

# Appendix: Previously Reviewed Baseline Upgrade Recommendations for the December 2020 PJM Board Review



# 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 overdutied.

**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

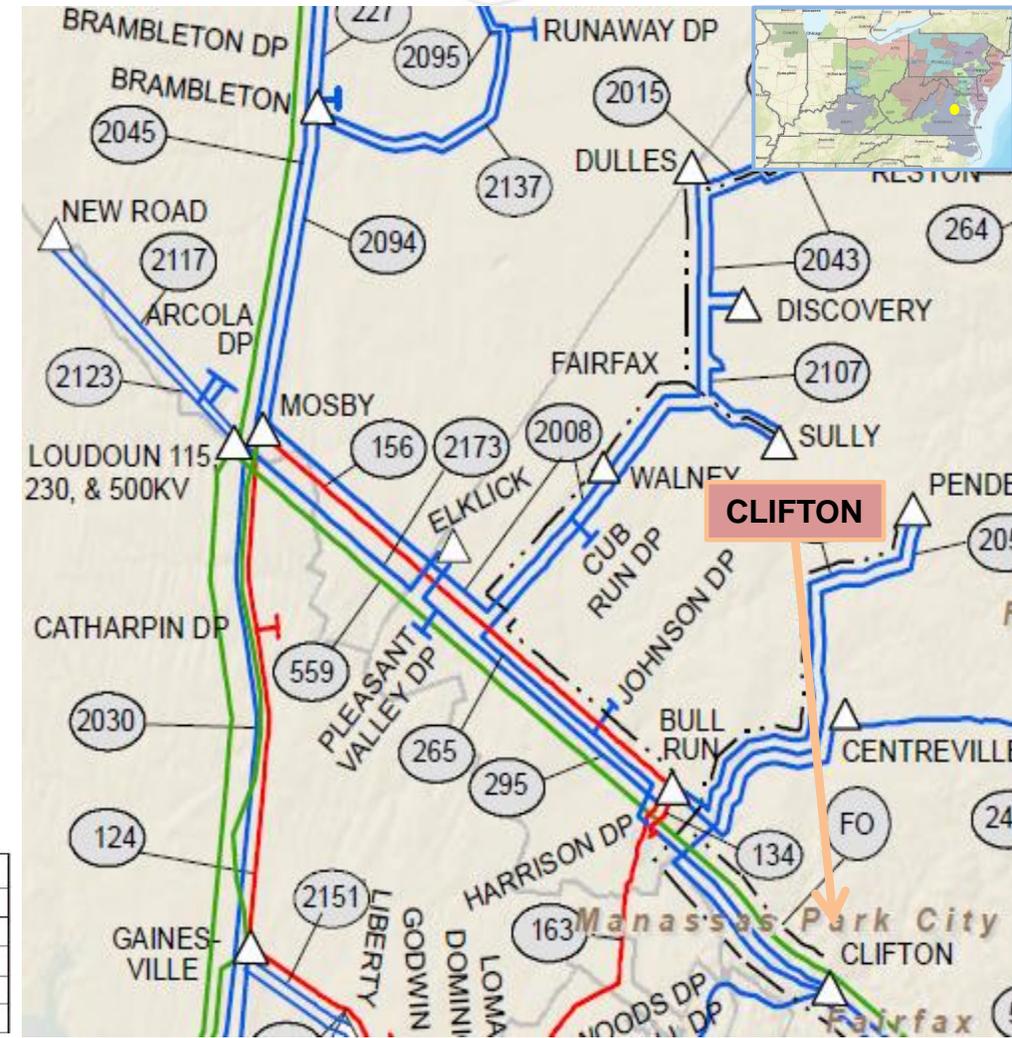
**Estimated Cost:** \$0.934M (\$0.467M each)

**Required In-Service:** 12/31/2021

**Projected In-Service:** 12/31/2021

**Previously Presented:** 8/4/2020

COLOR	VOLTAGE	TRANSMISSION LINE NUMBER
Green	500 KV.	500 thru 599
Blue	230 KV.	200 thru 299 & 2000 thru 2099
Red	115 KV.	1 thru 199
Orange	138 KV.	AS NOTED
Cyan	69 KV.	AS NOTED



