SCC-62

COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

APPLICATION OF

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

CASE NO. PUE-2016-00020

For approval and certification of Cunningham-Dooms 500 kV Transmission Line Rebuild under Va. Code § 56-46.1 and the Utility Facilities Act, Va. Code § 56-265.1 *et seq.*

REPORT OF HOWARD P. ANDERSON, JR., HEARING EXAMINER

November 9, 2016

HISTORY OF THE CASE

On March 2, 2016, 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 for transmission facilities in connection with the proposed rebuild of the Cunningham-Dooms Line #534 ("Application"). Dominion filed the Application pursuant to § 56-46.1 of the Code of Virginia ("Code") and the Utility Facilities Act, Code § 56-265.1 *et seq.*

According to the Application, the Company proposes to rebuild, entirely within its existing right-of-way ("ROW"), approximately 32.7 miles of its existing 500 kV Cunningham-Dooms Line #534 ("Line #534") transmission line in Fluvanna, Albemarle, and Augusta Counties located between the Company's existing Cunningham Switching Station in Fluvanna County and its existing Dooms Substation in Augusta County (collectively, "Rebuild Project").[1]

On March 30, 2016, the Commission issued an Order for Notice and Comment which, among other things, (i) docketed the Application; (ii) established a procedural schedule for the publication of public notice; (iii) provided for the filing of written comments, notices of participation and requests for hearing; (iv) directed Staff of the Commission ("Staff") to investigate the Application and file a report containing the Staff's findings and recommendations; and (v) appointed a Hearing Examiner to conduct all further proceedings in this matter and file a report on behalf of the Commission.

Twenty-one interested persons filed comments requesting a local hearing on the Company's Application. By Ruling dated July 1, 2016, the Company was directed to publish notice of public hearings which were held on August 8, 2016, in Charlottesville to receive testimony from public witnesses.

[1] Application, at 2.

SUMMARY OF THE HEARING RECORD

The Company's Direct Evidence

The Company presented the direct testimony of Sarah Rana, an Engineer III in the Electric Transmission Planning Department; Robert J. Shevenock II, Consulting Engineer in the Electric Transmission Line Engineering Department; Wilson O. Velazquez, Consulting Engineer in the Substation Engineering section of the Electric Transmission Group; and Amanda M. Mayhew, Senior Siting and Permitting Specialist all for Dominion Virginia Power.

Ms. Rana discussed the need for and benefits of the proposed rebuild. She testified that in order to comply with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards by increasing transmission capacity and replacing aging infrastructure, Dominion proposes to rebuild, entirely within its existing right-of-way, approximately 32.7 miles of its existing 500 kV Cunningham-Dooms Line #534 in Fluvanna, Albemarle, and Augusta Counties located between its existing Cunningham Switching Station in Fluvanna County and its existing Dooms Substation in Augusta County.[2]

Ms. Rana stated that the proposed project is needed to assure the Company can continue to provide reliable electric service consistent with mandatory NERC Reliability Standards for transmission facilities and the Company's Transmission Planning Criteria. Ms. Rana explained that the Cunningham-Dooms Line #534 provides service to the Company's transmission system in the western and central regions of Virginia, and is a critical component of the electric transmission grid that serves Virginia, Maryland, West Virginia, the District of Columbia, and beyond. Ms. Rana noted the Company's transmission facilities are not projected to meet the NERC Reliability Standards unless Cunningham-Dooms Line #534 remains in service. Therefore, Ms. Rana maintained that failure to address the significant inherent corrosion and deterioration associated with the existing COR-TEN® weathering steel lattice towers would limit the Company's ability to maintain reliable transmission service to its customers.[3]

Ms. Rana advised that no alternatives to the proposed Rebuild Project were considered because the Company would be using existing right-of-way and that demand-side resources would not be appropriate because the need for the Rebuild Project is not based on the planning studies of the Company, but rather on aging infrastructure.[4]

Mr. Shevenock described the transmission engineering considerations driving the need for the Rebuild Project and the design characteristics of the proposed replacement transmission line. Mr. Shevenock explained that the Rebuild Project would replace aging transmission facilities that are reaching the end of their service lives. Mr. Shevenock explained that Line #534 was completed in 1966 as part of the Company's 500 kV "original loop," and, as such, was part of the first 500 kV transmission system built in North America. Mr. Shevenock noted that Line #534 was built with first generation 500 kV technology, and after 50 years of continuous operation, is approaching the end it its useful life. He described the existing Line #534 as having weathering

[2] Rana Direct Testimony, at 2.
[3] *Id.* at 4, 5.
[4] *Id.* at 7.

steel tower structures that have experienced inherent corrosion and deterioration requiring repairs, including replacement of tower members. Mr. Shevenock further noted that industry studies show conductor splices begin to fail at 40 years and that the porcelain insulators are also at the end of their service lives and are in need of replacement.[5]

Mr. Shevenock explained that the existing lattice towers were made of a high strength low-alloy material introduced in the 1960s called weathering steel or COR-TEN® that was advertised as a superior product designed for longevity and lower maintenance (no painting) over its projected 60-year life. Weathering steel was designed to create an iron oxide patina that was supposed to protect the steel so that no other surface coating would be required, thus reducing maintenance costs. Mr. Shevenock noted patinas have a dark brown uniform appearance that blends into the natural background which was another justification for using what was believed to be, at that time, a maintenance-free product.

Mr. Shevenock advised, however, that over the years, weathering steel has proven to be anything but maintenance-free. Instead it produced inherent corrosion problems that continuously deteriorate the steel members in the lattice-type towers. In the mid-1970s, the Company's maintenance crews began to notice "pack-out"[6] at joint locations and began to monitor these conditions. In 1984, to ensure structural integrity of the towers, the Company made initial measurements for member thickness in both joint and reference steel[7] locations in various COR-TEN® towers across its system.[8]

Mr. Shevenock explained, in connection with an earlier project to rebuild an existing transmission line,[9] the Company retained Quanta Technology ("Quanta"), a leading expert in transmission and distribution solutions, to independently investigate the condition of the Company's original 500 kV COR-TEN® towers and assess the need to rebuild them. Quanta's investigation revealed that the deteriorated condition of the 500 kV original loop was due to the inherent corrosion properties of the COR-TEN® steel; the Company's program of monitoring, maintenance and repair was appropriate; and the infrastructure had reached a point where major replacement was the prudent approach. Mr. Shevenock reported that Quanta updated its original study in 2013 that confirmed the critical need to replace existing Line #534 as the next highest priority of the Company's remaining original 500 kV loop after the Cunningham-Elmont Line #553.[10]

Mr. Shevenock explained the towers that comprise a majority of Line #534 are self-supporting towers with four legs, each resting in its own concrete foundation. This tower type

---

[5] Shevenock Direct Testimony, at 2, 3.

[6] The term "pack-out" describes deformation of tower joints caused by the in-place corrosion of the steel. This pack-out is known to cause member cracking and fastener failure due to the deformation resulting from the phenomenon. During the 1980s, Company representatives discovered severe pack-out growth and pronounced rust in splice areas, which indicated continued corrosion and the potential for severe loss of the steel section. *Id.* at 3.

[7] Reference steel refers to the portion of the member that spans from one bolted end to the next, whereas joint steel is the location of the member in and around the bolts. *Id.* at 3, 4.

