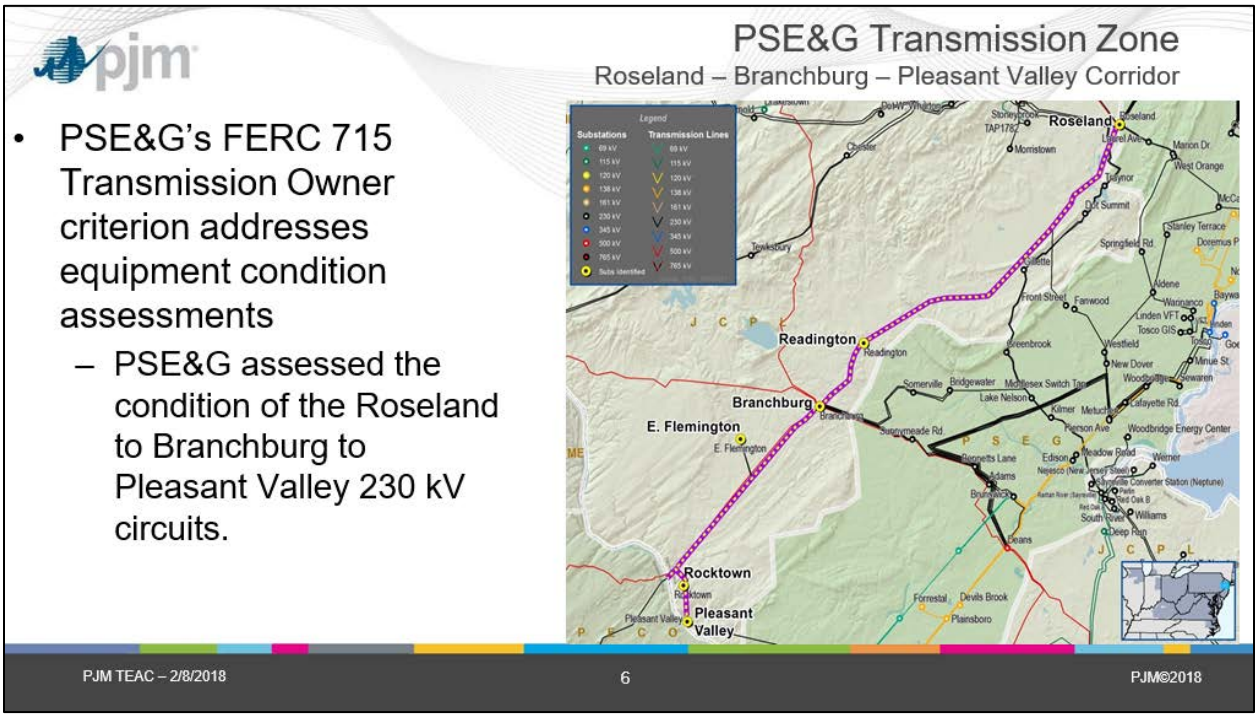
PJM TEAC Meeting

2-8-2017

Questions Pertaining to Proposed Projects & Scopes

PSEG: Roseland – Branchburg – Pleasant Valley Corridor



1. **What is the current limiting conductor on the line and what is the MVA rating of that conductor?**

2. **What is the conductor being proposed and what will be the MVA rating of that conductor**

3. **Is there any station work associated with this proposed project? If so what is the scope of that station work?**

4. **Why is there such a large per mile cost difference between the N4469 "Replace Readington – Roseland 230kV" estimates when compared to the current proposal.**
    a. **N4469: Project was estimated at $142.7 M for the rebuild**
    b. **N4469: Base on PJM's website this corridor is ~33 miles.**
    c. **N4469: This cost comes out to $4.32 M/mile.**
    d. **Current proposal 52 miles at a cost of $546M equating out to $10.5 M/mile.**

5. **Would the cost of the project be lower is a single circuit rebuild using existing ROW and was that considered?**

AEP: Twin Branch Project

AEP Transmission Zone

Problem: Short Circuit

- The Twin Branch 345kV breaker "JM" is overstressed

Immediate Need:

- Due to the immediate need, the timing required for an RTEP proposal window is infeasible. As a result, the local Transmission Owner will be the Designated Entity.

