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STATE CORPORATION COMMISSION
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APPLICATION OF

VIRGINIA ELECTRIC AND POWER COMPANY
d/b/a DOMINION VIRGINIA POWER

CASE NO. PUE-2012-00029

For approval and certification of electric facilities:
Surry-Skiffes Creek 500 kV Transmission Line,
Skiffes Creek-Wheaton 230 kV Transmission Line, and
Skiffes Creek 500 kV-230 kV-115 kV Switching Station

ORDER

On June 11, 2012, Virginia Electric and Power Company d/b/a Dominion Virginia Power ("Dominion" or "Company") filed with the State Corporation Commission ("Commission") an application for approval and certification of an electric transmission project, or for approval and certification of an alternative transmission project ("Application"). Dominion's proposed project and its proposed alternative project are described in turn below.

In its Application, Dominion proposed to construct: (a) approximately 7.4 miles of new overhead 500 kilovolt ("kV") electric transmission line from the Company's existing 500 kV-230 kV Surry Switching Station in Surry County to a new 500 kV-230 kV-115 kV Skiffes Creek Switching Station in James City County ("Surry-Skiffes Creek Line");¹ (b) the Skiffes Creek Switching Station; (c) approximately 20.2 miles of new 230 kV line, in the Counties of James City and York and the City of Newport News, from the proposed Skiffes Creek Switching Station to the Company's existing Wheaton Substation located in the City of Hampton ("Skiffes Creek-Wheaton Line"); and (d) additional facilities at the existing Surry Switching Station and Wheaton Substation. The Surry-Skiffes Creek Line, the Skiffes Creek Switching Station, the

¹ In September 2012, Dominion filed supplemental testimony estimating the length of its proposed route at 8.0 miles. *See, e.g.*, Ex. 38 (Harper supplemental direct).

Skiffes Creek-Wheaton Line, and the additional proposed facilities are herein referred to collectively as the "Proposed Project."²

As an alternative to the Proposed Project, Dominion would not construct the 500 kV Surry-Skiffes Creek Line but would instead construct a 500 kV line approximately 37.9 miles in length from the Company's existing Chickahominy Substation in Charles City County to the proposed Skiffes Creek Switching Station in James City County ("Chickahominy-Skiffes Creek Line" or "Alternate Route").³ The Chickahominy-Skiffes Creek Line, the Skiffes Creek Switching Station, and the Skiffes Creek-Wheaton Line (the latter two of which are also included in the Proposed Project), and additional facilities at the existing Chickahominy and Wheaton Substations are herein referred to collectively as the "Chickahominy Alternative Project."⁴

On July 11, 2012, the Commission issued an Order for Notice and Hearing, which, among other things: established a procedural schedule, including public witness and evidentiary hearings, for the Application; allowed opportunities for interested persons to intervene or comment in this proceeding; directed the Commission's Staff ("Staff") to conduct an investigation of the Company's Application and to file testimony and exhibits on the Application; and assigned a Hearing Examiner to conduct all further proceedings on this matter.

Notices of Participation were filed in this proceeding by the following: James City County; BASF Corporation ("BASF"); U.S. Home Corporation d/b/a Lennar ("Lennar"); James River Association ("JRA"); The Save the James Alliance Trust ("Save the James"); David and Judith Ledbetter (the "Ledbetters"); Brian Gordineer; Kingsmill Community Services

² Ex. 23 (Application) at 2.

³ *Id.* at 5-6.

⁴ *Id.* at 6.

Association; River Bluffs Condominium Association; James City County Citizens' Coalition; Old Dominion Electric Cooperative ("ODEC"); Charles City County; and the Environmental Respondents.⁵

On August 31, 2012, the Department of Environmental Quality ("DEQ") filed its report on Dominion's Application ("DEQ Report").⁶ The DEQ Report summarizes potential impacts of the Proposed Project and the Chickahominy Alternative Project, makes recommendations for minimizing those impacts, and outlines the Company's responsibilities for compliance with legal requirements governing environmental protection. The DEQ Report includes the following in its Summary of Recommendations:

(i) Alternative Recommendations

- The DEQ Office of Wetlands and Stream Protection recommends that one of the James River crossing alternatives be selected over the Chickahominy-Skiffes Creek-Wheaton Alternative (Environmental Impacts and Mitigation, item 1(c), page 12).
- Department of Conservation and Recreation Division of Parks and Recreational Resources recommends an underwater crossing for the transmission lines, which will have less impact on commercial shippers, boaters and other recreationalist [sic], should the Surry-Skiffes Creek 500 kV Proposed Route be chosen (Environmental Impacts and Mitigation, item 10(c), page 33).
- The Department of Historic Resources supports submerging the transmission lines within or beneath the Chickahominy or James rivers unless additional routes are considered that would not include adverse visual impacts on Carter's Grove and the Captain John Smith National Historic Water Trail (Environmental Impacts and Mitigation, item 12(e), page 39). In addition, the Virginia Outdoors Foundation and Virginia Board of Historic Resources recommend full consideration of the importance of Carter's Grove and its extensive conservation values in the selection of the

⁵ In this proceeding, Appalachian Voices, the Chesapeake Climate Action Network, and the Virginia Chapter of the Sierra Club have referred to themselves collectively as the "Environmental Respondents."

⁶ Ex. 12.

appropriate route (Environmental Impacts and Mitigation, item 13(d), page 40).

- The Hampton Roads Planning District Commission staff recommends that Dominion reconsider an underground crossing of the James River (Environmental Impacts and Mitigation, item 20(c), page 45).

(ii) Summary of General Recommendations

- Conduct an on-site delineation of wetlands and streams within the project area with verification by the U.S. Army Corps of Engineers (Corps), using accepted methods and procedures, and follow DEQ's recommendations to avoid and minimize impacts to wetlands and streams (Environmental Impacts and Mitigation, item 1(c), page 12).
- Follow DEQ's recommendations regarding air quality protection, as applicable (Environmental Impacts and Mitigation, item 4(c), page 16).
- Reduce solid waste at the source, reuse it and recycle it to the maximum extent practicable, and follow DEQ's recommendations to manage waste, as applicable, (Environmental Impacts and Mitigation, item 5(d), pages 18-19).
- Coordinate with the Department of Conservation and Recreation regarding recommended inventories of natural heritage species and for updates to the Biotics Data System database (if a significant amount of time passes before the project is implemented) (Environmental Impacts and Mitigation, item 6(c), pages 27-28).
- Coordinate with the Department of Game and Inland Fisheries regarding its recommendations for instream work, the general protection of wildlife resources and potential impact to the Game Farm Marsh Wildlife Management Area (Environmental Impacts and Mitigation, item 7(c)(i),(ii) and (iii), pages 29-30).
- Coordinate with the Department of Forestry regarding its recommendations for mitigation of the loss of forest lands (Environmental Impacts and Mitigation, item 9(c), pages 31-32).

- Coordinate with the Department of Conservation and Recreation regarding its recommendation to protect recreational resources (Environmental Impacts and Mitigation, item 10(c), page 33).
- Coordinate with the Department of Historic Resources regarding recommendations addressing visual impacts, consultations with the agency's Easement Program, National Park Service and affected localities, archaeological and architectural surveys, and evaluations and assessments to Virginia Landmarks Register- and National Register of Historic Places-eligible resources. (Environmental Impacts and Mitigation, item 12(d), page 38).⁷
- Coordinate with the Newport News-Williamsburg Airport as recommended by the Virginia Department of Aviation to prevent potential hazards to aviation and impacts to airport development (Environmental Impacts and Mitigation, item 15(c), page 41).
- Follow the principles and practices of pollution prevention to the extent practicable (Environmental Impacts and Mitigation, item 18, pages 43-44).
- Limit the use of pesticides and herbicides to the extent practicable (Environmental Impacts and Mitigation, item 19, page 44).⁸

On October 24, 2012, and January 10, 2013, public witness hearings were convened in Williamsburg and Richmond, respectively. From April 9 through April 18, 2013, a hearing was conducted for the purpose of receiving evidence offered by the Company, respondents, and Staff.⁹ The Commission also received more than 1,400 written and electronic public comments on the Application.

⁷ On September 7, 2012, DEQ filed additional comments related to the Department of Historic Resources' Phase I Cultural Resources Survey performed for the Proposed Project. Ex. 13.

⁸ Ex. 12 (DEQ Report) at 7-8.

⁹ Additionally, a representative of the Virginia Department of Historic Resources testified on April 9, 2013.

On May 24, 2013, the following case participants filed post-hearing briefs: Dominion; James City County, JRA, and Save the James; BASF; Lennar; the Ledbetters; ODEC; Charles City County; the Environmental Respondents; and Staff.

On August 2, 2013, Senior Hearing Examiner Alexander F. Skirpan, Jr., entered a 178-page report that explained the extensive procedural history in this case, summarized the record, analyzed evidence and issues in this proceeding, and made certain findings and recommendations ("Hearing Examiner's Report"). The Hearing Examiner's Report included the following findings:

1. [Dominion's] transmission planning criteria should be used in applying mandatory [North American Electric Reliability Corporation ("NERC")] transmission reliability planning standards;
2. [Dominion's] load flow studies are based on reasonable assumptions for transmission planning purposes, and were confirmed by an independent Staff consultant;
3. [Dominion's] load flow studies indicate that with the retirement of Yorktown Units 1 and 2, numerous NERC reliability violations begin to occur in the summer of 2015;
4. [Dominion's] load flow studies support the need for additional transmission and/or generation to resolve NERC reliability violations;
5. The Proposed Project will resolve all of the 2015 NERC reliability violations and with a minor upgrade continues to resolve identified NERC reliability violations through 2021;
6. The Proposed Project's overhead crossing of the James River will have a limited visual impact on one section of the Colonial Parkway and a very limited impact on a small portion of Jamestown Island. Overall, the Proposed Project will reasonably minimize the adverse impacts on the scenic assets, historic districts, and environments;
7. The Proposed Project is the least cost viable alternative for addressing the identified NERC reliability violations presented in

this case, can be constructed in a timely manner, and is the best alternative in this case;

- 8. The [Chickahominy] Alternative Project is a viable alternative, is electrically equivalent to the Proposed Project and can be constructed in a timely manner. However, the [Chickahominy] Alternative Project has a higher cost than the Proposed Project and will have a greater impact on scenic assets, historic districts and the environment;
- 9. None of the 230 kV transmission alternatives or [James City County witness Wayne] Whittier's Variations, by themselves, resolved all of the NERC reliability violations for 2015 or 2021;
- 10. Additional generation, and combinations of new 230 kV transmission alternatives with additional generation resolve the identified NERC reliability violations, but at a significantly higher price and at a greater risk of failing to be completed by the date needed;
- 11. The Commission may or may not decide to address whether the Skiffes Creek Switching Station is a "transmission line" for purposes of § 56-46.1 F;
- 12. The route crossing the James River should follow James River Crossing Variation 4 on the condition that the [James City County Economic Development] Authority and [Dominion] conclude a right-of-way agreement within three weeks of the Commission's final order. If such an agreement is not concluded three weeks from the Commission's final order, then the route crossing the James River should be James River Crossing Variation 1;
- 13. Any certificate issued by the Commission in this case should be conditioned to direct [Dominion] to maintain the tree buffer along BASF Drive by only expanding its existing right-of-way to the west.
- 14. Any certificate issued by the Commission in this case should be conditioned to direct [Dominion] to use galvanized steel monopoles for crossing the BASF property;
- 15. Any certificate issued by the Commission in this case should be conditioned to direct [Dominion] to follow the construction practices listed below:

- a) [Dominion] will use existing roadways for access to construction locations, unless use of such roadways is not practical.
- b) Construction traffic and equipment should be minimized so that only the vehicles and machinery necessary are used.
- c) [Dominion] will work with BASF in developing construction practices within appropriate bounds provided that BASF's requirements do not impede [Dominion's] construction schedule, do not cause the Company to absorb excessive cost to the project, and do not conflict with established safety and construction methods used by [Dominion] and its contractors.
- d) [Dominion] will use experienced and qualified construction firms in constructing the transmission line, and assign a [Dominion] representative experienced in transmission line construction to oversee all construction activities. Construction of the line will be done within the confines of the right-of-way except where ingress and egress is needed for tower locations or for set up locations for wire pulling activities.
- e) Construction activity in proximity to rivers and creeks should be avoided if possible, and otherwise undertaken with utmost care.
- f) Construction activity in proximity to remediation areas or areas identified as environmentally sensitive should be carefully coordinated with BASF, DEQ, and [the United States Environmental Protection Agency ("EPA")].
- g) Where possible, [Dominion] will make every effort to retain existing vegetation that will not interfere with the usage and reliable operation of the transmission line; and

[16.] Any certificate issued by the Commission in this case should be conditioned to direct [Dominion] to follow the right-of-way maintenance policies listed below:

- a) Mowing the right-of-way should be avoided where possible. It is especially important to avoid mowing on property adjoining the river. Instead, where possible a diverse meadow-like plant community on the right-of-way should be promoted.

- b) [Dominion] should conduct a vegetation inventory to identify compatible species that can be retained in the right-of-way. The inventory may be limited to types of species, rather than number of plants present.
- c) Where sufficient distance is allowed between the outside conductor and the cleared right-of-way, selective lateral trimming should be used to produce a more feathered appearance to the edge of the right-of-way.
- d) [Dominion] will work with BASF to avoid the use of herbicides in the right-of-way that would interfere with environmental remediation efforts on the property.
- e) An erosion plan should be developed and implemented in areas near rivers or creeks, and near areas with steep slopes.
- f) The right-of-way should be designed and maintained to prevent access by unauthorized persons and, especially, vehicles.^{10,11}

On August 30, 2013, the following parties filed comments on the Hearing Examiner's Report: Dominion; James City County and Save the James;¹² BASF; Lennar; JRA;¹³ the

¹⁰ Finding number 16(f), as identified and incorporated above, is included and recommended in the Hearing Examiner's analyses, and therefore appears to have been inadvertently omitted from his "Findings and Recommendations." Hearing Examiner's Report at 174, 177.

¹¹ *Id.* at 174-77.

¹² The joint comments of James City County and Save the James were filed after the close of business on August 30, 2013. On September 3, 2013, James City County and Save the James filed a motion for leave to amend and refile their comments for the stated purpose of correcting a typographical error. Dominion, which was the only participant to respond to this motion, responded that: (1) the initial comments filed by James City County and Save the James were untimely by one day; (2) the motion should be treated as a request for leave to file comments one day out-of-time; (3) Dominion was not prejudiced in these particular circumstances; (4) Dominion will not object to granting the motion to the extent it permits the amended comments to be filed one day out-of-time; and (5) Dominion objects to portions of those comments, unrelated to the identified typographical error, that seek to include evidence beyond the record in this proceeding and which Dominion indicates would be inappropriate and prejudicial for the Commission to consider. James City County and Save the James filed no reply. We grant James City County's and Save the James's motion, in part, and accept the filing of their amended joint comments. As discussed below, we grant Dominion's requested clarification that our decision in this proceeding has been reached without consideration of evidence not contained in the record. *See, e.g.*, 5 VAC 5-20-240.

