Dominion Supplemental Projects

Transmission Expansion Advisory Committee
December 03, 2024

Needs

Stakeholders must submit any comments within 10 days of this meeting in order to provide time necessary to consider these comments prior to the next phase of the M-3 process

Dominion Transmission Zone: Supplemental Equipment Material Condition, Performance and Risk

Need Number: DOM-2024-0086

Process Stage: Need Meeting 12/03/2024

Project Driver: Equipment Material Condition, Performance and Risk

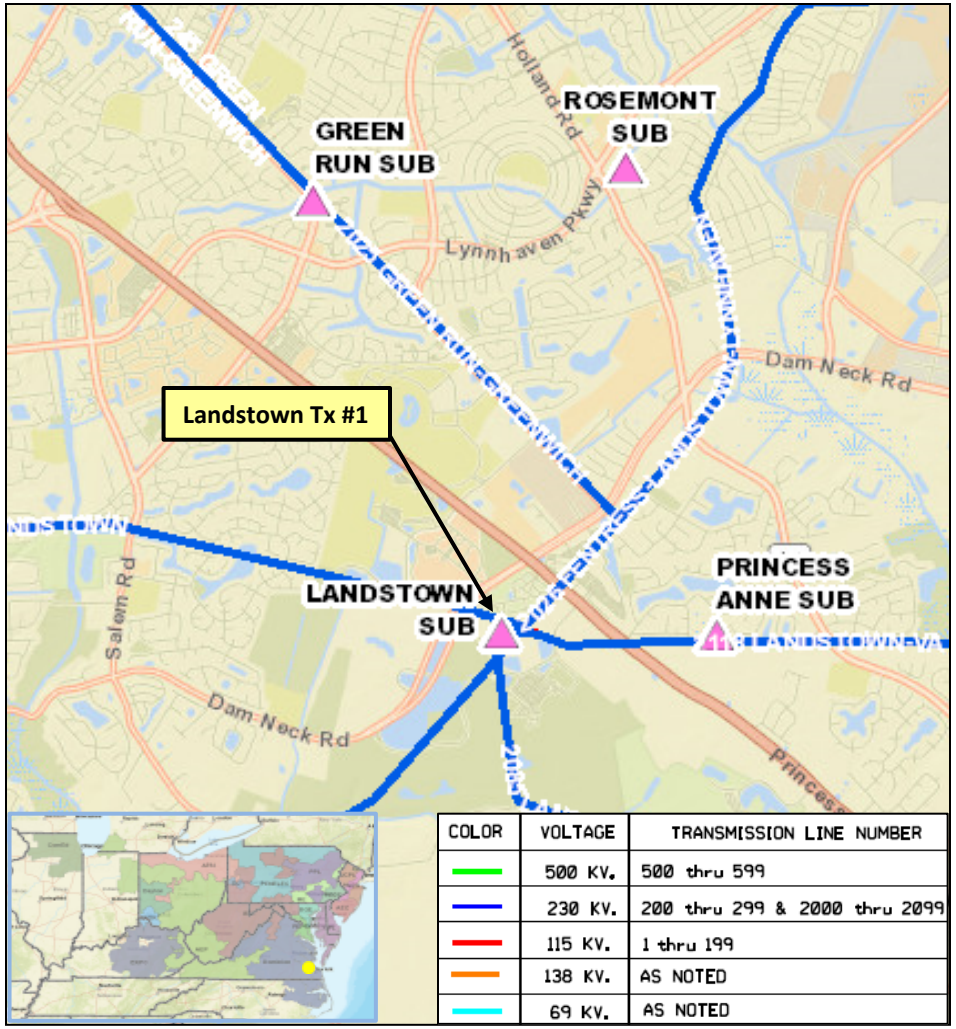
Specific Assumption References:

See details on Equipment Material Condition, Performance and Risk in Dominion's Planning Assumptions presented in December 2023.

Problem Statement:

Landstown TX#1 is a 224 MVA, 230/115/13.2 kV transformer bank manufactured in 1988. This transformer bank has been identified for replacement based on the results of Dominion's transformer health assessment (THA) process. Detailed drivers include:

- Age (>30 years old).
- Documented quality and design issues for the group of transformers purchased from this manufacturer.
- Reduced BIL rating (2 levels below std highside,1 level below std low side).
- Legacy core steel technology with high no-load loss.
- Legacy porcelain-type bushings.
- Aging LTC has limited parts availability. External oil filtration system has been fitted to the LTC, enhancing the possibility of oil leaks or spills.
- Transformer paint coating is degrading.
- THA score is below 80.



Dominion Transmission Zone: Supplemental Equipment Material Condition, Performance and Risk

Need Number: DOM-2024-0087

Process Stage: Need Meeting 12/03/2024

Project Driver: Equipment Material Condition, Performance and Risk

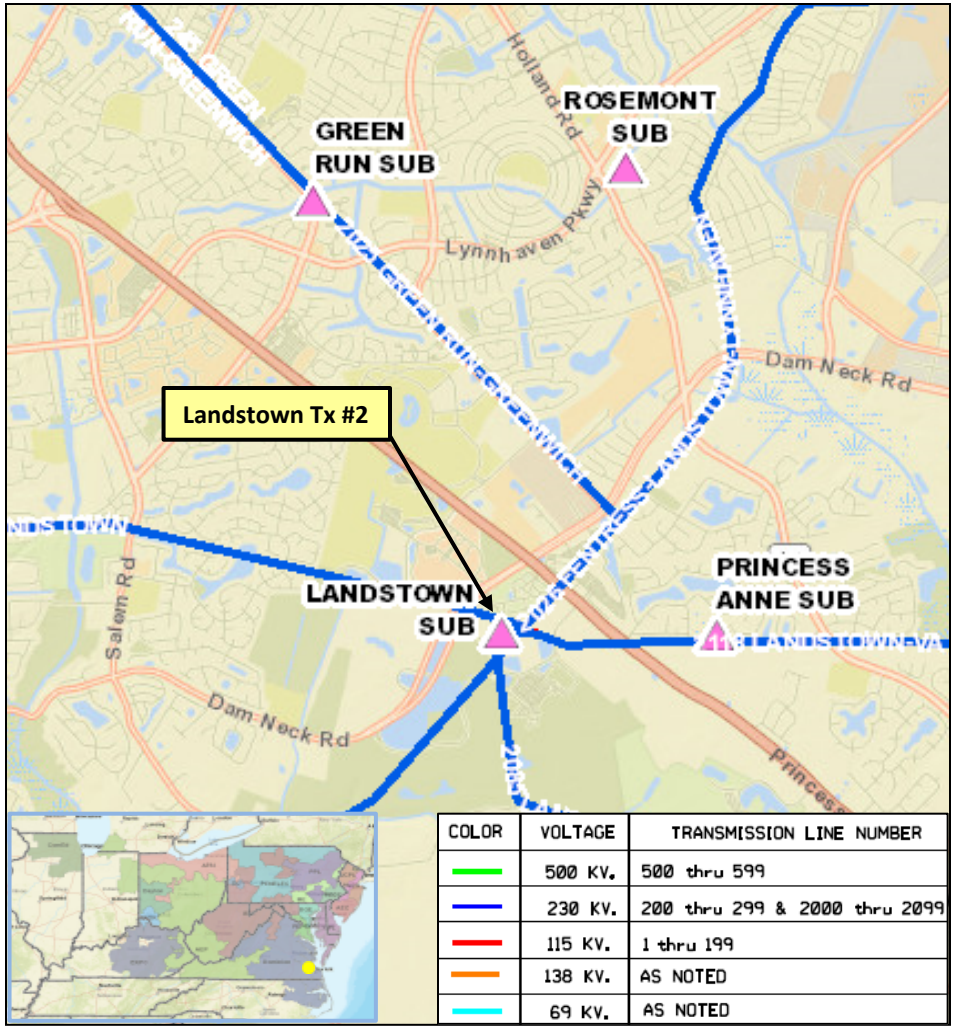
Specific Assumption References:

See details on Equipment Material Condition, Performance and Risk in Dominion's Planning Assumptions presented in December 2023.

