Sub Regional RTEP Committee
South

December 18, 2017

Baseline Reliability and Supplemental Projects
Second Review

Dominion: Baseline Violation
115 kV Line #43 Staunton to Harrisonburg End of Life

Date Project Last Presented: 10/30/2017 SRRTEP

Problem Statement: DOM "End of Life Criteria"

- 115kV Line #43 is approximately 22.8 miles long and was constructed on wood H-frame structures in 1958 from Staunton to Harrisonburg. This line has ACSR conductor and 3/8" steel static. This line serves Peach Grove DP, North River DP, Weyers Cave and Verona substations which encompasses 7,693 customers including 3,214 fed by Co-op. It has an existing summer emergency rating of 147 MVA between Harrisonburg and Verona. Between Verona and Staunton it has a rating of 168 MVA.
- Industry guidelines indicate equipment life for wood structures is 35-55 years, conductor and connectors are 40-60 years, and porcelain insulators are 50 years.
- Permanent MW load loss for removal of this line would be in excess of 58 MW. This line needs to be rebuilt to current standards based on Dominion's "End of Life" criteria.

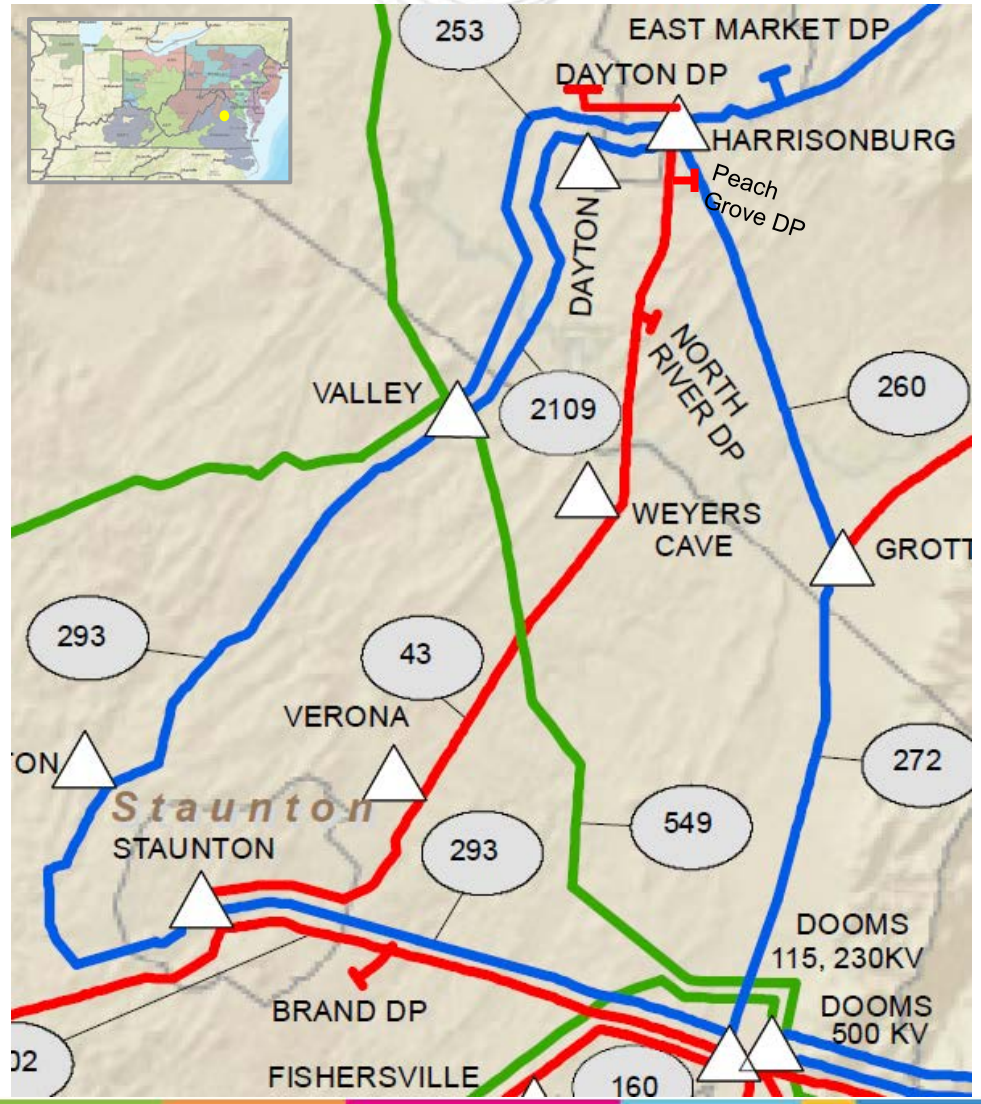
Recommended Solution:

- Rebuild 115kV Line #43 between Staunton and Harrisonburg (22.8 miles) to current standards with a summer emergency rating of 261 MVA at 115kV. (b2980)

Estimated Project Cost: $37.5 M

Projected In-service Date: 10/31/2022

Project Status: Conceptual



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

Dominion: Baseline Violation
115kV Line #29 Fredericksburg to Aquia Harbor End of Life

Date Project Last Presented: 10/30/2017 SRRTEP

Problem Statement: DOM "End of Life Criteria"

- Total line length of 115kV Line #29 is 24.4 miles and runs between Fredericksburg Substation and Possum Point Power Station. The proposed rebuild segment of the 115kV Line #29 between Fredericksburg and Aquia Harbor is approximately 12 miles long and was constructed on wood H-frame structures in 1957. Existing conductor in the proposed rebuild segment is a combination of 1109 ACAR, 2-721 ACAR and 795 ACSR with a summer rating of 239 MVA. The remaining 12 miles of Line #29 is on a common 230kV lattice structure with Line #252 (with the exception of the tap to Quantico) with a summer conductor rating of 361 MVA at 115kV.

- This line provides service to Quantico Substation with a total of 440 customers including the Quantico USMC Base. Quantico Substation is connected to Line #29 with a 1.7 mile 115kV tap off the main line.

- Rebuilding this 12 mile segment of Line #29 to current 230kV standards (with continued operation at 115kV) would be consistent with the Company's practice of containing or converting 115kV load in the Northern Virginia area and would support the future conversion of the entire Line #29 to 230kV with the remaining 12 miles already installed on 230kV structures.

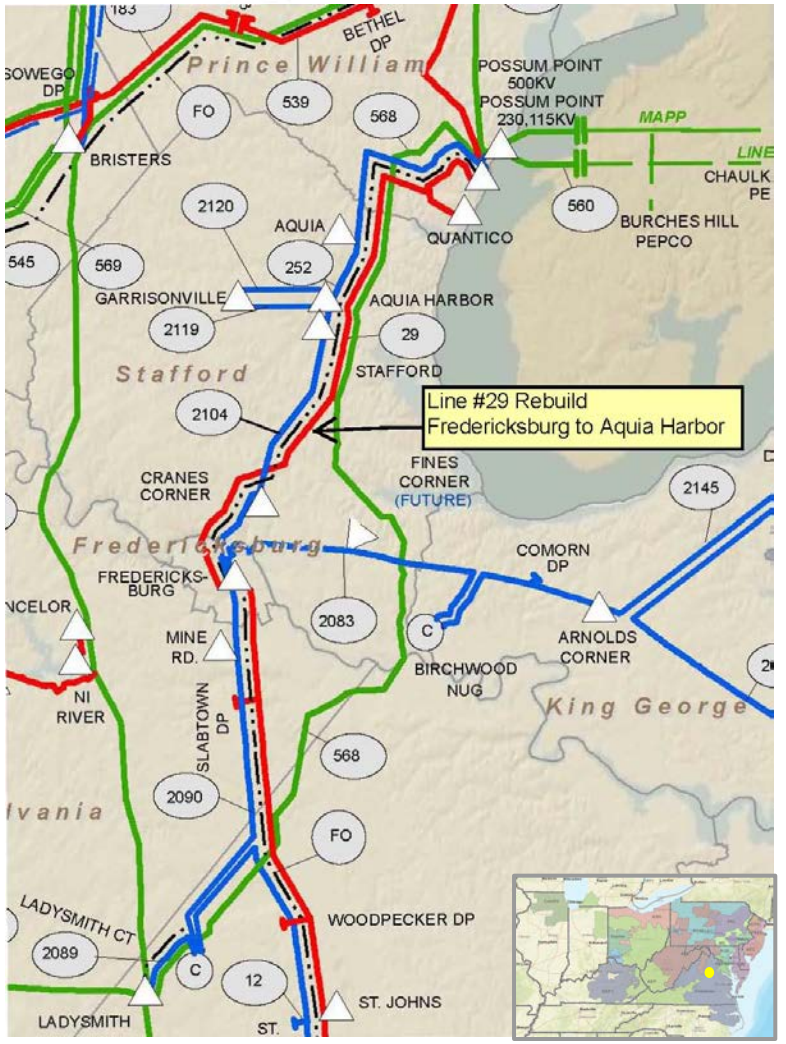
Recommended Solution:

- Rebuild Line #29 segment between Fredericksburg and Aquia Harbor to current 230kV standards (operating at 115kV) utilizing steel H-frame structures with 2-636 ACSR to provide a normal continuous summer rating of 524 MVA at 115kV (1047 MVA at 230kV). (b2981)

Estimated Project Cost: $12.5 M

Projected In-service Date: 12/31/2022

Project Status: Conceptual



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

Dominion: Supplemental Project
Carver Substation – New 115kV Circuit Switcher

Date Project Last Presented: 10/30/2017 SRRTEP

Problem Statement:

- The existing protection scheme on Carver 115/13.2kV transformer #6 requires momentarily opening the Line #3 breaker and the associated 115kV bus while a motor operated switch is opened to isolate the transformer.

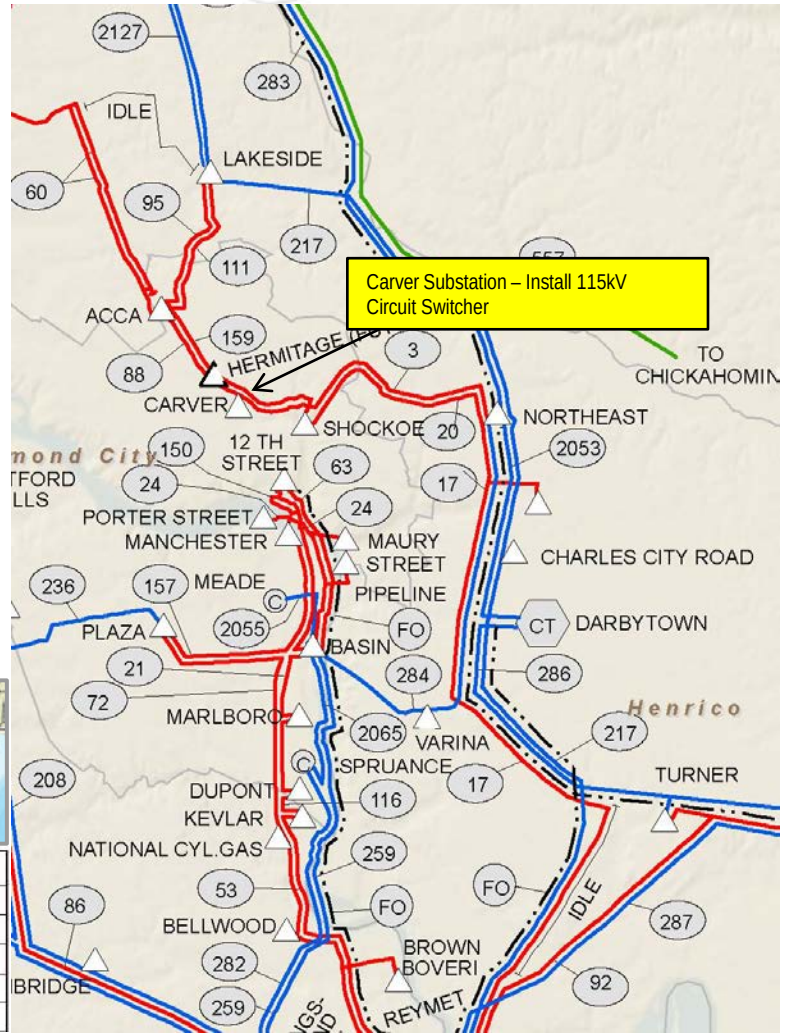
Selected Solution:

- Install a 115kV circuit switcher on the high side of transformer #6 to provide transformer protection and eliminate the need to open the Carver Line #3 breaker and 115kV bus during this event. (s1456)