¹³ Dominion also filed an objection to JRA's inclusion of evidence in its comments that was not made part of the evidentiary record. JRA filed no reply to Dominion's objection. As noted above, our decision has been reached without consideration of evidence not contained in the record.

Ledbetters; ODEC; Charles City County; and the Environmental Respondents. Additionally, the Colonial Williamsburg Foundation (the "Foundation"), which participated as a public witness in this proceeding, filed comments on the Hearing Examiner's Report.

On September 10, 2013, Dominion filed an objection to the Foundation's comments, asserting that the Commission's Rules of Practice and Procedure ("Rules") and Order for Notice and Hearing in this proceeding do not permit public witnesses to file comments on the Hearing Examiner's Report. The Foundation did not file a reply.

On October 16, 2013, James City County filed a motion with the Commission for leave to supplement the record in this proceeding to include comments prepared by the National Park Service ("NPS") to the United States Army Corps of Engineers. On October 23, 2013, Dominion filed a response opposing James City County's motion. On October 25, 2013, James City County filed a reply.

NOW THE COMMISSION, having considered this matter, is of the opinion and finds that the Proposed Project, using the James River crossing identified as Variation 4, is required by the public convenience and necessity, subject to the findings and conditions contained in this Order.

The Commission understands the importance of this case to the many people who cherish Virginia's historical and natural assets and to those who depend on the reliable electric service so critical to Virginia's economic strength, safety, and quality of life. The Commission takes seriously its responsibility, under the Code of Virginia, to determine whether the public convenience and necessity require the construction of transmission lines in the Commonwealth. This is one of the most important responsibilities that the General Assembly has entrusted to the Commission because of the many impacts from constructing – or from not constructing –

transmission lines. Ultimately, the Commission must base its decision on the law as applied to the factual record of the case. That is what we have done herein, as will be explained in detail below. The evidence is clear that the Proposed Project is necessary to continue reliable electric service to the hundreds of thousands of people who live and work across this broad region of Virginia.

It is because of the many impacts associated with transmission lines that the Commission first evaluates whether a proposed transmission line is, in fact, needed. Before approving transmission line construction, landowners, communities, and rate-paying residents and businesses in the Commonwealth expect and deserve assurance that a new line is actually needed.

Determining whether a proposed transmission line or other electric infrastructure, such as a generation facility, is needed often requires analysis of complex engineering evidence. Substantial engineering analysis was evaluated in this case. This evidence allowed us to determine not only whether a need for additional infrastructure exists, but also the magnitude and timing of any such need. A need that is severe and fast approaching, as detailed engineering evidence supports in this case, may require a solution different than if a need is more modest and further in the future.

The reliability risks presented in this case are far reaching and significant. Engineering studies in this case show that when Dominion's transmission system is stress-evaluated under federal and Virginia requirements, a number of transmission system overloads result. These overloads, which appear under the reasonable contingency conditions modeled in this case, identify a broad swath of the Commonwealth where the loss of electric service can be expected as early as 2015 unless Dominion's electric system is reinforced.

The identified overloads affect the following 14 counties and 7 cities, which are referred to collectively herein as the "North Hampton Roads Area": the counties of Charles City, James City, York, Essex, King William, King and Queen, Middlesex, Mathews, Gloucester, King George, Westmoreland, Northumberland, Richmond, and Lancaster; and the cities of Williamsburg, Yorktown, Newport News, Poquoson, Hampton, West Point, and Colonial Beach. Studies evaluating further stresses to Dominion's transmission system reveal cascading outages spreading from the North Hampton Roads Area into northern Virginia, the City of Richmond, and North Carolina absent alleviation. Dozens of engineering studies in this case, which have been independently verified by our Staff, demonstrate that significant reliability risks exist as early as 2015.

The complexity of transmission line proceedings does not end with an evaluation of need. If a need is established, the Commission may consider different ways of addressing that need. In doing so, the Commission weighs many types of impacts associated with infrastructure construction, including the effects on electric system reliability, economic development, the environment, scenic assets, historic districts, and ratepayers. Often these various factors are at odds with each other. Different projects or transmission routes can also involve tradeoffs among factors, including competing environmental considerations. Placing a project in a particular location involves impacts but also avoids impacts associated with a different location.

Given all the competing considerations and tradeoffs that must be considered, the Commission weighs carefully the relevant expected impacts of alternatives before ruling on a public utility's request for a certificate of public convenience and necessity to construct a transmission facility. Among the competing considerations that participants to this case addressed extensively were impacts on: environmental resources, including historic and scenic

assets; landowners; system reliability; and the customers who ultimately pay the costs of electric infrastructure. Although a more detailed analysis of our decision will be included in subsequent sections of this Order, the Commission addresses, at the outset, some of the evidence that was central to this case.

The Commission has considered the environmental impact of transmission lines, including the impact of overhead transmission on viewsheds from the James River and various locations in the vicinity of the Proposed Project. The Commission has also considered all record evidence that highlights the Historic Triangle of Jamestown, Williamsburg, and Yorktown – the importance of which extends well beyond the borders of this Commonwealth.¹⁴ The Commission cannot ignore, however, the change that has transpired from colonial times to date in the area where the Proposed Project would cross the James River.¹⁵ In the vicinity of the Proposed Project's route today are neighborhoods, multiple military installations, theme parks, a marina, a jail and detention center, and a supermarket distribution center, among other businesses and developments. All these developments depend on the same reliable electric grid to maintain the quality of life, health, safety, and prosperity to which our Commonwealth and our nation are accustomed.¹⁶

Numerous electrical alternatives have been offered, explored, and developed for our consideration – many at the suggestion of Staff, the Hearing Examiner, and James City County,

¹⁴ As discussed below, we have also fully considered record evidence highlighting the environmental, scenic, and historic impacts of the Chickahominy Alternative Project.

¹⁵ The Proposed Project would not be visible from most of Jamestown Island, including James Fort. *See, e.g.*, Ex. 124 (Lake rebuttal) at 9; Ex. 83 (McCoy), Attached Exhibit WDM-1 at 17-19; Ex. 118 (Harper rebuttal) at Rebuttal Schedule 1, 2.

¹⁶ *See, e.g.*, Ex. 50 (Reidenbach), Attached 2009 James City County Comprehensive Plan at Introduction 1 ("We will not settle for less than first-class education, medical care, public safety, recreation, and entertainment that strengthen the fabric of our community.").

among other participants. The alternatives to the Proposed Project that the Commission has evaluated include:

- generation (*i.e.*, power plant) options;
- demand-side management (*i.e.*, lowering electric demand by consumers);
- lower voltage transmission;
- underground transmission;
- transmission in different locations; and
- combinations of generation and transmission.

The engineering evidence in this case is overwhelming that, as a result of (1) generation retirements prompted by stricter federal environmental regulations and (2) normal continued load growth in the North Hampton Roads Area, an overhead 500 kV transmission line needs to be constructed soon to ensure that a large part of the Commonwealth continues to have reliable electric service. The Commission can no more ignore the severity of fast-approaching reliability problems than it can the environmental, scenic, and historic impacts associated with the many different possible alternatives explored in this case for addressing those problems. In this case, the risks associated with the construction of a lower voltage project, either underground or overhead, or other alternatives that do not include a 500 kV overhead transmission line, are simply too great. Were lesser transmission options, for example, approved herein, the record demonstrates that reliable electric service would be compromised to a degree that is unacceptable anywhere in the Commonwealth, much less in an area with a military presence as significant as in the Historic Triangle area and other portions of the North Hampton Roads Area.

After evaluating all the alternatives offered in this proceeding, the evidence in this case leads back to the two alternative 500 kV projects proposed for Commission approval in the Application: the Proposed Project and the Chickahominy Alternative Project. From just east of the Chickahominy Substation in Charles City County where an existing 500 kV transmission line

crosses over the James River on its way to the Surry Nuclear Power Station, Dominion's existing 500 kV transmission system is located south of the James River.¹⁷ Thus, a new 500 kV line extending either down the Peninsula from the Chickahominy Substation or across the James River from Surry is needed if – as is the case here – a further extension of Dominion's 500 kV system onto the Peninsula is required.

Comparing these two 500 kV options, the record supports the Hearing Examiner's findings that the Proposed Project "is the least cost viable alternative for addressing the identified NERC reliability violations presented in this case, can be constructed in a timely manner, and is the best alternative in this case"¹⁸ and that the Chickahominy Alternative Project "has a higher cost than the Proposed Project and will have a greater impact on scenic assets, historic districts and the environment."¹⁹

The Surry-Skiffes Creek Line of the Proposed Project offers a reasonable path into the highly constrained Peninsula where an overhead 500 kV transmission line is needed to reasonably ensure reliability. The Surry-Skiffes Creek Line would begin at the existing transmission switching station near the Surry Nuclear Power Station on the south shore of the James River; cross the James River in a manner designed to avoid, among other things, ship traffic and the airspace of military aircraft from a large nearby military installation (Fort Eustis and Felker Airfield);²⁰ and then come ashore on the BASF property in an industrial area that includes active environmental remediation sites.²¹ A crossing of the James River in this

¹⁷ Ex. 23 (Application), Attached Appendix at 6, 117.

¹⁸ Hearing Examiner's Report at 175.

¹⁹ *Id.*

²⁰ See, e.g., Ex. 118 (Harper rebuttal) at Rebuttal Schedules 1, 2.

²¹ See, e.g., Ex. 48 (Burrows) at Figure VCB-1; Ex. 60 (Henderson) at TCH-2.

particular area is reasonable and far preferable to the route that the Chickahominy Alternative Project would use to introduce 500 kV transmission to the Peninsula. In an area of the Commonwealth that is so full of scenic assets, and historic and environmental resources, the Proposed Project will have impacts, but they will be fewer and less significant than with the Chickahominy Alternative Project. Additionally, the Commission finds, based on the extensive factual record in this case, that construction of the Proposed Project, as approved herein, will reasonably minimize adverse impact on the scenic assets, historic districts, and environment of the area concerned.

The Proposed Project, using a tower alignment identified as Variation 4, is required by the public convenience and necessity, reasonably minimizes environmental impacts, and otherwise satisfies the requirements of Virginia law. With the retirement of local generation to comply with federal environmental regulations and normal load growth, a 500 kV transmission line is needed to deliver more electrons generated from outside of the North Hampton Roads Area, and the Proposed Project with Variation 4 is the best alternative for doing so.

A more detailed analysis of the applicable law and evidence in this case is included below.

CODE OF VIRGINIA

The statutory scheme governing the Company's Application is found in several chapters of Title 56 of the Code of Virginia ("Code").

Section 56-265.2 A of the Code provides that "it shall be unlawful for any public utility to construct . . . facilities for use in public utility service . . . without first having obtained a certificate from the Commission that the public convenience and necessity require the exercise of such right or privilege."

Section 56-46.1 of the Code further directs the Commission to consider several factors when reviewing the Company's Application.²² Subsection A of the statute provides, in part, that:

Whenever the Commission is required to approve the construction of any electrical utility facility, it shall give consideration to the effect of that facility on the environment and establish such conditions as may be desirable or necessary to minimize adverse environmental impact. . . . In every proceeding under this subsection, the Commission shall receive and give consideration to all reports that relate to the proposed facility by state agencies concerned with environmental protection; and if requested by any county or municipality in which the facility is proposed to be built, to local comprehensive plans that have been adopted. . . . Additionally, the Commission (a) shall consider the effect of the proposed facility on economic development within the Commonwealth . . . and (b) shall consider any improvements in service reliability that may result from the construction of such facility.

Subsection B of the statute further provides, in part, that:

As a condition to approval the Commission shall determine that the line is needed and that the corridor or route the line is to follow will reasonably minimize adverse impact on the scenic assets, historic districts and environment of the area concerned. . . . In making the determinations about need, corridor or route, and method of installation, the Commission shall verify the applicant's load flow modeling, contingency analyses, and reliability needs presented to justify the new line and its proposed method of installation. . . . Additionally, the Commission shall consider, upon the request of the governing body of any county or municipality in which the line is proposed to be constructed, (a) the costs and economic benefits likely to result from requiring the underground placement of the line and (b) any potential impediments to timely construction of the line.

The Code further requires that the Commission consider existing right-of-way easements when siting transmission lines. Section 56-46.1 C of the Code provides that "[i]n any hearing the public service company shall provide adequate evidence that existing rights-of-way cannot

²² Subsection D of the statute provides that "[a]s used in this section, unless the context requires a different meaning: 'Environment' or 'environmental' shall be deemed to include in meaning 'historic,' as well as a consideration of the probable effects of the line on the health and safety of the persons in the area concerned."

adequately serve the needs of the company." In addition, § 56-259 C of the Code provides that "[p]rior to acquiring any easement of right-of-way, public service corporations will consider the feasibility of locating such facilities on, over, or under existing easements of rights-of-way."

Parties to this proceeding have also requested our consideration of Code § 10.1-419, which provides as follows:

A. In keeping with the public policy of the Commonwealth of Virginia to conserve the portions of certain rivers possessing superior natural beauty, thereby assuring their use and enjoyment for their historic, scenic, recreational, geologic, fish and wildlife, cultural and other values, that portion of the Lower James River in Charles City, James City and Surry Counties, from an unnamed tributary to the James River approximately 1.2 miles east of Trees Point in Charles City County (northside) and Upper Chippokes Creek (southside) to Grices Run (northside) and Lawnes Creek (southside), is hereby declared to be an historic river with noteworthy scenic and ecological qualities.

B. In all planning for the use and development of water and related land resources which changes the character of a stream or waterway or destroys its historic, scenic or ecological values, full consideration and evaluation of the river as an historic, scenic and ecological resource should be given before such work is undertaken. Alternative solutions should also be considered before such work is undertaken.

C. The General Assembly hereby designates the Department of Conservation and Recreation as the agency of the Commonwealth responsible for assuring that the purposes of this chapter are achieved. Nothing in this designation shall impair the powers and duties of the local jurisdictions listed above or the Virginia Department of Transportation.

For inclusion of a project in the underground pilot program established by House Bill 1319 enacted by the 2008 Session of the General Assembly, a proposed electric transmission line of 230 kV or less must satisfy the following three criteria:

(1) An engineering analysis demonstrates that it is technically feasible to place the proposed line, in whole or in part, underground;

(2) The estimated additional cost of placing the proposed line, in whole or in part, underground does not exceed 2.5 times the cost of placing the same line overhead, assuming accepted industry standards for undergrounding to ensure safety and reliability. If the public utility, the affected localities, and the State Corporation Commission agree, a proposed underground line whose cost exceeds 2.5 times the cost of placing the line overhead may also be accepted into the pilot program; and

(3) The governing body of each locality in which a portion of the proposed line will be placed underground indicates, by resolution, general community support for the line to be placed underground.²³

House Bill 1319 further provides that "[p]ublic utility companies granted a certificate of public convenience and necessity for a proposed transmission line not included in this program or not otherwise being placed underground shall seek to implement low-cost and effective means to improve the aesthetics of new overhead transmission lines and towers."²⁴

Finally, Dominion requests a Commission determination that, based on the facts and circumstances of this case, the Skiffes Creek Switching Station constitutes a "transmission line" for purposes of Code § 56-46.1 F, which provides that "[a]pproval of a transmission line pursuant to this section shall be deemed to satisfy the requirements of § 15.2-2232 and local zoning ordinances with respect to such transmission line."