Problem Statement:

Landstown TX#2 is a 224 MVA, 230/115/13.2 kV transformer bank manufactured in 1990. This transformer bank has been identified for replacement based on the results of Dominion's transformer health assessment (THA) process. Detailed drivers include:

- Age (>30 years old).
- Reduced BIL rating (2 levels below std highside,1 level below std low side).
- Legacy core steel technology with high no-load loss.
- Legacy porcelain-type bushings.
- Oil DGA indicates high levels of CO and CO_2 indicating deterioration of dielectric paper insulation
- Aging LTC has limited parts availability.
- Transformer paint coating is degrading.
- THA score is 80.



Solutions

Stakeholders must submit any comments within 10 days of this meeting in order to provide time necessary to consider these comments prior to the next phase of the M-3 process

Dominion Transmission Zone: Supplemental Operational Flexibility and Efficiency

Need Number: DOM-2024-0027 (Cancellation)
Process Stage: Cancellation Meeting 12/03/2024
Previously Presented: Solution Meeting 07/09/2024
Project Driver: Operational Flexibility and Efficiency

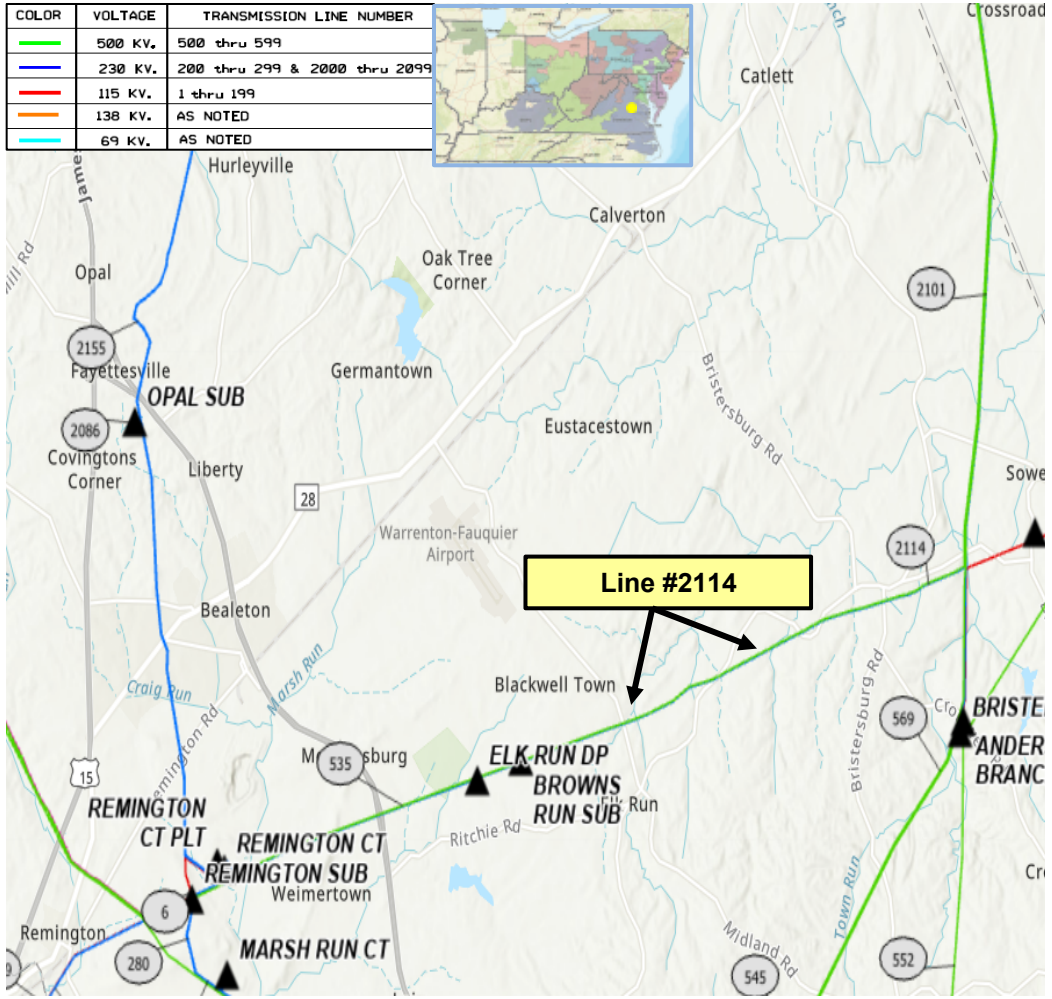
Specific Assumption References:

Operational Flexibility and Efficiency will be evaluated per Dominion's Transmission Planning Criteria and Assumptions.

Problem Statement:

Planning studies and Dominion Energy Operations Engineering studies have identified overloads on 230 kV Line #2114 (Remington CT – Elk Run – Rollins Ford) based on a 2021 DNH analysis in the 2026 RTEP model (L/O Line 569 (Loudoun – Morrisville)).

The Dominion Energy Operations team needs a temporary solution to meet load growth expectations while avoiding thermal overloading on Line #2114 and accordingly provide flexibility for future construction outages.



Dominion Transmission Zone: Supplemental Operational Flexibility and Efficiency

Need Number: DOM-2024-0027 (Cancellation)

Process Stage: Cancellation Meeting 12/03/2024

Proposed Solution:
~~Install an approximately 13.5 Ω series reactor at Remington CT on the terminal of Line #2114. *(Dominion is repurposing an already in-stock/readily available reactor for this purpose and is only an interim measure until permanent transmission fixes are in place by 2029).*~~ Coordination of outages has allowed for the uprate of Line #2114 (Remington CT – Rollins Ford) to be completed in time to resolve the need for the temporary installation of a series reactor.

