Reliability Analysis Update

Aaron Berner, Manager
Transmission Expansion Advisory Committee
September 1, 2020
First Review

Baseline Reliability Projects
Process Stage: First Review

Criteria: Dominion’s FERC 715 Planning Criteria (C.2.9 – End of Life Criteria)

Assumption Reference: FERC 715 Planning Criteria

Model Used for Analysis: 2020 Series 2025 RTEP

Problem Statement:
- The Doubs (FE) - Goose Creek (DEV) 500kV transmission Line #514 is an approximately 18-mile long line (3-miles is DEV owned) primarily constructed on weathering (COR-TEN®) steel lattice structures.
- Third party assessment has determined that the towers have corroded to a point where they exhibit pre-mature thinning of structure members and packout at joints. If left unaddressed these issues could result in failure of structures and potentially the collapse for the line. (DOM-05)

Existing Facility Rating: 2323/2323/2671 MVA

Proposed Facility Rating: 4330/4330/4979 MVA Summer
4980/5023/5928 MVA Winter

Note: The End of Life issue identified for Line #514 is linked to the M-3 need identified as APS-2020-011

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Proposed Solution:
Proposal 2020-W2-441: DEV’s portion of Line #514 consists of 16 structures and 3 of these structures were replaced in 2014 with galvanized structures. Replace the remaining 13 COR-TEN® towers with galvanized steel towers. Reconductor 3 mile section with 3-1351.5 ACSR 45/7. Upgrade line terminal equipment at Goose Creek substation to support the Line #514 rebuild.
- **Estimated Cost:** $7.6M

Alternatives:
Maintain existing condition is not a practicable alternative from a safety and reliability standpoint.
- **Estimated Cost:** $0

Required In-Service: 6/1/2025
Process Stage: First Review
Criteria: Winter N-1-1 Thermal & Voltage, 300 MW Load Loss
Assumption Reference: 2025 RTEP assumption
Model Used for Analysis: 2025 RTEP winter case
Proposal Window Exclusion: Immediate Need

Problem Statement:

- Various voltage magnitude and drop violations in the Northern Neck area for the loss of 230kv Line #224 Lanexa – Northern Neck and 230kv Line #2145 Birchwood – Dahlgren. (N2-WVM28-N2-WVM63, N2-WVD1-N2-WVD60).
- Continued use of operating procedure to open 115kv Line 65 at Northern Neck end to accommodate outages on one of the two 230 kV feeds into Northern Neck to mitigate thermal overloads on Line 65 and also to help control & mitigate voltage issues when either of the 230kv feeds are out going to the Northern Neck area results in a PJM planning criteria violation of dropping over 300 MW in the 2022/2023 timeframe based on the 2020 PJM load forecast.

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Addition of 2\textsuperscript{nd} 230kV Circuit from Lanexa to Northern Neck
Proposed Solution:
Install a 2nd 230kV circuit with a minimum summer emergency rating of 1047 MVA between Lanexa and Northern Neck Substations. The 2nd circuit will utilize the vacant arms on the double-circuit structures that are being installed on the Line #224 (Lanexa-Northern Neck) End-of-Life rebuild project (b3089). The Northern Neck terminal will be expanded from a 230kV, 4-breaker ring bus to a 6-breaker ring bus while the Lanexa terminal will be expanded from a 6-breaker ring bus to a breaker-and-a-half arrangement.

Estimated Cost: $23.0 M
- New 230 kV Circuit: $14.0 M
- Northern Neck Substation work: $ 5.0 M
- Lanexa Substation work: $ 4.0 M

Alternatives: N/A
Required In-Service: 6/1/2023
Recommended Solution
Baseline Reliability Projects
Dominion Transmission Zone: Baseline Clifton 230kV Breaker “201182” and “XT2011” Replacements

Process Stage: Recommended Solution
Criteria: Over Duty Breaker
Assumption Reference: none
Model Used for Analysis: 2024 short circuit model
Proposal Window Exclusion: FERC 715 (TO Criteria)
Baseline Reliability: TO Criteria Violation (FERC 715 (TO Criteria) Exclusion)
*This project inherits the exclusion of its parent project.

Problem Statement:
The Clifton 230kV breakers “201182” and “XT2011” are over duties.

Significant Driver:
b3110: Rebuild Line #2008 between Loudoun to Dulles Junction. Retire Line #156 from Loudoun to Bull Run. Cut and loop Line #265 (Clifton – Sully) into Bull Run Substation. Add three (3) 230kV breakers at Bull Run to accommodate the new line and upgrade the substation. (Dominion "End of Life Criteria”).

Existing Facility Rating: 50kA interrupting duty
Preliminary Facility Rating: 50kA interrupting duty
Recommended Solution:
b3110.3: Replace the Clifton 230kV breakers “201182” and “XT2011” with 63kA breakers

Estimated Cost: $0.934M ($0.467M each)
Required In-Service: 12/31/2021
Projected In-Service: 12/31/2021
Previously Presented: 8/4/2020
Cancellation
Baseline Reliability Projects
**Process Stage:** Recommended Solution - CANCEL

**Criteria:** Over duty breakers

**Assumption Reference:** none

**Model Used for Analysis:** PJM Short Circuit models 2021 and 2024

**Proposal Window Exclusion:** Substation Equipment Exclusion

**Problem Statement:**

**Existing Facility Rating:** 63kA

**Preliminary Facility Rating:** 63kA

**Recommended Solution:**
B2666.1 – b2666.14


**Estimated Cost:** $11.5M

**Required In-Service:** 6/1/2020

**Projected In-Service:** CANCEL

**Previously Presented:** 9/10/2015

**Cancellation Reason:** Breakers no longer over duty following model retool for FE Gen Deactivation Reinstatement
2020 RTEP Analysis Update
Window 1
May 15, 2020
– Preliminary 2025 results posted
  • Summer Baseline and N-1 Thermal
  • Summer Generator Deliverability

July 1, 2020
– Proposal Window No.1 opened

August 31, 2020
– Proposal Window No.1 closed
  (anticipated at the time material posted to the TEAC)

Window 2
Complete evaluations of the project and presentations to the stakeholders
Competitive Planner Contact Information

- If you have any questions related to Competitive Planning Process and Competitive Planner Tool, please contact ProposalWindow-Admin@pjm.com

- If you need an assistance with registration to Competitive Planner Tool, please contact AccountManager@pjm.com

- PJM Competitive Planning Process Webpage
  https://www.pjm.com/planning/competitive-planning-process.aspx

- Access Competitive Planner tool through PJM Planning Center Webpage

- Competitive Planner Tool Updates at Tech Change Forum
Facilitator: Sue Glatz, Suzanne.Glatz@pjm.com
Secretary: Ilyana Dropkin, Ilyana.Dropout@pjm.com
SME/Presenter: Aaron Berner, Aaron.Berner@pjm.com

Reliability Analysis Update

Member Hotline
(610) 666 – 8980
(866) 400 – 8980
custsvc@pjm.com
Questions?
2020

- TEAC meetings are the following Tuesdays or Wednesday in 2020:
  - 1/7, 2/4, 3/10, 4/14, 5/12, 6/2, 7/7, 8/4, 9/1, 10/6, 11/4 (Wednesday), 12/1.
• V1 – 8/25/2020 – Original slides posted
• V2 – 9/1/2020 – Added description to Significant Driver on Slide #8