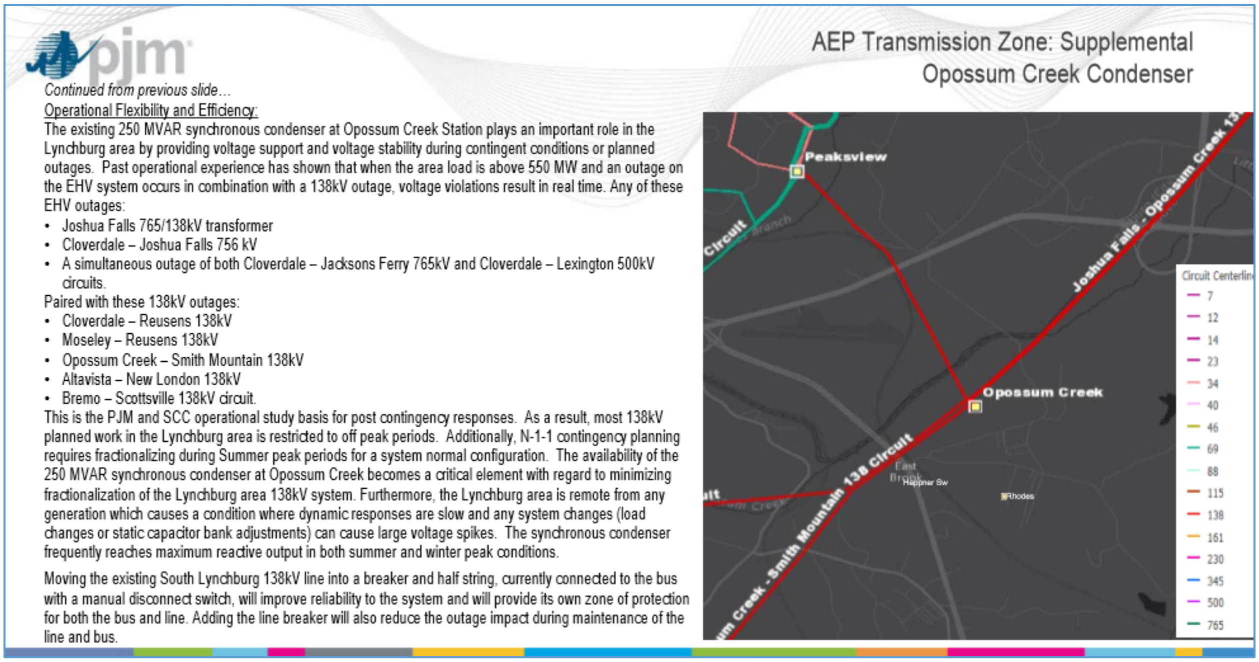
Q: What is the established date for the 138kV conversion? If a date and a conceptual project scope has not been established why should rate payers be requiring to pay $3M in additional cost?

Q: Would AEP be willing to forgo seeking a ROE for this incremental additional of $3M in project cost since it is not required?

Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed project?

Q: What will be the most limiting series element for each of the impacted through paths?

<u>Opossum Creek Condenser:</u>



Q: Please provide the study and result files associated with the noted violations outline in the problem statement.

Q: Does AEP and or PJM operate their system to an N-1-1 or N-2 in real time?

Q: Were switchable reactive devices allow to operate in AEP's study?

Q: Please identify the noted FERC 715 criteria the was violated in AEP's study.

Q: Did PJM conduct a retirement study for this condenser project?

Q: Please describe the process AEP used to determine the minimal +- MVAR capability, transient response times and short term over excitation requirements in order to size the condenser.

Q: What will be the new Normal and Emergency Ratings for all through paths impacted by the proposed project?

Q: What will be the most limiting series element for each of the impacted through paths?

Q: For all equipment being replaced, please inform stakeholders of the follow:

- Has the asset being replaced failed?
- Is the asset currently in-service?
- What will AEP do with the asset once it is removed from service?
- Will AEP make this asset available for purchase by an outside organization?
- Do all proceeds of asset sales or scrap sales get applied as a credit to the project cost?