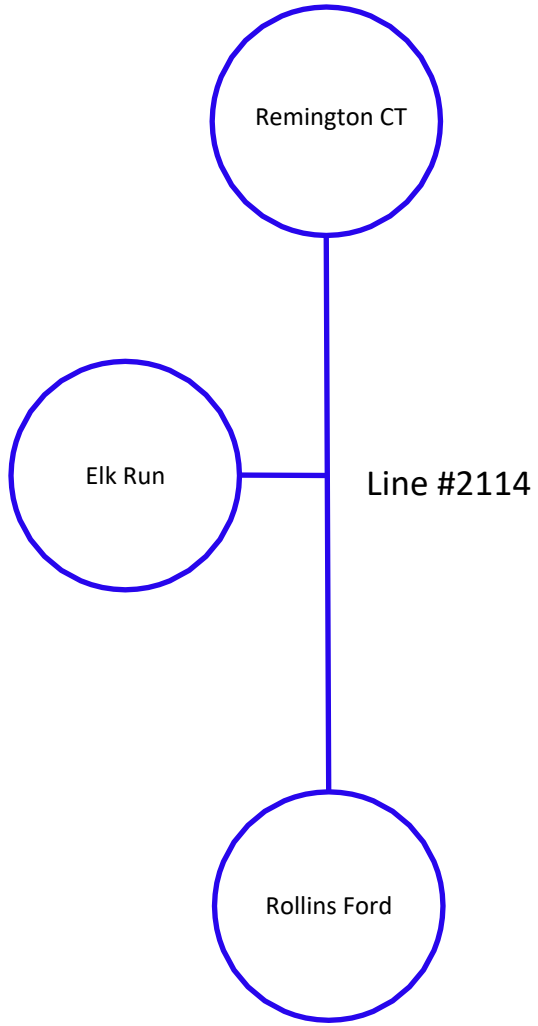
Estimated Project Cost: ~~$4M~~

Alternatives Considered:
~~No feasible alternatives~~

Projected In-service Date: ~~6/01/2025~~

Project Status: Engineering

Model: 2026 RTEP



Dominion Transmission Zone: Supplemental Do No Harm Analysis

Need Number: DOM-2023-0013-DNH

Process Stage: Solution Meeting 12/03/2024

Project Driver: Do No Harm Analysis

Specific Assumption References:

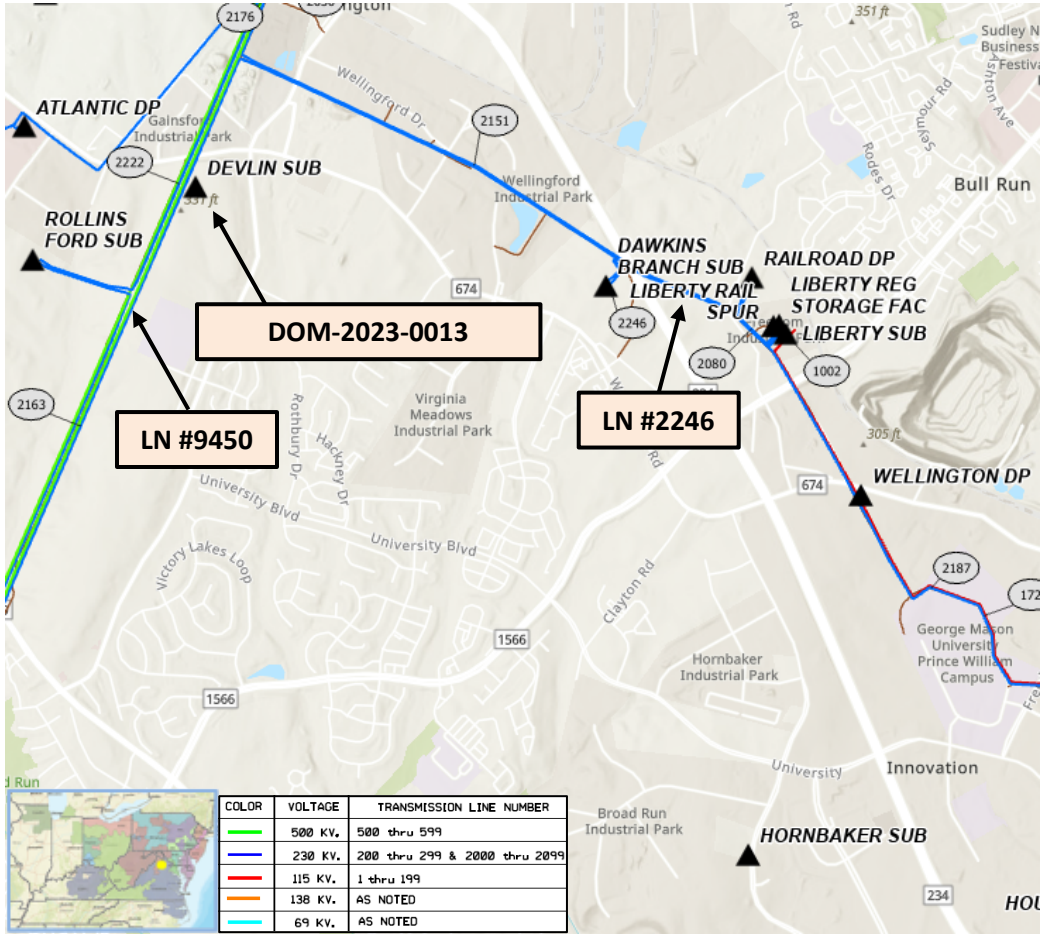
Customer load request will be evaluated per Dominion's Facility Interconnection Requirements Document and Dominion's Transmission Planning Criteria.

Problem Statement:

PJM has identified a 300 MW load drop violation due to the loss of the following separate facilities in the 2024 Do-No-Harm analysis:

- Dawkins Branch and Devlin
  - N-1-1 Contingency Scenario: L/O DVP_P:1-2: LN 9450 (Vint Hill – Devlin 230 kV) and DVP_P:1-2: LN 2246 (Dawkins Branch – Liberty 230 kV)
  - The combined loading of the two Substations is projected to exceed 300 MW by Summer 2029.

The violations are caused by previously presented Supplemental Project DOM-2023-0013 in the Dominion Zone.



Dominion Transmission Zone: Supplemental Do No Harm Analysis

Need Number: DOM-2023-0013-DNH

Process Stage: Solution Meeting 12/03/2024

Proposed Solution:

- Construct (2) 230 kV transmission lines on a shared tower structure for approximately 2.9 miles from Devlin to Pegasus Substation with a minimum summer normal conductor rating of 1572 MVA. Acquisition of new right-of-way will be required.
- Install 230 kV breakers and associated equipment (ie. switches, leads) at both Devlin and Pegasus Substations to accommodate the termination of the lines.

Estimated Project Cost: $88.0M (Total)

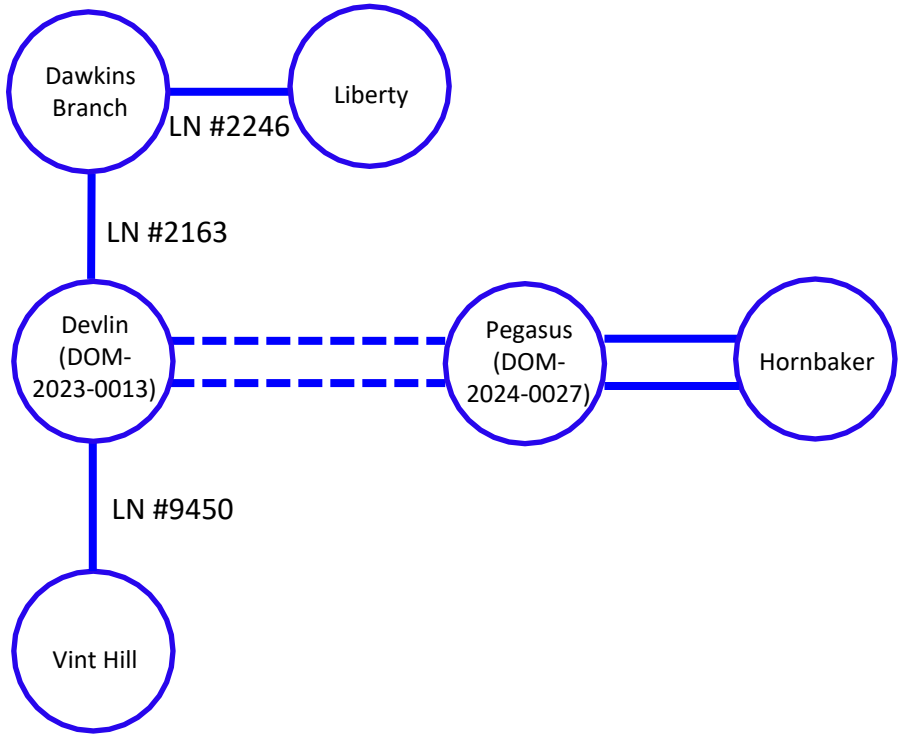
Transmission Line Cost: $33.0M

Real Estate Cost: $40.0M

Substation Cost: $15.0M

Alternatives Considered:

- Cut and extension of Line #2222 (Rollins Ford – Gainesville) into Devlin Substation or Line #2151 (Gainesville – Railroad) into Dawkins Branch Substation
  - Several N-1-1 scenarios result in increased powerflow and thermal violations along Lines #9450 (Vint Hill – Devlin), #2163 (Devlin – Dawkins Branch), and #2352 (Vint Hill – Rollins Ford). In consideration of continued load growth within the area, these alternatives were not chosen as the capacity constraints along the existing corridor would continue to persist.
- Extension of single-circuit 230 kV only from Devlin to Pegasus Substation
  - Not chosen due to avoidance of future thermal capacity constraints of a single conductor in consideration of continued load growth within the area.



Projected In-service Date: 06/15/2029

Project Status: Conceptual

Model: 2029 RTEP

Dominion Transmission Zone: Supplemental Customer Load Request

Need Number: DOM-2024-0047
Process Stage: Solution Meeting 12/03/2024
Previously Presented: Need Meeting 07/09/2024
Project Driver: Customer Service

Specific Assumption References:

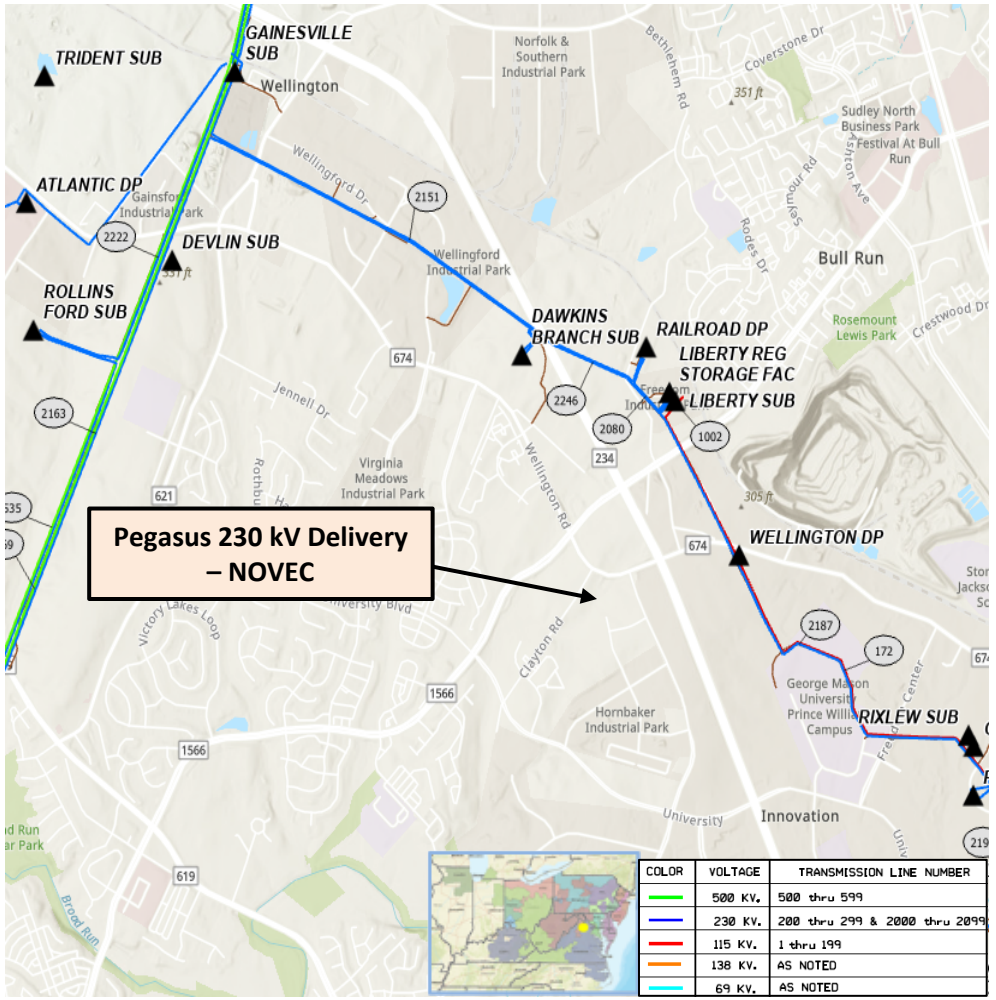
Customer load request will be evaluated per Dominion's Facility Interconnection Requirements Document and Dominion's Transmission Planning Criteria.

Problem Statement:

NOVEC has submitted a DP Request for a new substation (Pegasus) to serve a data center complex in Prince William County with a total load in excess of 100 MW.

Requested in-service date is 04/14/2027.

Initial In-Service Load	Projected 2029 Load
Summer: 22.8 MW Winter: 22.8 MW	Summer: 87.0 MW Winter: 87.0 MW



Dominion Transmission Zone: Supplemental Pegasus 230kV Delivery – NOVEC

Need Number: DOM-2024-0047

Process Stage: Solution Meeting 12/03/2024

Proposed Solution:

Interconnect the new substation by cutting and extending Line #2187 (Liberty – Hornbaker) and Line #9306 (Pioneer – Hornbaker) to the proposed site, terminating (2) 230 kV lines in-and-out of Pegasus Substation. Lines to terminate into a (6) breaker 230 kV breaker-and-a-half AIS configuration, expandable to an ultimate of (9) breakers.

Estimated Project Cost: $28.5M (Total)

Transmission Line Cost: $3.5M

Substation Cost: $25.0M

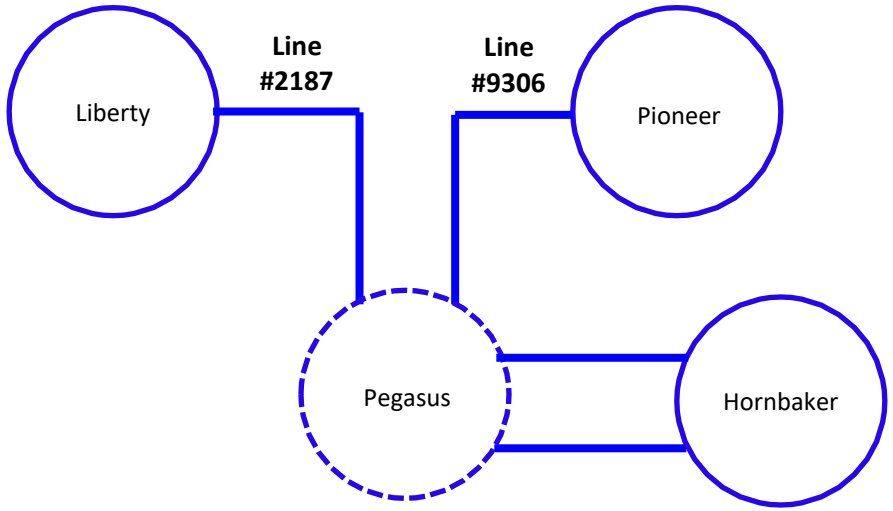
Alternatives Considered:

No feasible alternatives. The original cut and extension of Line #2187 to energize Hornbaker Substation passes within the vicinity of Pegasus Substation.