SYSTEM NEED

A series of load flow studies was introduced as evidence in this proceeding and evaluated by load flow study experts who testified as witnesses in this case. These studies demonstrate that the North Hampton Roads Area needs a significant electric system upgrade soon to maintain adequate reliability.

²³ 2008 Va. Acts ch. 799, Enactment 1, § 4, as extended by 2011 Va. Acts. ch. 244, Enactment 1.

²⁴ *Id.* at § 10.

The electric transmission system of Dominion and other public utilities is studied continually to assess its reliability in the near-term and long-term future. As a member of PJM Interconnection, LLC ("PJM"), a regional transmission organization,²⁵ Dominion does not assess the reliability of its transmission system only on its own. Through PJM's planning process, Dominion's transmission system is evaluated and planned as part of a 13-state region.²⁶

Central to transmission system planning are load flow modeling studies that simulate system conditions to identify, among other things, projected overloads on the system.²⁷ These engineering studies assess whether the transmission system complies with NERC reliability standards, which are established for the important purpose of ensuring that the transmission system remains reliable so that customers' needs for electric service can be met.²⁸ Federal law enacted in 2005 made compliance with federal electric reliability standards mandatory, with violations by utilities carrying fines of up to \$1 million per day.²⁹

Dominion filed in this proceeding a number of load flow studies, allowing interested parties and our Staff to analyze the inputs and results of those studies.³⁰ As Staff points out, because reliability violations in the North Hampton Roads Area "are identified by a number of different models examining a number of different future years, the evidence supporting a system

²⁵ The term "regional transmission organization" is synonymous with the term "regional transmission entity" used in Section 56-579 of the Code of Virginia, which required Dominion to transfer the management and control of its transmission assets to such an entity, subject to Commission approval.

²⁶ Hearing Examiner's Report at 129-31.

²⁷ As explained by Staff, overloads exist when "under certain conditions, electrical flow on various transmission lines will exceed the power levels those lines are designed to accommodate, which can result in a failure of the lines." Staff's Post-Hearing Brief at 8.

²⁸ Tr. 631 (Reidenbach) (agreeing that reliable electric service is important to James City County's "sustainable future going forward").

²⁹ Hearing Examiner's Report at 129-30.

³⁰ To assist in its investigation of the Application, Staff retained the services of a consultant with expertise conducting load flow studies. *See, e.g.*, Ex. 79 (Chiles) at 1-2.

need does not rely on any single set of assumptions."³¹ Notwithstanding the different assumptions used in the many load flow modeling studies analyzed in this case, the various load flow studies consistently reveal a significant system need in the area.

Dominion testified that it initially conducted load flow modeling studies indicating that normal load growth in the North Hampton Roads Area would result in reliability violations by 2019.³² Those initial studies were analyzed and verified by our Staff.³³

Importantly, the studies showing a need in 2019 were conducted *before* Dominion determined that six local generation units – two at the Yorktown Power Station and four at the Chesapeake Power Station – would be retired as a result of stricter federal environmental regulations, including the Mercury Air Toxics Standard ("MATS Rule").³⁴ Subsequent studies that included the impact of the generation retirements at these power stations showed that the retirement of only one unit at Yorktown was enough to cause reliability violations to begin in the summer of 2015.³⁵ Updated and supplemental studies directed by the Hearing Examiner and verified by Staff, confirm reliability violations occurring in the summer of 2015. For example, updated studies identify reliability violations or overloads projected to occur in 2015 on more

³¹ Staff's Post-Hearing Brief at 9-10. As recognized by Staff, these load flow models included different projected peak loads and different assumptions about both generation and transmission topology. *Id.* at 9.

³² Ex. 31 (Nedwick direct) at 11.

³³ *See, e.g.*, Ex. 79 (Chiles) at 11-16. Although Staff raised a concern about one scenario from the studies showing a 2019 need, Staff was able to replicate and verify those modeling results, and the Company addressed this scenario in rebuttal testimony. *See, e.g.*, Ex. 87 (Nedwick rebuttal) at 24-25; Ex. 79 (Chiles), Attached Exhibit JWC-2 at 2.

³⁴ *See, e.g.*, Ex. 87 (Nedwick rebuttal) at 4; Ex. 110 (Kelly rebuttal); Ex. 103 (Faggert rebuttal). As discussed below, retaining generation at these facilities is not a reasonable alternative to addressing the identified needs of the North Hampton Roads Area.

³⁵ *See, e.g.*, Ex. 23 (Application), Attached Appendix at 72, 78-81; Ex. 87 (Nedwick rebuttal) at 4, n.1.

than a dozen transmission lines and several transformers on Dominion's transmission system.³⁶ These projected overloads are widespread in the North Hampton Roads Area.³⁷

Consistent with NERC standards, the load flow studies discussed in the preceding paragraph involved stressing Dominion's transmission system under scenarios where one or two transmission circuits and one generation unit are unavailable.³⁸ NERC reliability standards also require testing for more extreme system conditions, including a scenario where all transmission lines located in a single right-of-way corridor and one generation unit are unavailable. The result of this analysis shows outages cascading into northern Virginia, the City of Richmond, and North Carolina.³⁹

James City County, Save the James, and JRA have suggested that transmission planning in the Commonwealth should be undertaken in a less rigorous manner than has been the past practice of the Commission.⁴⁰ The record does not support taking transmission planning in such a direction. The North Hampton Roads Area is already a "load pocket" relying significantly on transmission to deliver generation from other areas of the Commonwealth.⁴¹ This reliance will grow substantially with the upcoming retirements of two generation units at the Yorktown Power Station. At that time, the only remaining generation on the Peninsula will be a third unit at the

³⁶ See, e.g., Ex. 90 at 5.

³⁷ *Id.*

³⁸ As described in the record, overloads resulting from such conditions are referred to as "Category A", "Category B", and "Category C" violations. See, e.g., Ex. 31 (Nedwick direct) at 7-9.

³⁹ See, e.g., Ex. 23 (Application), Attached Appendix at 32-33, 43-45. For this reason, adding an additional line to this same corridor presents an unreasonable reliability risk. See, e.g., Ex. 31 (Nedwick direct) at 10-11.

⁴⁰ See, e.g., James City County's, Save the James's, and JRA's Joint Post-Hearing Brief at 25-26.

⁴¹ See, e.g., Ex. 89; Tr. 1074 (Chiles); Tr. 947 (Whittier).

Yorktown Power Station, which is subject to environmental restrictions that will severely limit its operation until its retirement.⁴²

The Commission is greatly concerned about the widespread nature of the projected NERC reliability violations that are supported by the record of this case and that so many violations are projected to occur as early as 2015. The load flow modeling evidence, which has been verified by our Staff,⁴³ establishes a clear need for significant new electric infrastructure to address fast-approaching reliability violations projected for Dominion's transmission system. With a system need clearly established, we next turn to potential alternatives for satisfying the identified need.

ALTERNATIVES

The parties and Staff presented numerous potential alternatives for addressing the significant and uncontested system needs identified by the record. Those alternatives include generation, demand-side management, lower voltage transmission, underground transmission, transmission in different locations, and combinations of generation and transmission. While some alternatives warranted – and received – considerable evaluation, others are more conceptual or possess glaring shortcomings. However, our decision in this proceeding has been reached only after consideration of all potential alternatives, many of which are addressed below. Additionally, the Commission has considered all relevant factors supported by record evidence for each alternative.

⁴² See, e.g., Ex. 31 (Nedwick direct) at 12-13; Ex. 110 (Kelly rebuttal) at 8, 15; Ex. 103 (Faggert rebuttal) at 14-15.

⁴³ See, e.g., Ex. 79 (Chiles); Tr. 1068-74.

In summary, the Commission finds, based on the record, that none of the alternatives other than new transmission at 500 kV that were explored in this proceeding reasonably meet the reliability need identified in this case.

Generation Alternatives

As supported by the record and discussed below, generation alternatives are not a reasonable alternative to a transmission solution for addressing Dominion's upcoming system need. Some of the generation alternatives identified in this proceeding are largely conceptual or hypothetical. Certain generation alternatives introduced or studied by case participants do not correspond to any actual generation project currently under development or which could be developed in time and at the scale necessary to ensure the electric system remains reliable for a large portion of the Commonwealth.⁴⁴ We find that while some of this evidence further informs the magnitude of the challenge facing Dominion and its customers in the affected area,⁴⁵ the more conceptual generation presented in the record of this proceeding does not identify a reasonable alternative to a transmission solution.

For example, Environmental Respondents asserted that distributed solar resources (or distributed solar combined with demand-side management resources⁴⁶) could satisfy the projected reliability criteria violations in the North Hampton Roads Area and could do so in the

⁴⁴ PJM testified that its interconnection queue – which developers of generation must clear before connecting to Dominion's transmission system – does not currently contain any generation interconnection requests that would potentially offset the need for the Proposed Project. Ex. 92 (Herling rebuttal) at 22.

⁴⁵ See, e.g., Ex. 79 (Chiles), Attached Exhibit JWC-2 at 13-15 (studying additional generation in the location of the proposed Skiffes Creek Switching Station while recognizing that location is not currently under active development for electric generation or the natural gas infrastructure necessary for such generation); Environmental Respondents' Post-Hearing Brief at 14-17 (distributed solar and demand-side management resources); James City County's, Save the James's, and JRA's Joint Post-Hearing Brief at 26 (liquified natural gas generation).

⁴⁶ Demand-side resources, and planning concerns about such resources, are discussed below. The planning concerns identified by record evidence are relevant to a consideration of these resources either as a stand-alone alternative or as part of alternative concepts that combine demand-side resources with other resources.

most cost-effective manner.⁴⁷ This assertion fails to appropriately recognize the magnitude of the projected reliability criteria violations made more imminent by significant generation retirements and operational restrictions resulting from environmental regulations. Although the Environmental Respondents cite to our recent approval of a distributed solar program through which Dominion will construct or facilitate up to 30 megawatts of distributed solar,⁴⁸ that 30 megawatts of nameplate capacity – even if all located in the North Hampton Roads Area – does not approach the size needed to address the reliability need identified in this case.⁴⁹ Nor do the Environmental Respondents substantiate their claim that solar resources are currently cost-effective.

Similarly, the record does not support suggestions by James City County that offshore wind or liquefied natural gas generation could satisfy the fast-approaching reliability criteria violations in the North Hampton Roads Area. Because these types of projects are exceptionally complex and, in some respects, may represent uncharted territory for developers,⁵⁰ the risk that such generation will be unavailable to address a need arising as soon as 2015 is too great to warrant further consideration in the instant case.

Based on the record, including the impending generation retirements and operating restrictions at the Yorktown and Chesapeake Power Stations, a more concrete approach to

⁴⁷ See, e.g., Environmental Respondents' Post-Hearing Brief at 14-17.

⁴⁸ *Application of Virginia Electric and Power Company, For approval of a Community Solar Power Program and for certification of proposed distributed solar generation facilities pursuant to Chapter 771 of the 2011 Virginia Acts of Assembly and §§ 56-46.1 and 56-580 D of the Code of Virginia*, Case No. PUE-2011-00117, 2012 S.C.C. Ann. Rept. 328, Order (Nov. 28, 2012).

⁴⁹ Studies were conducted in this case for the specific purpose of calculating how much generation would be needed to address projected reliability violations. See, e.g., Ex. 90 at Rebuttal Schedule 4.

⁵⁰ See, e.g., Tr. 1622-27 (identifying challenges and cost associated with obtaining a permit, constructing, and operating a liquefied natural gas import facility in a populated area like Yorktown); Tr. 1853 (describing the current construction cost of offshore wind).

addressing the needs of electric customers in the North Hampton Roads Area is required. To be clear, we appreciate that participants in this case have sought alternative solutions to addressing the identified system needs. However, for us to discharge in this case the responsibility delegated to us by the General Assembly, the Commission must identify those alternatives that may address identified system reliability needs and reasonably minimize adverse impact on scenic assets, historic districts, and the environment.

Although located outside of the North Hampton Roads Area, another potential generation alternative evaluated in this proceeding was generation in Brunswick County, Virginia. The addition of generation in Brunswick County is not a hypothetical, as the Commission recently approved the construction of a generation station in this location.⁵¹ However, the load flow results show that the generation project in Brunswick County will not address the identified system needs of the North Hampton Roads Area.⁵² Therefore the Brunswick County generation station is not a reasonable alternative in this case.

Other generation alternatives presented in this proceeding involve the potential retrofitting with additional emissions control equipment or the potential refueling, with natural gas, of generation units at the Yorktown and Chesapeake Power Stations.⁵³ Although some comparative environmental benefits can accrue from retaining infrastructure at a location with existing operations (and impacts), there can also be negative environmental impacts. The Environmental Respondents have, in prior proceedings, advocated that units at these stations

⁵¹ *Application of Virginia Electric and Power Company, For approval and certification of the proposed Brunswick County Power Station and related transmission facilities pursuant to §§ 56-580 D, 56-265.2, and 56-46.1 of the Code of Virginia, and for approval of a rate adjustment clause, designated Rider BW, pursuant to § 56-585.1 A 6 of the Code of Virginia*, Case No. PUE-2012-00128, Doc. Con. Cent. No. 130810071, Final Order (Aug. 2, 2013).

⁵² Ex. 81; Tr. 1077-80 (Chiles).

⁵³ As discussed herein, these options have been considered both on a stand-alone basis and in combination with other infrastructure upgrades.

should be retired.⁵⁴ The Environmental Respondents continued those efforts in the instant proceeding.

The evidence in this case – which includes, but is not limited to, environmental considerations – supports our finding that retrofitting or refueling options cannot address the identified NERC reliability violations in a cost-effective manner.⁵⁵

With respect to the option of retrofitting coal-fired units at the Yorktown and Chesapeake Power Stations with additional environmental equipment, the Commission finds that the risks and costs associated with such an option are too great based on the record. Retrofitting these units would require several very large capital expenditures because the units would need a significant amount of additional equipment to continue coal and oil operations and comply with existing and anticipated environmental regulations.⁵⁶ The evidence in this case indicates that such capital expenditures total many hundreds of millions of dollars and could well exceed one billion dollars.⁵⁷ Additionally, the compliance costs evaluated in this case do not reflect other risks attendant to coal and oil generation, such as the current uncertainty regarding future regulation of carbon dioxide at the federal level.⁵⁸ Moreover, load flow studies analyzed in this

⁵⁴ Environmental Respondents' March 1, 2013 Motion Seeking Leave To File a Notice of Participation Out of Time at 2.

