

Furnace Run Area Regional Transmission Upgrades

General Information

Proposing entity name	Company confidential and proprietary information
Does the entity who is submitting this proposal intend to be the Designated Entity for this proposed project?	Company confidential and proprietary information
Company proposal ID	Company confidential and proprietary information
PJM Proposal ID	633
Project title	Furnace Run Area Regional Transmission Upgrades
Project description	<p>Tie-line Impact Info: The proposal topology connects equipment owned by more than one Transmission Owner, in this case APS, BGE, MetEd, PenElec, PECO, PEPCO, and PPL (all PJM members). This Proposed Solution is a resubmittal of the modified Independence Energy Connection (IEC) Project. The Proposed Solution consists of: (1) the IEC West Portion, which is comprised of approximately 29 miles of new double-circuit 230 kV AC overhead transmission line between the existing Potomac Edison Ringgold Substation in Washington County, Maryland to a new Rice Substation in Franklin County, Pennsylvania; and (2) the reconfigured IEC East Portion, which is primarily comprised of adding 230 kV AC overhead transmission lines between a new Furnace Run Substation in York County, Pennsylvania, and the existing BGE Conastone (via Baltimore County) and Graceton Substations in Harford County, Maryland. Two documents are attached to show the progress already made on this Proposed Solution: - JOINT AMENDED APPLICATION OF TRANSOURCE PENNSYLVANIA LLC AND PPL ELECTRIC UTILITIES CORPORATION (Attachment 1) - MARYLAND ORDER APPROVING SETTLEMENT AND GRANTING CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY AND WAIVERS (Attachment 2)</p> <p>Interregional Project Info: The Proposed Solution only addresses an issue solely identified by PJM. The Proposed Solution is not a solution to a cross-border issue project between PJM and any other RTO. The Proposed Solution will create new tie-lines between PENELEC (Area 226), METED (Area 227), and APS (Area 201), and also create new tie lines between PECO (Area 230), METED (Area 227), PPL (Area 229), and BGE (Area 232). The Proposed Solution resolves the following issues open for competition: * 7.5 mile Lincoln-Straban-Germantown 115kV for loss of (FLO) Conastone-Brighton 500kV * 23.5 mile Conastone-Northwest 230kV CKT2 FLO Conastone-Brighton 500kV * Three Mile Island 500/230kV Transformer FLO Peachbottom-Conastone 500kV - FE identified as End of Life, but proposed replacement had insufficient ratings * 1.5 mile BGE section of Safe Harbor/Manor-Graceton 230kV FLO Peachbottom-Conastone 500kV</p>

Email	Company confidential and proprietary information
Project in-service date	03/2027
Tie-line impact	Yes
Interregional project	No
Is the proposer offering a binding cap on capital costs?	Yes
Additional benefits	Company confidential and proprietary information

Project Components

1. Rice – Ringgold 230 kV
2. Ringgold Station Upgrade
3. Rice Station
4. Manor - Graceton 230 kV Upgrade
5. Conastone – Otter Creek 230 kV Upgrade
6. Furnace Run Station
7. Graceton Station Upgrade
8. Conastone Station Upgrade
9. Ringgold - Catoctin 138 kV to 230 kV
10. Conastone - Northwest
11. Dickerson Station Upgrade
12. Conemaugh - Hunterstown 500 kV line Tie-in
13. Peach Bottom - Three Mile Island Tie-in

Greenfield Transmission Line Component

Component title	Rice – Ringgold 230 kV
Project description	Company confidential and proprietary information
Point A	Rice Station