**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:**

The Yukon 138kV breakers 'Y-11', 'Y-13', 'Y-18', 'Y-19', 'Y-4', 'Y-5', 'Y-8', 'Y-9', 'Y10', 'Y12', 'Y14', 'Y2', 'Y21', and 'Y22' are overstressed

**Existing Facility Rating:** 63kA

**Preliminary Facility Rating:** 63kA

**Recommended Solution:**

B2666.1 – b2666.14

Yukon 138kV breakers 'Y-11', 'Y-13', 'Y-18', 'Y-19', 'Y-4', 'Y-5', 'Y-8', 'Y-9', 'Y10', 'Y12', 'Y14', 'Y2', 'Y21', and 'Y22' with 80kA breakers

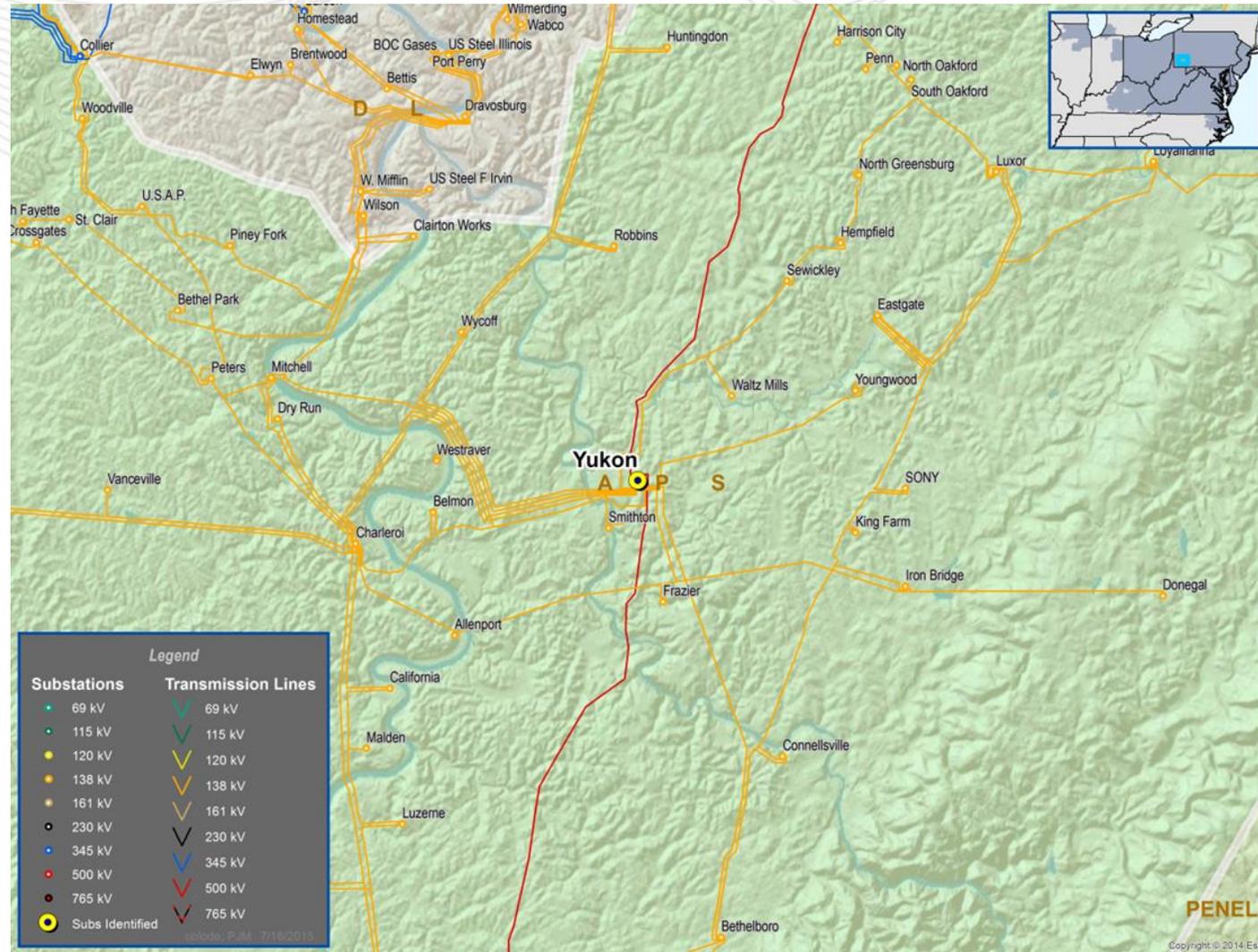
**Estimated Cost:** \$11.5M

**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





# DAYTON/AEP Transmission Zone

**B1570.4 Scope change (B1570.4 was presented in 4/11/2019 TEAC)**

## Original Scope:

Add a 345kV breaker at Marysville 345kV station and a 0.1 mile 345kV line extension from Marysville to the new 345/69KV Dayton transformer