Alternatives Considered:

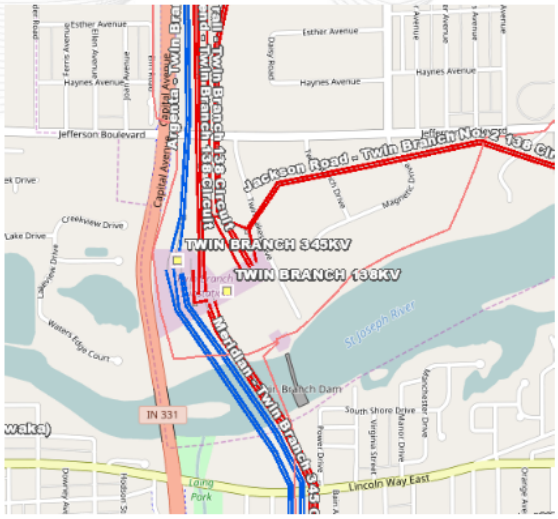
- Due to the immediate need of the project no alternatives were considered

Recommended Solution:

- Replace the Twin Branch 345kV breaker "JM" with 63 kA breaker (B2988)

Estimated Project Cost: $2M

Required IS Date: October 1, 2020



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1. How far into the future are PJM short studies currently looking?

2. Are FSA units and/or units not in-service included into the model?

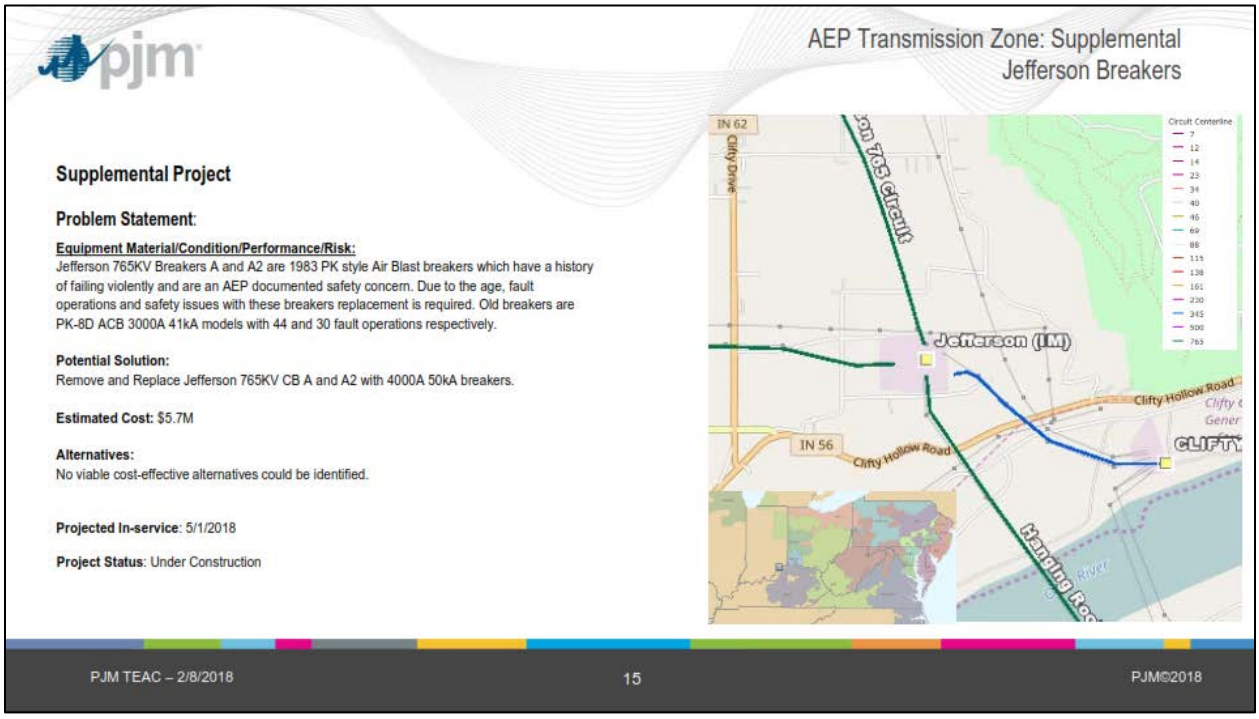
3. What is the CB's capability and duty %