[8] *Id.* at 3.

[9] *Application of Virginia Electric and Power Company D/B/A Dominion Virginia* Power, Case No. PUE-2011-00003, 2011 S.C.C. Ann. Rep. 420.

[10] Shevenock Direct Testimony, at 5-7.

utilizes a stub angle, which Mr. Shevenock described as a COR-TEN® steel angle partially embedded in concrete, for attaching the tower to the foundation. Mr. Shevenock stated severe and rapid corrosion has been prevalent at the tower base or ground line area due to the constant exposure to a wet or moist environment. He explained tower repairs have ranged from rust removal and application of a protective coating, to replacement of the stub angle with traditional base shoes. Without close monitoring and remedial action at the ground line area, Mr. Shevenock stated structural failure or collapse of the tower would likely occur.[11]

As with previous Company transmission lines constructed with COR-TEN®, Mr. Shevenock testified the Dooms-Cunningham Line #534 is in need of a complete rebuild due to the age and condition of the deteriorated lattice COR-TEN® towers. Without a rebuild, Mr. Shevenock stated the line will continue to deteriorate thereby increasing the risk of potentially severe impacts on the reliability of the grid during peak conditions.[12]

For the proposed Rebuild Project, Mr. Shevenock reported the Company proposes to (i) remove the existing 500 kV steel lattice towers of Line #534 and replace them with new 500 kV single circuit galvanized steel lattice towers; and (ii) remove and replace existing 2-2049.5 bundled all aluminum alloy conductors ("AAAC") with three triple-bundled 1351.5 aluminum conductor steel reinforces ("ACSR") phase conductors. Mr. Shevenock stated the estimated total cost of the proposed Rebuild Project, which is scheduled for completion by the summer of 2019, is approximately $59.0 million (in 2015 dollars).[13]

With regard to electric and magnetic fields ("EMF"), Mr. Shevenock stated that the existing facilities produce magnetic field levels ranging from 5.672 milligauss ("mG") to 113.655 mG at the edge of the ROW based on historical average and peak loading in 2015. In comparison, Mr. Shevenock testified magnetic field levels ranging from 6.416 mG to 111.268 mG were calculated for the proposed Rebuild Project at the edges of the ROW based on average historical loading in 2015. Magnetic field levels ranging from 6.738 mG to 116.902 mG were calculated for the proposed Rebuild Project at the edges of the ROW based on average and peak loading expected to occur in 2019 with the Rebuild Project in service.[14]

Mr. Shevenock explained magnetic field strength diminishes rapidly as distance from the source increases. The decrease is proportional to the inverse square of the distance. For example, a hypothetical magnetic field strength of 10 mG at the edge of the ROW (defined as 50 feet from the centerline) would decrease to 2.5 mG at a point 50 feet outside of the ROW.[15]

Mr. Velazquez described the work to be performed as part of the proposed Rebuild Project at the Company's existing Cunningham Station and Dooms Substation. Mr. Velazquez pointed out no new structures would be installed inside the Cunningham Station or the Dooms Substation as a result of the proposed Rebuild Project. However, Mr. Velazquez stated the Company would replace the existing Line #534 wave trap with a 5000A wave trap at its existing

[11] *Id.* at 4.
[12] *Id.* at 6.
[13] *Id.* at 7.
[14] *Id.* at 8.
[15] *Id.* at 9.

Cunningham Station and Dooms Substation. Mr. Velazquez reported the estimated cost of the work at the Cunningham Station is approximately $245,000, and the estimated cost of the work at the Dooms Substation is approximately $246,000.[16]

Ms. Mayhew described the route for the Rebuild Project as an existing 32.7 mile ROW within the Counties of Augusta, Albemarle, and Fluvanna that has been in continuous service since the 1964-1966 original construction. Ms. Mayhew reported the existing ROW contains multiple circuits and varies in width from a minimum of 150 feet to a maximum of 292 feet. No new easements would be required for the Rebuild Project as the new structures would be located entirely within the existing ROW.[17]

On December 7, 2015, Ms. Mayhew reported the Company sent letters to numerous federal, state, and local government officials describing the Rebuild Project and inviting comments and requests for information from the officials. In addition, Ms. Mayhew stated the Company held three public information open houses: two in Albemarle County, and one in Augusta County to inform the public about the Rebuild Project.[18]

Ms. Mayhew described the general character of the Rebuild Project area as predominantly rural with agricultural and scattered residential use. However, the ROW crosses the Shenandoah National Park, including Skyline Drive and the Appalachian Trail, in Augusta County and a portion of National Park Service Property in Albemarle County.[19] Ms. Mayhew advised that the Company did not consider alternate routes for the Rebuild Project based on stated preferences for use of existing ROW in the Code and Federal Energy Regulatory Commission guidelines.[20] Ms. Mayhew pointed out that there are 237 homes located within 500 feet and 14 homes located within 100 feet of the centerline of existing Line #534.[21]

The Department of Environmental Quality ("DEQ") Coordinated Review

Ms. Mayhew advised that DEQ will conduct an environmental and permitting review of the Company's Application including solicitation of comments from relevant agencies. Ms. Mayhew pointed out the Company developed a DEQ supplement (attached to the Application) that contains information on impacts and the status of agency review with respect to the following:

- air quality;
- water withdrawals and discharges;
- wetlands;
- solid and hazardous waste;
- natural heritage and threatened and endangered species;

---

[16] These costs are included in the overall $59 million Rebuild Project cost. Velazquez Direct Testimony, at 2, 3; Application, Appendix at 18.
[17] Mayhew Direct Testimony, at 2, 3.
[18] *Id.* at 3, 8.
[19] *Id.* at 2, 3.
[20] *Id.* at 3, 4.
[21] *Id.* at 6.

- erosion and sediment control;
- archeological, historic, scenic, and cultural resources;
- use of pesticides and herbicides;
- geology and mineral resources;
- wildlife resources;
- recreation, agricultural, and forest resources; and
- transportation infrastructure.

Ms. Mayhew pointed out, because the Rebuild Project is located entirely within the existing ROW, impacts would be reasonably minimized. Ms. Mayhew stated the appropriate environmental studies would be made of sensitive areas before construction commenced. Clearing and maintenance of the ROW would be done in such a manner that low buffers of vegetation would be retained as much as possible. Ms. Mayhew advised, after approval by the Commission, the Company would apply for necessary permits and conduct necessary environmental surveys pertaining to wetlands, cultural resources and rare species.[22]

Staff Report

The Staff Report provided by Armando J. De Leon, gave a detailed overview of the proposed Rebuild Project including its major components: (i) ROW and easements; (ii) proposed station improvements; (iii) conductors and support structures; (iv) the proposed construction schedule; and (v) the estimated cost of approximately $59 million. Of the $59 million, approximately $58.5 million is for line work, while $245,000 is designated for work at the Cunningham Station and $246,000 is designated for work at the Dooms Substation. Mr. De Leon pointed out, as a PJM baseline reliability 500 kV project, the cost would be socialized throughout the PJM system according to a methodology approved by PJM in December of 2015. Pursuant to this methodology, the Dominion Zone would be allocated 42.12% of the Rebuild Project cost or approximately $24.6 million for line work and approximately $206,388 for station work. The cost to be allocated to Virginia consumers would be approximately $24.8 million, while the other utilities of PJM that would benefit from the Rebuild Project would be apportioned the remaining cost.[23]

