

Front Royal - Racefield, Warrenton - Wheeler, North Anna - Lady Smith

General Information

Proposing entity name	Proprietary Company Information
Does the entity who is submitting this proposal intend to be the Designated Entity for this proposed project?	Yes
Company proposal ID	Proprietary Company Information
PJM Proposal ID	577
Project title	Front Royal - Racefield, Warrenton - Wheeler, North Anna - Lady Smith
Project description	New Racefield 500kV switchyard, New Racefield - Front Royal 500 kV line, New Warrenton - Wheeler DCT 230 kV line, New North Anna - Lady Smith 230 kV line, plus various modifications to existing lines and substations Proposal permitting and overhead costs are captured in Component 1B. See attachment 1 for flowgate information.
Email	Proprietary Company Information
Project in-service date	06/2027
Tie-line impact	No
Interregional project	No
Is the proposer offering a binding cap on capital costs?	Yes
Additional benefits	

Project Components

1. 1B - New 500kV Transmission Line from Allegheny Substation Front Royal to new Racefield switchyard
2. 33h - Marsh Run to Remington 230kV upgrade
3. 33D - New double circuit 230kV transmission line from new Cedar Hill substation to Wheeler substation
4. 33i - Wheeler to Linton Hall 230kV upgrade

5. 33j - Linton Hall to Atlantic 230kV upgrade
6. 33k - Remington to Remington CT 230kV upgrade
7. 33A - New 230kV transmission line from Dominion North Anna to Lady Smith
8. 01A - New 500kV line termination at Front Royal substation
9. 1F - New Racefield GIS Substation - 5 terminal
10. 33F - Wheeler substation 230kV expansion
11. 33B - North Anna substation 230kV expansion
12. 33C - Lady Smith substation 230kV expansion
13. 33E - Warrenton substation 230kV ring bus expansion
14. 50C - Mosby to Wishing Star 500kV Upgrade

Greenfield Transmission Line Component

Component title	1B - New 500kV Transmission Line from Allegheny Substation Front Royal to new Racefield switchyard	
Project description	Proprietary Company Information	
Point A	Front Royal	
Point B	Racefield	
Point C	N/A	
	Normal ratings	Emergency ratings
Summer (MVA)	3300.000000	3957.000000
Winter (MVA)	3984.000000	4018.000000
Conductor size and type	3x 1780 kcmil Chukar ACSR	
Nominal voltage	AC	
Nominal voltage	500	
Line construction type	Overhead	

General route description	<p>The route is approximately 48 miles long. Started at a new dead end structure in the existing Allegheny Power ROW at the north west corner of the Front Royal substation, the route goes north about 0.5 miles and then turns east at Rockland Rd to route around the Warren County Power Station. The route creates a new ROW until crossing the Shenandoah River at the Columbia Pipeline river crossing. The route follows the pipeline for about 5 miles and the pipeline ROW is expanded to the south to co-locate the new transmission line in the same corridor in order to reduce tree clearing impacts. The route then co-locates with Highway 50 for about 9 miles to reduce viewshed impact, with some minor route adjustments to reduce private building and residence impacts. The route deviates to the south from Highway 50 to the west of Middleburg to avoid significant residential and building impacts, for total of about 10 miles, before co-locating with Highway 50 again for about 3 miles on the eastern most portion and then terminating at the new Racefield switchyard.</p>
Terrain description	<p>Much of the project is located in the rolling hills and pastures of the Piedmont, where the bedrock consists mostly of gneiss, schist, and granite rocks at a typical depth of between 2 and 10 feet. Soils developed from these rocks and minerals form acid, infertile soils, with sandy loam surfaces. The rolling terrain is interrupted by steep ridges associated with the boundary of the Blue Ridge. Historically, much of the Piedmont region was cleared and farmed intensively, causing extreme erosion over much of the region. Much of the agricultural areas have since reverted to forests.</p>
Right-of-way width by segment	<p>The new right of way will have its own corridor and for the majority of the route, approximately 70%. Approximately 25% of the route will have a right of way adjacent to road ROW. The right of way for approximately 5% of the route will be an expansion of an existing transmission right of way. Where the transmission line is sited adjacent to existing roads, it may require partial use of road ROW and private parcels abutting the road ROW in select locations. Further refinement will be required once road right of way and property parcel boundary surveys are gathered. Approximately 85% of the route will have a 165 ft right of way, and approximately 15% of the route will have a right of way of 75 ft in congested areas.</p>
Electrical transmission infrastructure crossings	<p>See Attachment 4 (Google Earth .kmz) with identified major crossings.</p>
Civil infrastructure/major waterway facility crossing plan	<p>See Attachment 4 (Google Earth .kmz) with identified major crossings and Attachment 5 - Crossing Plan for more detail.</p>

