2030 Western Solution

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	975
Project title	2030 Western Solution
Project description	This Proposal is an alternate option for the following components in the 2030 Solution Proposal (PJM ID: 911): 1. 993189 - Line 2028 Rebuild - Charlottesville to Fork Union 2. 993450 - Line 2193 Rebuild - Bremo to Fork Union Wreck and Rebuild Line#2193 Bremo – Fork Union. Disconnect 230 kV Line #2111 Bear Garden- Bremo at the Bremo terminal and extend Line #2111 approximately 1.6 miles to Fork Union. The extension should not share circuit structures with Line #2193. Terminate line #2111 at Fork Union to create a Bear Garden – Fork Union 230 kV line. Rebuild line 2028 using double circuit structures. Build a new 230kV line from Fork Union station to Gordonsville, bypassing Charlottesville. This new line will share the double circuit structures with Line #2028, Line #2054 (Charlottesville-Hollymead Junction, coordinate with Project 993132) and Line #2135 (Hollymead Junction – Gordonsville coordinate with Project 993133). Build a new double-circuit 230 kV from Gordonsville to Southall and a new double-circuit 230 kV from Southall to North Anna. Coordination with project 993097 is needed.
Email	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Project in-service date	06/2030
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. 2111 Extension - Bear Garden to Fork Union
2. New 230 kV Lines - Fork Union to Gordonsville to Southall to North Anna
3. Bremo Substation Scope
4. Charlottesville Substation Scope
5. Fork Union Substation Scope
6. Gordonsville Substation Expansion
7. North Anna Substation Expansion
8. Southall Substation Expansion

Transmission Line Upgrade Component

Component title	2111 Extension - Bear Garden to Fork Union
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Impacted transmission line	Lines 2111 & 2193
Point A	Bear Garden
Point B	Bremo
Point C	Fork Union
Terrain description	Between Bremo and Fork Union, the project is approximately 1.6 miles long in the Piedmont region. The area is mostly rural and some suburban regions.
Existing Line Physical Characteristics	
Operating voltage	230
Conductor size and type	2-636 ACSR (24/7) 150°C MOT
Hardware plan description	New hardware will be used for line extension
Tower line characteristics	New structures will be used for extension

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	230.000000	230.000000
	Normal ratings	Emergency ratings
Summer (MVA)	1573.000000	1573.000000
Winter (MVA)	1648.000000	1648.000000
Conductor size and type	2-768.2 ACSS/TW/HS (20/7) 250°C MOT	
Shield wire size and type	(2) DNO-10410 shield wire	
Rebuild line length	1.6 Miles	
Rebuild portion description	Existing Facilities to be Removed: 1. (9) 115kV SC Wood H-Frame 2. (2) 115kV SC Steel H-Frame 3. (3) 115kV SC Wood 3-Pole 4. (1) 115kV SC Steel 3-Pole 5. (1) 115kV SC Steel A-Frame Backbone 6. (1) 115kV SC Self-Supporting Switch 7. (1) 230kV SC Steel H-Frame Backbone 8. 1.66 miles of 1-636 ACSR (24/7) “Rook” 9. 1.54 miles of 1-3#6 Alumoweld Permanent Facilities to be Installed: 1. (2) SC 230kV DDE Steel Monopole (arms) 2. (11) SC 230kV Susp Steel Monopole 3. (4) SC 230kV DDE Steel Monopole 4. (1) SC 230kV Steel Backbone 5. 1.69 miles of -768 ACSS/TW/HS “Maumee” Conductor 6. 1.69 miles of 2-DNO-11410 OPGW Existing Facilities to be Transferred or Modified: 1. Cut existing span of 2-636 ACSR (24/7) conductor and transfer to proposed structure 2111/9. 2. Cut existing spans of 2-OPT-GW 36 and transfer to proposed structure 2111/9.	
Right of way	An additional right-of-way width of 60ft will be required.	
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	$.00
Component cost (in-service year)	$.00