Projected In-service Date: 04/14/2027

Project Status: Engineering

Model: 2028 RTEP



Dominion Transmission Zone: Supplemental Customer Load Request

Need Number: DOM-2024-0063
Process Stage: Solution Meeting 12/03/2024
Previously Presented: Need Meeting 09/10/2024

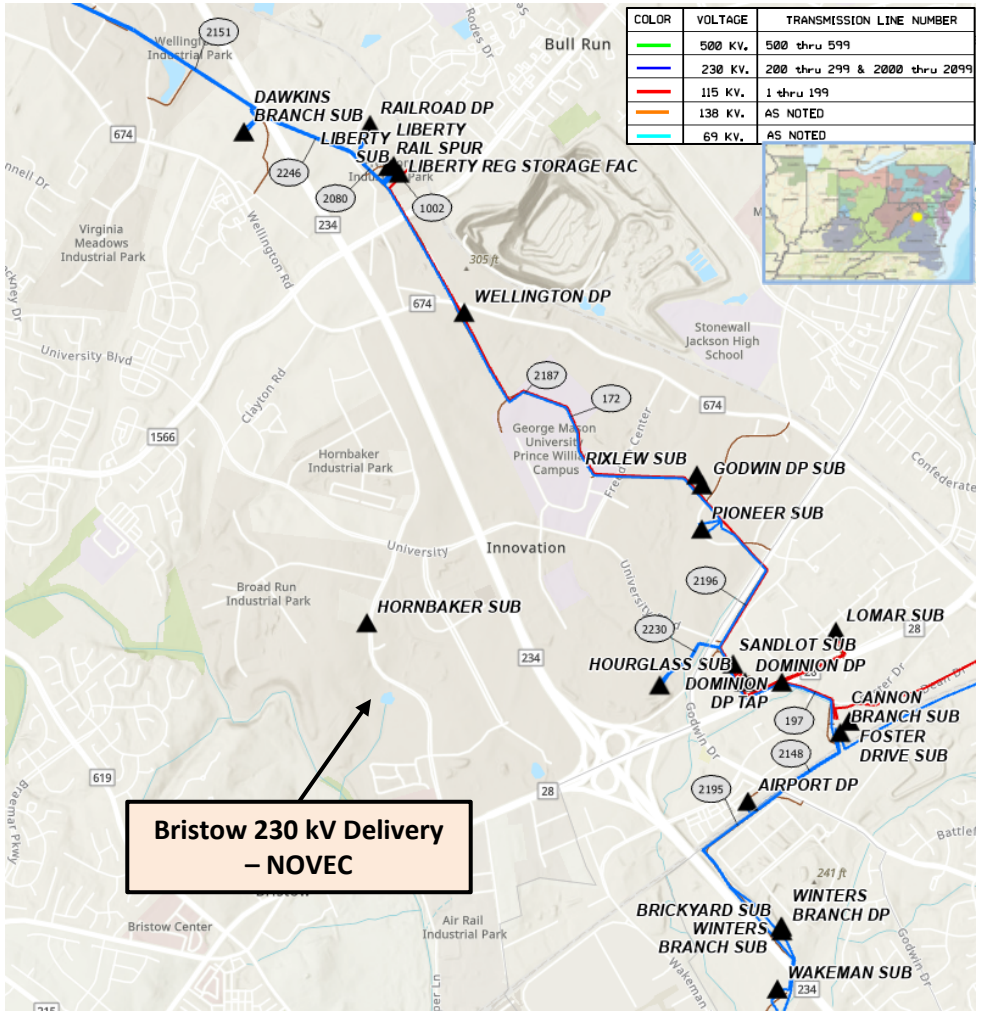
Project Driver: Customer Service

Specific Assumption References:
Customer load request will be evaluated per Dominion's Facility Interconnection Requirements Document and Dominion's Transmission Planning Criteria.

Problem Statement:
NOVEC has submitted a DP Request for a new substation (Bristow) to serve a data center complex in Manassas with a total load in excess of 100 MW.

Requested in-service date is 04/30/2028.

Initial In-Service Load	Projected 2029 Load
Summer: 50.2 MW Winter: 1.5 MW	Summer: 213.0 MW Winter: 140.0 MW

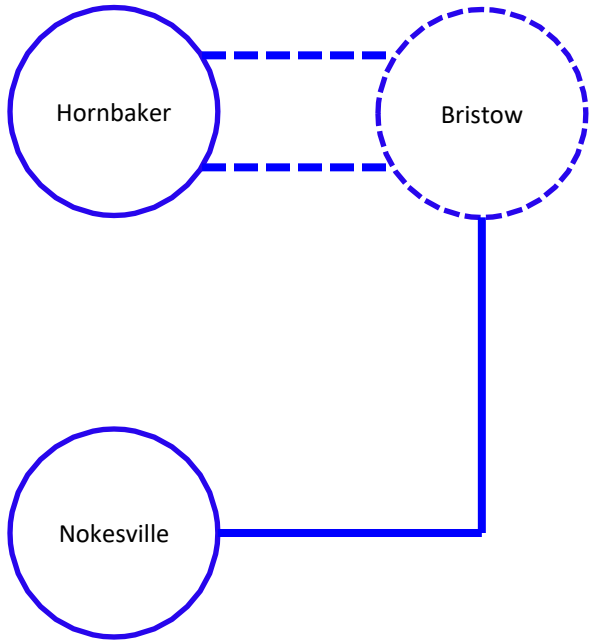


Dominion Transmission Zone: Supplemental Bristow 230kV Delivery – NOVEC

Need Number: DOM-2024-0063
Process Stage: Solution Meeting 12/03/2024

Proposed Solution:

- Interconnect the proposed Bristow substation by extending (2) 230 kV tie-lines between Hornbaker and Bristow.
- Due to being directly adjacent to Hornbaker Substation, the termination of the 230 kV line between Nokesville and Hornbaker Substations (DOM-2022-0045-DNH) will be reconfigured to terminate into Bristow.
- Lines to terminate into a 230 kV six-breaker ring arrangement.



Estimated Project Cost: $14.0M (Total)
Transmission Line Cost: $0.5M
Substation Cost: $13.5M

Alternatives Considered:

- No feasible alternatives. The proposed site is adjacent to Hornbaker Substation.