Environmental impacts	<p>Environmental constraints identified are manageable through implementation of an environmental avoidance, minimization, and mitigation strategy incorporated at the beginning of the routing/siting process. Co-location with existing utilities and other infrastructure was prioritized to the greatest extent practicable to minimize the environmental impact on the landscape. The proposed route crosses 17 national wetland inventory (NWI) wetlands and 58 waterbodies, but it appears that most features are small and could be avoided without permitting. The crossing of the Shenandoah River will require additional agency consultations. The crossing of the Appalachian Trail will also require additional agency coordination and permitting with the National Parks Service. Consultation with the Army Corps of Engineers, Fish and Wildlife Service, and numerous state agencies is expected. Fatal flaws have not been identified for proposed route. A cultural resource professional assisted with the routing process to identify and minimize impacts to known areas with historic sensitivities. This proposed route will require additional consultations with historic districts and is co-located through the Unison Battlefield area. An investigation to further identify and evaluate historic properties will be conducted to determine the presence of archaeologically or historically significant resources. Federally listed species have been identified including listed bats, the rusty patched bumble bee, and clam species, but no critical habitat was identified along the proposed route. If suitable habitat is identified or regulations change, agency coordination and species-specific surveys will occur. The project intends to adhere to tree removal seasonal restriction windows to avoid and minimize impacts to protected birds and bats, such as the Tri-colored Bat, Northern Long-eared Bat, Bald Eagle, and other common raptors. Erosion control best management practices and setbacks will be engineered and utilized to prevent sedimentation from leaving the site for the protection of aquatic species and to avoid water quality impacts. Routing through the Appalachian Mountains will require additional control measures and monitoring. There are no unique or sensitive environmental concerns or impacts with the proposed transmission line that cannot be addressed.</p>
Tower characteristics	<p>The majority, approximately 65%, of the proposed structures will be single circuit 500kV lattice towers (TTVS-500) in a horizontal conductor configuration. Approximately 35% of the structures will be single circuit 500kV steel monopoles (TVS-500) in a delta conductor configuration. Any proposed deadend structure will either be a steel lattice tower or a 3-pole, one phase per pole configuration. See proposed structure drawing set included in attachment 10.</p>
Construction responsibility	Proprietary Company Information
Benefits/Comments	Proprietary Company Information
Component Cost Details - In Current Year \$	
Engineering & design	Proprietary Company Information
Permitting / routing / siting	Proprietary Company Information
ROW / land acquisition	Proprietary Company Information

Materials & equipment	Proprietary Company Information
Construction & commissioning	Proprietary Company Information
Construction management	Proprietary Company Information
Overheads & miscellaneous costs	Proprietary Company Information
Contingency	Proprietary Company Information
Total component cost	\$140,661,710.00
Component cost (in-service year)	\$143,334,199.00

Transmission Line Upgrade Component

Component title	33h - Marsh Run to Remington 230kV upgrade
Project description	Proprietary Company Information
Impacted transmission line	Marsh Run to Remington C.T. 230kV line
Point A	Marsh Run
Point B	Remington C.T.
Point C	N/A
Terrain description	Upgrade is within existing ROW

Existing Line Physical Characteristics

Operating voltage	230
Conductor size and type	Incumbent / Current Transmission owner specific
Hardware plan description	Utilize existing line hardware to extent possible.
Tower line characteristics	Utilize existing towers to extent practicable.

Proposed Line Characteristics

Designed

Operating

Voltage (kV)	230.000000	230.000000
	Normal ratings	Emergency ratings
Summer (MVA)	1573.000000	1810.000000
Winter (MVA)	1648.000000	1896.000000
Conductor size and type	Incumbent / Transmission Owner to select conductor to achieve the required ratings	
Shield wire size and type	Utilize existing shield wire to extent practicable	
Rebuild line length	1.7 miles	
Rebuild portion description	Proposing to upgrade limiting elements to achieve specific rating.	
Right of way	Use of existing ROW to extent practicable.	
Construction responsibility	Proprietary Company Information	
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process	
Component Cost Details - In Current Year \$		
Engineering & design	Proprietary Company Information	
Permitting / routing / siting	Proprietary Company Information	
ROW / land acquisition	Proprietary Company Information	
Materials & equipment	Proprietary Company Information	
Construction & commissioning	Proprietary Company Information	
Construction management	Proprietary Company Information	
Overheads & miscellaneous costs	Proprietary Company Information	
Contingency	Proprietary Company Information	
Total component cost	\$2,499,000.00	
Component cost (in-service year)	\$2,758,428.00	

