Dominion Supplemental Projects

Transmission Expansion Advisory Committee
November 4, 2020
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.
Need Number: DOM-2020-0040

Process Stage: Need Meeting 11/04/2020

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 (Wakeman) to accommodate a new datacenter campus in Prince William County with a total load in excess of 100MW. Requested in-service date is 6/01/2022.

<table>
<thead>
<tr>
<th>Initial In-Service Load</th>
<th>Projected 2025 Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer: 5.0 MW</td>
<td>Summer: 179.1 MW</td>
</tr>
</tbody>
</table>
Dominion Transmission Zone: Supplemental Customer Load Request

**Need Number:** DOM-2020-0041

**Process Stage:** Need Meeting 11/04/2020

**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 to add a 4th distribution transformer at Cumulus Substation in Loudoun County. The new 84 MVA transformer is being driven by continued load growth in the area and contingency loading for loss of one of the existing transformers. Requested in-service date is 12/01/2022.

<table>
<thead>
<tr>
<th>Initial In-Service Load</th>
<th>Projected 2025 Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer: 142.8 MW</td>
<td>Summer: 256.1 MW</td>
</tr>
</tbody>
</table>
Dominion Transmission Zone: Supplemental Customer Load Request

Need Number: DOM-2020-0043

Process Stage: Need Meeting 11/04/2020

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 (Park Center) to accommodate a new datacenter campus in Fairfax County with a total load in excess of 100MW. Requested in-service date is 8/01/2024.

<table>
<thead>
<tr>
<th>Initial In-Service Load</th>
<th>Projected 2025 Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer: 29.0 MW</td>
<td>Summer: 41.0 MW</td>
</tr>
</tbody>
</table>
Dominion Transmission Zone: Supplemental Equipment Material Condition, Performance and Risk

**Need Number:** DOM-2020-0044

**Process Stage:** Need Meeting 11/04/2020

**Project Driver:** Equipment Material Condition, Performance and Risk

**Specific Assumption Reference:**

**Problem Statement:**
Dominion Energy has identified a need to replace 12 existing transmission towers that carry 230kV Lines #204 (Jefferson St-Gum Springs) and #220 (Ox-Gum Springs). The 12 towers include structures 204/29 to 204/40 and are located along an approximately 1.75 mile section of right-of-way between the Gum Springs tap and Belvoir Substation. The need for replacement is based on the Company’s End of Life criteria.

- The structures identified for replacement are CORTEN lattice-type towers that were constructed in 1966 and have reached the end of their useful life.
- 11 of the towers are double circuit structures while structure 204/40, located at the Gum Springs tap, is a triple circuit structure.
- Both lines, #204 and #220, provide service to Belvoir Substation and Gum Springs Substation with approximately 83 MW and 113 MW of tapped load, respectively.
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 Customer Load Request

Need Number: DOM-2020-0019

Process Stage: Solutions Meeting 11/04/2020

Previously Presented: Need Meeting 09/01/2020

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 (King and Queen) to replace the source to an island of load that will be lost when a river crossing is eliminated as part of the 230kV Line #224 (Lanexa-Northern Neck) rebuild project. Requested in-service date is 06/01/2023.

<table>
<thead>
<tr>
<th>Initial In-Service Load</th>
<th>Projected 2025 Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer: 3.3 MW</td>
<td>Summer: 3.5 MW</td>
</tr>
</tbody>
</table>
**Dominion Transmission Zone: Supplemental**

King and Queen 230kV Delivery - DEV

**Need Number:** DOM-2020-0019

**Process Stage:** Solutions Meeting 11/04/2020

**Proposed Solution:**
Tap Line #224 in accordance with the Company’s Facility Interconnection Requirements (FIR) document to create a tee-tap arrangement with line switches on either side of the tap. Install a 1200 Amp, 20kAIC circuit switcher and any additional transmission related equipment (e.g. 230kv bus, etc.) deemed necessary by the project team to support the interconnection of the permanent substation.

**Estimated Project Cost:** $1.75 M

**Alternatives Considered:**
1) 34.5kV distribution approx. 1.2 miles under the Mattaponi River (approx. $5.0M)
2) Rebuild approx. 14 mile of distribution (approx. $10.5M)

**Projected In-service Date:** 06/01/2023

**Project Status:** Engineering
Dominion Transmission Zone: Supplemental Equipment Material Condition, Performance and Risk

**Need Number:** DOM-2020-0028

**Process Stage:** Solution Meeting 11/04/2020

**Previously Presented:** Need Meeting 9/1/2020

**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 2019 and updated in June 2020

**Problem Statement:**
Dominion Energy has identified a need to replace 47 existing transmission towers (Staunton – Valley) of Line#293.