Estimated Project Cost: $275,000

Projected In-service Date: 3/1/2018

Project Status: Complete



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

Dominion: Supplemental Project
Kitty Hawk 230-115kV Transformer #7 Replacement

Date Project Last Presented: 10/30/2017 SRRTEP

Problem Statement:

- Kitty Hawk 230-115kV 168 MVA transformer #7 needs to be replaced as a result of Dominion's ongoing transformer health assessment (THA) process. This process considers design characteristics, past electrical test results, dissolved gas-in-oil test results, age, ongoing maintenance issues, and past failures of similar designed transformers.
- This transformer was manufactured in 1987 by North American.
- Drivers for replacement are age, reduced BIL ratings and transformers previously manufactured by North American are considered highly suspect due to previous transformer failures.

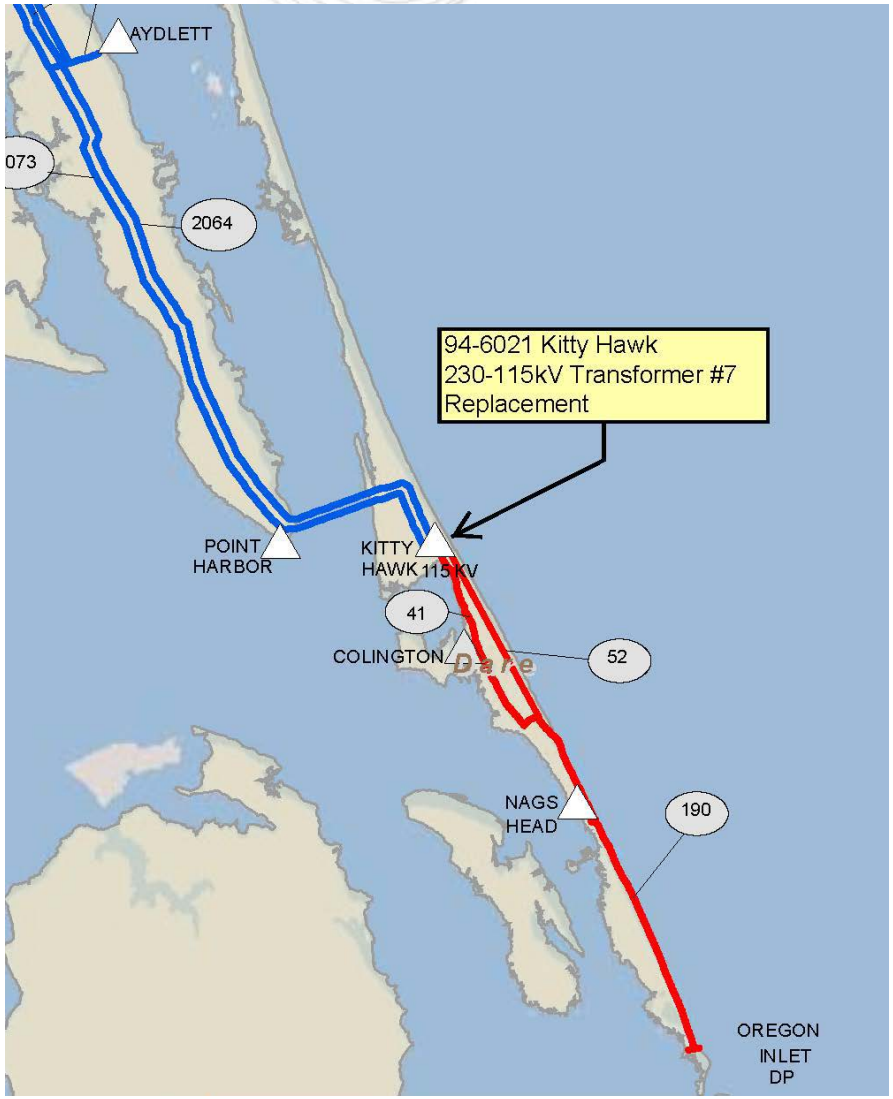
Selected Solution:

- Replace Kitty Hawk transformer #7 with a 168 MVA transformer. (s1457)

Estimated Project Cost: $3.0 M

In-service Date: 12/8/2017

Project Status: Complete



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

Dominion: Supplemental
Lines #93 & #140 Wave Trap & Line Terminal Equipment Replacement

Date Project Last Presented: 10/30/2017 SRRTEP

Problem Statement:

- 115kV Line #93 and 115kV Line #140 wave traps and associated line terminal equipment at Southampton substation need to be replaced due to age.