Greenfield Transmission Line Component

Component title	33D - New double circuit 230kV transmission line from new Cedar Hill substation to Wheeler substation	
Project description	Proprietary Company Information	
Point A	Cedar Hill	
Point B	Wheeler	
Point C		
	Normal ratings	Emergency ratings
Summer (MVA)	1573.000000	1810.000000
Winter (MVA)	1648.000000	1896.000000
Conductor size and type	3x 1780 kcmil Chukar ACSR	
Nominal voltage	AC	
Nominal voltage	230	
Line construction type	Overhead	
General route description	The Project is largely located in rural Spotsylvania County, Virginia. About 65% of the County is located in Virginia's Piedmont physiographic province and about 35% is in the Coastal Plain. Elevations range from sea level to approximately 540 feet.	
Terrain description	The Project is predominantly located in Fauquier County the the Piedmont region of Virginia. The area is largely characterized by rolling hills and numerous ridges near the boundary with the Blue Ridge Mountains. The bedrock consists mostly of gneiss, schist, and granite rocks at a typical depth of between 2 and 10 feet. Soils developed from these rocks and minerals form acid, infertile soils, with sandy loam surfaces. Historically, much of the Piedmont region was cleared and farmed intensively, causing extreme erosion over much of the region. Before modern soil fertility and managerial practices were adapted to these soils, agricultural production diminished and most farms reverted to forests. Over two thirds of this region is wooded today.	
Right-of-way width by segment	The new right of way will have its own corridor and will be 45 ft wide.	

Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz) with identified major crossings.
Civil infrastructure/major waterway facility crossing plan	See Attachment 4 (Google Earth .kmz) with identified major crossings and Attachment 5 - Crossing Plan for more detail.
Environmental impacts	<p>Environmental constraints identified are manageable through implementation of an environmental avoidance, minimization, and mitigation strategy incorporated at the beginning of the routing/siting process. Co-location with existing utilities and other infrastructure was prioritized to the greatest extent practicable to minimize the environmental impact on the landscape. The proposed route crosses 4 forested national wetland inventory (NWI) wetlands and 9 waterbodies, but it appears that most features are small and could be avoided without permitting. Consultation with the Army Corps of Engineers, Fish and Wildlife Service, and numerous state agencies are expected. Fatal flaws have not been identified for proposed route. A cultural resource professional assisted with the routing process to identify and minimize impacts to known areas with historic sensitivities. An investigation to further identify and evaluate historic properties will be conducted to determine the presence of archaeologically or historically significant resources. Federally listed species have been identified including listed bats, but no critical habitat was identified along the proposed route. If suitable habitat is identified or regulations change, agency coordination and species-specific surveys will occur. The project intends to adhere to tree removal seasonal restriction windows to avoid and minimize impacts to protected birds and bats, such as the northern long-eared bat, bald eagle, and other common raptors. Erosion control best management practices and setbacks will be engineered and utilized to prevent sedimentation from leaving the site for the protection of aquatic species and to avoid water quality impacts. There are no unique or sensitive environmental concerns or impacts with the proposed transmission line that cannot be addressed.</p>
Tower characteristics	The proposed structures will be double circuit 230kV steel monopoles (TVVS-230DC) in a vertical conductor configuration. Any proposed deadend structure will be a steel monopole. For additional details, see proposed structure drawing set included in attachment 10.
Construction responsibility	Proprietary Company Information
Benefits/Comments	Proprietary Company Information
Component Cost Details - In Current Year \$	
Engineering & design	Proprietary Company Information
Permitting / routing / siting	Proprietary Company Information
ROW / land acquisition	Proprietary Company Information
Materials & equipment	Proprietary Company Information

Construction & commissioning	Proprietary Company Information
Construction management	Proprietary Company Information
Overheads & miscellaneous costs	Proprietary Company Information
Contingency	Proprietary Company Information
Total component cost	\$34,566,070.00
Component cost (in-service year)	\$38,154,474.00

Transmission Line Upgrade Component

Component title	33i - Wheeler to Linton Hall 230kV upgrade
Project description	Proprietary Company Information
Impacted transmission line	Wheeler - Linton Hall 230 kV
Point A	Wheeler
Point B	Linton Hall
Point C	N/A
Terrain description	Upgrade is within existing ROW

Existing Line Physical Characteristics

Operating voltage	230
Conductor size and type	Incumbent / Current Transmission owner specific
Hardware plan description	Utilize existing line hardware to extent possible.
Tower line characteristics	Utilize existing towers to extent practicable.

