



Lanexa – Dunnsville 230 kV Outage Coordination

Paul McGlynn

Operating Committee
March 10, 2022



Rebuild Lanexa-Northern Neck 230 kV line

Dominion Transmission Owner Criteria (PJM South Region)

December 2018 TEAC

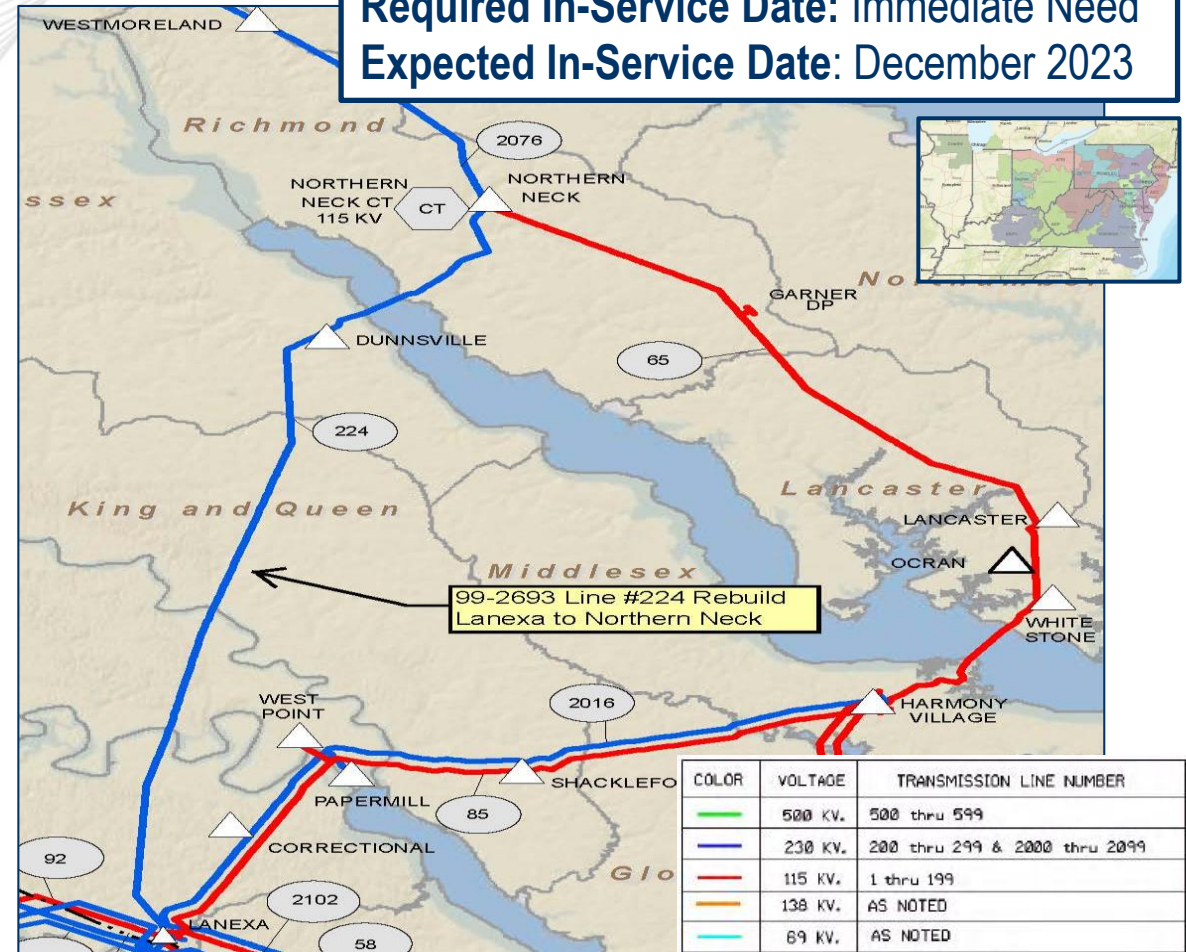
Board Approval: February 2019

Problem Statement: Dominion End-of-Life Criteria Lanexa-Northern Neck (41 miles) constructed in 1969 on wood H-frames and 32 weathering steel lattice towers. Industry guidelines indicate equipment life for wood structures is 35–55 years, steel structures is 40–60 years, conductor and connectors is 40–60 years, and porcelain insulators is 50 years.

Recommended Solution (b3089)

Rebuild Lanexa to Northern Neck utilizing double circuit structures to current 230 kV standards stringing only one side of the towers.