⁵⁵ See, e.g., Ex. 110 (Kelly rebuttal); Tr. 1600-10 (Kelly); Ex. 79 (Chiles), Attached Exhibit JWC-3 at 6-7, and Attached Exhibit JWC-5.

⁵⁶ Tr. 1600-06 (Kelly). As the Hearing Examiner recognized, "Mr. Kelly confirmed that to retrofit Yorktown Units 1 and 2 to comply with environmental regulations would require the installation of a Dry Scrubber, Baghouse, Selective Catalytic Reduction, Water Intake Screens, Variable Speed Drives, and Closed Cycle Cooling." Hearing Examiner's Report at 118.

⁵⁷ Ex. 79 (Chiles), Attached Exhibit JWC-3 at 6-7, and Attached Exhibit JWC-5; Ex. 110 (Kelly rebuttal) at 20-23.

⁵⁸ We recognized these risks in a recent proceeding. *Application of Appalachian Power Company, For approval of transactions to acquire interests in the Amos and Mitchell generation plants and to merge with Wheeling Power Company*, Case No. PUE-2012-00141, Doc. Con. Cent. No. 130730256, Order at 8-9 (July 31, 2013) (citing Presidential Memorandum of June 25, 2013, Power Sector Carbon Pollution Standards, 78 Fed. Reg. 39,535 (2013)).

case indicate that assuming the additional cost and risk identified herein would only temporarily delay the need for system reinforcements in the North Hampton Roads Area.⁵⁹ For these reasons, the Commission finds, based on the record, that retrofitting Yorktown or Chesapeake generation units is not a reasonable alternative for ensuring transmission system reliability for Dominion's customers.

Another option explored in substantial depth by Dominion and other case participants involved the repowering or refueling of generation at the Yorktown or Chesapeake Power Stations with natural gas. The record contains gas transportation cost data obtained by Dominion from natural gas industry participants in response to requests by the Company in 2010, 2011, and 2012 for such information.⁶⁰ This data reveals that, similar to the retrofit option, the cost of extending a natural gas pipeline into the Hampton Roads area significantly exceeds the cost of transmission line alternatives.⁶¹ This option becomes even more uneconomic with the capital cost that would be required at the Yorktown and Chesapeake Power Stations in order to generate electricity using natural gas from any such pipeline extension.⁶² Staff also concluded, based on a review of this information and research, that "it does not appear that natural gas pipeline capacity could be constructed in time to meet the fuel requirements for repowered units at Chesapeake or Yorktown."⁶³ Accordingly, the Commission finds that repowering units at Yorktown and Chesapeake is not a reasonable alternative for ensuring transmission system reliability.

⁵⁹ As discussed above, even without retirements at the Yorktown and Chesapeake Power Stations, reliability violations are projected to occur beginning in 2019 in the North Hampton Roads Area.

⁶⁰ See, e.g., Ex. 79 (Chiles) at 31, and Attached Exhibit JWC-3 at 2-4.

⁶¹ *Id.*, Attached Exhibit JWC-3 at 2-4, 8; and Attached Exhibit JWC-5.

⁶² *Id.*, Attached Exhibit JWC-3 at 4.

⁶³ *Id.*, Attached Exhibit JWC-3 at 3-4.

A combination of retrofitting or repowering at the Yorktown or Chesapeake Power Stations and installing an electric transmission line alternative in this case does not yield a conclusion different from our consideration of these generation alternatives without transmission. A transmission line obviously does not address the natural gas pipeline constraints into the North Hampton Roads Area or environmental regulations that will not allow Dominion to continue operating the Yorktown and Chesapeake Power Stations in the same manner as in the past. These significant generation limitations, as well as the cost and time associated with alternative transmission components, make the cost and risk of the combination generation and transmission alternatives excessive, regardless of which transmission line alternative is chosen.⁶⁴

In summary, while the Commission does not prejudge whether additional generation in the North Hampton Roads Area (or other concepts or projects discussed herein) may be reasonable at some point in the future, the record in this case does not support such generation as a reasonable alternative to a transmission solution for the area's significant transmission system needs appearing in 2015.

Demand-Side Resources

The Commission finds that demand-side resources, such as demand-side response and energy efficiency measures, were appropriately considered in this proceeding. The record supports the Hearing Examiner's conclusion that "additional amounts of [demand-side resources] should not be assumed to be available to address projected NERC reliability violations."⁶⁵

The PJM load forecasts incorporated in Dominion's load flow modeling studies include demand-side resources that have cleared a three-year forward capacity auction conducted by

⁶⁴ See, e.g., Ex. 87 (Nedwick rebuttal) at 13-14; Ex. 91 at Rebuttal Schedule 5.

⁶⁵ Hearing Examiner's Report at 150.

PJM.⁶⁶ In this case, James City County and the Environmental Respondents have asserted that the Commission should allow for more projected, and unspecified, demand-side resources to be considered.⁶⁷ In contrast, Staff has suggested that "[i]f anything, the evidence appears to support relying less on such resources for planning purposes."⁶⁸

The Commission declines to alter, in this case, the extent to which projected levels of demand-side resources are incorporated in the planning studies that are conducted to ensure the Commonwealth's transmission system remains reliable. As recognized by PJM, the fact that a resource clears an auction for three years into the future does not mean that such a resource will, in fact, be available in that future year.⁶⁹ PJM's Vice President of Transmission Planning testified in this proceeding that a significant percentage of demand-side resources that clear PJM's auctions have recently been observed "buying out" of their obligations and he expressed concern that PJM may be "over-relying on demand response."⁷⁰ Given this testimony, the Commission does not find it reasonable in this case to impute additional demand-side resource amounts above and beyond those of the PJM forecasts.

The Commission further notes that, as Staff recognizes, the record in this case "indicates that a very significant – if not extraordinary – amount of demand-side response would be required in the North Hampton Roads area to avoid construction" of either a 500 kV transmission project or a 230 kV transmission project combined with additional generation.⁷¹ For example,

⁶⁶ See, e.g., Ex. 92 (Herling rebuttal) at 11-12.

⁶⁷ See, e.g., Ex. 68 (Whittier) at 6, 13-15; Environmental Respondents' Post-Hearing Brief at 15-17.

⁶⁸ Staff's Post-Hearing Brief at 23 (emphasis omitted).

⁶⁹ See, e.g., Ex. 92 (Herling rebuttal) at 14-15.

⁷⁰ *Id.*

⁷¹ Staff's Post-Hearing Brief at 22-23.

Staff indicates that, to address projected 2015 NERC reliability violations, "the demand-side equivalent of 620 [megawatts] needed for a 'stand-alone' generation option would be required in the North Hampton Roads load area, which has only approximately 2,000 [megawatts] of peak demand."⁷²

However, the Commission finds PJM's testimony that planning studies may be over-relying on demand response raises concerns that warrant further evaluation in future transmission and generation certificate proceedings. Accordingly, Dominion is hereby directed to provide, in future transmission and generation certificate applications, more detailed analysis of demand-side resources incorporated in the Company's planning studies used in support of such applications.⁷³

230 kV Transmission Alternatives

In addition to alternatives that included generation or demand-side resources, as discussed above, several transmission alternatives were presented in this proceeding. Dominion's existing 500 kV system stops at the doorstep of the North Hampton Roads Area, with the closest lines at that voltage running from the Chickahominy Substation and Septa Substations to the Surry Nuclear Power Station.⁷⁴ Presently, a number of 230 kV and 115 kV lines transmit power into and within the North Hampton Roads Area.⁷⁵ As such, it is logical that many of the transmission alternatives evaluated in this proceeding are potential additions to Dominion's existing 230 kV transmission system.

⁷² *Id.* at 22. See, e.g., Ex. 87 (Nedwick rebuttal) at 11-12, Rebuttal Schedule 3.

⁷³ To the extent known by the Company, such information should include, for example, the locations and providers of demand-side resources included in the relevant planning studies.

⁷⁴ Ex. 23 (Application), Attached Appendix at 6, 117.

⁷⁵ *Id.*

James City County and Save the James have characterized a 500 kV transmission line as a "larger, more luxurious option [that] may need to be foregone in favor of a smaller, more economical product."⁷⁶ But this does not describe the choice before us. Based on the record, we find that 230 kV options would not ensure system reliability in the North Hampton Roads Area and that most, if not all, 230 kV options would actually cost more than the Proposed Project.

Case participants had the ability not only to evaluate the results of Dominion's load flow modeling, but also to add different types of projects to Dominion's models to assess the effectiveness of such projects in addressing projected NERC reliability violations. Our Staff first tested 230 kV options with the initial load flow models that Dominion used in support of its Application, and Staff filed its results in the pre-filed testimony of its engineering consultant.⁷⁷ Subsequently, the Hearing Examiner directed Dominion to conduct and file many additional and updated load flow models to test, among other things, 230 kV options.⁷⁸ The Hearing Examiner directed these further studies after receiving input from Dominion, Staff, James City County, and other case participants that then had the opportunity to evaluate the studies.⁷⁹ Finally, James City County conducted additional 230 kV analyses using the updated, supplemental load flow models directed by the Hearing Examiner.⁸⁰ Below we discuss, in turn, underground and overhead 230 kV options for the North Hampton Roads Area.

⁷⁶ James City County's and Save the James's Joint Comments on Hearing Examiner's Report at 21.

⁷⁷ *See, e.g.* Ex. 79 (Chiles) at 23-26, Attached Exhibit JWC-2 at 3-6, 10-14.

⁷⁸ *See, e.g.*, Hearing Examiner's Report at 7-8, 103-109.

⁷⁹ Shortly after Staff's testimony was filed, Dominion and Staff filed a motion to extend the procedural schedule for the purpose of conducting further studies and, in doing so, proposed a number of studies. After holding a prehearing conference, the Hearing Examiner directed that specific studies be conducted, including a study of an alternative identified by James City County witness Whittier. Hearing Examiner's Report at 7-8.

⁸⁰ Tr. 901-1014 (Whittier).

a. *230 kV Transmission Underground Alternatives*

The feasibility of undergrounding, in whole or in part, a transmission line crossing the James River was the focus of much evidence in this case. Compared to overhead alternatives, underground transmission lines require much different construction and materials, which result in different construction durations and costs. Additionally, the design and capability of a line depend on whether it is overhead or underground. For example, engineering evidence in this case indicates that undergrounding a 500 kV transmission line is not technically viable,⁸¹ meaning that undergrounding options must be at a lower voltage, such as 230 kV.

It is also important to understand that, when comparing transmission lines with different voltages (such as 500 kV and 230 kV), the difference in their voltages is not directly proportional to the difference in their capacities, measured in megavolt amperes ("MVA"), for delivering power. For example, the record in this case shows that the single-circuit 500 kV Surry-Skiffes Creek Line would provide approximately 4,300 MVA of capacity into the North Hampton Roads Area while an underground single-circuit 230 kV line that Dominion recently placed into service provides only 600 MVA of capacity.⁸²

Compared to an overhead transmission line, an underground line can lessen or eliminate certain environmental impacts, including many visual impacts⁸³ and impacts associated with securing a transmission tower into the ground or a river bed.⁸⁴ Replacing the overhead 500 kV

⁸¹ The record identifies only one location in the United States where 500 kV lines have been constructed underground. Those lines, which are short interconnections between generation at the Grand Coulee Dam and an adjacent switchyard, are in the process of being replaced with overhead lines due to reliability concerns. *See, e.g.*, Ex. 93 (Allen rebuttal) at 16, Rebuttal Schedule 3; Ex. 23 (Application), Attached Appendix at 58.

⁸² *See, e.g.*, Ex. 79 (Chiles) at 24; Ex. 33 (Allen direct) at 3-4; Ex. 102 (Thomassen rebuttal) at 13-15, Rebuttal Schedule 8.

⁸³ *See, e.g.*, Ex. 83 (McCoy), Attached Exhibit WDM-1 at 19-21.

⁸⁴ *See, e.g.*, Ex. 93 (Allen rebuttal) at 15.

Surry-Skiffes Creek Line with an underground transmission line would, for example, lower the scenic impact on Carter's Grove; Kingsmill; the Captain John Smith National Historic Water Trail; Black's Point; parts of the Colonial Parkway; and other viewpoints on or around this portion of the James River. However, as discussed further in our evaluation of 500 kV alternatives herein, the Commission agrees with the findings and conclusions of the Hearing Examiner that the Proposed Project, with an overhead 500 kV crossing of the James River: (1) will have little visual impact on the Colonial Parkway or Jamestown Island; (2) will have greater visual impacts on sites such as Carter's Grove and Kingsmill; and (3) will not alter the current nature of the James River in the relevant area.⁸⁵ Accordingly, while the Commission does not find that the environmental impact of extending an overhead 500 kV transmission line from the Surry Switching Station to the industrial BASF property is as great as some of the participants contend in this case, all identified impacts have been considered and weighed.

The Commission also recognizes, however, that underground transmission lines and their construction are not without environmental impacts. Underground construction creates other types of environmental impacts, including those associated with boring underground or boring under a river bed and dredging a river bed to install splice pits.⁸⁶ Among other environmental impacts, Dominion estimated that an underground river crossing of the James River would result in a riverbed excavation of 36,000 cubic yards.⁸⁷ Comparing overhead construction to underground construction therefore requires a weighing of, among other things, the environmental impacts of each.

⁸⁵ Hearing Examiner's Report at 134-40.

⁸⁶ See also Ex. 102 (Thomassen rebuttal); Tr. 1678-80 (Harper); Ex. 83 (McCoy), Attached Exhibit WDM-1 at 6-7; Tr. 1137 (McCoy).

⁸⁷ Ex. 93 (Allen rebuttal) at 15.

The Commission has carefully considered the relative impacts to historic resources, scenic assets, and other environmental considerations presented in this case. However, the factors that must be considered in this proceeding, as discussed above, are broad and are not limited only to environmental considerations. Based on the record, the Commission finds that the impediments associated with attempting to address the identified reliability violations in the North Hampton Roads Area by placing a transmission line underground outweigh competing environmental considerations. The Commission finds that underground alternatives do not reasonably meet the reliability need identified in this case.

Underground transmission projects are complex endeavors. The construction of an underground project can involve, among other things, significant horizontal drilling to install the pipes needed to contain underground electric cables, dredging large pits in the ground and the river bed to allow for underground electric cables to be spliced together, and constructing transition stations where the underground cable transitions to an overhead line.⁸⁸ Given the complexity of these projects, Staff noted that most of the recent underground transmission projects constructed by Dominion have experienced delays.⁸⁹

Dominion testified that an underground crossing of the James River would require an estimated 48 months (single circuit) or 60 months (double circuit) to complete.⁹⁰ But the load flow studies in this case demonstrate significant reliability violations occurring the summer after Yorktown generation retires in response to environmental regulations that include an April 2015 deadline for compliance with the MATS Rule. Accordingly, even if Dominion successfully

⁸⁸ *See, e.g.*, Ex. 102 (Thomassen rebuttal).