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	230.000000	230.000000

	Normal ratings	Emergency ratings
Summer (MVA)	1573.000000	1810.000000
Winter (MVA)	1648.000000	1896.000000
Conductor size and type	Incumbent / Transmission Owner to select conductor to achieve the required ratings	
Shield wire size and type	Utilize existing shield wire to extent practicable	
Rebuild line length	4.9 miles	
Rebuild portion description	Proposing to upgrade limiting elements to achieve specific rating.	
Right of way	Use of existing ROW to extent practicable.	
Construction responsibility	Proprietary Company Information	
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process	
Component Cost Details - In Current Year \$		
Engineering & design	Proprietary Company Information	
Permitting / routing / siting	Proprietary Company Information	
ROW / land acquisition	Proprietary Company Information	
Materials & equipment	Proprietary Company Information	
Construction & commissioning	Proprietary Company Information	
Construction management	Proprietary Company Information	
Overheads & miscellaneous costs	Proprietary Company Information	
Contingency	Proprietary Company Information	
Total component cost	\$5,000,000.00	
Component cost (in-service year)	\$5,519,064.00	

Transmission Line Upgrade Component

Component title	33j - Linton Hall to Atlantic 230kV upgrade
Project description	Proprietary Company Information
Impacted transmission line	Linton Hall - Atlantic 230 kV
Point A	Linton Hill
Point B	Atlantic
Point C	N/A
Terrain description	Upgrade is within existing ROW

Existing Line Physical Characteristics

Operating voltage	230
Conductor size and type	Incumbent / Current Transmission owner specific
Hardware plan description	Utilize existing line hardware to extent possible.
Tower line characteristics	Utilize existing towers to extent practicable.

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	230.000000	230.000000
	Normal ratings	Emergency ratings
Summer (MVA)	1573.000000	1810.000000
Winter (MVA)	1648.000000	1896.000000
Conductor size and type	Incumbent / Transmission Owner to select conductor to achieve the required ratings	
Shield wire size and type	Utilize existing shield wire to extent practicable	

Rebuild line length	4 miles
Rebuild portion description	Proposing to upgrade limiting elements to achieve specific rating.
Right of way	Use of existing ROW to extent practicable.
Construction responsibility	Proprietary Company Information
Benefits/Comments	Proprietary Company Information

Component Cost Details - In Current Year \$

Engineering & design	Proprietary Company Information
Permitting / routing / siting	Proprietary Company Information
ROW / land acquisition	Proprietary Company Information
Materials & equipment	Proprietary Company Information
Construction & commissioning	Proprietary Company Information
Construction management	Proprietary Company Information
Overheads & miscellaneous costs	Proprietary Company Information
Contingency	Proprietary Company Information
Total component cost	\$5,000,000.00
Component cost (in-service year)	\$5,519,064.00

Transmission Line Upgrade Component

Component title	33k - Remington to Remington CT 230kV upgrade
Project description	Proprietary Company Information
Impacted transmission line	Remington - Remington CT 230kV
Point A	Remington
Point B	Remington CT

Point C	N/A	
Terrain description	Upgrade is within existing ROW	
Existing Line Physical Characteristics		
Operating voltage	230	
Conductor size and type	Incumbent / Current Transmission owner specific	
Hardware plan description	Utilize existing line hardware to extent possible.	
Tower line characteristics	Utilize existing towers to extent practicable.	
Proposed Line Characteristics		
	Designed	Operating
Voltage (kV)	230.000000	230.000000
	Normal ratings	Emergency ratings
Summer (MVA)	1573.000000	1810.000000
Winter (MVA)	1648.000000	1896.000000
Conductor size and type	Incumbent / Transmission Owner to select conductor to achieve the required ratings	
Shield wire size and type	Utilize existing shield wire to extent practicable	
Rebuild line length	0.5 miles	
Rebuild portion description	Proposing to upgrade limiting elements to achieve specific rating.	
Right of way	Use of existing ROW to extent practicable.	
Construction responsibility	Proprietary Company Information	
Benefits/Comments	Proprietary Company Information	
Component Cost Details - In Current Year \$		
Engineering & design	Proprietary Company Information	