4. With or without Transformer #6 in-service

5. How was the 345kV high side transformer tie modeled in the assessment?

6. Projected project ISD?

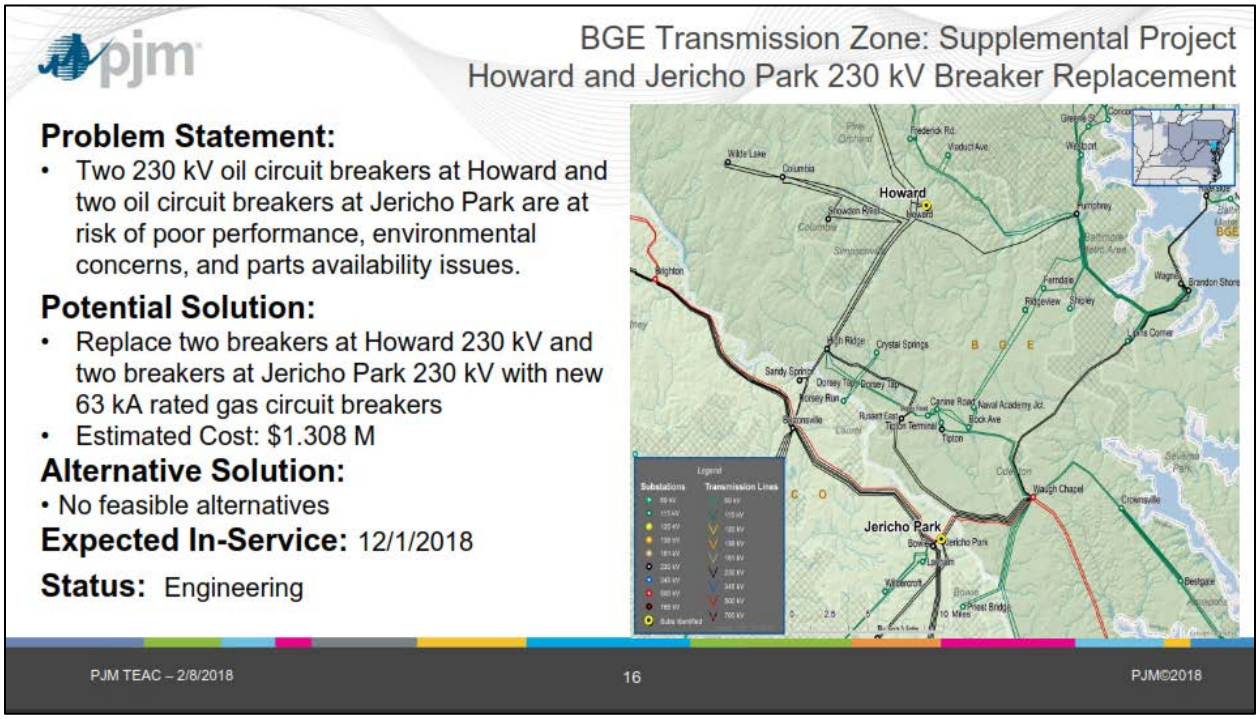
AEP: Jefferson Breakers



1. **Why wasn't this project brought to stakeholders prior to going into construction**

2. **Was the overload on the OVEC system considered with this project scope?**

AEP: Howard and Jericho



1. What are the ages of the CB's?

2. How many fault and switch operations have the CB had?

3. What type of oil circuit breakers are these and who manufactured them. (GE-FKs)?

4. Does BGE conduct oil testing on CB's, If so would BGE be will to provide the oil sampling data?

ComEd Transmission Zone: Supplement
Wayne 345-138kV Transformer 84 Replacement

Supplemental Project

Problem Statement:

Wayne 345-138kV auto-transformer 84

- Westinghouse 7-million series shell form
  - Susceptible to static electrification
  - Cannot be re-blocked
- Acoustic testing show high vibration and sharp increases in frequencies associated with looseness in the core assembly.
- Low ability to withstand through fault

Transformer 84 shares a bus position with 345kV line 14419 (Wayne-Aurora E.C.)
Tertiary cap banks no longer allowed.
Tertiary cap bank failures stress the 345-138kV transformers and have caused transformer failures in the past.