⁸⁹ Staff's Post-Hearing Brief at 42.

⁹⁰ *See, e.g.*, Ex. 93 (Allen rebuttal) at 10; Tr. 1464-65 (Allen); Dominion's Comments on the Hearing Examiner's Report at 36-37.

defers reliability violations by obtaining a limited extension of the MATS Rule,⁹¹ compliance with federal environmental regulation simply cannot be reconciled with the realities of underground construction. Additionally, even if an underground transmission line *could* be completed in time to address the need demonstrated in this case, the Commission finds, based on the record evidence, that such options would not be effective (much less cost-effective) or otherwise satisfy the requirements of Virginia law.

For example, substituting a single-circuit 230 kV underground transmission line for the proposed Surry-Skiffes Creek Line is estimated to cost approximately \$273 million, or approximately \$118 million more than the \$155 million Proposed Project.⁹² However, the load flow modeling studies in this case show that the underground line component of this more expensive project would, upon installation, be overloaded.⁹³ The Commission cannot find that the public convenience and necessity require what the evidence shows could be a useless, expensive project.⁹⁴

The performance of a double-circuit 230 kV underground Surry-Skiffes Creek Line would be better than a single circuit because the line itself would no longer be overloaded upon installation. However, load flow studies show that a double-circuit 230 kV underground line

⁹¹ Dominion can request a one-year extension of this deadline from the DEQ and can request a second one-year extension, in the form of an enforcement Administrative Order, from the Environmental Protection Agency. *See, e.g.*, Hearing Examiner's Report at 154.

⁹² *See, e.g.*, Ex. 91 at Rebuttal Schedule 5; Tr. 906-07 (Whittier) (testifying that overall the Company's construction costs are reasonable).

⁹³ *See, e.g.*, Tr. 1071-74 (Chiles); Ex. 90 at Rebuttal Schedule 4.

⁹⁴ Although this section of the Order discusses the total cost of projects or portions of projects, the record indicates that selecting a 230 kV project or the Chickahominy Alternative, rather than the 500 kV Proposed Project, would, under current federal regulation, increase the share of costs that PJM would assign to Virginia ratepayers. *See, e.g.*, Hearing Examiner's Report at 152; Staff's Post-Hearing Brief at 34-36; ODEC's Post-Hearing Brief at 8.

would not address projected overloads on one transmission line and one transformer.⁹⁵ This double-circuit option, which, at \$440 million, is estimated to cost \$285 million more than the Proposed Project, would still require additional infrastructure projects (with additional costs and impacts) to address projected reliability violations that the Proposed Project addresses.⁹⁶ Even if a project including a double-circuit 230 kV underground line could be completed in time to address upcoming NERC reliability violations, the Commission finds that the significant reliability and cost disadvantages of such a project, among other detrimental considerations, outweigh the beneficial considerations from constructing a double-circuit transmission line under, rather than over, the James River. The evidence demonstrates that this type of project would not reasonably meet the identified reliability need.

There are similar problems with the underground variation put forth by James City County that would combine a single-circuit 230 kV underground crossing of the James River with a special protection scheme of some unspecified type, among other components of this variation. This James City County underground variation is estimated by Dominion to cost approximately \$146 million more than the Proposed Project⁹⁷ while James City County estimates it would cost \$69 million more.⁹⁸ A James City County witness testified that a special protection scheme could be used to address one projected overload;⁹⁹ however, Dominion identified several transformers overloading with this variation.¹⁰⁰ Additionally, PJM's Vice President of

⁹⁵ See, e.g., Tr. 1071-74 (Chiles); Ex. 90 at Rebuttal Schedule 4.

⁹⁶ Ex. 90 at Rebuttal Schedule 4; Tr. 906-07 (Whittier) (testifying that overall the Company's construction costs are reasonable).

⁹⁷ Ex. 95.

⁹⁸ Tr. 922 (Whittier).

⁹⁹ Tr. 937 (Whittier).

¹⁰⁰ Tr. 1298, 1303 (Nedwick).

Transmission Planning testified that PJM only allows special protection schemes as a temporary measure in its region and that one type of special protection scheme, a system reconfiguration, may not even be effective in the North Hampton Roads Area.¹⁰¹ By relying on a conceptual special protection scheme and underground construction that is likely to extend beyond projected reliability violations, the Commission finds that this more costly variation presents an unreasonable reliability risk to customers that, among other factors, outweighs the beneficial considerations. Based on the evidence, the Commission finds that this alternative would not reasonably meet the reliability need identified in this case.

Another James City County 230 kV underground variation relies on a device known as a phase angle regulator ("PAR"). This alternative – which Dominion estimates would cost approximately \$142 million more than the Proposed Project¹⁰² and James City County estimates would cost \$37 million more¹⁰³ – was offered without an engineering study to evaluate its performance.¹⁰⁴ James City County testified that PARs are commonly installed and contended that a 230 kV project with a PAR could potentially work.¹⁰⁵ Dominion testified that this James City County alternative was electrically comparable to a project that PJM previously studied and found deficient¹⁰⁶ and testified further that using a PAR on a dynamic network system "would be

¹⁰¹ Tr. 1387-88 (Herling).

¹⁰² Ex. 95.

¹⁰³ Ex. 69.

¹⁰⁴ Tr. 987 (Whittier).

¹⁰⁵ *See, e.g.*, Tr. 925 (Whittier); James City County's and Save the James's Joint Comments on Hearing Examiner's Report at 19-20.

¹⁰⁶ Tr. 1300, 1346 (Nedwick) ("[T]he analysis that was done for the LS Power proposal that the PAR was never able to have a setting capable of preventing itself from overloading and at the same time it was causing other devices to overload."). *See also* Ex. 92 (Herling rebuttal) at 20 ("For the Yorktown Unit 2 sensitivity, the 230 kV Surry-Skiffes Creek line and PAR is not a workable solution. There is no one setting that would allow the 230 kV line to operate without resulting in Reliability Violations on some other circuit.").

at best . . . very problematic and potentially a detriment to reliability."¹⁰⁷ The Commission finds that, among other considerations, the reliability risk associated with this more costly underground alternative, which likely could not be constructed in time to address upcoming projected reliability violations and has been offered without study, outweighs the benefits associated with this option. Based on the evidence, the Commission finds that this alternative would not reasonably meet the reliability need identified in this case.

Although Dominion has not requested that the Proposed Project or any alternative thereof be included in the underground pilot program established by HB 1319, the Commission has nonetheless reviewed the criteria for potential inclusion in this program. Because, as discussed above, the Proposed Project and alternatives thereof are not viable for underground construction, none of the projects evaluated in this proceeding qualify for inclusion in the underground pilot program.¹⁰⁸

b. 230 kV Transmission Overhead Alternatives

James City County proposed two overhead 230 kV alternatives that include, among other components, river crossings near the James River Tower Bridge. Such projects would shift the environmental impacts associated with a river crossing downriver from where the Proposed Project is proposed to cross. Substantially different areas would be impacted by such projects.

The first such alternative, identified as Alternative C, was proposed in prefiled testimony. This alternative was ultimately abandoned by James City County after modeling studies

¹⁰⁷ Tr. 1346-47 (Nedwick). *See also* Ex. 92 (Herling rebuttal) at 20 ("Operationally, the 230 kV Surry-Skiffes Creek line and PAR, whether underground or overhead, is a challenging solution....").

¹⁰⁸ We therefore need not reach issues concerning the pilot program's other statutory criteria, including the cost criteria which Dominion asserts the underground alternatives also fail. *See, e.g.*, Ex. 93 (Allen rebuttal) at 19-20; Tr. 1454-55 (Allen).

indicated that it would not work electrically.¹⁰⁹ The record supports this conclusion and therefore Alternative C warrants no further consideration in this proceeding.¹¹⁰

The second proposed alternative with a downriver, overhead crossing of the James River was offered through oral testimony as a variation to the abandoned Alternative C ("Variation to Alternative C"). The primary components of Variation to Alternative C include a new transformer, rebuilding an existing transmission line, and constructing a new 230 kV transmission line between Dominion's existing Chuckatuck¹¹¹ and Whealton substations, which would require an overhead crossing of the James River.¹¹² James City County testified that its Variation to Alternative C did not address an overload on one transmission line¹¹³ while Dominion testified that this alternative also produced multiple transformer overloads and "troubling" effects on the operations of the Surry Nuclear Power Station.¹¹⁴

In proposing Variation to Alternative C as an overhead project, James City County acknowledged that a portion of a new Chuckatuck to Whealton line might need to be undergrounded if the existing right-of-way is constrained.¹¹⁵ The evidence in this case confirms this is a very constrained right-of-way, particularly in Newport News (*i.e.*, between the James River and the Whealton substation).¹¹⁶ As with other alternatives discussed above, this project presents unreasonable reliability risks. Even if it could be constructed in a timely and safe

¹⁰⁹ Tr. 939 (Whittier).

¹¹⁰ *See, e.g.*, Ex. 90.

¹¹¹ The Chuckatuck substation is located in Isle of Wight County. Ex. 119; Tr. 1681 (Harper).

¹¹² Ex. 71.

¹¹³ Tr. 941-45 (Whittier).

¹¹⁴ Tr. 1303-04 (Nedwick).

¹¹⁵ *See, e.g.*, Tr. 995 (Whittier).

¹¹⁶ Tr. 1680-85 (Harper); Ex. 119.

fashion, Variation to Alternative C would leave unaddressed certain projected reliability violations. Additionally, the underground construction required in a populated area of Newport News for this alternative makes it highly unlikely that such a complex project could be constructed in time to address projected reliability violations. The Commission also recognizes that underground construction would cost ratepayers more.¹¹⁷

The significant reliability risk associated with Variation to Alternative C is comparable to many of the 230 kV alternatives with underground crossings of the James River. Although James City County estimates the cost of Variation to Alternative C to be closer to the Proposed Project than those other alternatives, so too are the environmental impacts. This is because Variation to Alternative C involves, among other things, both an overhead crossing of the James River and a lengthy underground construction project.

The Commission finds that, among other considerations, the significant reliability risks associated with Variation to Alternative C and the costs associated therewith outweigh the benefits from constructing this alternative instead of the Proposed Project. Based on the evidence, the Commission finds that this alternative would not reasonably meet the reliability need identified in this case.

In comments on the Hearing Examiner's Report, James City County and Save the James indicated that that James City County "was able to resolve many, but not all, NERC violation [sic]" with its variations, and that those variations "would work" with "more time and effort."¹¹⁸ Such an assertion fails to appropriately recognize the considerable volume, quality, and weight

¹¹⁷ Ex. 96. These estimates do not include any costs associated with addressing remaining reliability violations or operational problems resulting from Variation to Alternative C.

¹¹⁸ James City County's and Save the James's Joint Comments on Hearing Examiner's Report at 19-20. James City County indicates that Dominion notified it of the Chickahominy Alternative Project and the Proposed Project in January and March of 2012, respectively. *Id.* at 28; Ex. 50 (Reidenbach) at 13.

of the engineering analysis of alternative projects included in the record. Indeed, the Hearing Examiner even directed Dominion to conduct and file load flow modeling analysis of a James City County variation,¹¹⁹ which the County ultimately abandoned.¹²⁰ Additionally, the Commission concludes, based on the record, that maintaining reliability of the grid used to support electric service in the North Hampton Roads Area and complying with federal environmental regulations do not allow more time for studying hypothetical options. Significant projected reliability violations resulting from known environmental regulations require construction to commence as soon as possible.

Dominion's Application also identifies double-circuit overhead 230 kV variations of the Proposed Project and the Chickahominy Alternative Project. More specifically, the Application identifies, as one alternative, construction of the Proposed Project with a double-circuit 230 kV (instead of single-circuit 500 kV) Surry-Skiffes Creek Line and, as a second alternative, construction of the Chickahominy Alternative Project with a double-circuit 230 kV (instead of single-circuit 500 kV) Chickahominy-Skiffes Creek Line. Although the option was approximately \$23 million less than the Proposed Project, Dominion rejected the 230 kV double-circuit Surry-Skiffes Creek Line because, among other things, it: (1) would not resolve all of the identified NERC criteria violations; (2) would require taller structures than a single-circuit 500 kV line; and (3) would limit potential future extensions of Dominion's transmission system to the south of the Surry Nuclear Power Station.¹²¹ Dominion rejected the double-circuit 230 kV Chickahominy-Skiffes Creek line because it failed to address identified

¹¹⁹ See, e.g., January 30, 2013 Hearing Examiner's Ruling at 2 (directing Dominion to model James City County's "Alternative C").

¹²⁰ Tr. 939 (Whittier).

¹²¹ See, e.g., Ex. 23 (Application), Attached Appendix at 55-56.

reliability criteria violations and would cost approximately \$36 million more than the Proposed Project.¹²² Based on the record, the Commission finds that these two alternatives, which no case participant supported, were reasonably rejected.

Because the evidence demonstrates that oncoming reliability violations cannot be reasonably addressed by generation alternatives (alone or in combination with transmission alternatives), demand side management alternatives, or lower voltage transmission (underground or overhead), we turn next to the 500 kV Proposed Project and the 500 kV Chickahominy Alternative Project.

500 kV Transmission Alternatives

Comparing the two electrically equivalent 500 kV projects proposed by Dominion, the Commission agrees with the Hearing Examiner that "the [Chickahominy Alternative Project] has a higher cost than the Proposed Project and will have a greater impact on scenic assets, historic districts and the environment."¹²³ Many public witnesses and case participants – including Dominion, the Ledbetters, Lennar, Charles City County, and Staff – introduced a considerable amount of comparative data, pictures, and other testimony that makes clear the comparative benefits of the Proposed Project.¹²⁴ The record does not support approval of the Chickahominy Alternative Project instead of the Proposed Project.

Because these two projects share many common components, their relative advantages and disadvantages stem from their use of different 500 kV lines: the approximately 8.0 mile-long Surry-Skiffes Creek Line of the Proposed Project and the approximately 37.9 mile-long Chickahominy-Skiffes Creek Line of the Chickahominy Alternative Project. The

¹²² See, e.g., Ex. 23 (Application), Attached Appendix at 56-57.

¹²³ Hearing Examiner's Report at 175.