Permitting / routing / siting	Proprietary Company Information
ROW / land acquisition	Proprietary Company Information
Materials & equipment	Proprietary Company Information
Construction & commissioning	Proprietary Company Information
Construction management	Proprietary Company Information
Overheads & miscellaneous costs	Proprietary Company Information
Contingency	Proprietary Company Information
Total component cost	\$735,000.00
Component cost (in-service year)	\$811,302.00

Greenfield Transmission Line Component

Component title	33A - New 230kV transmission line from Dominion North Anna to Lady Smith	
Project description	Proprietary Company Information	
Point A	North Anna	
Point B	Lady Smith	
Point C	N/A	

	Normal ratings	Emergency ratings
Summer (MVA)	1573.000000	1810.000000
Winter (MVA)	1648.000000	1896.000000
Conductor size and type	3x 1780 kcmil Chukar ACSR	
Nominal voltage	AC	
Nominal voltage	230	

Line construction type	Overhead
General route description	The route is approximately 14 miles long. Starting a dead end structure at the North Anna Nuclear Generating Facility substation, the line routes northeast for about 0.7 miles before reaching the existing North Anna - Lady Smith 500kV transmission line. The line then follows the existing North Anna - Lady Smith 500kV transmission line for about 13.5 miles, crossing over Lake Anna and utilizing the available existing ROW for the duration of the route to Lady Smith substation.
Terrain description	The Project is largely located in rural Spotsylvania County, Virginia. About 65% of the County is located in Virginia's Piedmont physiographic province and about 35% is in the Coastal Plain. Elevations range from sea level to approximately 540 feet.
Right-of-way width by segment	The proposed transmission line utilizes the existing ROW for the majority of its length.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz) with identified major crossings.
Civil infrastructure/major waterway facility crossing plan	See Attachment 4 (Google Earth .kmz) with identified major crossings and Attachment 5 - Crossing Plan for more detail.
Environmental impacts	Environmental constraints identified are manageable through implementation of an environmental avoidance, minimization, and mitigation strategy incorporated at the beginning of the routing/siting process. Co-location with existing utilities and other infrastructure was prioritized to the greatest extent practicable to minimize the environmental impact on the landscape. The proposed route crosses 15 national wetland inventory (NWI) wetlands and 18 waterbodies, but it appears that most features are small and could be avoided without permitting. Consultations with the Army Corps of Engineers, Fish and Wildlife Service, and numerous state agencies are expected. The crossing of Lake Anna is expected to require special consideration. Fatal flaws have not been identified for proposed route. A cultural resource professional assisted with the routing process to identify and minimize impacts to known areas with historic sensitivities. An investigation to further identify and evaluate historic properties will be conducted to determine the presence of archaeologically or historically significant resources. Federally listed species have been identified including listed bats and aquatic species, but no critical habitat was identified along the proposed route. If suitable habitat is identified or regulations change, agency coordination and species-specific surveys will occur. The project intends to adhere to tree removal seasonal restriction windows to avoid and minimize impacts to protected birds and bats, such as the northern long-eared bat, bald eagle, and other common raptors. Erosion control best management practices and setbacks will be engineered and utilized to prevent sedimentation from leaving the site for the protection of aquatic species and to avoid water quality impacts. There are no unique or sensitive environmental concerns or impacts with the proposed transmission line that cannot be addressed.
Tower characteristics	The proposed structures will be single circuit 230kV steel H-frames (THVS-230) in a horizontal configuration. Any proposed deadend structure will be a steel 3-pole. See proposed structure drawing set included in attachment 10.

Construction responsibility

Proprietary Company Information

Benefits/Comments

Resolves reliability issues identified per PJM's Gen. Deliv. Process

Component Cost Details - In Current Year \$

Engineering & design

Proprietary Company Information

Permitting / routing / siting

Proprietary Company Information

ROW / land acquisition

Proprietary Company Information

Materials & equipment

Proprietary Company Information

Construction & commissioning

Proprietary Company Information

Construction management

Proprietary Company Information

Overheads & miscellaneous costs

Proprietary Company Information

Contingency

Proprietary Company Information

Total component cost

\$33,082,000.00

Component cost (in-service year)

\$36,516,338.00

Substation Upgrade Component

Component title

01A - New 500kV line termination at Front Royal substation

Project description

https://nee.sharepoint.com/:x:/r/sites/ext_neet_gis/ext_neet_projects/_layouts/15/Doc.aspx?sourcedoc=%7B...