Estimated Project Cost: \$86 M
Required In-Service Date: Immediate Need
Expected In-Service Date: December 2023





Second Lanexa-Northern Neck 230kV Line

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

December 2020 TEAC Board Approval: December 2020

Proposal Window Exclusion: Immediate Need

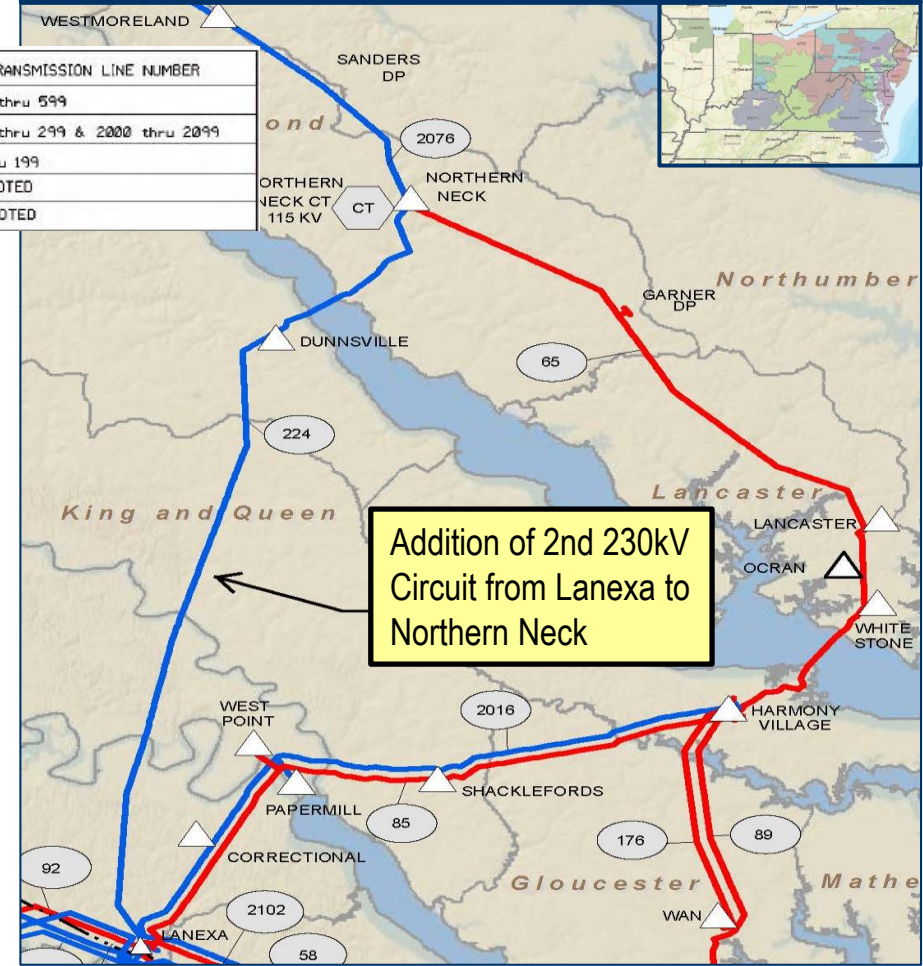
Problem Statement:

- 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).

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 Project Cost: \$23 M
Required In-Service Date: Immediate Need
Expected In-Service Date: December 2023