¹²⁴ See, e.g., Ledbetters' Post-Hearing Brief; Lennar's Post-Hearing Brief at 3-8; Staff's Post-Hearing Brief at 27-36.

much shorter Surry-Skiffes Creek Line is estimated to cost approximately \$58 million less than the Chickahominy-Skiffes Creek Line.¹²⁵

Based on information identifying certain environmental impacts that the Commission regularly assesses as part of our overall evaluation of transmission project impacts, the impacts associated with the Chickahominy Alternative Project were, almost across the board, numerically greater than for the Proposed Project.¹²⁶ For example, the Surry-Skiffes Creek Line of the Proposed Project passes within 500 feet of approximately 160 residences, while the Chickahominy-Skiffes Creek Line counts 1,129 residences within 500 feet of its route.¹²⁷

The difference between the overall environmental impacts of these two projects only grows when one looks beyond the numbers for the few impacts that appear to weigh in favor of the Chickahominy Alternative Project. For example, variations of the James River crossing of the Proposed Project would involve a longer crossing of surface waters than the Chickahominy River crossing for the Chickahominy Alternative Project. Looking only at this statistic, one might conclude that a James River crossing would be more visually impacting than the Chickahominy River crossing. One might further conclude that, since both lines would cross the Captain John Smith National Historic Water Trail, the longer crossing of the James River would be a greater impact to a historic resource than the shorter crossing of the Chickahominy. But persuasive evidence supports a contrary finding. Namely, one of the experts retained by Staff highlighted (and other evidence supported) a stark difference between impacts already existing on the relevant portions of the James River but absent from those portions of the Chickahominy River. Staff testified that "there really is no comparison" between the two crossings because the

¹²⁵ See, e.g., Ex. 116 (Swanson rebuttal) at Rebuttal Schedule 1.

¹²⁶ See, e.g., Hearing Examiner's Report at 142; Ex. 23; Ex. 29; Tr. 499 (Lake); Ex. 50 (Reidenbach) at 13-16.

¹²⁷ *Id.*; Ex. 83 (McCoy), Attached Exhibit WDM-1 at 23-24.

Chickahominy route would traverse a pristine area of the Captain John Smith National Historic Water Trail.¹²⁸

In contrast, the James River route is already heavily impacted by more modern developments.¹²⁹ Such developments include the Surry Nuclear Power Plant, Kingsmill (including its marina), water towers, the Ghost Fleet,¹³⁰ and tall theme park rides – all of which are visible from this portion of the James River.¹³¹

The environmental impact of the Proposed Project is discussed in greater detail below in our evaluation of the Proposed Project under applicable law. In this regard, James City County and Save the James argue that even if need is established, the statute requires the Proposed Project to be denied if there is not a route that satisfies the environmental standards in the Code.¹³² As discussed below, however, we have found based on the evidence in this case that the Proposed Project and the route approved herein meet the statutory environmental standards.

THE PROPOSED PROJECT

Need

The Proposed Project addresses significant near-term system needs in the North Hampton Roads Area while also addressing the area's longer-term needs.

As discussed above, the extensive load flow modeling results and analysis in this case demonstrate a significant system need projected to arise as early as 2015 and that the Proposed

¹²⁸ Tr. 1160-61 (McCoy). *See also* Ex. 63 (Street) at 9-11; Ex. 21 (Ledbetter).

¹²⁹ *See, e.g.*, Tr. 835-41 (Street).

¹³⁰ The Ghost Fleet is "a collection of retired naval vessels that are temporarily anchored offshore from Fort Eustis." Ex. 37 (Harper direct) at 14. *See also* Tr. 817 (Street).

¹³¹ *See, e.g.*, Tr. 1136-37 (McCoy); Ex. 100; Ex. 118 (Harper rebuttal) at Rebuttal Schedules 1, 2.

¹³² *See, e.g.*, James City County's and Save the James's Joint Comments on the Hearing Examiner's Report at 10-18.

Project, unlike other potential alternatives, will address that need.¹³³ Upcoming reliability violations have been projected under a variety of reasonable future scenarios that have been updated and expanded during the course of this case. The evidence in this case establishes that federal environmental regulation will soon affect the operation of generating facilities needed to maintain reliable electric service in the North Hampton Roads Area, but that the Proposed Project will complement existing infrastructure to maintain system reliability when these generation facilities are retired or significantly restricted.

Our approval herein is not a matter of "bigger is better;"¹³⁴ rather, we approve the Proposed Project because the evidence demonstrates that it is of the appropriate size, location, and design to address the significant reliability risks in the North Hampton Roads Area, and ensure the continued delivery of critically needed electric service to the hundreds of thousands of people in this region of Virginia. The evidence demonstrates that the public convenience and necessity require all components of the Proposed Project – including the 500 kV Surry-Skiffes Creek Line, the 230 kV Skiffes Creek-Wheaton Line, and the Skiffes Creek Switching Station, which is a critical part of both these lines – to ensure reliability in the Commonwealth.

Because the Proposed Project is needed to address significant near-term reliability violations, our approval herein is based significantly on that urgent need. In addition to this urgent need, the Commission finds that the Proposed Project addresses longer-term system needs fundamental to ensuring reliability further into the future. Namely, the Proposed Project addresses reliability violations projected as early as 2019 due solely to continued load growth in the North Hampton Roads Area (*i.e.*, without consideration of upcoming generation retirements).

¹³³ We agree with the Hearing Examiner that the record supports the continued use of Dominion's planning criteria, which has been accepted by this Commission for many years and in many cases, as well as by the Federal Energy Regulatory Commission and NERC. Hearing Examiner's Report at 129-31.

¹³⁴ James City County's and Save the James's Joint Comments on the Hearing Examiner's Report at 21.

Furthermore, the Commission agrees with the Hearing Examiner that an additional benefit of the Proposed Project is that it lowers the possibility "that this or nearby areas will be impacted by the need for additional transmission or generation."¹³⁵

Scenic Assets, Historic Districts and Resources, and the Environment

The Commission recognizes the environmental impact that the Proposed Project will have on the Counties of James City, Surry, and York and the Cities of Newport News and Hampton. However, the Commission finds, based on the record, that the routes chosen for the Surry-Skiffes Creek Line and the Skiffes Creek-Wheaton Line, and the use of an existing transmission corridor for the Skiffes Creek Switching Station, reasonably minimize adverse impact on the scenic assets, historic districts and resources, and environment in the area of the Proposed Project. Additionally, we adopt the DEQ recommendations identified below as conditions to our approval that we find, based on the record, are desirable or necessary to minimize adverse environmental impact.

The Proposed Project's more significant impacts to scenic assets, historic districts and resources, and the environment are associated with the 500 kV Surry-Skiffes Creek Line and specifically the portion of the line that crosses the James River. The Proposed Project will require the installation of towers and lines across the James River, but will do so in a part of the James River where the Commission finds that impacts to scenic assets, historic districts and resources, and the environment will be reasonable. The 3,000 mile-long Captain John Smith National Historic Trail, which includes the James River, possesses areas that are significantly developed.¹³⁶ As previously noted, visible already from the part of the James River where the

¹³⁵ Hearing Examiner's Report at 157.

¹³⁶ Tr. 831-32 (Street).

Proposed Project would cross are, among other things, the Surry Nuclear Power Station, a resort community with a marina and riverfront golf, the Ghost Fleet, theme park rides, water towers, and a sewage treatment plant.¹³⁷ Multiple military installations and several industrial properties, including the BASF property, also are adjacent to this part of the James River.¹³⁸

The record further suggests that development along this portion of the James River has not concluded. BASF has detailed its interest and efforts to redevelop its shoreline property.¹³⁹ A James City County witness testified that the BASF property: (1) "represents one of the largest contiguous parcels of land identified for development in the County and its sole option for a deep-water port;" (2) is located in a place that "makes this an attractive area for a number of potential development opportunities;" and (3) is located "within both the County's designated Enterprise and Tourism Zones, which makes future development potentially eligible for certain financial incentives from both the County and the Commonwealth."¹⁴⁰ Looking beyond the BASF property, James City County's witnesses testified that investment in a major conference and recreational center is being made in the area of the James River crossing, and the comprehensive local plan introduced by the County outlines a vision for future development.¹⁴¹ Although the Commission does not speculate about the extent to which any future development in this area might further impact the James River, the record demonstrates that this portion of the James River mixes progress with history.

¹³⁷ Tr. 1169-70 (McCoy); Ex. 83 (McCoy), Attached Exhibit WDM-1 at 18-20; Ex. 118 (Harper rebuttal) at Rebuttal Schedule I; Tr. 587, 607 (Reidenbach); Ex. 100.

¹³⁸ Ex. 118 (Harper rebuttal) at Rebuttal Schedule I; Tr. 591 (Reidenbach); Tr. 779 (Henderson).

¹³⁹ See, e.g., Ex. 46 (Waltz); Ex. 60 (Henderson); Ex. 62 (Romeo).

¹⁴⁰ Ex. 56 (Middaugh) at 8-9.

¹⁴¹ *Id.* at 8; Ex. 50 (Reidenbach), Attached 2009 Plan at 113, 115, 126.

The Historic Triangle offers some of the Commonwealth's and our nation's foremost historic resources.¹⁴² But the documented trove of rich historic resources within the Historic Triangle underscores how the route of the Proposed Project reasonably minimizes adverse impacts to the environment. The Proposed Project is proposed for construction along a route where it will avoid impacting most of the historic resources contained in the Historic Triangle.

Additionally, the record does not support James City County's assertions about the significance of impacts to identified historic resources, scenic assets, and the environment in the area of the Proposed Project. The evidence in this case included, among other things, detailed testimony by experts in photographic simulations and many photographs containing simulated facilities, provided by both Dominion and James City County. Based on a review of the evidence, the Commission agrees with the Hearing Examiner's conclusions that: (1) "the Proposed Project will have a limited visual impact on one section of the Colonial Parkway and a very limited impact on a small portion of Jamestown Island;"¹⁴³ (2) "From most of the Colonial Parkway, and the areas of Jamestown Island that are the focus of most public interest, such as the visitor's center, fort, settlement, and archeological digs, the Proposed Project will not be seen;"¹⁴⁴ (3) "Where the Proposed Project is visible from the Colonial Parkway or Jamestown Island, because . . . the Proposed Project will be more than four to six miles distant, the Proposed Project should blend with the other modern intrusions on the viewshed;"¹⁴⁵ (4) "the Proposed

¹⁴² See, e.g., Ex. 67 (Kelso); Ex. 76 (Chappell); Tr. 1035-37 (Campbell).

¹⁴³ Hearing Examiner's Report at 140. See, e.g., Ex. 23 (Application), Attached Appendix C at 19, 43; Ex. 83 (McCoy), Attached Exhibit WDM-1 at 19, 31; Ex. 84 (Westergard); Ex. 85.

¹⁴⁴ Hearing Examiner's Report at 140. See, e.g., Ex. 124 (Lake rebuttal) at 9; Ex. 83 (McCoy), Attached Exhibit WDM-1 at 18-19, 31.

¹⁴⁵ Hearing Examiner's Report at 140. See, e.g., Ex. 23 (Application), Attached Appendix C at 19, 43; Ex. 83 (McCoy), Attached Exhibit WDM-1 at 19, 31; Ex. 84 and 85 (Westergard).

Project will not alter the nature of this section of the James River;"¹⁴⁶ and (5) "The Proposed Project will have a significant visual impact on the view from Carter's Grove, and will impact the view from Kingsmill Resort and Golf Club."¹⁴⁷

The Commission has also considered Code § 10.1-419, which, among other things, defines a portion of the James River as a "Historic River." The Surry-Skiffes Creek Line of the Proposed Project straddles the downriver boundary of the Historic River defined by this statute. As the Surry-Skiffes Creek Line leaves the Surry Nuclear Power Station property, the Proposed Project begins within the Historic River, then crosses over to a part of the James River that is not so designated by the statute before arriving onshore in James City County.¹⁴⁸ The record supports the Hearing Examiner's finding that "the Surry-Skiffes Creek Line would not change the character of the James River where it crosses the portion of the James River designated by § 10.1-419 as an 'Historic River.'"¹⁴⁹ Even ignoring the other industrial, commercial, and military sites in this part of the James River, the area where the Surry-Skiffes Creek Line would fall within the "Historic River" designation is an extension of existing electric infrastructure and operations at the Surry Nuclear Power Station, which contains significant electric transmission infrastructure and electric generation dependent on, among other things, water from the James River.

The Commission further agrees with the Hearing Examiner that "the portion of the Surry-Skiffes Creek Line crossing through the portion of the James River designated by

¹⁴⁶ Hearing Examiner's Report at 140. *See, e.g.*, Ex. 48 (Burrows) at Figure VCB-1; Ex. 60 (Henderson) at TCH-2; Ex. 118 (Harper rebuttal) at Rebuttal Schedule 1; Tr. 591 (Reidenbach); Tr. 779 (Henderson).

¹⁴⁷ Hearing Examiner's Report at 140. *See, e.g.*, Ex. 83 (McCoy), Attached Exhibit WDM-1 at 19-20; Ex. 125; Ex. 23 (Application), Attached Appendix G.

¹⁴⁸ Tr. 853-56 (Street); Ex. 66.

¹⁴⁹ Hearing Examiner's Report at 139.

§ 10.1-419 as an 'Historic River' will be the least visually impacting portion of the James River crossing of the Surry-Skiffes Creek Line."¹⁵⁰ The evidence shows that Hog Island will offer partial screening of this portion of the Surry-Skiffes Creek Line when viewed from the "Historic River" and upriver historic resources.¹⁵¹ We also note that numerous potential alternative solutions have been evaluated in this proceeding, as contemplated by § 10.1-419.

Based on the evidence of environmental impacts in this case – including, but not limited to, impacts to the James River, Carter's Grove and other historic resources and scenic assets, and to Kingsmill – the Commission finds that the Surry-Skiffes Creek Line route reasonably minimizes adverse environmental impacts.

The Commission similarly finds that the Skiffes Creek-Wheaton Line route reasonably minimizes adverse impacts to scenic assets, historic districts and resources, and the environment. This line will be constructed entirely in an existing right-of-way already occupied by transmission lines.¹⁵² As such, the adverse impacts associated with the Skiffes Creek-Wheaton Line route are minimal.

Using the Skiffes Creek Switching Station as part of the Surry-Skiffes Creek Line and the Skiffes Creek-Wheaton Line will also reasonably minimize adverse impacts to scenic assets, historic districts and resources, and the environment. This site is located near, among other things, Route 143, Interstate 64, a jail, a detention center, and the Yorktown Naval Weapons Station.¹⁵³ Additionally, the Skiffes Creek Switching Station will be constructed on property

¹⁵⁰ *Id.* at 139-40.

¹⁵¹ *See, e.g.*, Ex. 66.

¹⁵² *See, e.g.*, Ex. 37 (Harper direct) at 3-5.

¹⁵³ *See, e.g.*, Ex. 118 (Harper rebuttal) at Rebuttal Schedules 1, 2; Ex. 60 (Henderson), Attached Exhibit TCH-10.

owned by Dominion that already serves as a significant transmission corridor for the North Hampton Roads Area.¹⁵⁴

Economic Development

The Commission must consider a diverse and broad range of economic development interests presented by the Application. By statute, we must consider "economic development within the Commonwealth."¹⁵⁵ Therefore the Commission's consideration of economic development in this proceeding includes, but is not limited to, the two counties (James City and Charles City) that participated as parties.

