Lines #541 (Front Royal to Morrisville) Rebuild

General Information

Proposing entity name	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Does the entity who is submitting this proposal intend to be the Designated Entity for this proposed project?	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Company proposal ID	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
PJM Proposal ID	671
Project title	Lines #541 (Front Royal to Morrisville) Rebuild
Project description	This project addresses overloads on Line #541, identified under the Prelim 2028 RTEP cases for 2022W3 (the new Generator Deliverability as well as N-1 study), by rebuilding approximately 47 miles of the transmission line form Front Royal to Morrisville substation to current 500 kV standards. The new conductor will have a minimum normal summer rating of 4357 MVA. Substation equipment, at Morrisville and Front Royal, will be upgraded to support the new conductor rating.
Email	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Project in-service date	06/2028
Tie-line impact	No
Interregional project	No
Is the proposer offering a binding cap on capital costs?	No
Additional benefits	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Project Components

1. Front Royal Substation Terminal Equipment Upgrade
2. Morrisville Substation Terminal Equipment Upgrade
3. Line # 541 (Front Royal to Morrisville) Rebuild

Substation Upgrade Component

Component title	Front Royal Substation Terminal Equipment Upgrade
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Front Royal
Substation zone	366
Substation upgrade scope	Purchase and install substation material: 1. Four (4) 500 kV, 5000A Double End Break Switches. 2. Two (2) 500 kV, 63kAIC, 5000A, SF6 Circuit Breakers. 3. One (1) Panel Retirement 4. Approximately 2000 FT 6 in. Sch. 80 AL tube bus. 5. Foundations and steel structures as required. 6. Conductor, connectors, conduit, control cable, and grounding material as necessary per engineering standards. Purchase and install relay material: 1. Two (2), 4535 – 500kV GE Circuit Breaker Condition Monitor OR 4536 – 500kV Axion Circuit Breaker Condition Monitor. 2. Two (2), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box. 3. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber, CD/Fiber Line Panel (500kV w/ 2 Fiber Cables). Reuse relay material: 1. Two (2), 4510 - SEL-2411 Equipment Annunciator Remove substation material: 1. Four (4), 500 KV 4000A Double End Break Switches. 2. Two (2) 500 kV, 50kAIC, 4000A, SF6 Circuit Breakers. 3. One (1), 500KV 4000A Line Trap.

Transformer Information

None

New equipment description	Purchase and install substation material: 1. Four (4) 500 kV, 5000A Double End Break Switches. 2. Two (2) 500 kV, 63kAIC, 5000A, SF6 Circuit Breakers. 3. One (1) Panel Retirement 4. Approximately 2000 FT 6 in. Sch. 80 AL tube bus. 5. Foundations and steel structures as required. 6. . Two (2), 4535 – 500kV GE Circuit Breaker Condition Monitor OR 4536 – 500kV Axion Circuit Breaker Condition Monitor. 7. Two (2), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box. 8. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber, CD/Fiber Line Panel (500kV w/ 2 Fiber Cables).
Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. Relay Settings and protection & control design to add transmission breakers will be revised as part of the SPE scope of work. 3. 4-hole pad connections must be replaced with 6-hole connections to maintain 5000A ratings.
Real-estate description	Substation is not being expanded.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$3,943,931.00
Component cost (in-service year)	$4,223,950.10

Substation Upgrade Component

Component title	Morrisville Substation Terminal Equipment Upgrade
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Morrisville
Substation zone	366