Mr. De Leon reported the rebuilt line would be supported by galvanized structures that vary in height from 108 feet to 174 feet, all having a width of 73 feet at the cross arm. The galvanized structures would replace existing towers that vary in height from 72 feet to 149 feet, making the average height of the new structures approximately 28.8 feet taller than the structures being replaced. The greatest change in structure height is 63 feet. Mr. De Leon explained the proposed structures are taller due to an increase in the National Electric Safety Code ground clearance requirements,[24] an increase in conductor sag with the proposed conductor, and increased tower spacing between the conductor attachment and the top of the proposed structures (as compared to existing structures).[25] Mr. De Leon noted the Company also stated that the greater

[22] *Id.* at 7, 8.
[23] Staff Report, at 4.
[24] *See* Marne, David J. "Vertical Clearance." *McGraw-Hill's National Electrical Safety Code (NESC) 2012 Handbook*. New York: McGraw-Hill, 2012. Rule 232. Print. *Id.* at 7.
[25] Company Response to Staff Interrogatory No. 1-4.

height of the new towers would allow for a structure-to-structure replacement at all locations except one. Mr. De Leon reported the new foundations would be approximately three feet in diameter and have a depth of 12 feet. The Rebuild Project would place a new tower at the approximate location of each existing structure, but would add one additional tower at a location between existing structures 426 and 427.[26] Mr. De Leon stated the Company plans to replace the existing COR-TEN® weathering steel towers with new single-circuit galvanized steel lattice towers that are similar to the existing towers and to other galvanized towers used in the Company's 500 kV system. The Company acknowledged the finish on the new towers would be different from the finish on the towers being replaced due to the difference in materials designed to specifically address the degradation issues experienced with the COR-TEN® structures.[27]

Mr. De Leon submitted that Staff reviewed the information provided by the Company, verified its power flow studies, and reached a conclusion that the Company has sufficiently demonstrated the need for the Rebuild Project and Staff does not oppose the Company's request that the Commission issue the necessary certificate of public convenience and necessity ("CPCN") for the proposed Rebuild Project. Staff did recommend, however, the Company provide the Commission with information responsive to the concerns expressed in the public comments regarding a dulled finish on the towers. Specifically, Staff recommended the Company detail whether using structures with a dulled finish would be a feasible alternative, and if so, provide the incremental costs associated with this change.[28]

Company Rebuttal

The Company presented the rebuttal testimony of Amanda Mayhew, Robert J. Shevenock II, and Robert B. Smith, consulting engineer in the electric transmission department of Dominion Virginia Power.

Ms. Mayhew responded to Staff's Report and recommendations made by the DEQ. Ms. Mayhew agreed with the conclusions contained in Staff's Report and especially Staff's corroboration of the Company's assessment that any alternative to the proposed Rebuild Project would require the Company to construct transmission facilities in a new ROW instead of the current ROW which is available and feasible.[29]

Ms. Mayhew had no objections or concerns with the agency recommendations contained in the DEQ Report. Ms. Mayhew noted the Company would coordinate with the Thomas Jefferson Planning District regarding transmission structure designs that would allow broadband service use.[30]

---

[26] Company Response to Staff Interrogatory No. 1-3.
[27] Staff Report, at 8, 9.
[28] *Id.* at 18, 19.
[29] Mayhew Rebuttal Testimony, 1, 2.
[30] *Id.* at 2, 3.

Mr. Shevenock provided three clarifications to the Staff Report:

1. In addition to the existing Cunningham-Elmont 500 kV Line #553, Dooms-Charlottesville 230 kV Lines # 233 and # 291, and the Dooms-Sherwood 115 kV Line # 39, the Cunningham-Dooms Line # 534 will share the ROW with a section of the Sherwood-Bremo Line #91.
2. While all *typical* structures would have 73 foot cross-arms, four *non-typical* structures would have cross-arm widths of 73.4 feet, 75 feet, 92.75 feet, and 93.7 feet.
3. In addition to the shared ROW with the existing 115 kV Line # 39 and rebuilt 500 kV Line #534, a section of Line # 91, Sherwood-Bremo, will also be included in the ROW for the Rebuild Project.[31]

Mr. Smith addressed the feasibility of using a dulled finish on the tower structures as urged by public witnesses. Mr. Smith advised the Company proposes the use of new single-circuit galvanized steel lattice tower structures because the self-supporting steel lattice tower is cost-effective and is similar in appearance to the existing transmission line tower system being replaced. Mr. Smith explained a hot dip galvanized coating was chosen by the Company for its proven performance in protecting and extending the service life of the steel. Mr. Smith noted the Company has used the hot dip galvanized coating for new lattice towers since 1985 when the Company terminated the use of COR-TEN® steel due to its high maintenance costs and reduced service life performance.[32]

Mr. Smith maintained both independent and Company observations regarding the natural dulling of hot dip galvanized tower steel indicated that the reflectivity and associated shine of the newly-installed galvanized steel would naturally start to diminish once the galvanized coating is exposed to the environment. Mr. Smith stated a noticeable visual appearance of the natural weathering (i.e., oxidization) and dulling process would typically be observable within six to twelve months of exposure. Mr. Smith reported at least one independent source has observed that the reflectivity of the newly-dipped galvanized coating dropped by 20 % within one week of exposure to the environment and can drop by 60% to 67% within two to four years of exposure.[33]

Mr. Smith described the typical process manufacturers use to chemically dull the finish of transmission facilities as follows:

> After the hot dip galvanizing process is complete, tower steel would likely undergo a chemical treatment comprised of a zinc phosphate or phosphoric acid-based solution to produce a dulling effect on the galvanized steel. To chemically dull the galvanized steel, manufacturers generally use the following procedures, which must be completed under strict parameters to ensure the galvanized coating on the steel is not compromised:
>
> 1. cleaning of the steel;

[31] Shevenock Rebuttal Testimony, at 2, 3.
[32] Smith Rebuttal Testimony, at 2, 3.
[33] *Id.* at 3.

2. application of the chemical solution (zinc phosphate or phosphoric acid);
3. thorough water rinsing of the steel; and
4. sealant application or passivation (i.e., application or process to prevent white rust formation while material is shipped and stored).[34]

Mr. Smith stated there are potential risks and implications associated with using a chemical post-treatment to dull the finish of transmission structures. Specifically, Mr. Smith pointed out the Company is concerned about the manufacturer's ability to consistently ensure proper application and removal of the chemical dulling treatment on the galvanized steel. Mr. Smith noted, if the required procedures are performed improperly, the chemical dulling treatment could compromise the galvanized coating on the steel and negatively impact its service life. Mr. Smith stressed the tower manufacturer would have to enforce strict quality control requirements during the chemical dulling process. Mr. Smith noted an additional risk that some of the dulling process could result in non-uniform dulling resulting in a greater visual impact than if the galvanized steel were allowed to weather and dull naturally.[35]