Greenfield Transmission Line Component

Component title	New 230 kV Lines - Fork Union to Gordonsville to Southall to North Anna	
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Point A	Fork Union	
Point B	Gordonsville to Southall	
Point C	North Anna	
	Normal ratings	Emergency ratings
Summer (MVA)	1573.000000	1573.000000
Winter (MVA)	1648.000000	1648.000000
Conductor size and type	2-768.2 ACSS/TW/HS (20/7) 250°C MOT	
Nominal voltage	AC	
Nominal voltage	230	
Line construction type	Overhead	

General route description	The proposed line mileage from Gordonsville to Southall is based on a straight-line distance from substation to substation. The linear distance is then increased by 5% in rural counties and 10% in populated counties. Structure quantities are then based on an assumed span length of 85% the maximum span length allowable for typical Dominion standard right of ways. A detailed circuit route will be required prior to an SCC filing. a. The new lines from Gordonsville to Southall are in Lousia and Albemarle Counties, which are classified as rural in this case.
Terrain description	The project area is in the central Virginia Piedmont region with elevations ranging from approximately 350 to 600 feet. The terrain is predominately vegetated existing right-of-way consisting of moderate slopes. The line will cross Route 15, 33, and 522 and some smaller roads, a railroad track, and several small streams.
Right-of-way width by segment	From Gordonsville to Southall 230kV line will have 100 feet of right-of-way for 24.36 miles.
Electrical transmission infrastructure crossings	To be determined in detailed design.
Civil infrastructure/major waterway facility crossing plan	Refer to Real Estate and Permitting Summary.
Environmental impacts	Refer to Real Estate and Permitting Summary.
Tower characteristics	Permanent Facilities to be Installed: 1. (1) SC 230kV Susp Steel Monopole (2XX1) 2. (5) SC 230kV DDE Steel Monopole (arms) (2XX1) 3. (1) SC 230kV Steel Backbone (2XX1) 4. (3) SC 230kV Steel Backbone (2XX2 / 2XX3) 5. (23) DC 230kV DDE Steel 2-Pole (2XX2 / 2XX3) 6. (135) DC 230kV Susp Steel Monopole (2XX2 / 2XX3) 7. 24.21 miles of 2-768 ACSS/TW/HS “Maumee” Conductor (Line 2XX1) 8. 24.36 miles of 2-768 ACSS/TW/HS “Maumee” Conductor (Line 2XX2) 9. 24.36 miles of 2-768 ACSS/TW/HS “Maumee” Conductor (Line 2XX3) 10. 1 mile of 2-7#7 Alumoweld (Line 2XX1) 11. 24.36 miles of 2-DNO-11410 OPGW (Line 2XX2 / Line 2XX3)
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	$261,903,870.01
Component cost (in-service year)	$280,499,045.00

Substation Upgrade Component

Component title	Bremo Substation Scope
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Bremo
Substation zone	345
Substation upgrade scope	Purchase & Install Substation Material: 1. One (1), 230kV, 4000A, 80kAIC, Circuit Breaker 2. One (1), 230kV, 4000A, Double End Break Switch 3. One (1), 230kV, 4000A, Center Break Switch 4. Three (3), 180kV MO (S), 144kV MCOV, Surge Arresters 5. Approximately 70FT of 5IN SCH 40 AL Tube Bus 6. Conductor, connectors, control cable, conduit, steel, foundation, and grounding as required per engineering standards Remove Substation Material: 1. One (1), 230kV, 2000A, SF6 Circuit Breaker 2. Two (2), 230kV, 2000A Center Break Switch 3. Three (3), 180kV MO (S), 144kV MCOV, Surge Arresters 4. Approximately 70FT of 3 ½ IN SCH 40 AL Tube Bus. 5. Conductors, connectors, control cable, conduit, steel, foundation, and grounding as required per engineering standards Purchase & Install Relay Material: 1. One (1), 1340 – 24” Dual SEL-411L CD/Fiber Line Panel 2. One (1), 1511 – 24” Single SEL-351 Transmission Breaker w/o Reclosing Panel 3. One (1), 4526_A – Circuit Breaker Fiber Optic Makeup Box 4. One (1), 4510 - SEL-2411 Equipment Annunciator 5. One (1), 4551 – Axion Breaker Condition Monitor (for 230kV 80kA Circuit Breakers) 6. Two (2), Panel Retirement