• The 293 line was constructed largely on wood H-frame structures in timeframe between 1971 and 1981. Approximately 17.8 miles of 21.27 miles of this line was constructed on wood H-frame structures and these structures are at the end of their useful life.
• Industry guidelines indicate equipment life for wood structures is 35-55 years.
• The Line #293 provides service to West Staunton Substation (Dominion Distribution) with approximately 46.6 MW tapped load.
Dominion Transmission Zone: Supplemental
230kV Line #293 – EOL Rebuild

**Need Number:** DOM-2020-0028

**Process Stage:** Solutions Meeting 11/04/2020

**Proposed Solution:**
Approximately 17.8 miles involving wood H-frame structures and weathering steel Corten lattice towers will be replaced with steel monopoles and new conductor with a normal summer rating of 1047 MVA.

**Estimated Project Cost:** $35.6 M

**Alternatives Considered:**
No feasible alternatives

**Projected In-service Date:** 12/15/2024

**Project Status:** Conceptual

**Model:**

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Legend
- Rebuild 230 kV
- Exiting 230kV
Need Number: DOM-2020-0035

Process Stage: Solutions Meeting 11/04/2020

Previously Presented: Need Meeting 10/06/2020

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 to add a 3rd distribution transformer at Farmwell Substation in Loudoun County. The new transformer is being driven by continued load growth in the area and contingency loading for loss of one of the existing transformers. Requested in-service date is 01/01/2023.

<table>
<thead>
<tr>
<th>Initial In-Service Load</th>
<th>Projected 2025 Load</th>
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</thead>
<tbody>
<tr>
<td>Summer: 136.3 MW</td>
<td>Summer: 228.2 MW</td>
</tr>
</tbody>
</table>
**Need Number:** DOM-2020-0035

**Process Stage:** Solutions Meeting 11/04/2020

**Proposed Solution:**
Install a 1200 Amp, 50kAIC circuit switcher and associated equipment (bus, switches, relaying, etc.) to feed the new transformer at Farmwell.

**Estimated Project Cost:** $0.50 M

**Alternatives Considered:**
No feasible alternatives

**Projected In-service Date:** 01/01/2023

**Project Status:** Engineering

**Model:** 2025 RTEP
**Problem Statement:**
Dominion Energy has identified a need to replace 60 concrete structures of Line #2007 (Lynnhaven – Thalia) based on the Company’s End of Life criteria.

- The 3.37 miles long line was constructed on concrete structures in 1970. These structures have developed significant structural concerns as they age.
- Every pole is experiencing hairline cracking at a minimum, and many of the poles have more advanced cracking that has exposed some of the interior reinforcing bars and cables.
- The cracks allow for significant water infiltration which can accelerate the deterioration of the concrete and cause rusting of the steel reinforcing components.
- The Line #2007 provides service to Thalia substation with approximately 134 MW of tapped load.

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Dominion Transmission Zone: Supplemental Equipment Material Condition, Performance and Risk
**Dominion Transmission Zone: Supplemental Line #2007 End-of-Life Rebuild – Lynnhaven to Thalia**

**Need Number:** DOM-2020-0036

**Process Stage:** Solutions Meeting 11/04/2020

**Proposed Solution:**
Rebuild the 3.37 miles long Line #2007 between Lynnhaven and Thalia to current 230kV standards. The normal summer rating of the line will be 1047 MVA.

**Estimated Project Cost:** $7.0 M

**Alternatives Considered:**
No feasible alternatives

**Project Target In-service Date:** 12/31/2025

**Project Status:** Conceptual

**Model:**

![Diagram of Lynnhaven and Thalia]
Dominion Transmission Zone: Supplemental Equipment Material Condition, Performance and Risk

**Need Number:** DOM-2020-0037  
**Process Stage:** Solutions Meeting 11/04/2020  
**Previously Presented:** Need Meeting 10/06/2020  
**Project Driver:** Equipment Material Condition, Performance and Risk

**Specific Assumption References:**  

**Problem Statement:**  
Dominion Energy has identified a need to replace 20 concrete structures (Structure 2019/21 – Thalia segment) of Line #2019 (Greenwich – Thalia) based on the Company’s End of Life criteria.

- The 1.17 miles segment of Line #2019 was constructed on concrete structures in 1970. These structures have developed significant structural concerns as they age.
- Every pole is experiencing hairline cracking at a minimum, and many of the poles have more advanced cracking that has exposed some of the interior reinforcing bars and cables.
- The cracks allow for significant water infiltration which can accelerate the deterioration of the concrete and cause rusting of the steel reinforcing components.
- The Line #2019 provides service to Thalia substation with approximately 134 MW of tapped load.

Partial rebuild Line #2019 between structure 2019/21 and Thalia
Dominion Transmission Zone: Supplemental Line #2019 End-of-Life Partial Rebuild – Thalia to Greenwich

**Need Number:** DOM-2020-0037

**Process Stage:** Solutions Meeting 11/04/2020

**Proposed Solution:**
Rebuild approximately 1.17 miles of Line #2019 between Thalia and Structure 2019/21 to current 230kV standards. The normal summer rating of the line segment will be 1047 MVA.