As discussed above, the need demonstrated in this proceeding is for significant additional facilities to maintain reliable electric service across a substantial portion of the Commonwealth. Customers in these counties and cities include citizens, schools, local governments, and businesses that depend on reliable power for a variety of needs. This area of the Commonwealth also includes a considerable military presence that provides security for our country and jobs in the Commonwealth.

In James City County, the record includes, among other things, evidence of:

- (1) development of the tourism sector through, among other things, long-standing preservation efforts and more recent efforts to obtain World Heritage status designation of the Historic Triangle;¹⁵⁶
- (2) plans by BASF for the sale and development of its property where Dominion proposes to bring the Surry-Skiffes Creek Line onshore in James City County;¹⁵⁷
- (3) plans for a

¹⁵⁴ See, e.g., Ex. 118 (Harper rebuttal) at Rebuttal Schedule 6; Ex. 23 (Application), Attached Appendix at 117.

¹⁵⁵ Va. Code § 56-46.1 A.

¹⁵⁶ See, e.g., Ex. 77 (Campbell); Ex. 67 (Kelso); Ex. 76 (Chappell); Ex. 78 (Schreiber).

¹⁵⁷ See, e.g., Ex. 46 (Waltz); Ex. 60 (Henderson); Ex. 50 (Reidenbach) at 10; Tr. 590 (Reidenbach). The BASF property is currently zoned industrial and is under environmental remediation resulting from past industrial activities. Ex. 46 (Waltz); Ex. 48 (Burrows).

major conference center and recreational center in the immediate area of the vicinity of the Proposed Project;¹⁵⁸ (4) shipping traffic through the portion of the James River where the Surry-Skiffes Creek line would cross and which Dominion proposes to accommodate through tower placement and height;¹⁵⁹ and (5) military air traffic in the vicinity of the Surry-Skiffes Creek Line, which Dominion has accommodated through tower location.¹⁶⁰

The Commission finds that the Proposed Project will support economic development in the Commonwealth by cost-effectively maintaining system reliability in a large part of the Commonwealth and adequately increasing transmission capacity. Given these benefits and the modern development existing along the route of the Proposed Project, the Commission cannot conclude that tourism in the Historic Triangle or economic development in the Commonwealth will be negatively impacted by the Proposed Project.

However, as discussed below, the Commission finds that economic development efforts regarding the BASF property, in combination with environmental considerations and consideration of James City County's comprehensive plan, support our approval of the James River crossing known as Variation 4.

Comprehensive Plan

The Commission has considered the evidence received on James City County's 2009 comprehensive plan, which was introduced into the record ("2009 Plan").¹⁶¹ With respect to its 2009 Plan, James City County's witness testified that "any of the routings presented by

¹⁵⁸ Ex. 56 (Middaugh) at 8.

¹⁵⁹ Ex. 83 (McCoy) at 5 ("Because of ship traffic, four of the towers would be almost 300 feet in height."). Ex. 37 (Harper direct) at 13-14; Ex. 118 (Harper rebuttal) at Rebuttal Schedules 1, 2.

¹⁶⁰ Ex. 38 (Harper supplemental direct).

¹⁶¹ We have also considered the testimony of Charles City County regarding its comprehensive plan and potential impacts of the Chickahominy Alternative Project on, among other things, the Chickahominy Indian Tribe's annual Pow-Wow event. Ex. 20 (Rowe) at 2-4.

Dominion have an adverse impact on James City County" and the "proposed locations are generally not consistent with the Comprehensive Plan Land Use Designations or adopted Goals, Strategies and Actions particularly in the Land Use, Community Character, Economic Development and Environmental sections."¹⁶²

The 2009 Plan also identifies the area around the BASF property as one with further development potential. The 2009 Plan, among other things, identifies that: (1) "[o]pportunities for redevelopment exist throughout the County, from the BASF property and the nearby borrow pits in Grove. . . . ;"¹⁶³ (2) "The former BASF site . . . was served by barge on the Wood Creek side until the 1980s. Both Wood Creek and Skiffe's Creek offer opportunity for barge access. The James River provides direct access to the Port of Virginia, the busiest ice-free harbor (by tonnage) in the world. . . . ;"¹⁶⁴ and (3) a four-lane roadway project is "necessary to promote future industrial development in the Skiffe's Creek industrial area and to meet local traffic needs."¹⁶⁵

Finally, the Commission does not find that James City County has provided, pursuant to Code § 56-46.1 B, adequate evidence that existing planned corridors or routes designated in its 2009 Plan can adequately serve the needs identified by the record. To the contrary, James City County has advocated for potential underground alternatives and potential alternatives outside of James City County that would, if pursued instead of the Proposed Project, compromise reliable electric service for Dominion's customers in the North Hampton Roads Area.

¹⁶² Ex. 50 (Reidenbach) at 16.

¹⁶³ *Id.*, Attached 2009 Plan at 126.

¹⁶⁴ *Id.*, Attached 2009 Plan at 113.

¹⁶⁵ *Id.*, Attached 2009 Plan at 115. *See also* Ex. 60 (Henderson) at 7, Attached Exhibit TCH-10; Tr. 778-80, 796 (Henderson) (identifying an approved highway interchange in the vicinity of Skiffes Creek and the BASF property).

Variation 4

Dominion and BASF identified several potential approaches to crossing the James River from the Surry Nuclear Power Station property, most with only slight variations in tower alignment. After some of these variations proved unworkable,¹⁶⁶ parties focused on three potential approaches to crossing the James River: Variations 1, 3, and 4.¹⁶⁷

Dominion supports Variation 1, which would come onshore in the middle of the BASF property. Dominion contends, and the Hearing Examiner agrees, that Variation 1 would have a lesser visual impact on Carter's Grove, the Colonial Parkway, and Black's Point than would Variations 3 or 4.¹⁶⁸ Additionally, Dominion contends that it is "uncertain whether it will be able to obtain the entire right-of-way necessary for the Variation 3 or 4 routes as the Company cannot exercise the power of eminent domain over a portion of the property owned by the [James City County Economic Development Authority ("EDA")]."¹⁶⁹

In contrast, BASF asserts that its "main purpose for participating in this case is to make sure the Commission understands how important it is that, if a transmission line is going to be constructed on BASF's property, it needs to go on the Variation 3-4 route on the north side of the property...."¹⁷⁰ BASF's preference for Variation 3 or 4 is based in part on economic development efforts regarding its property, as discussed above. BASF's preference is also based on its active onsite environmental remediation through the execution of an environmental plan

¹⁶⁶ See, e.g., Ex. 38 (Harper supplemental direct) (amending Dominion's recommended tower alignment across the James River as a result of consultation with officials from the United States Department of Defense).

¹⁶⁷ See, e.g., Ex. 66; Ex. 97.

¹⁶⁸ See, e.g., Dominion's Comments on the Hearing Examiner's Report at 52-54; Hearing Examiner's Report at 170.

¹⁶⁹ See, e.g., Dominion's Comments on the Hearing Examiner's Report at 54.

¹⁷⁰ BASF's Comments on the Hearing Examiner's Report at 2.

that was approved and is overseen by the DEQ.¹⁷¹ BASF raised concerns about the ability to implement onsite remediation in the manner currently approved by DEQ if Variation 1 is constructed.¹⁷²

The Commission agrees with the Hearing Examiner's analysis of the various James River crossing variations, including their relative impacts to the environment, scenic assets, and historic resources.¹⁷³ Among the record evidence that has been evaluated, the environmental and economic development considerations in particular favor Variation 4, rather than Variation 1 or 3.¹⁷⁴ Accordingly, the Proposed Project with Variation 4 is approved herein.

The Hearing Examiner recommended approval of Variation 4 on the "condition that the [EDA] and [Dominion] conclude a right-of-way agreement within three weeks of the Commission's final order. If such an agreement is not concluded three weeks from the Commission's final order, then the route crossing the James River should be James River Crossing Variation 1."¹⁷⁵ Dominion took exception to this recommendation and asserted that Variation 1 should be approved unconditionally, while James City County, Save the James, and BASF also took exception to conditional approval.¹⁷⁶

The Commission agrees with James City County and BASF that conditional approval of Variation 4 is not appropriate at this time. James City County's economic development director

¹⁷¹ See, e.g., Ex. 48 (Burrows).

¹⁷² *Id.*; Tr. 549-84 (Burrows); Ex. 127 (Taylor rebuttal).

¹⁷³ Hearing Examiner's Report at 164-72.

¹⁷⁴ See, e.g., Tr. 661-85 (Seymour); Tr. 590 (Reidenbach); Ex. 48 (Burrows); Tr. 549-84 (Burrows).

¹⁷⁵ Hearing Examiner's Report at 175-76.

¹⁷⁶ See, e.g., Dominion's Comments on Hearing Examiner's Report at 42-55; James City County's and Save the James's Joint Comments on Hearing Examiner's Report at 23-26; BASF's Comments on Hearing Examiner's Report at 1-26.

testified that the EDA was committed to negotiating an easement with Dominion to the extent such an agreement is necessary for the more northern crossing in James City County for Variation 3, which is identical to that of Variation 4.¹⁷⁷ Although Dominion and the EDA had not yet executed such an agreement when the record closed in this proceeding,¹⁷⁸ the Commission fully expects that the EDA, Dominion, and any other necessary parties to such an agreement will continue negotiating in good faith to complete any right-of-way agreement necessary for Variation 4.

Department of Environmental Quality and BASF Property Conditions

The Commission finds it necessary and desirable to condition the approval herein on the conditions contained in the Summary of General Recommendations of the DEQ Report, with two exceptions. First, with respect to coordination with the Department of Forestry, it is appropriate that our Order should not foreclose the Company's ability to negotiate and potentially avoid mitigation for loss of forest land.¹⁷⁹ Second, it is appropriate for Dominion to continue to coordinate with the Federal Aviation Administration and the Virginia Department of Aviation to prevent potential hazards to aviation.¹⁸⁰ Should expansion at the Newport News-Williamsburg Airport develop in the future such that Dominion's continuing use of its existing right-of-way proposed for the Skiffes Creek-Wheaton Line becomes an impediment, such a scenario would involve issues broader than this proceeding, as Dominion's existing right-of-way already includes several other transmission lines.

¹⁷⁷ Tr. 661-85 (Seymour); Ex. 97.

¹⁷⁸ Ex. 134.

¹⁷⁹ Ex. 118 (Harper rebuttal) at 4.

¹⁸⁰ *Id.* at 4-5.

The Commission also finds it necessary and desirable to condition the approval herein on additional conditions recommended by the Hearing Examiner, which are identified above as conditions 13, 14, 15, and 16.¹⁸¹ These conditions, which are approved for application to the BASF property, are reasonable.

Existing Rights-of-Way

Most of the Proposed Project would be constructed on existing rights-of-way.¹⁸² The 20.2 mile-long Skiffes Creek-Wheaton Line will be constructed entirely in an existing right-of-way.¹⁸³ Additionally, the much shorter Surry-Skiffes Creek Line begins within Dominion's Surry Nuclear Power Station property and the James City County portion of the line was designed to be collocated, to the extent practicable, with existing 115 kV facilities.¹⁸⁴ The Skiffes Creek Switching Station would use property through which several transmission lines currently cross, resulting in an expansion of an existing transmission corridor onto property already owned by Dominion.¹⁸⁵

Dominion appropriately considered and rejected – or, in the case of the Chickahominy Alternative Project, proposed as an alternative to the Proposed Project – projects that would have made additional use of other existing rights-of-way. The evidence in this case was overwhelming that such projects produced far greater environmental impacts or could not adequately serve the needs of Dominion's customers. The evidence does not indicate that the

¹⁸¹ As shown and noted above, this Order renumbers the conditions contained in the "Findings and Recommendations" section of the Hearing Examiner's Report and includes one condition that appears to have been inadvertently omitted therefrom.

¹⁸² See, e.g., Ex. 23 (Application), Attached Appendix at 125-32.

¹⁸³ See, e.g., Ex. 37 (Harper direct) at 3-5.

¹⁸⁴ *Id.* at 5, 20, 22-23; Ex. 124 (Lake rebuttal) at 15-20.

¹⁸⁵ See, e.g., Ex. 118 (Harper rebuttal) at Rebuttal Schedule 6.

public interest would be served by approving alternative routes making greater use of existing rights-of-way.

Health and Safety

The Commission finds that the Proposed Project does not represent a hazard to human health or safety. The Proposed Project will be installed using well-established methods for transmission line construction. Concerns regarding airspace and water navigation have been addressed by, among other things, tower alignment and coordination with appropriate governmental agencies. Additionally, the evidence in this case regarding electromagnetic fields does not support a finding that the Proposed Project represents a public health or safety hazard.¹⁸⁶

Skiffes Creek Switching Station

Dominion requests a Commission determination, based on the facts and circumstances of this case, that the Skiffes Creek Switching Station constitutes a "transmission line" for purposes of Code § 56-46.1 F, which provides that "[a]pproval of a transmission line pursuant to this section shall be deemed to satisfy the requirements of § 15.2-2232 and local zoning ordinances with respect to such transmission line." Although the Hearing Examiner found that the Commission has discretion to either address this issue or leave it for a circuit court to decide, the Hearing Examiner's Report includes substantial analysis of this issue,¹⁸⁷ which parties had addressed through evidence and in their pleadings.

Dominion asserts that the term "transmission line," which is undefined by the Code, is subject to statutory interpretation and that the Commission is the proper forum for such

¹⁸⁶ See, e.g., Ex. 14 (Erdreich rebuttal); Ex. 17 (Ledbetter) at 6-8.

¹⁸⁷ Hearing Examiner's Report at 157-64, 175.

interpretation.¹⁸⁸ In support of its request, Dominion asserts, among other things, that: (1) the Skiffes Creek Switching Station is "[p]hysically and operationally . . . an inseparable part of the proposed 500 kV and 230 kV lines;"¹⁸⁹ (2) NERC's definition of "transmission line" includes the Skiffes Creek Switching Station;¹⁹⁰ and (3) engineering witness testimony supports a finding that the term "transmission line" can include the Skiffes Creek Switching Station.¹⁹¹ Dominion also asserts that requesting approval of a special use permit from James City County for the Skiffes Creek Switching Station would be "futile" as evidenced by testimony of the County's witnesses and statements of counsel in this proceeding.¹⁹²

James City County and Save the James argue that Dominion's requested ruling presents an issue of pure statutory interpretation regarding zoning authority, which they contend is a matter of judicial prerogative.¹⁹³ To that end, James City County and Save the James advise that James City County filed, shortly before briefs were submitted in our proceeding, a petition for declaratory judgment and injunctive relief in circuit court and that the circuit court petition seeks an interpretation of Code § 56-46.1.¹⁹⁴

James City County and Save the James nonetheless argue, in this Commission proceeding, against Dominion's request. They assert, among other things, that: (1) Dominion

¹⁸⁸ See, e.g., Dominion's Comments on the Hearing Examiner's Report at 28-31.