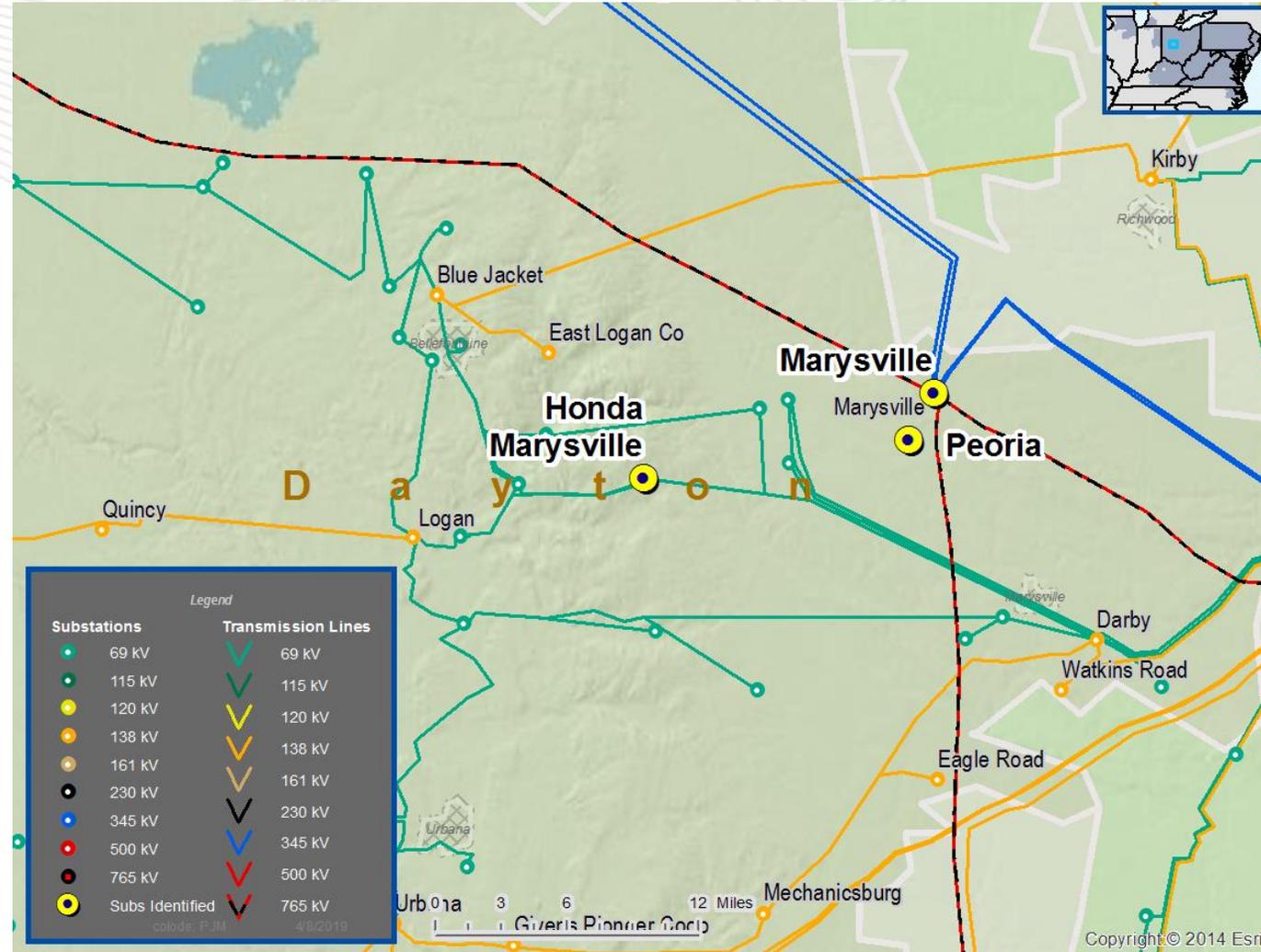
**Original Estimated Cost: \$4.1M**

## New Scope:

~~Add a 345kV breaker at Marysville 345kV station~~ **Add a new 345 kV string with two new 5000A, 63 kV circuit breakers at AEP's Marysville 345 kV station** and a 0.1 mile 345kV line extension from Marysville to the new 345/69KV Dayton transformer

**New Estimated Cost: \$4.1M-\$6.45M**

**Reason for the scope change:** The Original scope to add a breaker to an existing string was found to be very complex and costly during the Detailed Scoping stage. In addition, outage durations would have increased, custom T-Line poles needed to be installed in the drive path, and 765/345 kV Transformer #2 would have to be relocated along with all the control cables.