Projected In-service Date: 04/30/2028

Project Status: Engineering

Model: 2029 RTEP

Dominion Transmission Zone: Supplemental Customer Load Request

Need Number: DOM-2024-0023

Process Stage: Need Meeting 04/30/2024

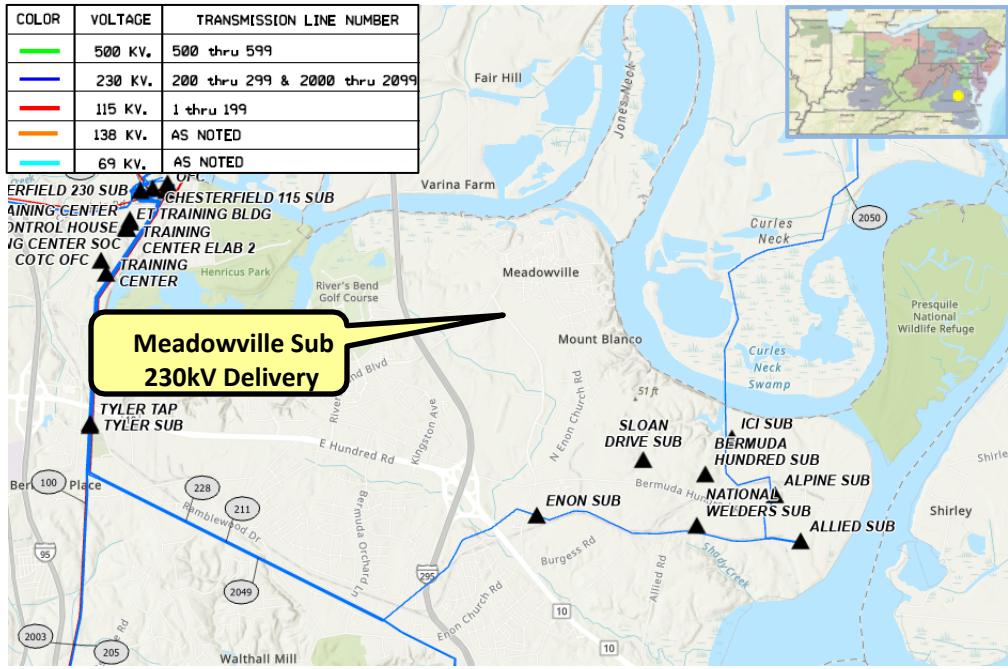
Project Driver: Customer Service

Specific Assumption References:

Customer load request will be evaluated per Dominion's Facility Interconnection Requirements Document and Dominion's Transmission Planning Criteria.

Problem Statement:

DEV Distribution has submitted a DP Request for a new substation (Meadowville) to serve a data center in Chesterfield County with a total load in excess of 100 MW. The requested in-service date is 12/31/2027.



Initial In-Service Load	Projected 2029 Load
Summer: 80.0 MW Winter: 80.0 MW	Summer: 300.0 MW Winter: 300.0 MW

Dominion Transmission Zone: Supplemental Meadowville 230kV Delivery - DEV

Need Number: DOM-2024-0023

Process Stage: Solution Meeting 12/03/2024

Project Driver: Customer Service

Proposed Solution:
Connect the new substation by extending new double circuit 230kV lines from future Sloan Drive Substation. Lines to terminate in a 230kV six-breaker ring arrangement.

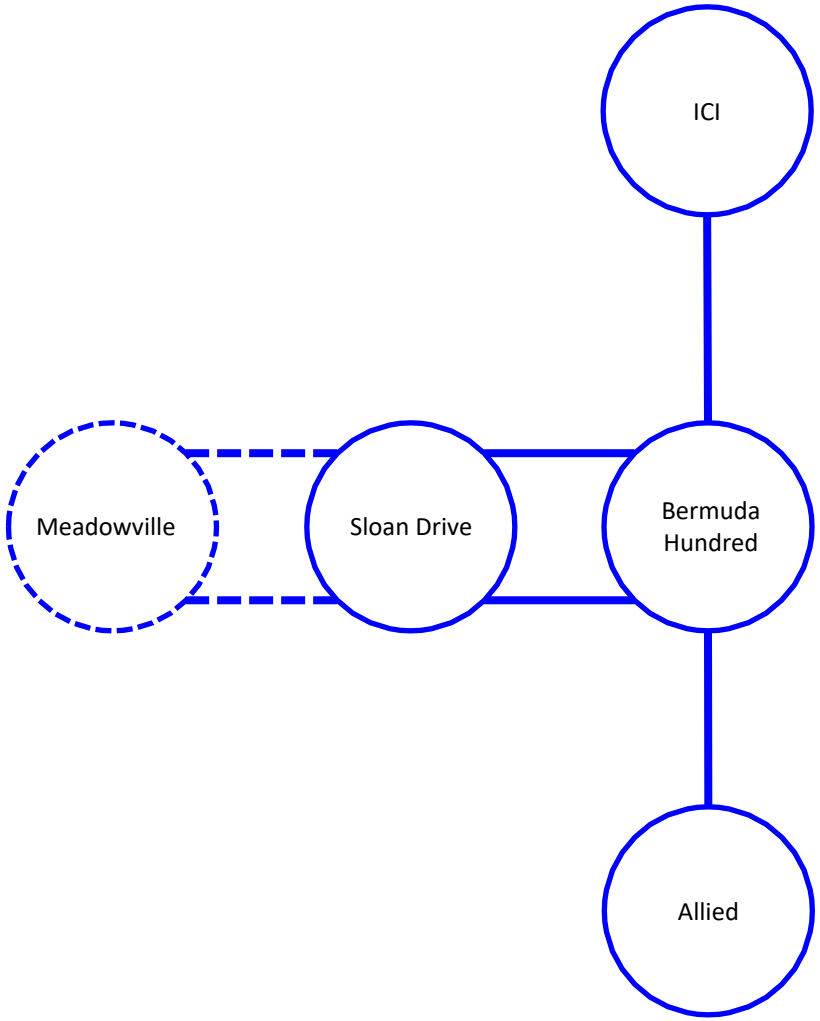
Estimated Project Cost: $36.9M
- Substation: $13.7M
- Transmission Lines: $23.2M

Alternatives Considered: None, new station is adjacent to future Sloan Drive Substation and nearest source.

Projected In-service Date: Q1 2028

Project Status: Engineering

Model: 2029 RTEP



Dominion Transmission Zone: Supplemental Customer Load Request

Need Number: DOM-2024-0024

Process Stage: Solution Meeting 12/03/2024

Previously Presented: Need Meeting 04/30/2024

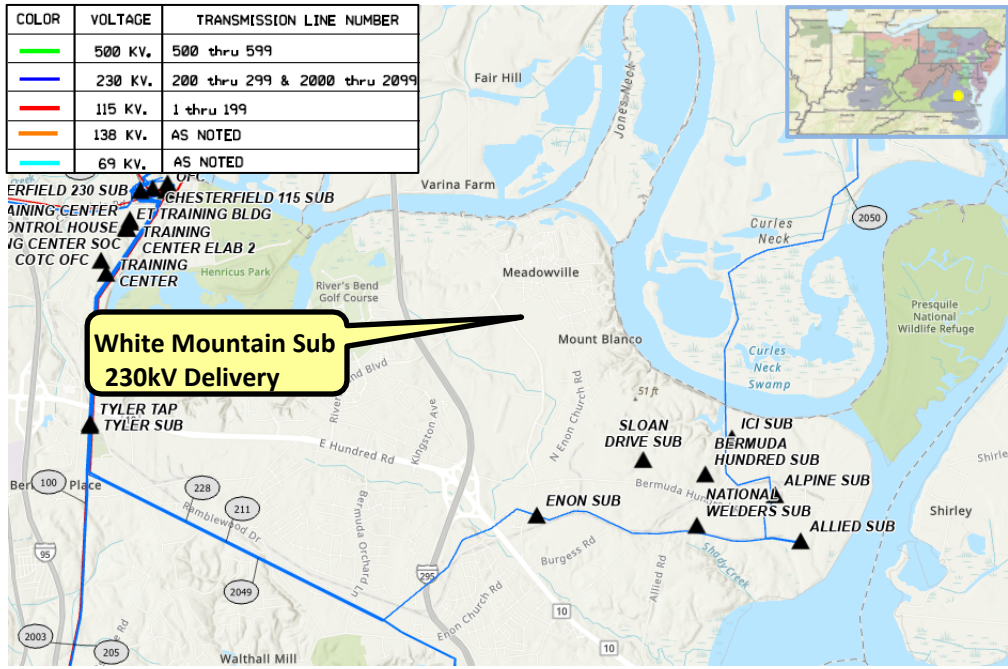
Project Driver: Customer Service

Specific Assumption References:

Customer load request will be evaluated per Dominion's Facility Interconnection Requirements Document and Dominion's Transmission Planning Criteria.