Point B Ringgold Station

Point C

	Normal ratings	Emergency ratings
Summer (MVA)	1827.000000	2075.000000
Winter (MVA)	2246.000000	2485.000000
Conductor size and type	2 bundled 795 ACSS @482 degree F, six-wired	
Nominal voltage	AC	
Nominal voltage	230	
Line construction type	Overhead	
General route description	<p>The Rice-Ringgold 230kV line will connect the existing Ringgold Substation to a new 500/230 kV Rice Substation. The line will be approximately 29 miles long, constructed with two-bundle 795 ACSS in a double circuit configuration but operated as a single circuit. The Ringgold Substation will be expanded and upgraded to accommodate the new 230 kV circuit. The new 230 kV line will exit the expanded Ringgold Substation from the southeast and turn north into Pennsylvania and continue until it enters the Rice Substation from the south.</p>	
Terrain description	<p>The topography for the Rice - Ringgold 230 kV line is mostly flat. Land use in the area encompasses mostly cultivated crops, low- to medium-density developed areas, and crosses state and county highways and existing utilities.</p>	
Right-of-way width by segment	<p>The Rice-Ringgold 230kV Route is the result of a robust siting and outreach process which included input from landowners, local officials, and key stakeholders on a multitude of study segments. The proposed route will be 130 feet in width, parallels existing rights-of-way including interstates, roads, railroads, and existing transmission lines for 42% of its length, and best minimizes potential impacts to the natural and human environments. The extensive Siting Study is available for review under PA PUC docket A-2017-2640200. In addition, the Proposing Entity has been able to obtain 70% of the required ROW, via option agreements or easements, for the Rice-Ringgold 230kV line route.</p>	
Electrical transmission infrastructure crossings	<p>- Antrim-West Waynesboro 69 kV line, - Fayetteville-Allegheny 69 kV line, - Fayetteville-West Waynesboro 138 kV line, - Reid-Ringgold 138 kV line, - Reid-West Waynesboro 69 kV line, - Ringgold-East Hagerstown 138 kV line, - Ringgold-West Waynesboro 138 kV line, - West Waynesboro-East Waynesboro 138 kV line, - Grand Point-Allegheny Energy 138 kV line</p>	
Civil infrastructure/major waterway facility crossing plan	<p>Rice-Ringgold 230kV line crosses railroads, several streams, but no major water facilities.</p>	

Environmental impacts	Rice-Ringgold 230kV line has undergone a robust siting analysis, as well as the required environmental and cultural resource surveys. Due to the advanced phases of the Proposed Solution, environmental impacts, mitigation, and permitting requirements are well documented and underway. The Pennsylvania Department of Conservation and Natural Resources issued a concurrence for the Rice-Ringgold 230kV line, stating that the lance-leaf buckthorn (a sensitive species) would not be impacted by the project based on surveys conducted along the route. In addition, the Pennsylvania Historical and Museum Commission cleared the Proposed Solution for both archaeological and cultural resources with an MOU that was executed with the Proposing Entity. A significant portion of wetland mitigation has already been secured. Extensive coordination with the Maryland Power Plant Research Program (PPRP) has also occurred with the remaining conditions for the Proposed Solution documented in the Order (see Attachment 1). As a result of these activities being completed, the Proposing Entity has a significant advantage to implement the project in an expedited timeframe.
Tower characteristics	The project will use steel, monopole structures with foundations. The use of steel monopoles was determined during the siting of the Proposed Solution due to significant landowner opposition to lattice towers, particularly in agricultural areas.
Construction responsibility	Company confidential and proprietary information
Benefits/Comments	Company confidential and proprietary information
Component Cost Details - In Current Year \$	
Engineering & design	Company confidential and proprietary information
Permitting / routing / siting	Company confidential and proprietary information
ROW / land acquisition	Company confidential and proprietary information
Materials & equipment	Company confidential and proprietary information
Construction & commissioning	Company confidential and proprietary information
Construction management	Company confidential and proprietary information
Overheads & miscellaneous costs	Company confidential and proprietary information
Contingency	Company confidential and proprietary information
Total component cost	\$64,554,090.00
Component cost (in-service year)	\$70,539,997.00

Substation Upgrade Component

Component title	Ringgold Station Upgrade
Project description	Company confidential and proprietary information
Substation name	Ringgold Station
Substation zone	APS
Substation upgrade scope	The Ringgold 230 Station will be reconfigured to a Double-Breaker Double-bus scheme. The two Ringgold 230/138 kV transformers will be replaced. Two Ringgold 138 kV breakers will be replaced for short circuit duty. To accommodate the new line, the 230 kV substation will need to be expanded 84 feet by 190 feet on the southeast side of the station, requiring site grading and grubbing, a new drive gate and fence expansion.