Selected Solution:

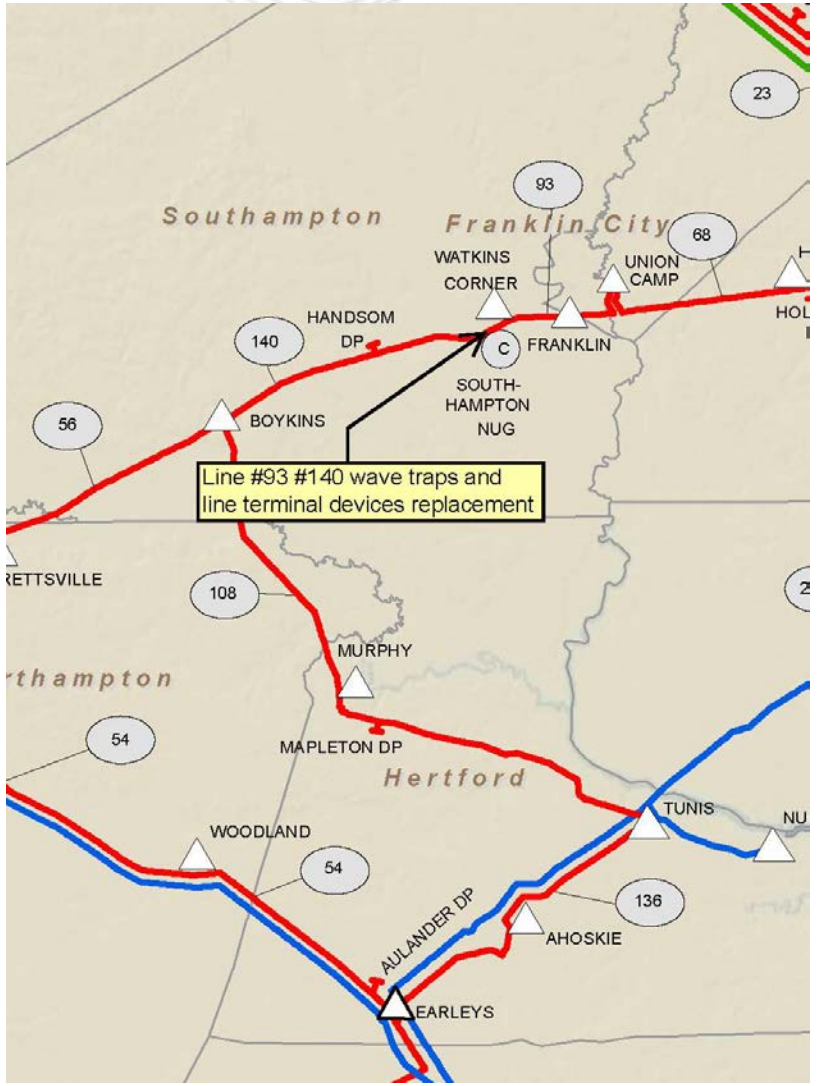
- Replace one 115kV breaker and #93 & #140 line relays at Southampton. Replace existing Line #93 & Line #140 1200A wave traps at Southampton with 2000A wave traps. 115kV Line #93 Southampton – Watkins Corner segment summer emergency rating will be increased from 239MVA to 287MVA. 115kV Line #140 Hansom DP – Southampton segment summer emergency rating will be increased from 239MVA to 287MVA. (s1458)

Estimated Project Cost: $1.0 M

Projected In-service Date: 11/15/2017

Project Status: Complete

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



Next Steps

Upcoming SRRTEP-South Meetings

South	Start	End
1/30/2018	8:30	11:30
3/27/2018	8:30	11:30
5/30/2018	8:30	11:30
7/27/2018	8:30	11:30
9/28/2018	8:30	11:30
11/29/2018	8:30	11:30

Questions?

or

RTEP@pjm.com

Revision History

12/13/2017 – V1 – Original version posted to PJM.com