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

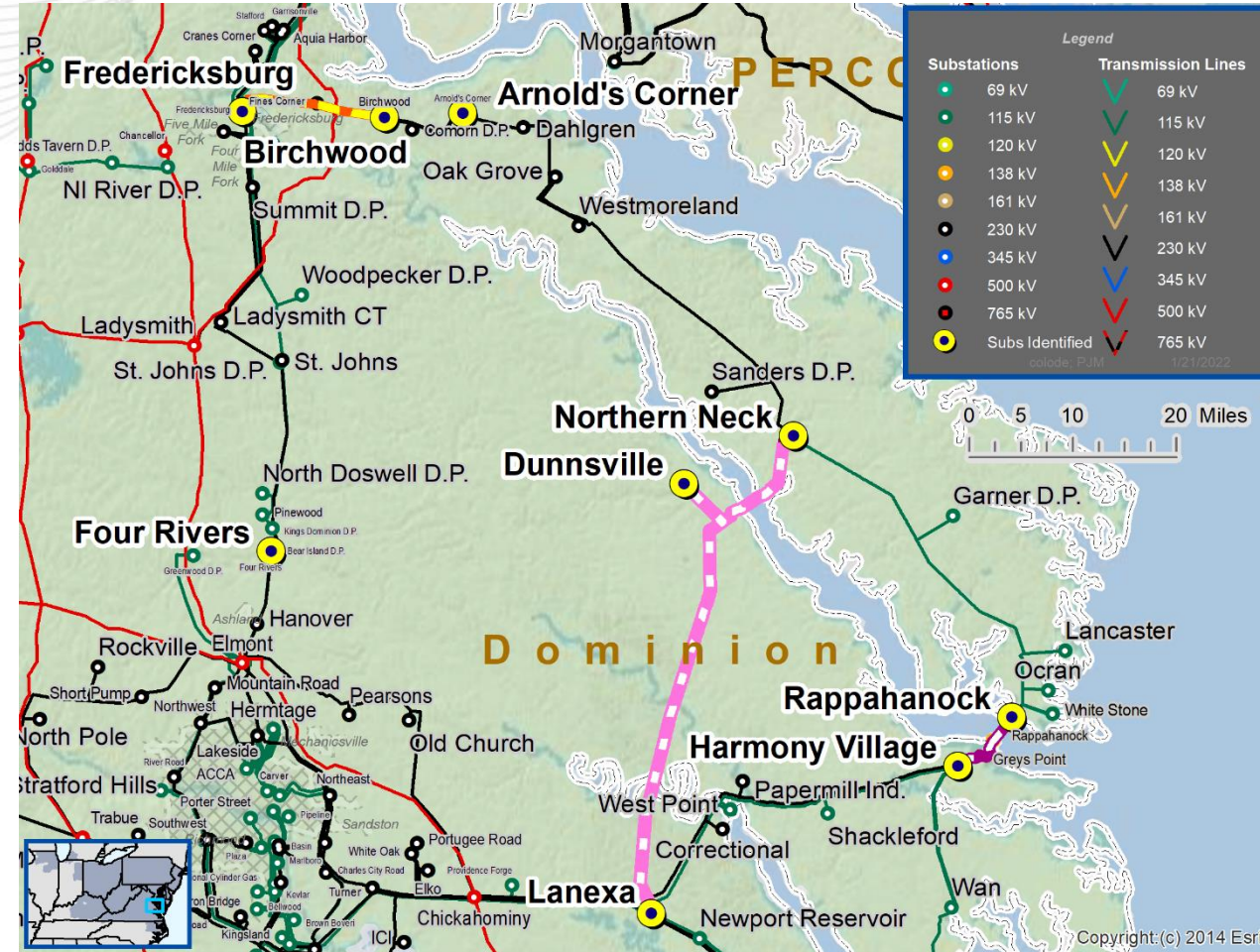


Estimated Cost: \$23.0 M	New 230 kV Circuit: \$14.0 M (b3223.1)	Northern Neck Substation work: \$5.0 M (b3223.2)	Lanexa Substation work: \$4.0 M (b3223.3)
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Dunnsville-Lanexa outage 1/5/22 – 7/31/23
 Outage request submitted 4/6/20

Dunnsville-Northern Neck outage
 6/12/23 – 3/31/24
 Outage request submitted 5/7/20

Planning and Operations analyses completed in 2020 identified heavy congestion on Harmony Village-Greys Point 115 kV for the loss of Fredricksburg-Birchwood 230 kV



December 2018
Lanexa –
Northern Neck
230 kV rebuild
(b3089)
reviewed with
TEAC

Outage request
submitted April
2020

January 2022
Lanexa –
Dunnsville 230
kV line outage
began

March 2024
Both Lanexa -
Dunnsville –
Northern Neck
230 kV
expected in-
service

February 2019
Lanexa –
Northern Neck
230 kV rebuild
(b3089)
approved by the
PJM Board

December 2020
2nd Lanexa –
Northern Neck
230 kV line
reviewed by
TEAC and
approved by
PJM Board

June 2023
Northern Neck –
Dunnsville
outage begins

ENSURING RELIABILITY:

Ongoing review and assessment of critical facilities

- Thermography
- Aerial patrols
- Increased substation inspections

Addressed concerns about Northern Neck combustion turbines

- Maintenance
- Fuel availability
- Emission allowances

Extensive coordination between PJM and Dominion to prepare for the outage and to minimize potential impact