Substation name

Front Royal

Substation zone

Allegheny Power

Substation upgrade scope

Terminate new 500 kV line in the 500 kV ring bus. Add one new 500 kV circuit breaker and two new MODs.

Transformer Information

None	
New equipment description	AC Substation: Add two (2) new 500 kV breakers to existing ring bus.
Substation assumptions	The use of a spare position appears to be available
Real-estate description	No expansion of substation fence anticipated
Construction responsibility	Proprietary Company Information
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process

Component Cost Details - In Current Year \$

Engineering & design	Proprietary Company Information
Permitting / routing / siting	Proprietary Company Information
ROW / land acquisition	Proprietary Company Information
Materials & equipment	Proprietary Company Information
Construction & commissioning	Proprietary Company Information
Construction management	Proprietary Company Information
Overheads & miscellaneous costs	Proprietary Company Information
Contingency	Proprietary Company Information
Total component cost	\$2,800,000.00
Component cost (in-service year)	\$3,090,676.00

Greenfield Substation Component

Component title	1F - New Racefield GIS Substation - 5 terminal
Project description	Proprietary Company Information
Substation name	Racefield

Substation description New Gas Insulated Switchgear, 5-terminal, 500 kV breaker and a half configuration on ~7 acre property near the existing Buttermilk and planned Wishing Star substations in Virginia. Terminate new Front Royal - Racefield 500kV transmission line and loop in two existing Brambleton - Arcola 500kV transmission lines.

Nominal voltage AC

Nominal voltage 500

Transformer Information

None

Major equipment description AC Gas Insulated Substation (GIS): New proposed 500 kV Substation. New Breaker and a Half (BAAH) switchyard, three (3) bay, five (5) line terminals, eight (8) 500 kV, 5000A, 63kAIC breakers

	Normal ratings	Emergency ratings
Summer (MVA)	0.000000	0.000000
Winter (MVA)	0.000000	0.000000

Environmental assessment Environmental constraints identified are manageable through implementation of an environmental avoidance, minimization, and mitigation strategy incorporated at the beginning of the siting process. Co-location with existing utilities and other infrastructure was prioritized to the greatest extent practicable to minimize the environmental impact on the landscape. The proposed site crosses no national wetland inventory (NWI) wetlands or waterbodies but is located adjacent to a small pond. Fatal flaws have not been identified. A cultural resource professional assisted with the siting process to identify and minimize impacts to known areas with historic sensitivities. An investigation to further identify and evaluate historic properties will be conducted to determine the presence of archaeologically or historically significant resources. Federally listed species have been identified in the general area, including listed bats. If suitable habitat for bats or any other protected species is identified or regulations change, agency consultation and species-specific surveys will occur. The project intends to adhere to tree removal seasonal restriction windows to avoid and minimize impacts to protected birds and bats, such as the Tri-colored Bat, Northern Long-eared Bat, Bald Eagle, and other common raptors. Erosion control best management practices and setbacks will be engineered and utilized to prevent sedimentation from leaving the site for the protection of aquatic species and to avoid water quality impacts. There are no unique or sensitive environmental concerns or impacts with the proposed substation site that cannot be addressed.