Mr. Smith explained, as the galvanized coating approaches the end of its service life, a zinc-rich paint covering would need to be applied to the galvanized towers. Mr. Smith reported naturally-dulled galvanized steel lattice towers in the Company's service territory usually require one zinc-rich paint treatment during the service life of a transmission line and, in some instances, no additional paint treatments may be necessary. However, with the chemically-dulled galvanized steel, Mr. Smith expects additional paint treatments would be necessary because of the likelihood that the original galvanized coating would experience a reduced service life as a result of the chemical dulling process. Further, Mr. Smith noted each subsequent zinc-based paint treatment would have a lower service life due to the difficulty in obtaining an adequately adherent surface with each subsequent application. Mr. Smith estimated the first paint treatment would last approximately 15 years; the second paint treatment would last approximately 8 years and subsequent paint treatments would last approximately 5 years. Therefore, from a maintenance perspective, Mr. Smith expects additional paint treatments over the life span of the chemically dulled towers compared to the non-dulled towers. The cost of the additional paint treatments, which Mr. Smith stated are expensive, would be in addition to the one-time dulling cost of approximately $266,000.[36]

Mr. Smith admitted that the Company had obtained only limited information from tower manufacturers on their dulling processes and Mr. Smith further admitted he does not have the expertise to form an opinion regarding potential environmental impacts associated with a chemically-dulled finish for the towers. While Mr. Smith stated he is not aware of any negative impacts related to other utilities' use of chemically dulled transmission towers, he pointed out the Company's experience with galvanized towers without the dulling process indicated the galvanized coating provides 40 to 60 years of corrosion protection for the towers located in the Company's service territory.[37]

---

[34] *Id.* at 3, 4.
[35] *Id.* at 4.
[36] *Id.* at 4-7.
[37] *Id.* at 6, 7.

In conclusion, Mr. Smith stated the Company does not believe it would be appropriate to increase the incremental cost of the Rebuild Project for a chemical dulling process that contains potential risks and poses additional maintenance requirements over the life of the galvanized steel towers. Therefore, the Company proposes to install single-circuit galvanized steel lattice towers that will dull naturally over time and would be more cost effective to maintain over the service life of the transmission line based on the information currently available to the Company.[38]

Public Comments

Twenty-five public comments were received by the Commission pertaining to this case. These comments are set forth below and generally addressed three primary topics: (i) a request that the Commission schedule a local public hearing to gather input from concerned citizens; (ii) a general consensus that the project is needed; and (iii) a concern that the design, including both the height of the towers and the materials chosen, would impact the local view shed and affect tourism, agriculture, and the Albemarle County Comprehensive Plan ("Comprehensive Plan").

In response to these comments and requests for a local hearing, a public hearing was scheduled to receive comments from public witnesses on August 8, 2016, in the Albemarle County Office Building Auditorium in Charlottesville, Virginia.

Public Witnesses

A local public hearing was convened on August 8, 2016, in Charlottesville, Virginia. Twenty-three public witnesses appeared at the hearing.

Ann Mallek of Earlysville, spoke in her capacity as the Supervisor of the White Hall District and requested the Commission reject the request of Dominion for the Cunningham-Dooms Rebuild Project. Ms. Mallek stated, "[m]y issues of concern are height, width, and most importantly, the appearance and surface color of the towers."[39] She further stated height, width, and surface appearance can negatively impact historic areas, local agriculture, and tourism "which rely on a lovely environment for their success."[40] Ms. Mallek advocated the use of darker materials, such as COR-TEN® steel, instead of galvanized steel for the poles, to minimize the viewshed impact and she believes the additional cost is warranted. She provided written materials, which detailed the Comprehensive Plan, in support of her position. Finally, Ms. Mallek raised concerns about how forthright, specifically regarding tower height, Dominion has been with information on this project and previous projects.[41]

Steven James, an electrical engineer from Charlottesville, with 32 years of experience at Public Service and Electric Gas, raised points regarding the aesthetics of the tower design, project scope, project cost, and regulatory review.[42]

---

[38] *Id.* at 8.
[39] Transcript ("Tr.") at 7.
[40] *Id.* at 10.
[41] *Id.* at 6-16.
[42] *Id.* at 17-23.

Regarding aesthetics, Mr. James stated Dominion's application "looks like a boiler-plate replacement job" due to its similarity to the last five jobs Dominion completed.[43] He said staying with what is known to be effective makes sense; however, the publics' opinion should be considered when there are visual and environmental concerns. Mr. James referenced a 150-mile project, Roseland of Susquehanna, in the northern part of PJM which was completed in 2015 and "used several different tower designs depending on the aesthetic needs and the concerns they got from the constituencies."[44] Because of a request from the Nation Park Service, PJM used COR-TEN® monopoles to blend in with the environment. Mr. James requested this option be considered for the Line #534 Rebuild Project.[45]

Next, Mr. James discussed the scope of the Rebuild Project. He stated the current filing indicates the primary driver for the Rebuild Project is the age of the current line. Since the proposed Rebuild Project will increase the line's capacity by 60%, Mr. James argued there is a "load-serving need there that is also a driving factor in the size of this line."[46]

He stated the packet Dominion Virginia Power filed with the Commission shows the cost as $59 million and the original request Dominion submitted to PJM was $110 million. This discrepancy concerned Mr. James because he thinks the "story seems to be changing quite a bit."[47] He further stated when you take a line of this magnitude out of service, there are always downstream cost impacts called "location marginal pricing." Mr. James stated, "[y]ou could do a $60 million project and incur hundreds of millions of dollars in generation shift cost for which the customers are going end up saddled with."[48]

Finally, Mr. James raised concerns about regulatory review. He referenced Senate Bill 1349 and the potential of a power company to complete a project "on the cheap side because they may not be in for a rate review where you'll get the chance to look at the rate base and scrutinize their capital projects."[49]

David King of King Family Vineyards in Crozet, stated he agreed with Ann Mallek's earlier testimony. Mr. King continued by saying Dominion Virginia Power "just finished rebuilding the southernmost line in this right of way and used at the end of that rebuild a single pole weathered material."[50] He said it does not make sense that the Company "would apply for a rebuild of the secondary line with taller, wider, more visual, visible structures with the material that would not be consistent with the weathered material they had just used in the same right of way."[51]

He further stated Stantec, the third party provider of the DEQ assessment, used average heights for the structures to assess the visual impact. Mr. King maintained, "[t]he visual

---

[43] *Id.* at 19.
[44] *Id.* at 20.
[45] *Id.* at 19, 20.
[46] *Id.* at 20, 21.
[47] *Id.* at 22.
[48] *Id.* at 22, 23.
[49] *Id.* at 23.
[50] *Id.* at 28.
[51] *Id.* at 27-29.

assessment using average height can only be misleading at best. At worst, it could be considered to be fraudulent."[52] Specifically Mr. King stated in the DEQ Supplement of the Company's Application at Attachment 2.H.2, Section 3.3.2.1, he believes the statements regarding the visual impact are "factually incorrect."[53]

Finally, Mr. King stated hundreds of businesses in the Crozet area, like his family, use the mountains to improve their businesses and their lives. Because of this, Mr. King contends the rebuild, as proposed, would negatively impact local businesses.[54]

Genevieve Keller of Charlottesville, spoke on behalf of the Preservation Virginia Public Policy Committee to communicate the Committee's concern regarding "the process of the project and the completeness of the information available to date."[55] She stated until recently it was thought that this project was only a replacement line. Ms. Keller stated that she is also a commissioner for the Thomas Jefferson Planning District Commission. She represented the Planning District Commission by stating, "we are now particularly concerned about the visual effects related to surface finishes and colors associated with the current tower and line design."[56] Ms. Keller concluded by saying, "I ask you to take all scenic, historic, and visual concerns into account in all decision making regarding this line."[57]