Transformer Information

None

New equipment description	1. One (1), 230kV, 4000A, 80kAIC, Circuit Breaker 2. One (1), 230kV, 4000A, Double End Break Switch 3. One (1), 230kV, 4000A, Center Break Switch 4. Three (3), 180kV MO (S), 144kV MCOV, Surge Arresters 5. One (1), 1340 – 24” Dual SEL-411L CD/Fiber Line Panel 6. One (1), 1511 – 24” Single SEL-351 Transmission Breaker w/o Reclosing Panel 7. One (1), 4526_A – Circuit Breaker Fiber Optic Makeup Box 8. One (1), 4510 - SEL-2411 Equipment Annunciator 9. One (1), 4551 – Axion Breaker Condition Monitor (for 230kV 80kA Circuit Breakers)
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 P&C design will be revised as part of the SPE Scope of Work. 3. 4-hole pad connections must be replaced with 6-hole pad connections to maintain 4000A ratings. 4. It was determined that the GA would not need any additional equipment relocation thus it has been omitted from the submittal
Real-estate description	Additional real estate is not needed.
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	$1,944,559.10
Component cost (in-service year)	$2,082,623.00

Substation Upgrade Component

Component title	Charlottesville Substation Scope
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Charlottesville
Substation zone	345
Substation upgrade scope	Purchase & Install Substation Material: 1. Two (2), 230kV, 80kAIC, 4000A, SF6 Circuit Breakers 2. Two (2), 230kV, 4000A, Double End Break Switches 3. One (1) 230kV, 4000A Wave Trap 4. Conductors, connectors, conduit, foundations, structures, and grounding material as per engineering standards. Remove Substation Material: 1. Two (2), 230kV, 50kAIC, 3000A, SF6 Circuit Breakers 2. Two (2), 230kV, 3000A, Center Break Switches 3. One (1), 230kV, 2000A, Wave Trap 4. Conductors, connectors, conduit, foundations, structures, and grounding material as per engineering standards. Purchase & Install Relay Material: 1. Two (2) 4510 - SEL-2411 Equipment Annunciator 2. Two (2), 1510 – Dual SEL-351 Transmission Breaker w/ Reclosing Panel 3. One (2), 4526_A – Circuit Breaker Fiber Optic Makeup Box 4. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber Line Panel 5. Two (2), 4551 – Axion Breaker Condition Monitor (for 230kV 80kA Circuit Breakers) 6. Three (3), Panel Retirement

Transformer Information

None

New equipment description	1. Two (2), 230kV, 80kAIC, 4000A, SF6 Circuit Breakers 2. Two (2), 230kV, 4000A, Double End Break Switches 3. One (1) 230kV, 4000A Wave Trap 4. Two (2) 4510 - SEL-2411 Equipment Annunciator 5. Two (2), 1510 – Dual SEL-351 Transmission Breaker w/ Reclosing Panel 6. One (2), 4526_A – Circuit Breaker Fiber Optic Makeup Box 7. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber Line Panel 8. Two (2), 4551 – Axion Breaker Condition Monitor (for 230kV 80kA Circuit Breakers)
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. 4-hole pad connections must be replaced with 6-hole pad connections to maintain 4000A ratings. 3. Relay Settings and P&C design will be revised as part of the SPE Scope of Work. 4. Coordinate with Project # 99-3132. 5. It was determined that the GA would not need any additional equipment relocation thus it has been omitted from the submittal
Real-estate description	Additional real estate is not needed.
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	$2,861,499.10
Component cost (in-service year)	$3,064,666.00

Substation Upgrade Component

Component title	Fork Union Substation Scope
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Fork Union
Substation zone	345