**Estimated Project Cost:** $3.0 M

**Alternatives Considered:**
No feasible alternatives

**Project Target In-service Date:** 12/15/2025

**Project Status:** Conceptual

**Model:**
**Dominion Transmission Zone: Supplemental Do No Harm Analysis**

**Need Number:** DOM-2020-0021 DNH  
**Meeting Date:** 11/04/2020  
**Process Stage:** SOLUTIONS  
**Supplemental Project Driver:** Do No Harm Analysis

**Specific Assumption Reference:**  
Customer load request will be evaluated per Dominion’s Facility Interconnections Requirements Document & Dominion’s Transmission Planning Criteria.

**Problem Statement:**  
PJM has identified a 300MW N-1-1 Load Drop violation for the loss of Line #2170 (Buttermilk to Pacific) and Line #2165 (BECO to Pacific) during the 2020 Do-No-Harm analysis.

The violation was caused by Supplemental Project DOM-2020-0021 in the Dominion Zone.
**Need Number:** DOM-2020-0021 DNH  
**Meeting Date:** 11/04/2020  
**Process Stage:** SOLUTIONS

**Proposed Solution:**
Cut Line #2015 (Dulles-Reston) and extend a new 230kV double-circuit line approx. 3.5 miles to Global Plaza Substation, creating Line #2015 (Dulles to Global Plaza) and Line #9225 (Global Plaza to Reston).

**TO Alternatives Considered:**
No feasible alternatives

**Estimated Cost:** $44M (Total)  
- Transmission Line $39M  
- Substation $ 5M

**Projected In-service Date:** 12/31/2025  
**Project Status:** Conceptual
Need Number: DOM-2020-0003 DNH
Meeting Date: 11/04/2020
Process Stage: SOLUTIONS
Supplemental Project Driver: Do No Harm Analysis

Specific Assumption Reference:
Customer load request will be evaluated per Dominion’s Facility Interconnections Requirements Document & Dominion’s Transmission Planning Criteria.

Problem Statement:
PJM has identified a 300MW N-1-1 Load Drop violation for the loss of Line #9192 (Shellhorn to Sojourner) and Line #2183 (Evergreen Mills to Poland Road) during the 2020 Do-No-Harm analysis.

The violation was caused by Supplemental Project DOM-2020-0003 in the Dominion Zone.
**Proposed Solution:**
Build a new substation (Takeoff) by cutting Line #2008 (Lincoln Park-Loudoun), Line #265 (Bull Run-Sully), and Line #2107 (Discovery-Sully). Extend a new 230kV double-circuit line approx. 3 miles from Aviator to Takeoff. Terminate all lines in a 230kV breaker-and-a-half arrangement at Takeoff Substation. Reconductor a segment of 230kV Line #2008 between Loudoun and Takeoff (approx. 5.2 miles) using a standard high capacity conductor. Upgrade terminal equipment as needed to achieve a summer normal rating of 1574 MVA.

**TO Alternatives Considered:**
No feasible alternatives

**Estimated Cost:** $70M (Total)
- Transmission Line $36M
- Substation $28M
- Reconstructor $6M

**Projected In-service Date:** 12/31/2025

**Project Status:** Conceptual
Appendix
### High level M-3 Meeting Schedule

<table>
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<tr>
<th>Assumptions</th>
<th>Activity</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Posting of TO Assumptions Meeting information</td>
<td>20 days before Assumptions Meeting</td>
</tr>
<tr>
<td></td>
<td>Stakeholder comments</td>
<td>10 days after Assumptions Meeting</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Needs</th>
<th>Activity</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TOs and Stakeholders Post Needs Meeting slides</td>
<td>10 days before Needs Meeting</td>
</tr>
<tr>
<td></td>
<td>Stakeholder comments</td>
<td>10 days after Needs Meeting</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Solutions</th>
<th>Activity</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TOs and Stakeholders Post Solutions Meeting slides</td>
<td>10 days before Solutions Meeting</td>
</tr>
<tr>
<td></td>
<td>Stakeholder comments</td>
<td>10 days after Solutions Meeting</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Submission of Supplemental Projects &amp; Local Plan</th>
<th>Activity</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do No Harm (DNH) analysis for selected solution</td>
<td>Prior to posting selected solution</td>
<td></td>
</tr>
<tr>
<td>Post selected solution(s)</td>
<td>Following completion of DNH analysis</td>
<td></td>
</tr>
<tr>
<td>Stakeholder comments</td>
<td>10 days prior to Local Plan Submission for integration into RTEP</td>
<td></td>
</tr>
<tr>
<td>Local Plan submitted to PJM for integration into RTEP</td>
<td>Following review and consideration of comments received after posting of selected solutions</td>
<td></td>
</tr>
</tbody>
</table>
Revision History