Robert DuVal of North Garden, spoke as a land owner in the South Fork Farms Development which the line transverses. Mr. DuVal stated his concern is in regards to the height and color of the new towers. He stated the new towers will be 30 feet taller than the existing towers. Mr. DuVal explained, "[s]o essentially the towers now will really stand out, whereas before the visual effects, while they were there, weren't totally obtrusive."[58] Additionally, he was concerned that neither he nor his neighbors received notice from Dominion Virginia Power regarding the Rebuild Project. He believes by the end of the new tower's 50-year lifespan, it will affect a larger number of people in the viewshed. In conclusion, Mr. DuVal stated he is not opposed to the Rebuild Project, but he does not feel Dominion Virginia Power has done enough to take into account the visual effects the line will have on the community.[59]

Adam Donovan-Groves, a wedding planner in Charlottesville, expressed concern about the effect of the line on property values and aesthetics of the area. Mr. Donovan-Groves stated Charlottesville ranges between being the number two and number three wedding destination on the east coast. He gave the example of a client who is spending $75,000 to $100,000 for a wedding. Would he or she want to spend that much money knowing there are silver towers upsetting the view? Mr. Donovan-Groves stated, "[w]e want to make sure the view stays

[52] *Id.* at 28.
[53] *Id.* at 29.
[54] *Id.* at 30.
[55] *Id.* at 33.
[56] *Id.*
[57] *Id.* at 32-34.
[58] *Id.* at 36.
[59] *Id.* at 35-39.

beautiful."[60] In summary, he stated that he is not opposed to rebuilding the transmission line but he does not want the towers and lines to stand out.[61]

Matt Argon a new resident of Charlottesville, spoke in favor of maintaining the aesthetics of the area. Mr. Argon said many new residents, like him, are drawn to the area for economic opportunities, the beautiful vistas, and opportunities to bird watch and hike. He said he agreed with previous speakers and wanted to echo that "the route stay in the current right of way and to employ some less visually obtrusive set of supports for the line."[62]

Andrew Carter a land owner from Keswick, spoke against the proposed power line upgrade. Mr. Carter owns land which is next to property where the existing right of way crosses Route 20. The house site on his property is in full view of the right of way which he believes is a contributing factor to the market value of his property. Mr. Carter stated the proposed height increase and the color and appearance of the towers would diminish the view from many properties in the county. In addition, He believes property owners take "a hit in our property values by having a blight on the landscape."[63]

Mark Graham of Charlottesville, spoke in his capacity as the Director of Community Development for Albemarle County. Mr. Graham stated scenic resources are important to the county both as a community asset and for economic development. Agriculture, specifically agri-tourism, is a targeted industry in Albemarle County. Mr. Graham praised Dominion Virginia Power for utilizing the existing right of way for the power line rebuild. He advocated working together to mitigate the effect the towers will have on scenic resources. Mr. Graham noted that Albemarle County does have design guidelines for entrance corridors for wireless facilities, which he is glad to share with Dominion and the Commonwealth. Additionally, he offered the help of county staff, who have decades of experience working with their scenic resources.[64]

Jean Hyatt of Charlottesville, spoke as the president of Preservation Piedmont, a historic preservation group that supports Charlottesville and surrounding counties. Ms. Hyatt expressed concern regarding the towers' impact in the Albemarle Rural Historic District, the Greenwoods/Afton Rural Historic District, the Shenandoah National Park, and adjacent scenic areas. Ms. Hyatt requested that "Dominion Virginia Power do whatever it can to minimize the visibility of these towers by using a less reflective metal. We also ask [ ] to keep the towers at a reduced height wherever possible on the line."[65]

Jeff Werner of Charlottesville, spoke on behalf of the Piedmont Environmental Council. Mr. Werner stated, "[w]e believe that the Commission and Dominion Virginia Power have a responsibility to protect what the community values and we urge you to require stringent mitigation measures relative to those visual impacts."[66] Mr. Werner requested COR-TEN® steel be used, or other measures be taken, to minimize the visual effect of the line. He stated the

[60] *Id.* at 41.
[61] *Id.* at 40-43.
[62] *Id.* at 44, 45.
[63] *Id.* at 45-47.
[64] *Id.* at 50-53.
[65] *Id.* at 54, 55.
[66] *Id.* at 57.

Council's main concern is the visual impact on places such as the Appalachian Trail, the Shenandoah National Park, Greenwood/Afton Historic District, and Southern Albemarle Historic District. Finally, Mr. Werner requested, "the [Commission] require that the applicants for all large scale transmission line projects employ a process similar to that that was used in the Hollymead project."[67]

Andrew Baldwin of Greenwood, spoke as a land developer who owns Shamrock Farms, and on behalf of Pente Land Corporation. Since the Cunningham-Dooms line crosses Shamrock Farms, Mr. Baldwin echoed earlier requests to paint the towers or use metal that will blend into the landscape. He stated he is not as concerned about the height of the towers; but, he said using galvanized metal will "light up the side of that mountain."[68]

Rick Randolph of Keswick, stated that while he is the Supervisor of the Scottsville District; he was speaking tonight on behalf of past and future generations. Mr. Randolph quoted sections of the Comprehensive Plan, which speak to preserving the landscape of the area. He summarized his position by stating, "[t]he bright steel proposed for Dominion's new towers contradicts every tenet of what Albemarle treasures in its rural landscape. I appeal to the Commission to recognize the vital importance of viewsheds to past current and future generations of Albemarle County residents and visitors, and require Dominion to ensure that their replacement towers are compatible with their surroundings instead of in conflict with Albemarle's Comprehensive Plan and the rural area spread over three of the County's six magisterial districts."[69]

Candace Carter Crosby of Earlysville, stated that she was in favor of reducing the visual impact of the new towers. Ms. Crosby stated in December she visited a tree farm near Waynesboro. On the way there, she saw a transmission line which she described as "enormous" and the towers' shiny steel as "blinding." She continued by saying, "[t]wo immediate thoughts came to mind. One, these lines are way too big, too shiny, and wrong in this beautiful valley landscape. And two, the property values of these farms and houses have taken a huge hit. For Albemarle County, please ask the Dominion Virginia Power engineers to find a better, less distracting material for these unsightly towers. Their enormous height can be reduced as well, one hopes."[70]

Scott Medvetz a homeowner from North Garden, spoke with regard to concerns about the visual and economic impacts and notification process of the proposed Rebuild Project. Mr. Medvetz stated the current lines and towers blend into the landscape reasonably well due to their height and dark color. If the height is increased by 30 feet and the towers are made of more reflective material, he believes the views from his property will be significantly impacted. He is also concerned about the new towers' effect on his property value. Finally, Mr. Medvetz thought the notification process of the Rebuild Project was incomplete. He stated many people who would

[67] *Id.* at 55-59.
[68] *Id.* at 60-62.
[69] *Id.* at 66-69.
[70] *Id.* at 70.

be directly affected by the line, such as his neighbor and himself, who live within 1500 feet of the towers, were not notified of the Rebuild Project.[71]