Potential Solution:

Replace Wayne 345-138kV transformer
Finish ring bus on red 345kV bus - Install two 345kV breakers
Retire Tertiary cap bank
Install 138kV cap bank

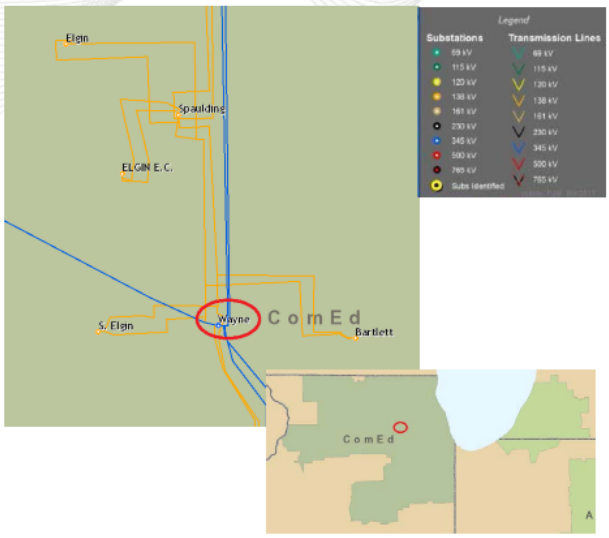
Estimated Cost: $15M

Alternatives:

- No feasible alternatives

Projected In-service: 12/31/2019

Project Status: Engineering



1. **What is the future 0626 shown on the one-line?**
2. **Is this station the same station that was impacted by S0363 Circuit Switcher which cost $0.45 M**
3. **What will be done with this circuit switcher once the ring goes into service?**
4. **Will the transformer be protected by a Circuit and two 345kV circuit breakers associated with the ring bus installation?**
5. **What not just install line circuit breakers similar to the previous project?**

AEP Transmission Zone: Supplemental
Twin Branch Station Upgrades

Previously Presented: 1/11/2018

Problem Statement:
Equipment Material/Condition/Performance/Risk:
CB's J2, K2, and L1 at Twin Branch are all PK-type air blast breakers installed in the late 60's or early 70's. These four breakers are showing significant signs of deterioration. Drivers include age, number of fault operations, and a lack of available repair parts.
Breakers J2 and L1 are PK 3000A 41kA models. Breaker K2 is a PK 3000A 50kA model.

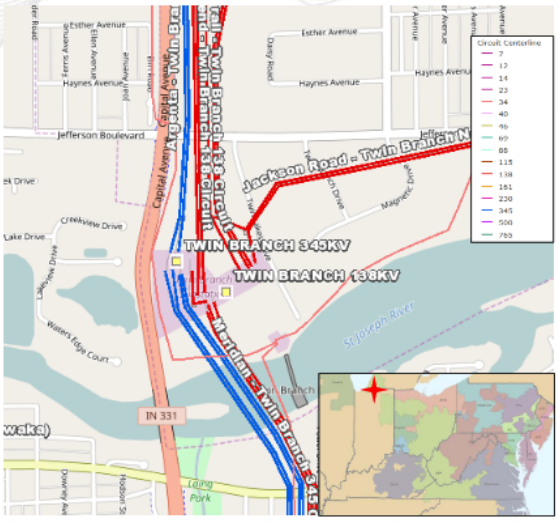
Selected Solution:
Remove and replace 345kV circuit breakers L1, K2 and J2 with 5000A 63kA models. (S1464)

Estimated Transmission Cost: $6.4 M

Alternatives:
No viable cost effective alternates were identified

Projected In-service: 12/31/2018

Project Status: Engineering



1. What voltage are the CB's?

2. Number of fault operations?

3. Current breaker duties %