¹⁸⁹ *Id.* at 15-18, 23.

¹⁹⁰ *Id.* at 24-25. Dominion also asserts that our Staff's filing guidelines for transmission line applications include the Skiffes Creek Switching Station. *Id.* at 23-24.

¹⁹¹ *Id.* at 26-28.

¹⁹² *Id.* at 9-12. Dominion also asserts that its position is consistent with a 1975 decision of the Circuit Court of Fauquier County, entered shortly after the enactment of Code § 56-46.1 F and a 2009 decision of the Maine Public Utilities Commission. *Id.* at 7-9, 18-23, 29-30.

¹⁹³ See, e.g., James City County's and Save the James's Joint Comments on the Hearing Examiner's Report at 26-27.

¹⁹⁴ *Id.* at 27-31. See also Dominion's Comments on the Hearing Examiner's Report at 31, n.114.

seeks a statutory interpretation that violates the plain meaning of Code § 56-46.1 because the terms "electrical utility facilities" and "electric transmission line" in Sections (A) and (B) of the statute, respectively, must be separate and distinct;¹⁹⁵ (2) "Dominion is unable to prove that James City County's zoning authority is expressly and clearly preempted for approval of a switching station;"¹⁹⁶ (3) James City County's and Save the James's interpretation of "transmission line" is consistent with a Webster's Dictionary definition¹⁹⁷ and Dominion's use of different terminology in its Application;¹⁹⁸ and (4) engineering witness testimony supports a finding that the term "transmission line" cannot include the Skiffes Creek Switching Station.¹⁹⁹

James City County and Save the James further assert that Dominion "pre-judg[es] the results of a legislative [county zoning] process which has not yet begun, and presum[es] it to be unreasonable against the presumption to be afforded legislative discretion."²⁰⁰ However, James City County and Save the James also advise us that: (1) during the pendency of this case, James City County's zoning administrator issued a zoning determination; and (2) "neither the court nor this Commission has jurisdiction to allow a collateral attack on the Zoning Administrator's determination."²⁰¹

¹⁹⁵ See, e.g., James City County's and Save the James's Joint Comments on the Hearing Examiner's Report at 31-38.

¹⁹⁶ *Id.* at 34.

¹⁹⁷ *Id.* at 36-37.

¹⁹⁸ *Id.* at 37-38.

¹⁹⁹ *Id.* at 36-37.

²⁰⁰ *Id.* at 31.

²⁰¹ *Id.* at 31, 39. Our Staff had previously asserted that circuit courts could determine this issue. Staff's Post-Hearing Brief at 48.

Lennar asserts, among other things, that: (1) "when a transmission line has a switching station as an 'inseparable' ... part, the switching station must also enjoy preemption;"²⁰² and (2) "[i]t is imperative that the Commission understand that its failure to find and order that the [Skiffes] Creek Switching Station is part of the Surry-[Skiffes] Creek transmission line could cause the Proposed Project not to be built or its construction delayed until after legislative relief might be secured."²⁰³ ODEC recommends that the Commission "find that the Skiffes Creek Switching Station is necessary to or inseparable from the Proposed Project."²⁰⁴

Before us is a transmission line project that will not work – and therefore cannot satisfy an urgent reliability need – without the Skiffes Creek Switching Station. James City County recognizes that:

As shown in Dominion's Application, the switching station is required to step down or transform the 500 kV power to 230 kV to feed power into two existing 230 kV transmission lines at the site, and to feed power into the new 230 kV transmission line to the Whealton [sic], and to feed power into two 115 kV transmission lines already on the site. . . . Without this switching station, there is no way for 500 kV power to be used in the project, no way to step it down or transform the voltage of the power in a usable way, as the 500 kV line ends at the Skiffes Creek site.²⁰⁵

Dominion asserts that "neither the new 500 kV line nor the new 230 kV line could, or would, be constructed or operated without Skiffes Station, which is integral to those lines."²⁰⁶ One of the experts retained by Staff described the importance of the Skiffes Creek Switching Station and its location as follows:

²⁰² Lennar's Comments on the Hearing Examiner's Report at 5 (citations omitted).

²⁰³ *Id.* at 3-4.

²⁰⁴ ODEC's Comments on the Hearing Examiner's Report at 10.

²⁰⁵ James City County's, Save the James's, and JRA's Joint Post-Hearing Brief at 50 (citations omitted).

²⁰⁶ Dominion's Comments on the Hearing Examiner's Report at 18; Ex. 87 (Nedwick rebuttal) at 36-38.

It's really twofold. The strong source, number one, serves basically as a surrogate, if you will, for the Yorktown generation. So it's reasonable to assume that that makes sense.

The other thing is by splitting up the 230 [kV] lines coming from Chickahominy going down further, going down to Whealton, by splitting those circuits and injecting power at . . . [Skiffes Creek], what we're really doing is we're sending power throughout the peninsula both north and south in that case, which is going to create a counterflow to resolve the generator deficiencies in the north, which is going to solve NERC violations to the north. It's also going to deal with the issues of the generation load deficiency in the south at that injection point, as well. . . . [W]hat we're really doing is lessening the generation load balance, so we're reducing flows across the northern and southern circuit sends [sic] into the system.²⁰⁷

The need for the Skiffes Creek Switching Station, and indeed the entire Proposed Project, is underscored by the record developed on potential transmission alternatives thereto. As discussed above, only the Chickahominy Alternative Project – which also requires construction of the Skiffes Creek Switching Station – can reasonably address fast-approaching NERC reliability violations for the North Hampton Roads Area.

The evidence demonstrates that the ability to address significant NERC reliability violations projected to occur in the North Hampton Roads Area as early as 2015 depends, in large part, on the Skiffes Creek Switching Station. Consequently, if the Proposed Project, including the Skiffes Creek Switching Station, is not constructed soon, the loss of electric service can be expected across a broad swath of the Commonwealth.

As amply demonstrated in the record, transmission studies under federal and Virginia requirements reveal a significant reliability risk for customers that must be promptly addressed. The Commission is greatly concerned about this identified need. However, our identification of the electric equipment to be included in certificates of public convenience and necessity for

²⁰⁷ Tr. 1110-11 (Chiles).

transmission lines necessarily turns on evidence regarding the engineering characteristics of that equipment. In this regard, the Commission has considered and weighed the extensive engineering evidence in this proceeding.

From an engineering standpoint, the Commission finds that the Skiffes Creek Switching Station will be an electrically, physically, and operationally inseparable part of several high voltage transmission lines. As the Hearing Examiner recognizes (using James City County's and Save the James's proposed dictionary definition), a transmission line includes a "circuit," which requires a completed path.²⁰⁸ The Skiffes Creek Switching Station enables a number of transmission circuits to be completed and connected through transformers and other associated equipment.²⁰⁹ Electrons will flow through these interconnected lines based on the laws of physics.²¹⁰

These engineering characteristics of a high voltage transmission switching station are simply unaffected by the Application's delineation of project components as "lines" and a "station." Additionally, the Skiffes Creek Switching Station is not simply a part of the Surry-Skiffes Creek Line *or* the Skiffes Creek-Wheaton Line; rather, the station is a critical part of *both* of these proposed lines *and* the other transmission lines interconnected within the station.

The engineering evidence in this case also demonstrates that no "transmission line," even as James City County and Save the James define one, will simply end at the property line of the Skiffes Creek Switching Station. James City County and Save the James offer a dictionary definition that limits a "transmission line" to conductors, a metallic line, or wires.²¹¹ The

²⁰⁸ Hearing Examiner's Report at 163-64.

²⁰⁹ Ex. 87 (Nedwick rebuttal) at 36-37, Ex. 23 (Application), Attached Appendix at 262, 264-65; Ex. 26.

²¹⁰ See, e.g., Tr. 1005 (Whittier).

²¹¹ James City County's and Save the James's Joint Comments on the Hearing Examiner's Report at 36-37.

evidence in this case shows that numerous high voltage transmission conductors, metallic lines, and wires will enter, exit, and be located throughout – and as part of – the Skiffes Creek Switching Station.²¹² James City County and Save the James also state that "[a] 'transmission line' is certainly an 'assemblage of electronic [sic] elements' such as the lines, the conductors, and the towers."²¹³ The very purpose and function of the Skiffes Creek Switching Station is to assemble numerous electrical transmission elements, including conductors, circuit breakers, switches, coupling capacitor voltage transformers, wave traps, transformers, and arresters.²¹⁴

Given the engineering evidence in this case, the Commission cannot pretend as if the Skiffes Creek Switching Station – which will be a critical part of several high voltage transmission lines – is not a part of any transmission line for purposes of Code § 56-46.1 F. The Skiffes Creek Switching Station is no less a part of the Surry-Skiffes Creek and Skiffes Creek-Whealton Lines than the towers which James City County and Save the James recognize to be part of these lines.²¹⁵ No part of this vital project will be built or can function without the Skiffes Creek Switching Station. Accordingly, the transmission line certificates of public convenience and necessity authorized herein shall include the Skiffes Creek Switching Station.

²¹² Ex. 23 (Application), Attached Appendix at 262, 264-65; Ex. 26; Ex. 35 (Garrett direct) at 4. The Hearing Examiner correctly distinguished between a transmission switching station, as proposed in this proceeding, and a distribution substation. Hearing Examiner's Report at 161-62.

²¹³ James City County's and Save the James's Joint Comments on the Hearing Examiner's Report at 36-37.

²¹⁴ Ex. 23 (Application), Attached Appendix at 262, 264-65; Ex. 26; Ex. 35 (Garrett direct) at 4; Ex. 87 (Nedwick rebuttal) at 36-38.

²¹⁵ James City County's and Save the James's Joint Comments on the Hearing Examiner's Report at 36-37. Indeed, the record shows that the Skiffes Creek Switching Station property will include several steel backbone structures, among other supporting equipment. *See, e.g.*, Ex. 23 (Application), Attached Appendix at 264; Ex. 35 (Garrett direct) at 4.

Public Witness Comments on the Hearing Examiner's Report

As the Commission has previously explained, participation as a public witness does not provide a basis for us to consider comments on a Hearing Examiner's Report.²¹⁶ While we encourage all interested persons and entities to participate in Commission proceedings, we must ensure that our procedures remain fair to the applicant and to those who participate in accordance with the Commission's orders and regulations. Pursuant to our Order for Notice and Hearing in this case, adequate notice was provided and interested persons were afforded an opportunity to participate as public witnesses or to become parties to this case. These procedures for participation require issues and evidence to be raised in manner that permits an applicant and other parties an opportunity to address the same. Pursuant to these procedures, the Foundation and NPS each chose to participate in this proceeding as a public witness, not a party. Rule 5 VAC 5-20-80 C, *Public Witnesses*, states that public witnesses are limited to:

filing written comments in advance of the hearing if provided for by [C]ommission order or by attending the hearing, noting an appearance in the manner prescribed by the [C]ommission, and giving oral testimony. Public witnesses may not otherwise participate in the proceeding, be included in the service list, or be considered a party to the proceeding.

Accordingly, the Foundation's comments on the Hearing Examiner's Report were not considered in reaching our determination in this proceeding. However, the Foundation's oral testimony and the written comments that were submitted in compliance with our Rules and Order for Notice and Hearing have been fully considered.

²¹⁶ *Application of Virginia Electric and Power Company d/b/a Dominion Virginia Power, Application of Virginia Electric and Power Company, For approval and certification of electric facilities: Waxpool 230 kV Double Circuit Transmission Line, Brambleton-BECO 230 kV Transmission Line and 230-34.5 kV Waxpool Substation, Case No. PUE-2011-00129, 2012 S.C.C. Ann. Rept. 353, 356, Final Order at 12 (Dec. 28, 2012); Application of Appalachian Power Company, For a certificate of public convenience and necessity authorizing operation of the Falling Branch-Merrimac 138 kV Transmission Line, Case No. PUE-2012-00007, 2012 S.C.C. Ann. Rept. 380, 384-85, Order at 14-15 (Dec. 21, 2012).*

For similar reasons, James City County's motion to supplement its comments on the Hearing Examiner's Report with comments from the NPS, which was a public witness in this proceeding, is denied. Federal agencies often participate as parties to our proceedings, but the NPS declined to do so in this proceeding. Additionally, James City County offers as evidence a communication submitted by the NPS to a federal agency as part of a different review process. The Commission trusts that the NPS communication will receive due consideration in the federal review process for which it was intended.

NPS's written comments that were submitted in compliance with our Rules and Order for Notice and Hearing have been fully considered. Additionally, we note that the DEQ recommendations that are adopted herein direct Dominion to consult with, among others, NPS.

Accordingly, IT IS ORDERED THAT:

(1) Pursuant to §§ 56-46.1, 56-265.2, and related provisions of Title 56 of the Code, the Company's Application for approval and for certificates of public convenience and necessity is granted, as provided herein and subject to the requirements set forth in this Order.

(2) Dominion is authorized to construct and operate the Proposed Project with Variation 4.

(3) Pursuant to the Utility Facilities Act, Chapter 10.1 (§ 56-265.1 *et seq.*) of Title 56 of the Code, the Company is issued the following certificates of public convenience and necessity:

Certificate No. ET-138e, which authorizes Virginia Electric and Power Company under the Utility Facilities Act to operate certificated facilities in Surry County, all as shown on the map attached to the certificate, and to construct and operate facilities as authorized in Case No. PUE-2012-00029, cancels Certificate No. ET-138d, issued to Virginia Electric and Power Company on June 9, 1989, in Case No. PUE-1988-00083.

Certificate No. ET-771, which authorizes Virginia Electric and Power Company under the Utility Facilities Act to operate

certificated facilities in the Counties of James City and York and the Cities of Hampton and Newport News, all as shown on the map attached to the certificate, and to construct and operate facilities as authorized in Case No. PUE-2012-00029, cancels Certificate No. ET-77k, issued to Virginia Electric and Power Company on June 18, 2010, in Case No. PUE-2009-00049.

(4) The Commission's Division of Energy Regulation forthwith shall provide Dominion copies of the certificates issued in Ordering Paragraph (3) with the detailed maps attached.

(5) The construction approved herein must be completed and in service by June 1, 2015, provided, however, that Dominion is granted leave to apply for an extension for good cause shown.

(6) James City County's and Save the James' September 3, 2013 motion to amend their joint comments on the Hearing Examiner's Report is granted in part and denied in part, as set forth herein.

(7) James City County's October 16, 2013 motion is denied.

(8) This case shall remain open until the Proposed Project is in service.

AN ATTESTED COPY hereof shall be sent by the Clerk of the Commission to all persons on the official Service List in this matter. The Service List is available from the Clerk of the Commission, c/o Document Control Center, 1300 East Main Street, First Floor, Tyler Building, Richmond, Virginia 23219.