Transformer Information

	Name	Capacity (MVA)
Transformer	Transformer 1	339
	High Side	Low Side Tertiary
Voltage (kV)	230	138
	Name	Capacity (MVA)
Transformer	Transformer 2	339
	High Side	Low Side Tertiary
Voltage (kV)	230	138
New equipment description	- Replace the (2) Ringgold 230/138 kV transformers – Replace (2) Ringgold 138 kV breakers for short circuit duty - Reconfigure the Ringgold 230 Station to Double-Breaker Double-Bus scheme	
Substation assumptions	The existing AC station service is assumed to be sufficient to accommodate the new substation equipment. The existing station control enclosure is assumed to be sufficient to accommodate the new transmission line and circuit breaker protection and control relay panels. This proposal assumes that all necessary outages will be available to execute this work.	

Real-estate description	This proposal assumes that all necessary outages will be available to execute this work. The proposal also assumes that there is land available to accommodate the expansion of the station.
Construction responsibility	Company confidential and proprietary information
Benefits/Comments	Company confidential and proprietary information
Component Cost Details - In Current Year \$	
Engineering & design	Company confidential and proprietary information
Permitting / routing / siting	Company confidential and proprietary information
ROW / land acquisition	Company confidential and proprietary information
Materials & equipment	Company confidential and proprietary information
Construction & commissioning	Company confidential and proprietary information
Construction management	Company confidential and proprietary information
Overheads & miscellaneous costs	Company confidential and proprietary information
Contingency	Company confidential and proprietary information
Total component cost	\$14,800,000.00
Component cost (in-service year)	\$16,172,360.00
Greenfield Substation Component	
Component title	Rice Station
Project description	Company confidential and proprietary information
Substation name	Rice Station

Substation description

The new Rice Substation will be built near the intersection of Olde Scotland Road and Two Turn Road (at 39°59'52.70"N, 77°33'7.16"W), in close proximity to the existing Hunterstown-Conemaugh 500 kV line, and will serve as a termination point for the proposed 230 kV line from Ringgold Substation. The Proposing Entity chose the proposed site to optimize cut-in of the existing 500 kV transmission lines and length of the respective taps. The Rice Substation will be laid out as a three breaker ring bus on the 500 kV side and a single breaker protecting a single line exiting on the 230 kV side. This arrangement accommodates two 500 kV line terminals, six single-phase 333 MVA 500 kV/230kV/13.8 kV transformers, and one 230 kV line terminal. The Rice station is approximately 790 feet by 480 feet on approximately 37 acres of land, which the proposing entity has under option for purchase.

Nominal voltage

AC

Nominal voltage

500/230

Transformer Information

Name		Capacity (MVA)	
Transformer	Transformer Bank 1	1000	
	High Side	Low Side	Tertiary
Voltage (kV)	500	230	13.5

Name		Capacity (MVA)	
Transformer	Transformer Bank 2	1000	
	High Side	Low Side	Tertiary
Voltage (kV)	500	230	13.5

Major equipment description

• 3-breaker ring at 500 kV (4000 Amp) with two 500/230 kV Transformers, configured to operate together. • Single 230 kV breaker (5000 Amp) to serve as low side transformer protection and line protection for the new 230 kV line.