Morgan Butler of Charlottesville, spoke in favor of dulling treatments for the towers on the proposed Rebuild Project. In support of his position, Mr. Butler stated the impacted area is exceptional in that a national park, a national scenic byway, and three historic districts are included. He stated Dominion Virginia Power's testimony estimated the cost for dulling to be $266,000, which is only one-half of a percent of the projected $59 million for the entire Rebuild Project. Mr. Butler stated, "in my opinion the additional costs and risks of the chemical dulling treatment discussed in the rebuttal testimony seems manageable, particularly relative to . . . the tremendous value of the visual resources at stake here . . . [i]f chemical dulling is not the best solution, then please make sure additional efforts are undertaken to determine what is."[72]

Liz Palmer of Charlottesville, Supervisor for the Samuel Miller District on the Albemarle County Board of Supervisors stated that her concerns pertain to the aesthetic impact of the lines on the quality of life, the agri-tourism industry, and the scenic beauty. Ms. Palmer requested Dominion Virginia Power provide a GIS elevation map with an overlay photo simulation of the towers. She stated these maps are regularly provided to Albemarle County from cell tower installers. Ms. Palmer continued by saying, in order to determine the visual impact of the towers, they need to know what the towers look like *in situ*. She also suggested one way to mitigate the effect on the view is by placing the lines "along the contour of mountains" instead of over ridge lines.[73] Ms. Palmer closed by saying, "[p]lease don't let this decision be made without the benefit of a detailed photo simulation of the project, and without the chance for us and our planning staff to work with Dominion to mitigate the impacts where we can."[74]

Sally Thomas of Charlottesville, spoke on behalf of the Scenic Virginia Organization and requested the towers' visual effect on the beauty of the area be minimized. Ms. Thomas stated, "beauty is good for business, whether it is measured in tourism dollars, real estate values or the quality of life that attracts entrepreneurs and others to come live here."[75] Ms. Thomas stated that the Scenic Virginia Organization supports using materials for the towers that have a dull finish to fit in with the local character. In summary, Ms. Thomas stated, "[p]lease join the community and Commonwealth and individual efforts and minimize visual insults to the important scenic and cultural resources of this region."[76]

John Cruickshank of Charlottesville, representing the Piedmont Group of the Sierra Club, testified in support of maintaining the height of the existing towers and using materials that blend with the landscape. Mr. Cruickshank also requested Dominion Virginia Power publish the herbicides it uses under transmission lines so citizens can judge whether they are safe. He maintained, "electric industry sales in Virginia peaked in 2010 and sales have flattened since

---

[71] *Id.* at 72, 73.
[72] *Id.* at 74-78.
[73] *Id.* at 80.
[74] *Id.* at 78-81.
[75] *Id.* at 82.
[76] *Id.* at 82-85.

then."[77] Since electricity use in Virginia has not increased, Mr. Cruickshank stated he understood the need to repair or replace the power lines but he questioned the need for a power upgrade.[78]

David Stoner of Greenwood, stated that he had a career in the electric utility industry, but that he was in favor of evaluating other options to minimize the visual impact of the proposed towers. Mr. Stoner stated he found Dominion Virginia Power's application to be deficient in assessing the visual impact of the proposed towers. The culture resource section of the application done by Stantec did not assess changes in the proposed surface treatment from COR-TEN® to galvanized steel. He requested the Commission require Dominion Virginia Power to perform a visual assessment that would review the new galvanized steel finish and evaluate other alternative designs for the Rebuild Project. Potential options Mr. Stoner suggested are monopoles with a COR-TEN® finish or an H-frame steel design, which can lower the height. Mr. Stoner concluded by stating that he believes exploring these alternatives is warranted given the potential effect on historic, scenic, and cultural resources.[79]

Kirby Hutto, from North Garden, stated that the ROW passes through his property and that he was in favor of minimizing the towers' visual impact by using materials with a color that blends in with the surroundings. Mr. Hutto stated he understands the need for the Rebuild Project and is fine with the 30-foot increase in tower height presented by the Company in the May meeting at Walton School. He said there was no mention of using galvanized steel at that meeting. After the meeting, Mr. Hutto drove across Afton Mountain toward Augusta County. Along the drive, he viewed a power line with new galvanized poles and was "shocked at how [ ] they stood out from the background. They're really a visual blight."[80] Mr. Hutto is concerned that using galvanized steel towers will negatively affect his quality of life and his property value. He concluded by saying there must be a solution that will blend in with the natural beauty and will not adversely affect property values and quality of life.[81]

Julia Shields, a life-long resident of Greenwood, spoke about the beauty of the Crozet area and invited the Hearing Examiner to visit the area so she can show him some of the beautiful sites.[82]

Sally Thomas, a former member of the Albemarle County Board of Supervisors, spoke regarding the cell tower ordinances in the county. When cell towers were first built, Ms. Thomas stated the county created ordinances to protect the visual impact on the area. These ordinances were challenged all the way to the Federal Court of Appeals, where the ordinances were upheld. The Court found in the county's favor because the importance of the county's visual protection was addressed in Albemarle County's Comprehensive Plan, which gave grounds to restrict the visual impact of the towers.[83]

---

[77] *Id.* at 88.
[78] *Id.* at 86-88.
[79] *Id.* at 88-92.
[80] *Id.* at 94.
[81] *Id.* at 92-95.
[82] *Id.* at 97-99.
[83] *Id.* at 100, 101.

Randy Caldejon of Crozet, spoke in favor of minimizing the transmission line towers' visual impact. Mr. Caldejon stated he and his wife moved from Northern Virginia to Crozet because they love the beauty of the mountains and that the current power line was never even considered because they blend into the background. Mr. Caldejon maintained the new towers, if built as proposed, will move to the foreground because of their height and the glare produced by the galvanized steel. Mr. Caldejon stated that he is concerned the proposed towers will affect his property value and the economy of the area.[84]

Company Supplemental Testimony

On September 2, 2016, the Company filed the Supplemental Testimony of Gerald W. Jackson, Project Manager III, Transmission Projects for Dominion, in accordance with Ordering Paragraph (5) of the Hearing Examiner's Ruling dated July 1, 2016.

Mr. Jackson's testimony addressed comments made by public witnesses at the public hearing held in Charlottesville on August 8, 2016. The Company responded to four primary issues involved with the Rebuild Project: (1) mitigation of visual impacts with respect to the transmission tower finish and heights, as well as the impact of the tower finish and heights on historic districts; (2) the proposed capacity of the conductors; (3) consideration of the Albemarle County Comprehensive Plan; and (4) herbicide use for ground cover control for clearing and maintaining the ROW.[85]

The Company stated, although technically and commercially feasible, it does not support the accelerated dulled finish process prior to construction as an appropriate engineering alternative for several reasons. First, the chemically dulled finish would add an incremental cost of approximately $266,000 to the Rebuild Project. Second, the Company has concerns about the manufacturer's ability to properly apply and remove the chemical dulling treatment on the galvanized steel, which could negatively impact and reduce the service life of the towers. Third, in addition to potentially reducing the transmission towers' service life, the chemical dulling treatment would increase infrastructure maintenance costs over the life of the Rebuild Project, requiring the application of at least one or more additional zinc-rich paint treatments compared to what would be required for a naturally-dulled galvanized steel coating. Finally, the chemical dulling treatment could be applied in a non-uniform manner, which could result in a greater visual impact than if the galvanized steel were allowed to weather and dull naturally. The Company concluded that the galvanized steel towers it proposes would naturally dull and achieve a look and finish comparable to an artificially-dulled tower within four to five years in normal weather conditions without the increased cost and potential detrimental impacts associated with the chemically dulled finish.[86]