Substation upgrade scope	Purchase & Install Substation Material: 1. Five (5), 230kV, 80kAIC, 4000A, SF6 Circuit Breakers 2. Ten (10), 230kV, 4000A, Double End Break Switches 3. Two (2), 230kV, 4000A, Center Break Switches 4. Six (6), 180kV MO (S), 144kV MCOV Station Class Surge Arresters 5. Six (6), 230kV, Coupling Capacitor Voltage Transformers, Relay Accuracy 6. One (1) 230kV, 4000A Wave Trap 7. Conductors, connectors, conduit, foundations, structures, and grounding material as per engineering standards. Remove Substation Material: 1. Three (3), 230kV, 63kAIC, 3000A, SF6 Circuit Breakers 2. Eight (8), 230kV, 3000A, Center Break Switches 3. One (1), 230kV, 3000A, Wave Trap 4. Conductors, connectors, conduit, foundations, structures, and grounding material as per engineering standards. Purchase & Install Relay Material: 1. Two (2) 4510 - SEL-2411 Equipment Annunciator 2. Two (2), 1510 – Dual SEL-351 Transmission Breaker w/ Reclosing Panel 3. Two (2), 4526_A – Circuit Breaker Fiber Optic Makeup Box 4. Five (5), 4551 – Axion Breaker Condition Monitor (for 230kV 80kA Circuit Breakers) 5. Three (3), 1340 – 24” Dual SEL-411L CD/Fiber Line Panel 6. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber Line Panel 7. Two (2), 4506 – 3 Phase CCVT Potential Makeup Box 8. Four (4), Panel Retirements Reuse Relay Material: 1. Three (3) 4510 - SEL-2411 Equipment Annunciator 2. Three (3), 1510 – Dual SEL-351 Transmission Breaker w/ Reclosing Panel 3. Three (3), 4526_A – Circuit Breaker Fiber Optic Makeup Box

Transformer Information

None

New equipment description	1. Five (5), 230kV, 80kAIC, 4000A, SF6 Circuit Breakers 2. Ten (10), 230kV, 4000A, Double End Break Switches 3. Two (2), 230kV, 4000A, Center Break Switches 4. Six (6), 180kV MO (S), 144kV MCOV Station Class Surge Arresters 5. Six (6), 230kV, Coupling Capacitor Voltage Transformers, Relay Accuracy 6. One (1) 230kV, 4000A Wave Trap 7. Two (2) 4510 - SEL-2411 Equipment Annunciator 8. Two (2), 1510 – Dual SEL-351 Transmission Breaker w/ Reclosing Panel 9. Two (2), 4526_A – Circuit Breaker Fiber Optic Makeup Box 10. Five (5), 4551 – Axion Breaker Condition Monitor (for 230kV 80kA Circuit Breakers) 11. Three (3), 1340 – 24” Dual SEL-411L CD/Fiber Line Panel 12. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber Line Panel 13. Two (2), 4506 – 3 Phase CCVT Potential Makeup Box
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. 4-hole pad connections must be replaced with 6-hole pad connections to maintain 5000A ratings. 3. Relay Settings and P&C design will be revised as part of the SPE Scope of Work. 4. It was determined that the GA would not need any additional equipment relocation thus it has been omitted from the submittal
Real-estate description	Additional real estate is not needed.
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	$8,066,306.40
Component cost (in-service year)	$8,639,014.00

Substation Upgrade Component

Component title	Gordonsville Substation Expansion
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Gordonsville
Substation zone	345
Substation upgrade scope	Purchase & Install Substation Material: 1. Two (2), 230kV Backbones (Provided by Transmission) 2. Five (5), 230kV, 80kAIC, 4000A, SF6 Circuit Breakers 3. Ten (10), 230kV, 4000A, Double End Break Switches 4. Nine (9), 180kV MO (S), 144kV MCOV Station Class Surge Arresters 5. Eleven (11), 230kV, Coupling Capacitor Voltage Transformers, Relay Accuracy 6. Bus, fence, roadway, conductors, connectors, conduit, control cable, cable trench, foundations, structures, and grounding material as per engineering standards. Purchase & Install Relay Material: 1. Five (5) 4510 - SEL-2411 Equipment Annunciator 2. Five (5), 1510 – Dual SEL-351 Transmission Breaker w/ Reclosing Panel 3. Five (5), 4526_A – Circuit Breaker Fiber Optic Makeup Box 4. Three (3), 1340 – 24” Dual SEL-411L CD/Fiber Line Panel 5. Three (3), 4506 – 3 Phase CCVT Potential Makeup Box 6. Five (5), 4551 – Axion Breaker Condition Monitor (for 230kV 80kA Circuit Breakers)