Operating plan jointly developed with Dominion

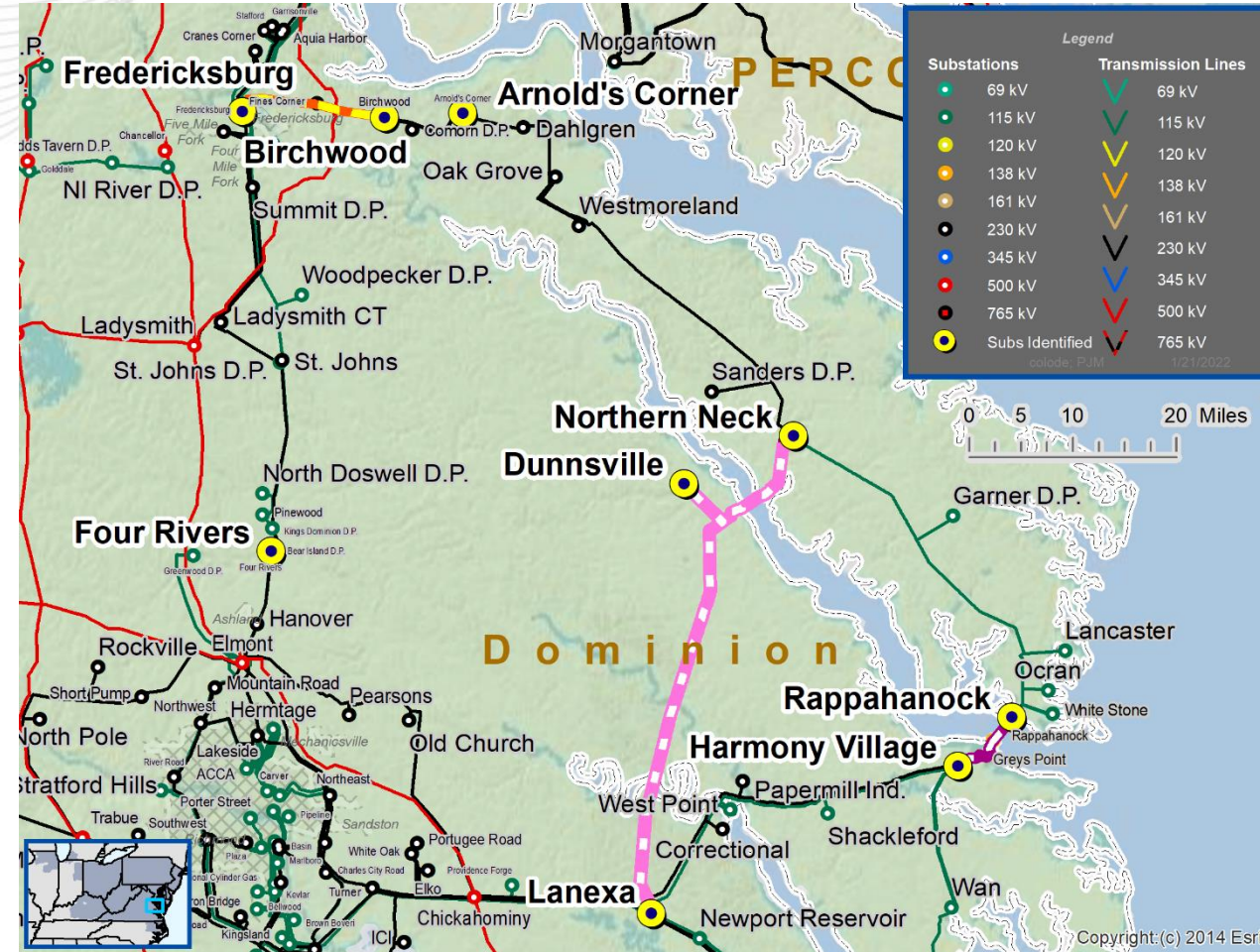
Operating Steps

- Dispatch Northern Neck CTs to control post contingency flow
- Issue Post Contingency Local Load Relief Warning if needed after all CTs dispatched
- Open the path at Northern Neck once post contingency flow exceeds load dump rating
- Approximately 300 MW load at-risk

Emergency restoration time 12 hours during winter and summer peak season and 4 days during spring and fall

115 kV upgrade to reduce load at risk: b3707

- Reconductor 0.57 mi of Harmony Village – Greys Point and 0.97 mi of Rappahannock – White Stone 115kV
- Expected ISD – end of April 2022



Presenter:
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Lanexa – Dunnsville 230 kV Outage Coordination



Member Hotline

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