# Dominion Transmission Zone: Baseline 500kV Line #514 Rebuild (End of Life Criteria)

**Process Stage:** Second 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:**

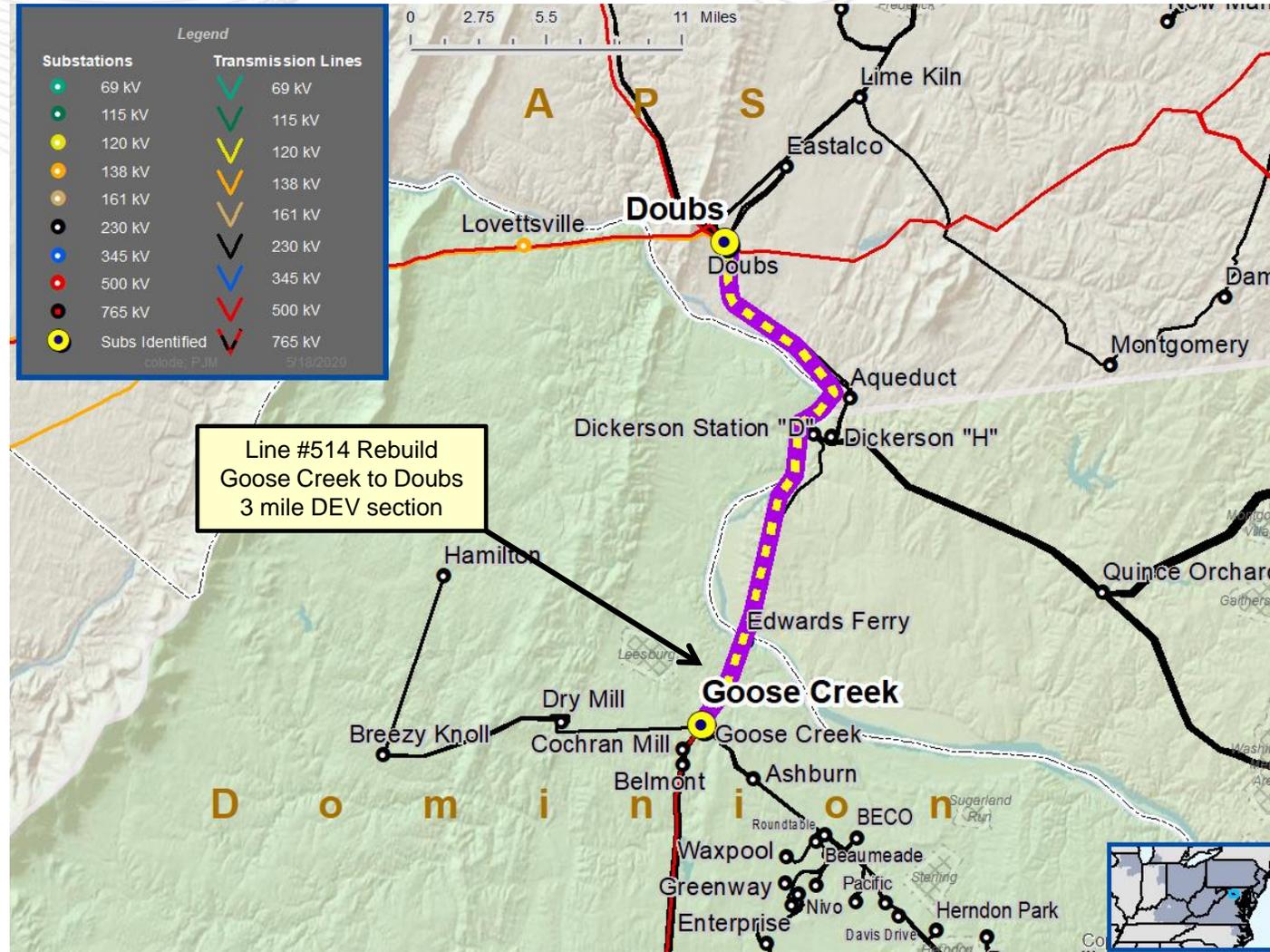
- The Doubs(FE) - Goose Creek(DEV) 500kV transmission Line #514 is an approximately 18-mile long line(3-miles is DEV owned) primarily constructed on weathering (COR-TEN®) steel lattice structures.
- Third party assessment has determined that the towers have corroded to a point where they exhibit pre-mature 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-O5)