The Company pointed out Ann Mallek and Liz Palmer, both members of the Albemarle County Board of Supervisors, raised concerns about the increased tower height associated with the Rebuild Project. The Company noted it has maintained an open discourse with local stakeholders

[84] *Id.* at 102-104.
[85] Jackson Supplemental Testimony, at 3.
[86] *Id.* at 3, 4.

throughout the Application process and remains willing to exchange additional information about the Rebuild Project as it becomes available.[87]

The Company stated the existing 500 kV structures range between approximately 72 feet and 149 feet in height, with an approximate average overall height of 106 feet over the total length of the transmission line. The Company maintained the use of modern materials, compliance with National Electrical Safety Code clearance requirements, and application of good utility engineering practices require the new towers to be taller structures. Consequently, the proposed structure heights of the Rebuild Project towers are expected to range between approximately 108 feet and 174 feet, with an overall approximate average height of 134 feet over the approximately 32.7 miles of the Rebuild Project. Compared to the existing structures, the increase in average transmission tower height for the entire line length is estimated to be approximately 28 feet. The Company pointed out final tower heights of specific towers would be determined in the final engineering process and typically are not available until final design which occurs after the Commission issues it Final Order in this proceeding. The Company pointed out that it believes in the soundness of its line engineering approach and reserving the more extensive final engineering process as final is, not only consistent with Commission practice but, reasonable and prudent.[88]

Several public witnesses expressed concerns regarding the potential impact of the transmission tower heights and finish on historical districts. The Company pointed out that the existing Cunningham-Dooms line crosses the Greenwood-Afton Rural Historic District, the Skyline Drive Historic District, and Jefferson-Carter Rural Historic District, and all of these historical districts received their designation as historic districts after the establishment of the existing ROW.[89]

Several public comments raised the issues as to whether the proposed Rebuild Project was compatible with the Comprehensive Plan which includes a commitment to protect its natural landscapes. In response, the Company stated, as required by § 15.2-2232 of the Code, it considered the Comprehensive Plan when planning, routing, and designing the Rebuild Project as well as the comprehensive plans for Augusta and Fluvanna Counties to evaluate the potential effect the Rebuild Project would have on future development. The Company stated it has made a concerted effort to minimize the impact to Albemarle County through its routing and design of the proposed Rebuild Project. First, the Company pointed out the Rebuild Project would be entirely within existing ROW and would replace an existing transmission line.[90] Specifically, the Company proposes to conduct a one-for-one tower structure replacement[91] to minimize impact to mountain landscapes, soil, vegetation, and wildlife. The Company further pointed out using existing ROW eliminates the building of new access roads because the Company can use existing roads, thereby minimizing additional impact to natural landscapes. The Company maintained its proposed Rebuild Project reasonably minimizes additional impacts and would not impact future

[87] *Id.* at 6, 7.
[88] *Id.* at 5, 6.
[89] *Id.* at 7, 8.
[90] *Id.* at 11.
[91] The Company stated only one new tower structure would be required for the Rebuild Project. *Id.* at 12.

development plans in Albemarle County and is consistent with the county's vision to protect its natural landscapes, as set forth in its Comprehensive Plan.[92]

In response to public witnesses who expressed concern regarding the increased capacity of the proposed conductors and contended the Company did not adequately represent the need for a circuit upgrade as part of the Rebuild Project, the Company responded that current load forecasts indicate load will increase in the future. The Company explained the existing line is comprised of three phase 2-2049.5 AAAC that have a transfer capability of 2913 MVA. The Company's present standard conductor for 500 kV construction is 3-1351.5 ACSR with a transfer capability of 4330 MVA. The Company pointed out that all new 500 kV transmission lines will have this transfer capability.[93]

The Company stated herbicides used to maintain the ROW are approved by the U.S. Environmental Protection Agency and are registered with both state and federal agencies. The Company explained herbicide applications are made every three to five years by trained applicators who typically use backpack sprayers. The Company stated this method of herbicide application not only limits the amount of herbicide applied, but also targets only particular weeds as necessary.[94]

DISCUSSION

Need

I find there is a definite need for the proposed Rebuild Project. The Company has made it clear that without a rebuild of the Dooms-Cunningham #534 line the existing line will continue to deteriorate past its useful operating life, thereby increasing the risk of potentially severe impacts on the reliability of the grid during peak conditions. Staff confirmed the Company's concerns were justified by the condition of similar structures that were removed during other rebuild projects throughout the Company's 500 kV transmission system. Based on load flow studies[95] PJM identified the Rebuild Project as an "immediate need" project based on "end-of-life" criteria.[96] Staff reviewed the information provided in the Company's Application regarding the current condition of the structures, line splices, and insulators that make up the existing Cunningham-Dooms 500 kV Line # 534. Further, Staff reviewed and verified the power flow studies included in the Company's Application and as provided in response to interrogatories. Based on its review, Staff determined the Company's analyses are reasonable and the Company demonstrated a need for the proposed Rebuild Project.[97]

---

[92] *Id.* at 12.
[93] *Id.* at 9.
[94] *Id.* at 13, 14.
[95] The transmission planning contingency power flow studies conducted by PJM and the Company for the Rebuild Project were based on the assumptions used in the 2020 RTEP process, using the 2015 PJM Load Forecast, which represented the most up-to-date system model at the time of the Application. Staff Report, at 13.
[96] Application Appendix at 12; Company Response to Staff Interrogatory 2-13.
[97] Staff Report, at 15.

Alternative Solutions

I find that there are no viable or reasonable alternatives to the Company's proposed Rebuild Project. Any alternative to the Rebuild Project would require the construction of new 500 kV facilities in a new ROW at considerable additional cost and impacts. Moreover, the Company pointed out in its Application that the Cunningham-Dooms 500 kV Line # 534 plays a critical role in the reliable operation of its electric transmission system.[98]

Economic Development

I find the proposed Rebuild Project will have a positive impact on economic development in both the local area and statewide. The Cunningham-Dooms 500 kV Line # 534 serves an area that is rapidly growing, and includes infrastructure that is essential to the economic welfare of the Commonwealth of Virginia as well as surrounding states.

DEQ Coordinated Environmental Review

In accordance with paragraph three of the Department of Environmental Quality – State Corporation Commission Memorandum of Agreement Regarding Coordination of Reviews of the Environmental Impact of the Proposed Electric Generating Plants, dated August 14, 2002, and at the request of Staff, DEQ coordinated an environmental review of the proposed Rebuild Project by the various state and local agencies responsible for reviewing the environmental impacts of electric utility projects. The results of DEQ's review are contained in a report dated May 11, 2016, filed with the Commission on the following day. The DEQ Report summarizes the proposed Rebuild Project's potential impacts on natural resources, makes recommendations for minimizing those impacts, and outlines the Company's responsibilities for compliance with legal requirements governing environmental protection.

I find the recommendations contained in the DEQ Report are reasonable and should be implemented by the Company. With the recommendations and procedures provided by DEQ, I find the proposed Rebuild Project will have a reasonably minimal impact on the environment and scenic resources consistent with § 56-46.1 of the Code.