Transformer Information

None

New equipment description	1. Two (2), 230kV Backbones (Provided by Transmission) 2. Five (5), 230kV, 80kAIC, 4000A, SF6 Circuit Breakers 3. Ten (10), 230kV, 4000A, Double End Break Switches 4. Nine (9), 180kV MO (S), 144kV MCOV Station Class Surge Arresters 5. Eleven (11), 230kV, Coupling Capacitor Voltage Transformers, Relay Accuracy 6. Five (5) 4510 - SEL-2411 Equipment Annunciator 7. Five (5), 1510 – Dual SEL-351 Transmission Breaker w/ Reclosing Panel 8. Five (5), 4526_A – Circuit Breaker Fiber Optic Makeup Box 9. Three (3), 1340 – 24” Dual SEL-411L CD/Fiber Line Panel 10. Three (3), 4506 – 3 Phase CCVT Potential Makeup Box 11. Five (5), 4551 – Axion Breaker Condition Monitor (for 230kV 80kA Circuit Breakers)
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. 4-hole pad connections must be replaced with 6-hole pad connections to maintain 5000A ratings. 3. Relay Settings and P&C design will be revised as part of the SPE Scope of Work.
Real-estate description	Additional real estate is not needed for this expansion.
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	$17,309,375.50

Component cost (in-service year)	$18,538,341.00

Substation Upgrade Component

Component title	North Anna Substation Expansion
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	North Anna
Substation zone	345
Substation upgrade scope	Purchase & Install Substation Material: 1. Two (2), 230kV Backbones (Provided by Transmission) 2. Four (4), 230kV, 80kAIC, 4000A, SF6 Circuit Breakers 3. Eight (8), 230kV, 4000A, Double End Break Switches 4. Six (6), 180kV MO (S), 144kV MCOV Station Class Surge Arresters 5. Eight (8), 230kV, Coupling Capacitor Voltage Transformers, Relay Accuracy 6. Bus, fence, roadway, conductors, connectors, conduit, control cable, cable trench, foundations, structures, and grounding material as per engineering standards. Remove Substation Material: 1. One (1), 230kV, 3000A, Center Break Switch 2. Foundations, steel, structures, and grounding material as per engineering standards. Purchase & Install Relay Material: 1. Four (4) 4510 - SEL-2411 Equipment Annunciator 2. Four (4), 1510 – Dual SEL-351 Transmission Breaker w/ Reclosing Panel 3. Four (4), 4526_A – Circuit Breaker Fiber Optic Makeup Box 4. Two (2), 1340 – 24” Dual SEL-411L CD/Fiber Line Panel 5. Four (4), 4551 – Axion Breaker Condition Monitor (for 230kV 80kA Circuit Breakers) 6. Two (2), 4506 – 3 Phase CCVT Potential Makeup Box 7. Two (2), 4507 – 1 Phase CCVT Potential Makeup Box

Transformer Information

None

New equipment description	1. Two (2), 230kV Backbones (Provided by Transmission) 2. Four (4), 230kV, 80kAIC, 4000A, SF6 Circuit Breakers 3. Eight (8), 230kV, 4000A, Double End Break Switches 4. Six (6), 180kV MO (S), 144kV MCOV Station Class Surge Arresters 5. Eight (8), 230kV, Coupling Capacitor Voltage Transformers, Relay Accuracy 6. Four (4) 4510 - SEL-2411 Equipment Annunciator 7. Four (4), 1510 – Dual SEL-351 Transmission Breaker w/ Reclosing Panel 8. Four (4), 4526_A – Circuit Breaker Fiber Optic Makeup Box 9. Two (2), 1340 – 24” Dual SEL-411L CD/Fiber Line Panel 10. Four (4), 4551 – Axion Breaker Condition Monitor (for 230kV 80kA Circuit Breakers) 11. Two (2), 4506 – 3 Phase CCVT Potential Makeup Box 12. Two (2), 4507 – 1 Phase CCVT Potential Makeup Box