Normal ratings	Emergency ratings
Summer (MVA)	999.000000
	1248.000000

Winter (MVA)	1248.000000	1348.000000
Environmental assessment	Several potential substation sites were vetted during the siting process with the current Rice Substation site selected as the preferred site. The existing property is currently used as an agricultural field. The Proposing Entity has completed the required environmental and cultural resource surveys on the property and no concerns were identified.	
Outreach plan	The Proposed Entity has already completed a robust outreach program during the siting phase of the Proposed Solution. As the Proposed Solution continues to move forward, representatives will continue to be available throughout construction to answer questions from landowners.	
Land acquisition plan	The proposed site for the Rice Substation has been obtained by the Proposing Entity. No further acquisitions are required for the substation site.	
Construction responsibility	Company confidential and proprietary information	
Benefits/Comments	Company confidential and proprietary information	
Component Cost Details - In Current Year \$		
Engineering & design	Company confidential and proprietary information	
Permitting / routing / siting	Company confidential and proprietary information	
ROW / land acquisition	Company confidential and proprietary information	
Materials & equipment	Company confidential and proprietary information	
Construction & commissioning	Company confidential and proprietary information	
Construction management	Company confidential and proprietary information	
Overheads & miscellaneous costs	Company confidential and proprietary information	
Contingency	Company confidential and proprietary information	
Total component cost	\$31,615,291.00	
Component cost (in-service year)	\$34,546,894.00	
Transmission Line Upgrade Component		
Component title	Manor - Graceton 230 kV Upgrade	

Project description	Company confidential and proprietary information
Impacted transmission line	Manor- Graceton 230 kV
Point A	Manor Station
Point B	Furnace Run Station
Point C	Graceton Station
Terrain description	Terrain within the Study Area, and crossed by the Proposed Solution is hilly to gently rolling in a mostly agricultural landscape with large forested tracts and residential development.

Existing Line Physical Characteristics

Operating voltage	230
Conductor size and type	Lapwing 1590 ASCR 45/7 5 stranding
Hardware plan description	Manor-Graceton 230kV line is a single circuit between the PPL Manor substation in Pennsylvania and the BGE Graceton substation in Maryland. Ownership of the line transitions at the state border. In Pennsylvania, PPL rebuilt the line in the past decade as weathered steel monopole structures. The monopoles are capable of holding six (6) arms for double circuit usage but currently only have three (3) arms on the structures with the single 230kV circuit. In Maryland, the BGE owned portion of the line remains on lattice steel structures terminating into Graceton.
Tower line characteristics	The existing line currently has lattice structures and monopole structures.

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	230.000000	230.000000
	Normal ratings	Emergency ratings
Summer (MVA)	647.000000	801.000000
Winter (MVA)	746.000000	903.000000
Conductor size and type	1590 kcmil ACSR Falcon	

Shield wire size and type	Overhead shield wires will be 0.752 OPGW fiber optic cables.
Rebuild line length	11.0 miles
Rebuild portion description	The Manor - Graceton 230 kV line involves adding a second circuit to the existing transmission line owned by PPL and BGE. For the BGE owned portion of Manor-Graceton 230kV line in Maryland, eight (8) existing lattice structures would be replaced with double circuit steel monopoles and additional conductor will be added to the line to create Furnace Run-Graceton #1 and #2. At the state line, where the line ownership changes to PPL, there are existing double circuit capable steel monopole structures. Arms will be added to the structures to accommodate a second circuit and conductor will be added to this portion of the line up to a point where it intersects an existing, de-energized, 69kV corridor. At this point, the two circuits originating from Graceton, and a third circuit originating from Manor will turn west towards Furnace Run following and expanding PPL's existing 69kV corridor.
Right of way	All of the necessary rights-of-way have been acquired in both Pennsylvania and Maryland for the Furnace Run- Graceton double circuit transmission line.
Construction responsibility	Company confidential and proprietary information
Benefits/Comments	Company confidential and proprietary information
Component Cost Details - In Current Year \$	
Engineering & design	Company confidential and proprietary information
Permitting / routing / siting	Company confidential and proprietary information
ROW / land acquisition	Company confidential and proprietary information
Materials & equipment	Company confidential and proprietary information
Construction & commissioning	Company confidential and proprietary information
Construction management	Company confidential and proprietary information
Overheads & miscellaneous costs	Company confidential and proprietary information
Contingency	Company confidential and proprietary information
Total component cost	\$21,800,000.00
Component cost (in-service year)	\$23,821,449.00

Transmission Line Upgrade Component

Component title	Conastone – Otter Creek 230 kV Upgrade
Project description	Company confidential and proprietary information
Impacted transmission line	Conastone - Otter Creek
Point A	Conastone Station
Point B	Furnace Run Station
Point C	Otter Creek Station
Terrain description	Terrain within the Study Area, and crossed by the Proposed Solution is hilly to gently rolling in a mostly agricultural landscape with large forested tracts and residential development.