**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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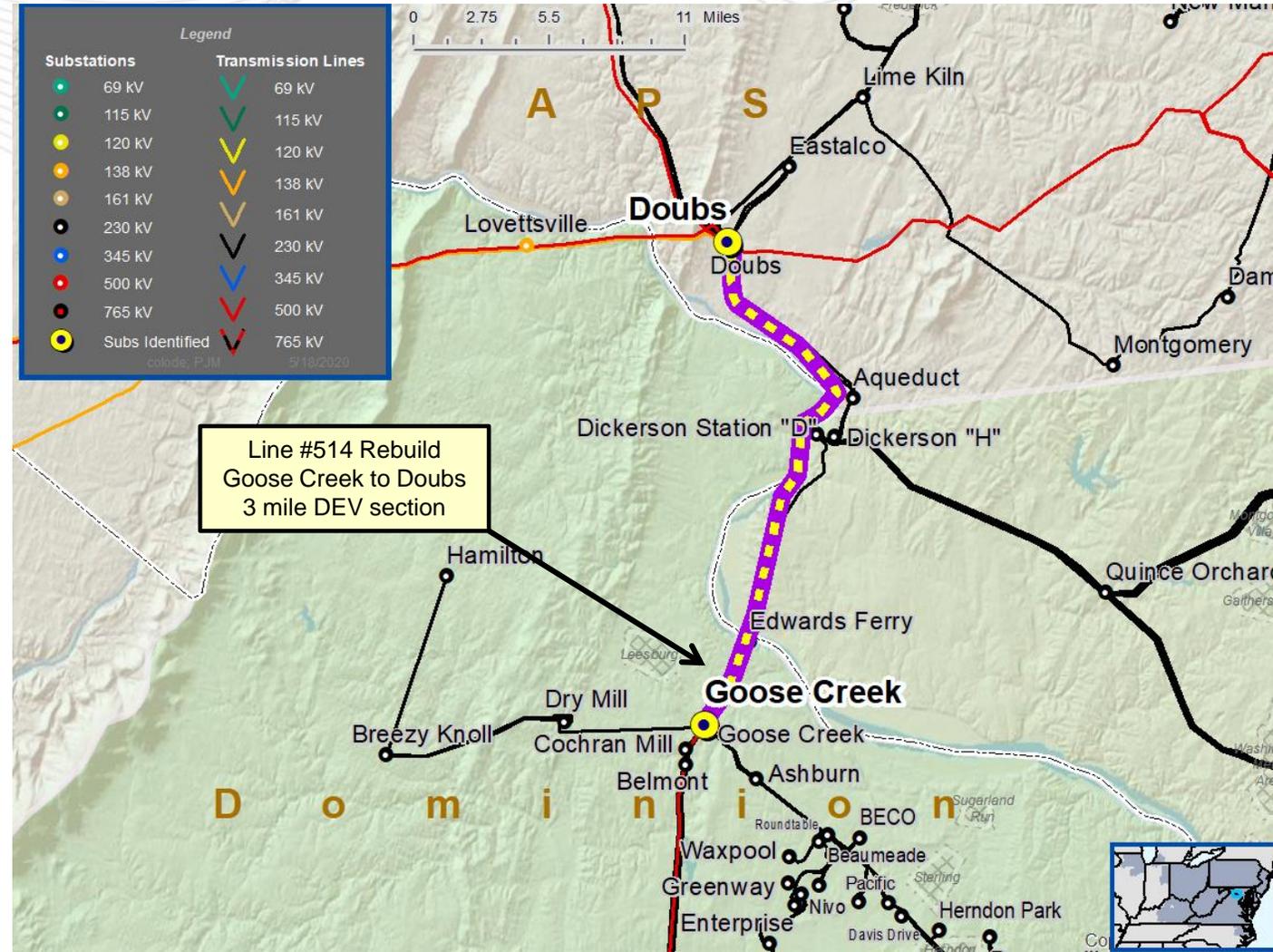
# Dominion Transmission Zone: Baseline 500kV Line #514 Rebuild (End of Life Criteria)