Problem Statement:

DEV Distribution has submitted a DP Request for a new substation (White Mountain) to serve a data center in Chesterfield County with a total load in excess of 100 MW. The requested in-service date is 06/30/2028.



Initial In-Service Load	Projected 2029 Load
Summer: 100.0 MW Winter: 100.0 MW	Summer: 100.0 MW Winter: 100.0 MW

Dominion Transmission Zone: Supplemental White Mountain 230kV Delivery - DEV

Need Number: DOM-2024-0024

Process Stage: Solution Meeting 12/03/2024

Project Driver: Customer Service

Proposed Solution:
Connect the new substation by extending a new 230kV feed from future Sloan Drive Substation. Lines to terminate in a 230kV six-breaker ring arrangement.

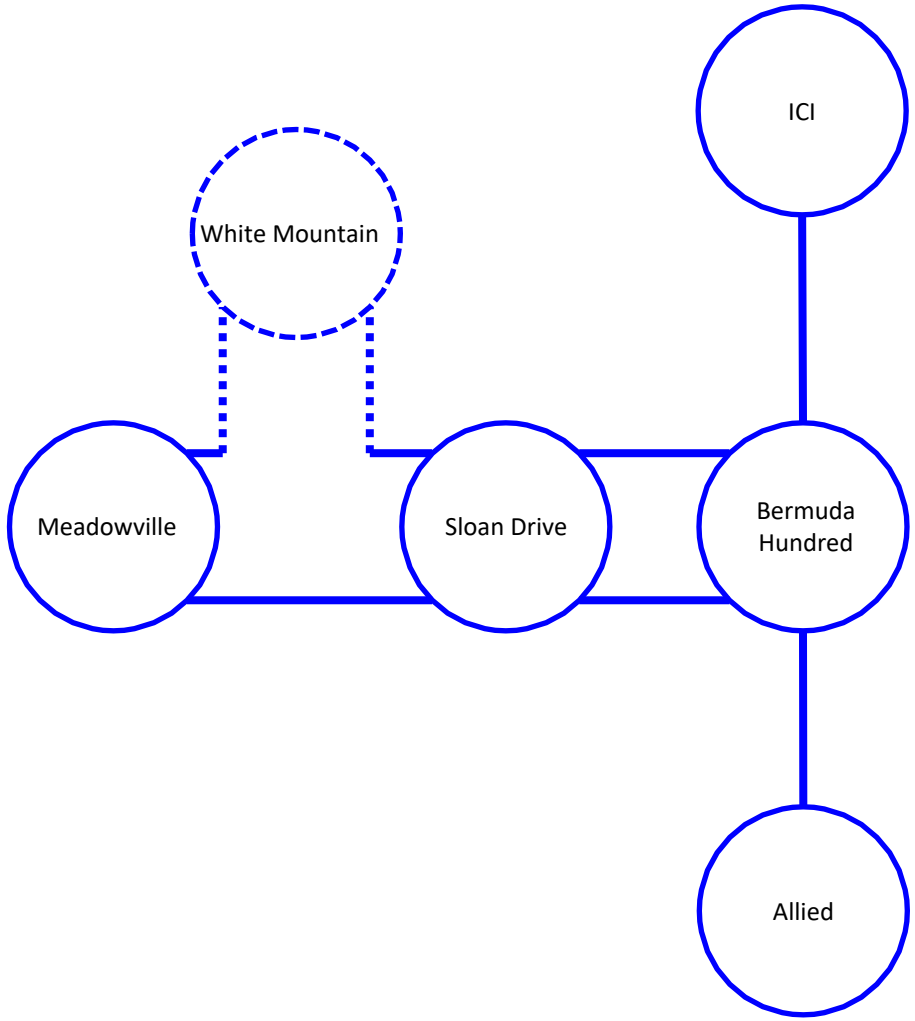
Estimated Project Cost: $19.0M
- Substation: $13.8M
- Transmission Lines: $5.2M

Alternatives Considered: None, new station is adjacent to future Meadowville Substation, both on Customer property.

Projected In-service Date: Q1 2028

Project Status: Engineering

Model: 2029 RTEP



Dominion Transmission Zone: Supplemental Customer Load Request

Need Number: DOM-2019-0021, DOM-2024-0022, DOM-2024-0023, DOM-2024-0024 - DNH

Process Stage: Solution Meeting 12/03/2024

Previously Presented:

Solution Meeting 6/30/2024: DOM-2019-0021 & DOM-2024-0022

Solution Meeting 12/03/2024: DOM-2024-0023 & DOM-2024-0024

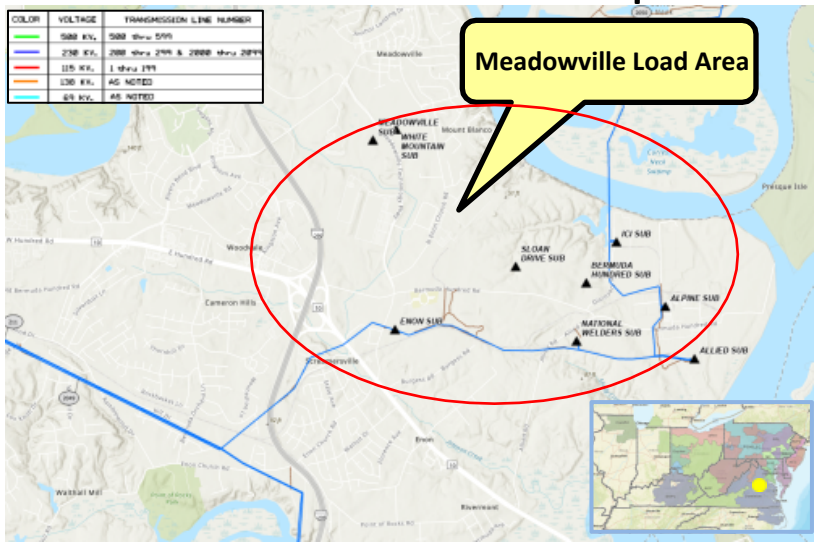
Project Driver: Do No Harm Analysis – Meadowville Load Area

