Public Version

Dominion
Virginia Power

PROJECT PROPOSAL

Palmyra 500 kV Switching Station

for:

2014/2015 Long Term Window

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A. Executive Summary

A.1. Names and address of proposing entity

Entity and address	Contact for Technical Inquiries
Dominion Virginia Power (Dominion) 701 East Cary Street Richmond, Virginia 23139	Ronnie Bailey ronnie.bailey@dom.com 804-771-3155

A.2. General description of proposed project

This proposal by Dominion Virginia Power is in response to the 2014/15 RTEP Long Term Proposal Window, and is comprised of the following components:

- **Palmyra 500 kV Switching Station:** Construct a new 500 kV switching station by connecting the existing 500 kV line 553, Elmont to Cunningham, and 500 kV line 576, Midlothian to North Anna, into a 500 kV breaker and half arrangement.
- **Dooms Substation:** Add a new 300 MVAR 230 kV Capacitor bank and associated switchgear.
- **Morrisville Substation:** Add a new 300 MVAR 230 kV Capacitor bank and associated switchgear.
- **Shellhorn Substation:** Add a new 300 MVAR 230 kV Capacitor bank and associated switchgear.
- **Liberty Substation:** Add a new 150 MVAR 230 kV Capacitor bank and associated switchgear.
- **Cannon Branch Substation:** Add a new 150 MVAR 230 kV Capacitor bank and associated switchgear.

Dominion believes that the combination of shunt capacitors and new station facilities included in the Project provides a robust, cost effective and feasible solution to address congestion under varying system conditions. In contrast, Dominion evaluated various combinations of the shunt capacitor banks as standalone options (shunt-only options). Many shunt-only options do exceed the B/C threshold; however, Dominion believes such upgrades would serve only as a short term fix to shift congestion to other areas rather than resolve the system issues. For example, a shunt-only option may reduce congestion across the AP South interface while increasing congestion across the AEP-Dom interface.

Furthermore, Dominion believes the benefits of shunt-only options are mostly “on paper” (i.e. driven by the analysis approach) rather than benefits that will be delivered in real-time operations like those from a robust solution. To expand on this point, PJM’s proxy methodology to simulate transfers across the interfaces by scaling the load up in the sink areas results in reactive deficiency which the shunt capacitors appear to stabilize. However, these analytical benefits are likely to be limited in a real-time simulation when opportunity transfers are taking place across the PJM system and sink areas are more expansive.

A.3. Market efficiency flowgates addressed

The following flowgates are addressed by this solution:

- AP SOUTH
- AEP-DOM

A.4. Total proposed project cost

The total projected cost for this project is approximately $43 million.

A.5. Overall schedule duration

The expected schedule duration is 31 months from receipt of approval from PJM. For purposes of this proposal Dominion is assuming a July 2019 in service date. However, given the 31 months schedule this project can be placed in service at least a year earlier but would depend on PJM selection and approval.

A.6. The value proposition

The Palmyra 500 kV Switching Station Project will provide significant value to electric customers based on the following factors:

- The Project delivers significant customer savings in excess of the cost. The Project provides $279.7 million in regional cost saving benefits to PJM customers with a projected benefit to cost ratio of 4.5. For details, refer to a separate file entitled *Attachment 1 Palmyra BC Ratio.xlsx.*
- The Project is a robust solution that greatly reduces congestion on the PJM system. The Palmyra 500 kV switching station solution significantly increases the power transfer capability over a wide geographic area. For details, see the accompanying file entitled *Attachment 2 Palmyra Congestion Reduction Summary.xlsx*.
- Property is available for sale large enough to accommodate this new substation as well as future expansion. Dominion is preparing a contract for purchase. Additional details can be provided upon request.
- Connects two major 500 kV lines, North Anna to Midlothian, and Elmont to Cunningham together at a location where these two lines cross.
- This new proposed substation connection these 500 kV lines provide future benefits of expansion possibilities.
- This proposal is an easy solution to be constructed with limited permitting. No new line construction or CPCN required.

A.7. Designated Entity

A.7.a. Status/pre-qualification

Dominion has received Pre-Qualification status from PJM under ID 13-03a indicating satisfaction of the pre-qualification requirements for Designated Entity status as defined in the PJM Amended and Restated Operating Agreement (“PJM OA”) in section 1.5.8(a). Consequently, Dominion is eligible as a Designated Entity to construct, own and operate facilities within PJM’s footprint. The information as posted on PJM’s website reflects the Company’s current qualifications.