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. 4-hole pad connections must be replaced with 6-hole pad connections to maintain 5000A ratings. 3. Relay Settings and P&C design will be revised as part of the SPE Scope of Work.
Real-estate description	Additional real estate is required for this expansion.
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	$18,984,562.70
Component cost (in-service year)	$18,538,341.00

Substation Upgrade Component

Component title	Southall Substation Expansion
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Southall
Substation zone	345

Substation upgrade scope	Purchase & Install Substation Material: 1. Four (4), 230kV,80kAIC, 4000A, SF6 Circuit Breakers 2. Eight (8), 230kV, 4000A, Double End Break Switches 3. Twelve (12), 180kV MO (S), 144kV MCOV Station Class Surge Arresters 4. Twelve (12), 230kV, Coupling Capacitor Voltage Transformers, Relay Accuracy 5. Bus, fence, roadway, conductors, connectors, conduit, control cable, cable trench, foundations, structures, and grounding material as per engineering standards. Remove Substation Material: 1. Bus, conductors, connectors, conduit, control cable, foundations, structures, and grounding material as needed. Relocation & Reuse Substation Material: 1. Three (3), 230kV Station Service Transformers 2. Two (2), Station Service Disconnect Switches Purchase & Install Relay Material: 1. Four (4) 4510 - SEL-2411 Equipment Annunciator 2. Four (4), 1510 – Dual SEL-351 Transmission Breaker w/ Reclosing Panel 3. Four (4), 4526_A – Circuit Breaker Fiber Optic Makeup Box 4. Four (4), 4551 – Axion Breaker Condition Monitor (for 230kV 80kA Circuit Breakers) 5. Four (4), 1340 – 24” Dual SEL-411L CD/Fiber Line Panel 6. Four (4), 4506 – 3 Phase CCVT Potential Makeup Box

Transformer Information

None

New equipment description	1. Four (4), 230kV,80kAIC, 4000A, SF6 Circuit Breakers 2. Eight (8), 230kV, 4000A, Double End Break Switches 3. Twelve (12), 180kV MO (S), 144kV MCOV Station Class Surge Arresters 4. Twelve (12), 230kV, Coupling Capacitor Voltage Transformers, Relay Accuracy 5. Four (4) 4510 - SEL-2411 Equipment Annunciator 6. Four (4), 1510 – Dual SEL-351 Transmission Breaker w/ Reclosing Panel 7. Four (4), 4526_A – Circuit Breaker Fiber Optic Makeup Box 8. Four (4), 4551 – Axion Breaker Condition Monitor (for 230kV 80kA Circuit Breakers) 9. Four (4), 1340 – 24” Dual SEL-411L CD/Fiber Line Panel 10. Four (4), 4506 – 3 Phase CCVT Potential Makeup Box
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. 4-hole pad connections must be replaced with 6-hole pad connections to maintain 5000A ratings. 3. Relay Settings and P&C design will be revised as part of the SPE Scope of Work.
Real-estate description	Additional real estate is not required for this expansion.
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	$7,095,986.40
Component cost (in-service year)	$7,599,801.00

Congestion Drivers

None

Existing Flowgates

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2025W1-GD-LL25	313373	6GRAPEVINE	314765	6MTEAGLE	1	230	345	Generation Deliverability	Included
2025W1-GD-LL1NEW	313707	6FORK UNION	313373	6GRAPEVINE	1	230	345	Generation Deliverability	Included
2025W1-IPD-LL43	313707	6FORK UNION	313867	6BREMODIST	1	230	345	Individual Plant Deliverability	Included
2025W1-GD-LL13	314747	6BREMO	313867	6BREMODIST	1	230	345	Generation Deliverability	Included
2025W1-GD-LL14	313867	6BREMODIST	313707	6FORK UNION	1	230	345	Generation Deliverability	Included
2025W1-IPD-LL42	313867	6BREMODIST	314747	6BREMO	1	230	345	Individual Plant Deliverability	Included
2025W1-GD-LL33	314765	6MTEAGLE	314749	6CHARLVL	1	230	345	Generation Deliverability	Included

New Flowgates

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

Financial Information

Capital spend start date	01/2026

Construction start date	06/2028
Project Duration (In Months)	53

Additional Comments

None