Existing Line Physical Characteristics

Operating voltage	230
Conductor size and type	1590kcmil ACSR “Falcon”
Hardware plan description	Conastone-Otter Creek 230kV line is a single circuit between the PPL Otter Creek substation in Pennsylvania and the BGE Conastone substation in Maryland. Ownership of the line transitions at the state border. PPL and BGE rebuilt the line in the past decade as weathered steel monopole structures. The monopoles are capable of holding six (6) arms for double circuit usage but currently only have three (3) arms on the structures with the single 230kV circuit. In Maryland, the BGE owned portion of the line remains on lattice steel structures terminating into Conastone.
Tower line characteristics	The existing line currently has monopole and lattice structures.

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	230.000000	230.000000
	Normal ratings	Emergency ratings
Summer (MVA)	647.000000	801.000000

Winter (MVA)	746.000000	903.000000
Conductor size and type	1590 kcmil ACSR 54/19 "Falcon"	
Shield wire size and type	Overhead shield wires will be 0.752 OPGW fiber optic cables.	
Rebuild line length	16.0 miles	
Rebuild portion description	For the BGE owned portion of Otter Creek-Conastone 230kV line in Maryland, additional conductor would be added to the line to create Furnace Run-Conastone#1 and #2. At the state line, where the line ownership changes to PPL, there are existing double circuit capable steel monopole structures. Arms would be added to the structures to accommodate a second circuit and conductor would be added to this portion of the line up to a point where it intersects an existing, de-energized, 69kV corridor. At this point, the two circuits originating from Conastone, and a third circuit originating from Otter Creek would turn east towards Furnace Run following and expanding PPL's existing 69kV corridor, terminating in the 230kV AIS yard.	
Right of way	All of the necessary rights-of-way have been acquired in both Pennsylvania and Maryland for the Furnace Run-Conastone double circuit transmission line.	
Construction responsibility	Company confidential and proprietary information	
Benefits/Comments	Company confidential and proprietary information	
Component Cost Details - In Current Year \$		
Engineering & design	Company confidential and proprietary information	
Permitting / routing / siting	Company confidential and proprietary information	
ROW / land acquisition	Company confidential and proprietary information	
Materials & equipment	Company confidential and proprietary information	
Construction & commissioning	Company confidential and proprietary information	
Construction management	Company confidential and proprietary information	
Overheads & miscellaneous costs	Company confidential and proprietary information	
Contingency	Company confidential and proprietary information	
Total component cost	\$29,000,000.00	

Component cost (in-service year) \$31,689,083.00

Greenfield Substation Component

Component title Furnace Run Station

Project description Company confidential and proprietary information

Substation name Furnace Run

Substation description The new Furnace Run Substation will be built near the intersection of Delta Rd and Chanceford Rd (at 39°51'8.91"N, 76°25'23.57"W), in close proximity to the existing Three Mile Island-Peach Bottom 500 kV line and directly adjacent to the 69kV corridor that will be used for the six (6) 230kV circuits terminating into Furnace Run. The Proposing Entity chose the proposed site to optimize the cut-in of the existing 500 kV transmission lines and length of the respective taps. The Furnace Run Substation will be laid out as an eight (8) breaker 500 kV GIS in a breaker-and-a-half configuration, and a fourteen (14) breaker 230 kV AIS in a breaker-and-a-half configuration. The substation will have three (3) 500/230kV transformer banks, each bank having three (3) 333MVA 500/230kV single-phase transformer units. The proposed station is approximately 890 feet by 480 feet on approximately 42 acres of land, which the Proposing Entity has under option for purchase.