Outreach plan	<p>The Company is committed to working with all interested stakeholders through a robust public outreach program to address/respond to community concerns and inform the public about the project to the greatest extent practicable. The Company believes a well-designed public outreach program can have numerous benefits, including fostering a cooperative relationship with landowners and other stakeholders, expediting the regulatory permitting process, and assisting with project development. In general, the purpose of the community outreach plan is to gain community support for the project. In the affected communities, the Company's public outreach plan will educate the public and relevant stakeholders on specific project details to enable timely regulatory approvals and construction activities. Elements of the public outreach plan will include the following: 1) Identify potential issues at an early stage by engagement with key community stakeholders at the outset; 2) Broaden the community engagement process to identify potential and relevant community benefits that can facilitate community support for the proposed project; 3) Develop a broad base of community support for the proposed project before the regulatory agencies; and 4) Develop a comprehensive administrative record documenting the community outreach process that can be presented to the regulatory agency or, in the event of a legal challenge, to the appropriate court. The outreach plan proposes to dedicate considerable time and resources in engaging the community, and specifically the affected community during the planning process to identify highly sensitive areas that have the least amount of cultural, environmental, and social impacts on the community. The plans will reflect avoidance of impacts rather than mitigation. However, in some cases, if avoidance is not possible, then the Company will involve the community in providing appropriate and practical mitigation measures. The Company will commence its public outreach activities following project award.</p>
Land acquisition plan	See Attachment 9 for Land Acquisition Plan.
Construction responsibility	Proprietary Company Information
Benefits/Comments	Resolves reliability and market efficiency issues identified per PJM's. process. Substation is a switchyard with no voltage transformation.
Component Cost Details - In Current Year \$	
Engineering & design	Proprietary Company Information
Permitting / routing / siting	Proprietary Company Information
ROW / land acquisition	Proprietary Company Information
Materials & equipment	Proprietary Company Information
Construction & commissioning	Proprietary Company Information
Construction management	Proprietary Company Information

Overheads & miscellaneous costs	Proprietary Company Information
Contingency	Proprietary Company Information
Total component cost	\$23,436,000.00
Component cost (in-service year)	\$25,868,959.00

Substation Upgrade Component

Component title	33F - Wheeler substation 230kV expansion
Project description	Proprietary Company Information
Substation name	Wheeler
Substation zone	Dominion
Substation upgrade scope	Add one new 230kV circuit breaker and repective MODs at the existing Wheeler Substation. Terminate the two new 230kV transmission lines.

Transformer Information

None	
New equipment description	AC Substation: Add one (1) new 230 kV breaker to existing ring.
Substation assumptions	The use of a position within the ring appears to be available.
Real-estate description	No expansion of substation fence anticipated
Construction responsibility	Proprietary Company Information
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process

Component Cost Details - In Current Year \$

Engineering & design	Proprietary Company Information
Permitting / routing / siting	Proprietary Company Information
ROW / land acquisition	Proprietary Company Information

Materials & equipment	Proprietary Company Information
Construction & commissioning	Proprietary Company Information
Construction management	Proprietary Company Information
Overheads & miscellaneous costs	Proprietary Company Information
Contingency	Proprietary Company Information
Total component cost	\$1,400,000.00
Component cost (in-service year)	\$1,545,338.00

Substation Upgrade Component

Component title	33B - North Anna substation 230kV expansion
Project description	Proprietary Company Information
Substation name	North Anna
Substation zone	Dominion
Substation upgrade scope	Add two new 230 kV circuit breakers and one MOD at the existing North Anna Substation.

Transformer Information

None	
New equipment description	AC Substation: Add one (1) new 230 kV breaker to existing bay in breaker and a half (BAAH) bus.
Substation assumptions	The use of a position within a bay appears to be available.
Real-estate description	No expansion of substation fence anticipated
Construction responsibility	Proprietary Company Information
Benefits/Comments	Proprietary Company Information

Component Cost Details - In Current Year \$

Engineering & design	Proprietary Company Information
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Permitting / routing / siting	Proprietary Company Information
ROW / land acquisition	Proprietary Company Information
Materials & equipment	Proprietary Company Information
Construction & commissioning	Proprietary Company Information
Construction management	Proprietary Company Information
Overheads & miscellaneous costs	Proprietary Company Information
Contingency	Proprietary Company Information
Total component cost	\$1,400,000.00
Component cost (in-service year)	\$1,545,338.00

Substation Upgrade Component

Component title	33C - Lady Smith substation 230kV expansion
Project description	Proprietary Company Information
Substation name	Lady Smith
Substation zone	Dominion
Substation upgrade scope	Add one 230kV circuit breaker and one MOD to existing bus.

Transformer Information

None	
New equipment description	AC Substation: Add one (1) new 230 kV breaker to existing bus.
Substation assumptions	The use of a position within the 230 kV bus appears to be available.
Real-estate description	No expansion of substation fence anticipated
Construction responsibility	Proprietary Company Information
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process

Component Cost Details - In Current Year \$

Engineering & design	Proprietary Company Information
Permitting / routing / siting	Proprietary Company Information
ROW / land acquisition	Proprietary Company Information
Materials & equipment	Proprietary Company Information
Construction & commissioning	Proprietary Company Information
Construction management	Proprietary Company Information
Overheads & miscellaneous costs	Proprietary Company Information
Contingency	Proprietary Company Information
Total component cost	\$1,400,000.00
Component cost (in-service year)	\$1,545,338.00

Substation Upgrade Component

Component title	33E - Warrenton substation 230kV ring bus expansion
Project description	Proprietary Company Information
Substation name	Warrenton
Substation zone	Dominion
Substation upgrade scope	Add four 230kV circuit breakers and terminate two new 230kV transmission lines.