Substation upgrade scope	Purchase and install substation material: 1. Three (3) 500 kV, 5000A Double End Break Switches. 2. Two (2) 500 kV, 63kAIC, 5000A, SF6 Circuit Breakers. 3. Approximately 1000 FT 6 in. Sch. 80 AL tube bus. 4. Three (3) 396 kV, 318 kV MCOV Station Class Surge Arresters 5. Two (2) Panel Retirement 6. Foundations and steel structures as required. 7. Conductor, connectors, conduit, control cable, and grounding material as necessary per engineering standards. Purchase and install relay material: 1. One (1), 4510 - SEL-2411 Equipment Annunciator. 2. Two (2), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel. 3. Three (3), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box. 4. Two (2), 4535 – 500kV GE Circuit Breaker Condition Monitor OR 4536 – 500kV Axion Circuit Breaker Condition Monitor. 5. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber, CD/Fiber Line Panel (500kV w/ 2 Fiber Cables). Reuse relay material: 1. Two (2), 4510 - SEL-2411 Equipment Annunciator. 2. One (1), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel. 3. One (1), 4535 – 500kV GE Circuit Breaker Condition Monitor OR 4536 – 500kV Axion Circuit Breaker Condition Monitor. Remove Substation Material: 1. Three (3), 500 KV 4000A Double End Break Switches. 2. One (1) 500 kV, 50kAIC, 4000A, SF6 Circuit Breakers. 3. One (1), 500KV 4000A Line Trap.

Transformer Information

None

New equipment description	1. Three (3) 500 kV, 5000A Double End Break Switches. 2. Two (2) 500 kV, 63kAIC, 5000A, SF6 Circuit Breakers. 3. Approximately 1000 FT 6 in. Sch. 80 AL tube bus. 4. Three (3) 396 kV, 318 kV MCOV Station Class Surge Arresters 5. Foundations and steel structures as required. 6. One (1), 4510 - SEL-2411 Equipment Annunciator. 7. Two (2), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel. 8. Three (3), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box. 9. Two (2), 4535 – 500kV GE Circuit Breaker Condition Monitor OR 4536 – 500kV Axion Circuit Breaker Condition Monitor. 10. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber, CD/Fiber Line Panel (500kV w/ 2 Fiber Cables).
Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. Relay Settings and protection & control design to add transmission breakers will be revised as part of the SPE scope of work. 3. 4-hole pad connections must be replaced with 6-hole connections to maintain 5000A ratings.
Real-estate description	Substation is not being expanded.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Component Cost Details - In Current Year $

Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$3,846,075.00
Component cost (in-service year)	$4,119,146.33

Transmission Line Upgrade Component

Component title	Line # 541 (Front Royal to Morrisville) Rebuild
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Impacted transmission line	Line #541
Point A	Front Royal
Point B	Morrisville
Point C	
Terrain description	The project area is in the Shenandoah Valley region with elevations ranging from approximately 260 to 1760 feet. The terrain is predominately vegetated existing right-of-way consisting of mostly moderate slopes. The line will cross three railroads, I-66, John Marshall Highway, Lee Highway, and Route 15 and will cross the Shenandoah River, Rappahannock River, and the Appalachian Trail.

Existing Line Physical Characteristics

Operating voltage	500
Conductor size and type	2-2500 ACAR (84/7) 90°C MOT [46.68 miles]

Hardware plan description	New hardware will be used for line rebuild.
Tower line characteristics	Existing Structures will be removed and new structures will be used for this rebuild.

Proposed Line Characteristics

	Designed	**Operating**
Voltage (kV)	500.000000	500.000000
	Normal ratings	**Emergency ratings**
Summer (MVA)	4357.000000	4357.000000
Winter (MVA)	5155.000000	5155.000000

Conductor size and type	3-1351.5 ACSR (45/7) 110°C MOT
Shield wire size and type	DNO-10100 48-fiber OPGW shielding
Rebuild line length	46.68 miles
Rebuild portion description	Approximately 275 structures will be removed and replaced with a mixture of new Lattice towers and monopole structures depending on how much right-of-way is needed for the different segments. 46.68 miles of 1351.5 ACSR "Dipper" conductor will be installed, as well as dual DNO-10100 48-fiber OPGW shield wire.
Right of way	No additional right of way is required for this project.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Component Cost Details - In Current Year $

Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$291,244,730.00
Component cost (in-service year)	$311,923,105.83

Congestion Drivers

None

Existing Flowgates

None

New Flowgates

The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Financial Information

Capital spend start date	06/2025
Construction start date	06/2028
Project Duration (In Months)	36

Additional Comments

N/A