## Recommended 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. (b3247)

- **Estimated Cost: \$7.6M**

**Required In-Service: 6/1/2025**





# Dominion Transmission Zone: Baseline Northern Neck Area

**Process Stage:** Second Review

**Criteria:** Winter N-1-1 Thermal & Voltage, 300 MW Load Loss

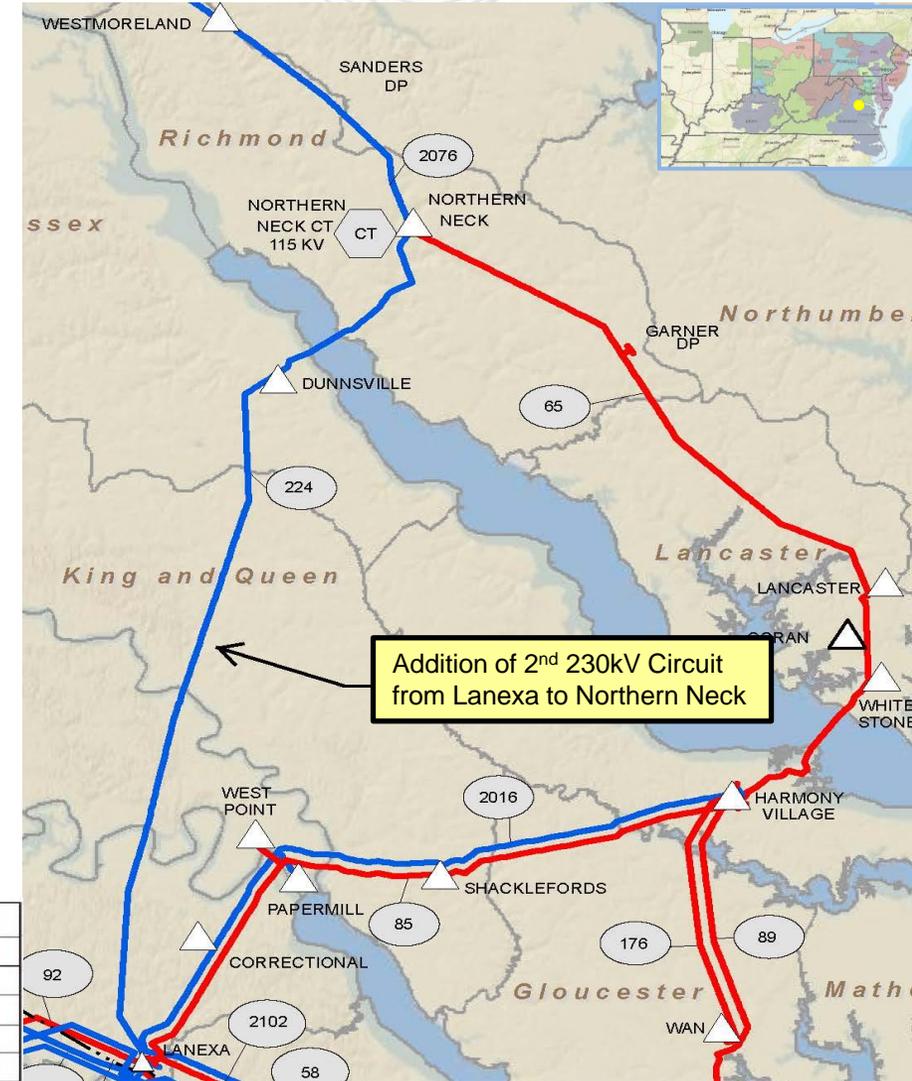
**Assumption Reference:** 2025 RTEP assumption