Transformer Information

None	
New equipment description	AC substation: Add four (4) new 230kV breakers to existing ring bus.
Substation assumptions	Area west of the substation appears to be available.
Real-estate description	Expected expansion of fenceline is within utility owned property.

Construction responsibility	Proprietary Company Information
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process.
Component Cost Details - In Current Year \$	
Engineering & design	Proprietary Company Information
Permitting / routing / siting	Proprietary Company Information
ROW / land acquisition	Proprietary Company Information
Materials & equipment	Proprietary Company Information
Construction & commissioning	Proprietary Company Information
Construction management	Proprietary Company Information
Overheads & miscellaneous costs	Proprietary Company Information
Contingency	Proprietary Company Information
Total component cost	\$1,400,000.00
Component cost (in-service year)	\$1,545,338.00

Transmission Line Upgrade Component

Component title	50C - Mosby to Wishing Star 500kV Upgrade
Project description	Proprietary Company Information
Impacted transmission line	Mosby to Wishing Star 500kV (Two Circuits)
Point A	Mosby
Point B	Wishing Star
Point C	N/A
Terrain description	Work required is within existing ROW.

Existing Line Physical Characteristics

Operating voltage	500/230
Conductor size and type	Incumbent / Current Transmission owner specific
Hardware plan description	Utilize existing line hardware to extent possible.
Tower line characteristics	Utilize existing towers to extent practicable.

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	500.000000	500.000000
	Normal ratings	Emergency ratings
Summer (MVA)	4295.000000	4357.000000
Winter (MVA)	5066.000000	5196.000000
Conductor size and type	Incumbent / Transmission Owner to select conductor to achieve the required ratings.	
Shield wire size and type	Utilize existing shield wire to extent practicable.	
Rebuild line length	5	
Rebuild portion description	Proposing to upgrade limiting elements to achieve specific rating.	
Right of way	Use of existing ROW to extent practicable.	
Construction responsibility	Proprietary Company Information	
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process	

Component Cost Details - In Current Year \$

Engineering & design	Proprietary Company Information
Permitting / routing / siting	Proprietary Company Information
ROW / land acquisition	Proprietary Company Information

Materials & equipment	Proprietary Company Information
Construction & commissioning	Proprietary Company Information
Construction management	Proprietary Company Information
Overheads & miscellaneous costs	Proprietary Company Information
Contingency	Proprietary Company Information
Total component cost	\$5,000,000.00
Component cost (in-service year)	\$5,519,064.00

Congestion Drivers

None

Existing Flowgates

None

New Flowgates

Proprietary Company Information

Financial Information

Capital spend start date	09/2023
Construction start date	07/2025
Project Duration (In Months)	45

Cost Containment Commitment

Cost cap (in current year)	Proprietary Company Information
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Components covered by cost containment

1. 1B - New 500kV Transmission Line from Allegheny Substation Front Royal to new Racefield switchyard - NEETMA
2. 33D - New double circuit 230kV transmission line from new Cedar Hill substation to Wheeler substation - NEETMA
3. 33A - New 230kV transmission line from Dominion North Anna to Lady Smith - NEETMA
4. 01A - New 500kV line termination at Front Royal substation - AP
5. 1F - New Racefield GIS Substation - 5 terminal - NEETMA

Cost elements covered by cost containment

Engineering & design	Yes
Permitting / routing / siting	Yes
ROW / land acquisition	Yes
Materials & equipment	Yes
Construction & commissioning	Yes
Construction management	Yes
Overheads & miscellaneous costs	Yes
Taxes	Yes
AFUDC	No
Escalation	No
Additional Information	Proprietary Company Information
Is the proposer offering a binding cap on ROE?	Yes
Would this ROE cap apply to the determination of AFUDC?	Yes
Would the proposer seek to increase the proposed ROE if FERC finds that a higher ROE would not be unreasonable?	No

Is the proposer offering a Debt to Equity Ratio cap?

Proprietary Company Information

Additional cost containment measures not covered above

Proprietary Company Information

Additional Comments

None