A.7.b. Statement of intent

For this proposal, Dominion Virginia Power seeks to be the designated entity to construct, own, operate, maintain and finance the proposed project components as described in Section C of this proposal.

B. Company Evaluation Information

B.1. Technical and engineering qualifications

Dominion

Dominion is one of the nation's largest producers and transporters of energy, with a portfolio of approximately 27,500 megawatts of generation, 11,000 miles of natural gas transmission, gathering and storage pipeline and 6,400 miles of electric transmission lines. Dominion operates one of the nation's largest natural gas storage systems with 947 billion cubic feet of storage capacity and serves retail energy customers in 15 states.

Dominion's existing electric transmission facilities are all within the PJM footprint. Dominion has an Electric Transmission staff of over 800 engineers, technicians, operators, and other construction and support personnel dedicated to develop, construct, maintain, and operate these facilities. Dominion has over 80 years' experience in developing, constructing, maintaining and operating transmission facilities, including the most recent nine years as a PJM member.

Dominion has a fully-staffed Substation Engineering team inclusive of Physical Design, System Protection Design, Communications support, Site Plan Development; and Transmission Line Engineering inclusive of overhead and underground design, Civil Engineering support and Geotechnical support. Dominion is fully-staffed for engineering support activities inclusive of siting/routing transmission lines, site development for substations as well as all real estate-related activities.

B.2. Experience

B.2.a. Types of facilities proposed

The facilities being proposed for this proposal are within Dominion's existing transmission zone in PJM. The types of facilities in this proposal are those with which Dominion has extensive experience developing, operating and maintaining on a daily basis.

B.2.b. Standardized construction, maintenance, and operating practices

Dominion also has fully developed standardized construction, maintenance, and operating practices.

All work and design meets and adheres to the PJM Transmission and Substation Design Technical Requirements and PJM Manual 7 - PJM Protection standards.

As mentioned above, this proposal will become part of the existing transmission footprint of Dominion. These new facilities will utilize the same standard construction, maintenance, and operating practices for their respective utilities.

For more information on Dominion, please refer to the pre-qualification documents posted on PJM's website.

B.2.c. Working in the geographical region

This project is within the geographical region Dominion's existing transmission system. The facilities will be part of the PJM Southern. All new facilities will be supported by existing resources.

B.2.d. Rights of way in geographical region of project

Dominion has extensive experience in acquiring rights-of-way for this proposal as the area of focus is part of its existing transmission footprint with PJM.

B.3. Financing plan

Refer to the filed pre-qualification documents of Dominion posted on PJM's website for information regarding the financing plan.

B.4. Cost containment and adherence to construction schedules

The type of work being proposed in this proposal is well within those types of facilities that Dominion routinely constructs, owns and operates. In the last five years, Dominion has annually managed large projects with a combined value of over $700 million. Dominion's substation and line project managers are capable of executing projects of varying complexity from small projects, such as the addition of circuit breakers, to large projects, including the construction of 500 kV lines in mountainous terrain.

A few examples of Dominion's recent projects delivered on-schedule and within budget include:

- Dominion constructed the 65 mile line #580 to Loudoun 500 kV line (Part of 502 Junction-Loudoun) – Obtained right-of-way (ROW) and Certificate of Public Convenience and Necessity (CPCN) approval in Virginia and constructed line by the PJM target date of 6/01/2011 within the approved budget.
- Dominion constructed the 60 mile Carson to Suffolk 500 kV line - Obtained ROW and CPCN in Virginia and constructed line by the PJM target date of 6/01/2011 within the approved budget
- Dominion rebuilt 96 miles of the Mt Storm to Doubs 500 kV rebuild project – Obtained CPCN in Virginia. Project was completed one year in advance of the PJM required target date of 6/01/2015 and within the approved budget.

B.5. Unique qualifications

Refer to the filed pre-qualification documents of Dominion posted on PJM's website for information regarding the unique qualifications.

B.6. Assumptions in developing proposal

The assumptions made in developing the proposal are mentioned in the various project components outlined herein.