**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).
- Overload of 115kv Lines Rappahannock – Whitestone and Harmony Village – Greys Point for the loss of 230kv Line #224 Lanexa – Northern Neck and 230kv Line #2145 Birchwood – Dahlgren. (N2-WT9-N2-WT12)
- 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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Cyan	69 KV.	AS NOTED

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# Dominion Transmission Zone: Baseline Northern Neck Area

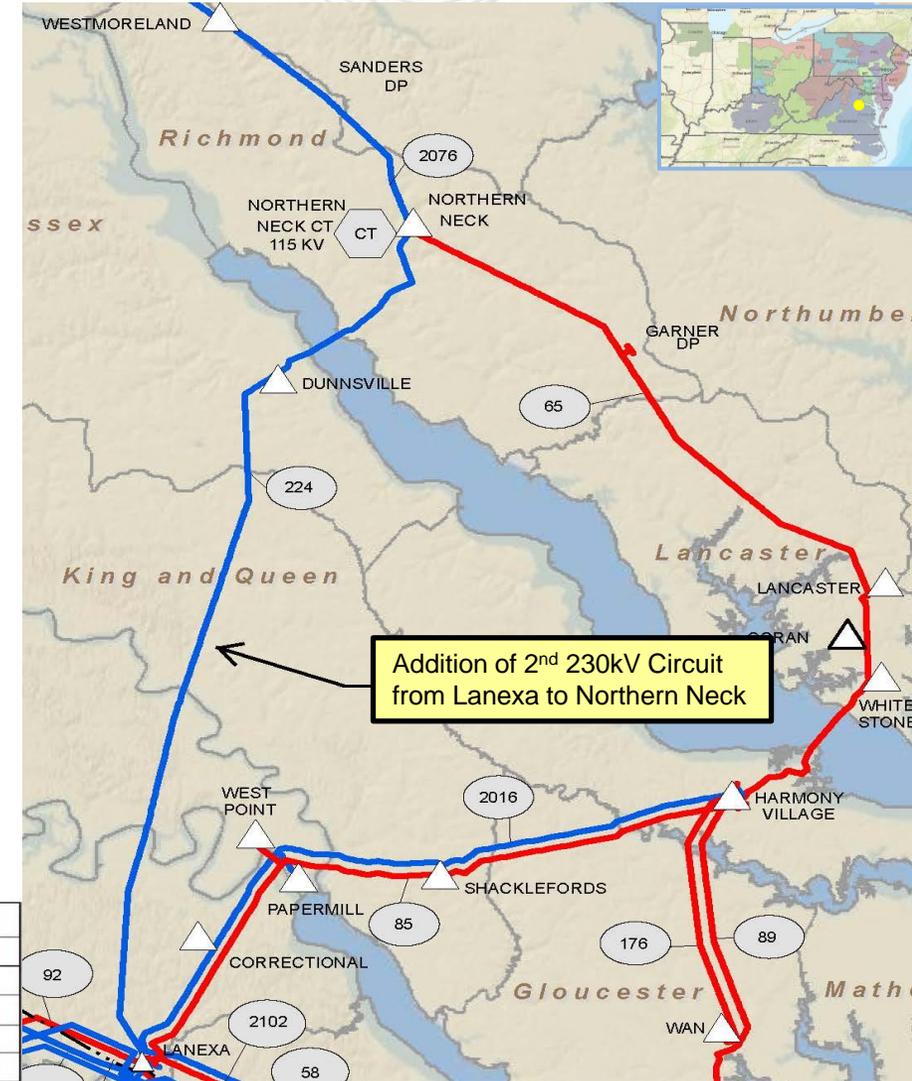
## Recommended Solution:

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 (b3223.1)
- Northern Neck Substation work: \$ 5.0 M (b3223.2)
- Lanexa Substation work: \$ 4.0 M (b3223.3)

Required In-Service: 6/1/2023



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