EMF

From August 15, 1984, to October 31, 2000, the Virginia Department of Health ("VDH") monitored the ongoing research on the possible health effects of EMF and ultimately concluded there was no causal connection between EMF and cancer in humans. Specifically, on October 31, 2000, the VDH reported:

> . . . there is no conclusive and convincing evidence that exposure to extremely low frequency EMF emanated from nearby high voltage transmission lines is causally associated with an increased incidence of cancer or other detrimental health effects in humans. Even if it is assumed that there is an increased risk of

[98] Application Appendix at 13.

> cancer as implied in some epidemiologic studies, the empirical relative risk appears to be fairly small in magnitude and the observed association appears to be tenuous. The studies published in the literature lack clear demonstration of a cause and effect relationship as well as a definitive dose-response gradient. A two- to three-fold increase in relative risk of certain cancers observed in some studies is within the range where experimental bias or confounding factors cannot be completely ruled out.
>
> Evidence from the laboratory studies has thus far failed to confirm that exposure to EMF causes cancer in experimental animals. Laboratory experiments have also failed to show how EMF could initiate or promote the growth of cancer. The results of both *in vivo* and *in vitro* experimental studies conducted so far do not lend support to an association between exposure to EMF and cancer.
>
> Furthermore, scientific proof of a causal association is established using multiple criteria, only one of which is epidemiologic association. Other important criteria in confirming causality (including strength of association, consistency and specificity of observations, appropriate temporal relationship, dose-response relationship, biological plausibility, and experimental verification) have not been satisfied for the implicit adverse effects of power-line frequency EMF.[99]

Expert panels formed by national and international scientific agencies have evaluated the scientific research related to health and power-frequency EMF and provided conclusions that form the basis of guidance to governments and industries. It is the general scientific consensus of the health agencies reviewing this research that, at levels associated with the operation of the proposed transmission line, or other common sources of EMF in the environment, the research does not support the conclusion that EMF causes any long-term, adverse health effects.

Tower Finish and Height

In response to the comments received at the local hearing, I conducted a field trip on August 18, 2016, to meet with public witnesses who requested that I view the impact of the proposed Rebuild Project on their property. During the field trip, I observed 500 kV galvanized steel lattice towers of the Lexington-Dooms transmission line that were installed in the fall of 2015. Without question, the recently installed towers of the Lexington-Dooms transmission line were bright and highly reflective. I also observed a galvanized steel monopole that was installed within the last two to three years and galvanized steel lattice transmission towers that had been installed approximately 10 years ago. Finally, I observed transmission towers made of COR-TEN® material. Based on my overall observations, the galvanized steel towers installed within the past two to three years had begun to dull significantly. The galvanized steel towers installed approximately ten years ago had a dulled patina that blended well into the background of either sky or forest. At a distance, the galvanized towers that weathered for at least two years blended into the background at least as well, if not better, than the COR-TEN® towers that were of a much darker finish. The towers with the COR-TEN® finish provided a stark contrast,

---

[99] Virginia Department of Health, *Monitoring of Ongoing Research on the Health Effects of High Voltage Transmission Lines*, Final Report (Oct. 31, 2000), at 20.

especially with the sky, because of its very dark finish. While I have not observed any towers with a chemically dulled finish, the naturally weathered galvanized steel towers blended well with backgrounds of both forest and sky.

Both the King Family Vineyard and Mrs. Shields have a view of the Cunningham-Dooms line as it descends Calf Mountain. However, in both instances, their view of the transmission line is from a distance of approximately one mile and, although the initial brightness of the towers will make the towers highly visible, as the galvanized steel of the proposed towers weathers naturally, the visual impact will be greatly diminished.

I find that requiring the Company to use a chemical dulling process on the newly installed towers is unwarranted. While the new towers will be bright and reflective at first, a dull finish will naturally be acquired in a few years. After two to three years, the finish on the towers should be sufficiently dulled to the point the towers are non-reflective. As stated above, from observations made during my field trip, the natural dulling of the galvanized steel blends well with natural surroundings. Further, while the initial cost of the dulling process is known, the additional maintenance costs and potential corrosion rate is unknown. Moreover, the potential detrimental effect of the chemical dulling process on the life span of the towers is also unknown.

The increased tower height is a direct result of (i) current NERC and National Electrical Safety Code clearance requirements; (ii) the use of modern materials; and (iii) compliance with, and application of, good utility engineering practices. The Rebuild Project is replacing a transmission line built to standards effective in the 1960's and modern standards require taller structures to meet current safety and engineering standards. I find that the Company has more than adequately explained why the Rebuild Project requires the new taller towers.

Conductor Capacity

As noted by Company witness Jackson, the existing line is comprised of three phase 2-2049.5 AAACs that have a transfer capability of 2913 MVA. These 2-2049.5 AAAC conductors were the standard conductors used for the Company's original 500 kV loop constructed in the 1960's. The Company's present standard conductor for 500 kV construction is the 3-1351.5 ACSR with a transfer capability of 4330 MVA.[100] The increased capacity is derived from the use of modern conductors and capacitors employing the latest technological advances. All of the Company's new 500 kV transmission lines will have this increased transfer capability.

Albemarle County Comprehensive Plan

The Comprehensive Plan addresses natural beauty and scenic landscapes which have been taken into consideration. The Comprehensive Plan specifically addresses cell towers and transmission line towers are not mentioned. The use of existing ROW and the fact that the Rebuild Project replaces an existing transmission line should also be taken into account when evaluating the overall impact to scenic and historical areas.

[100] Jackson Supplemental Testimony, at 9.

FINDINGS AND RECOMMENDATIONS

Based on the record in this proceeding, I find that:

1. The proposed Rebuild Project is justified by the public convenience and necessity;
2. The proposed Rebuild Project will maximize the use of existing ROWs;
3. The recommendations contained in the DEQ Report are reasonable and should be adopted by the Commission as conditions of approval;
4. The proposed Rebuild Project is essential to support ongoing economic development and overall system reliability;
5. The proposed Rebuild Project is not suitable for underground construction; and
6. The proposed Rebuild Project with its use of existing ROWs and tower design reasonably mitigates the projects overall impact and generally improves the aesthetics of the proposed Rebuild Project as required by Section 10 of HB 1319.

In accordance with the above findings, **I RECOMMEND** the Commission enter an order that:

1. ***ADOPTS*** findings in this Report;

2. ***GRANTS*** the Company's Application to construct the proposed transmission line and station improvements; and

3. ***DISMISSES*** this case from the Commission's docket of active cases.

COMMENTS

There are no respondents, therefore there will be no comment period.

Respectfully submitted,

Howard P. Anderson, Jr.
Hearing Examiner

Document Control Center is requested to mail a copy of this Report to: Charlotte P. McAfee, Esquire, Dominion Resources Services, Inc., 120 Tredegar Street, Riverside 2, Richmond, Virginia 23219; Kristian M. Dahl, Esquire, McGuireWoods LLP, Gateway Plaza, 800 East Canal Street, Richmond, Virginia 23219; and C. Meade Browder, Jr., Senior Assistant Attorney General, Division of Consumer Counsel, Office of the Attorney General, 202 North Ninth Street, Richmond, Virginia 23219.