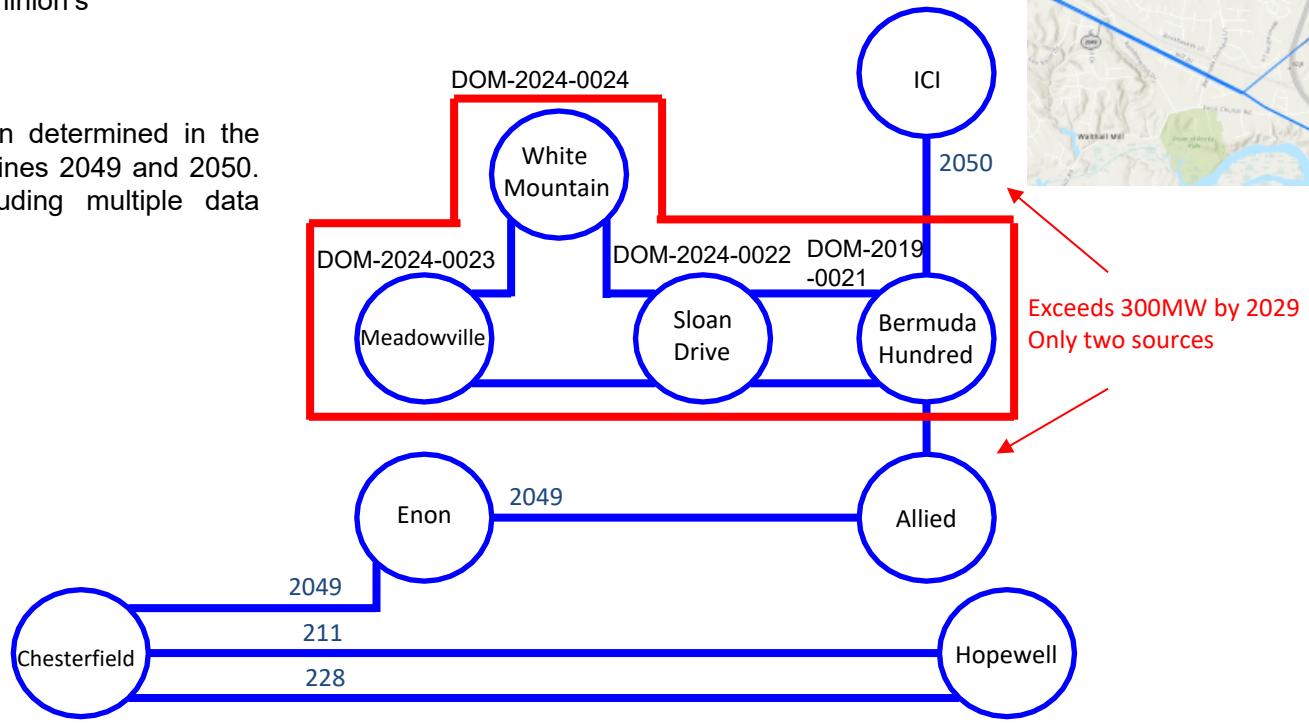
Specific Assumption References:

Customer load request will be evaluated per Dominion's Facility Interconnection Requirements Document and Dominion's Transmission Planning Criteria.

Problem Statement:

A 300MW N-1-1 contingency violation has been determined in the Meadowville general load area with the loss of Lines 2049 and 2050. This violation affects multiple customers including multiple data centers, industrial, and residential load.





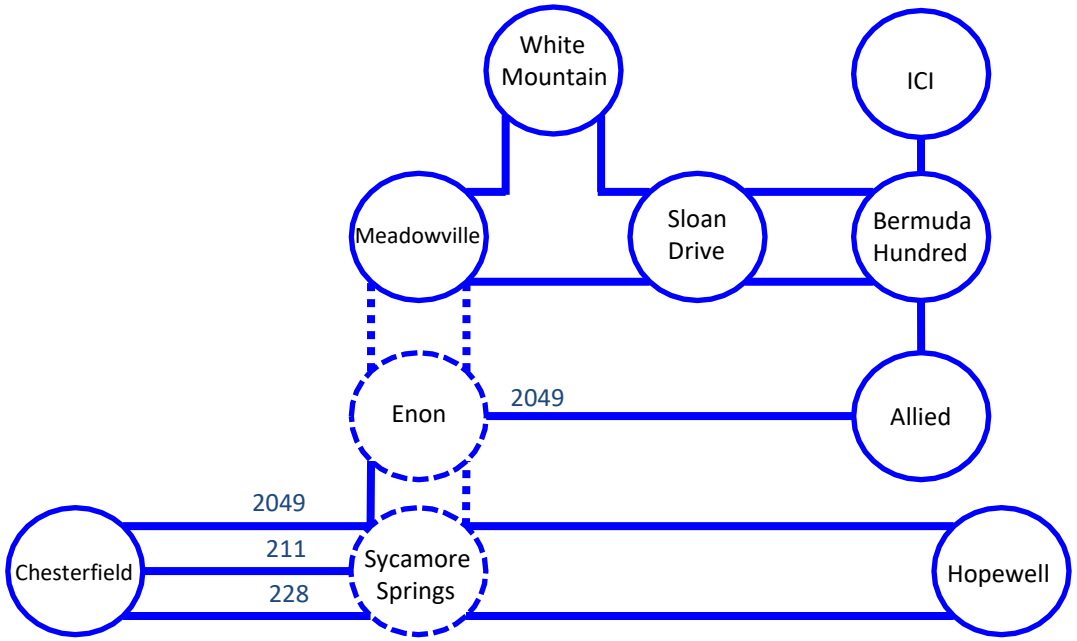
Need Number: DOM-2019-0021, DOM-2024-0022, DOM-2024-0023, DOM-2024-0024 - DNH
Process Stage: Solution Meeting 12/03/2024
Project Driver: Do No Harm – Meadowville Load Area

Proposed Solution:
- Connect future Meadowville substation to existing Enon substation by constructing approximately two miles of double circuit 230kV lines.
- Enon substation will need to be expanded to include a new 230kV ring bus.
- Construct new Sycamore Springs switching station in existing transmission corridor. Loop existing 230kV Lines 211, 228, and 2049 in and out of Sycamore Springs.
- Wreck and rebuild approximately two miles of existing 230kV Line 2049 between Sycamore Springs and Enon substation with double circuit structures. Install second 230kV conductor on new structures to create a third source to the Meadowville area.

Estimated Project Cost: $92.7M
Substation: $37.6M
Transmission Lines: $55.1M

Alternatives Considered:
Wreck and rebuild existing Line 2050 from future Bermuda Hundred substation to existing Chickahominy substation (approximately 14 miles). This option would be more expensive as it is ~12 miles longer. As well, the environmental impact would be greater due to the additional mileage and right-of-way needed to expand from a single circuit to double circuit. This option also crosses the James River.

Projected In-service Date: Q4 2028
Project Status: Engineering
Model: 2029 RTEP



Appendix

High level M-3 Meeting Schedule

Assumptions

Activity	Timing
Posting of TO Assumptions Meeting information	20 days before Assumptions Meeting
Stakeholder comments	10 days after Assumptions Meeting

Needs

Activity	Timing
TOs and Stakeholders Post Needs Meeting slides	10 days before Needs Meeting
Stakeholder comments	10 days after Needs Meeting

Solutions

Activity	Timing
TOs and Stakeholders Post Solutions Meeting slides	10 days before Solutions Meeting
Stakeholder comments	10 days after Solutions Meeting

Submission of Supplemental Projects & Local Plan

Activity	Timing
Do No Harm (DNH) analysis for selected solution	Prior to posting selected solution
Post selected solution(s)	Following completion of DNH analysis
Stakeholder comments	10 days prior to Local Plan Submission for integration into RTEP
Local Plan submitted to PJM for integration into RTEP	Following review and consideration of comments received after posting of selected solutions

Revision History

11/22/2024– V1 – Original version posted to pjm.com