Nominal voltage AC

Nominal voltage 500/230

Transformer Information

	Name		Capacity (MVA)
Transformer	Transformer Bank 1		1000
	High Side	Low Side	Tertiary
Voltage (kV)	500	230	13.5
	Name		Capacity (MVA)
Transformer	Transformer Bank 2		1000
	High Side	Low Side	Tertiary

Voltage (kV)	500	230	13.5
	Name		Capacity (MVA)
Transformer	Transformer Bank 3		1000
	High Side	Low Side	Tertiary
Voltage (kV)	500	230	13.5
Major equipment description	- (8) 4000+ Amp 500 kV GIS Circuit Breakers in a breaker-and-a-half scheme - (3) 500/230 kV Transformer Banks - Name Plate Ratings for each single-phase transformer is 333 MVA - (14) 4000 Amp 230 kV Circuit Breakers in a breaker-and-a-half scheme		
	Normal ratings	Emergency ratings	
Summer (MVA)	999.000000	1248.000000	
Winter (MVA)	1248.000000	1348.000000	
Environmental assessment	Several potential substation sites were vetted during the siting process with the current Furnace Run Substation site selected as the preferred site. The site is partly agricultural use and partly forested. The Proposing Entity has completed the required environmental and cultural resource surveys on the property and no concerns were identified.		
Outreach plan	The Proposed Entity has already completed a robust outreach effort during the siting phase of the Proposed Solution. As the Proposed Solution continues to move forward, representatives will continue to be available throughout construction to answer questions from landowners.		
Land acquisition plan	All necessary land rights for the Furnace Run station have been acquired. The Proposing Entity's ownership of the land required for the Furnace Run substation site is a significant benefit, given that alternative suitable substation sites in the area are very limited. The advanced engineering of the substation provides a major benefit by combining GIS and AIS technologies.		
Construction responsibility	Company confidential and proprietary information		
Benefits/Comments	Company confidential and proprietary information		
Component Cost Details - In Current Year \$			
Engineering & design	Company confidential and proprietary information		

Permitting / routing / siting	Company confidential and proprietary information
ROW / land acquisition	Company confidential and proprietary information
Materials & equipment	Company confidential and proprietary information
Construction & commissioning	Company confidential and proprietary information
Construction management	Company confidential and proprietary information
Overheads & miscellaneous costs	Company confidential and proprietary information
Contingency	Company confidential and proprietary information
Total component cost	\$75,822,723.00
Component cost (in-service year)	\$82,853,536.00

Substation Upgrade Component

Component title	Graceton Station Upgrade
Project description	Company confidential and proprietary information
Substation name	Graceton Station
Substation zone	BGE
Substation upgrade scope	BG&E will add a second circuit to their structures and terminate them into the existing Conastone and Graceton Substations. This will include remote-end work at Conastone on Circuit #1 and terminal Equipment at Conastone on Circuit #2.

Transformer Information

None	
New equipment description	- Build-out existing substation bay for addition of new Furnace Run – Graceton #2 circuit and 22093 relocation - Reconfigure the protective relaying for former 22093 to reconnect to the Furnace Run – Graceton #2 circuit
Substation assumptions	The existing AC station service is assumed to be sufficient to accommodate the new substation equipment. The existing station control enclosure is assumed to be sufficient to accommodate the new transmission line and circuit breaker protection and control relay panels.

Real-estate description	All necessary land rights are acquired.
Construction responsibility	Company confidential and proprietary information
Benefits/Comments	Company confidential and proprietary information

Component Cost Details - In Current Year \$

Engineering & design	Company confidential and proprietary information
Permitting / routing / siting	Company confidential and proprietary information
ROW / land acquisition	Company confidential and proprietary information
Materials & equipment	Company confidential and proprietary information
Construction & commissioning	Company confidential and proprietary information
Construction management	Company confidential and proprietary information
Overheads & miscellaneous costs	Company confidential and proprietary information
Contingency	Company confidential and proprietary information
Total component cost	\$9,400,000.00
Component cost (in-service year)	\$10,271,634.00

Substation Upgrade Component

Component title	Conastone Station Upgrade
Project description	Company confidential and proprietary information
Substation name	Conastone Station
Substation zone	BGE
Substation upgrade scope	BG&E will add a second circuit to their structures and terminate them into the existing Conastone and Graceton Substations. This will include remote-end work at Graceton on Circuit #1 and terminal Equipment at Graceton on Circuit #2.

Transformer Information

None

New equipment description

- A new breaker-and-a-half rung will be installed at Conastone. The existing hot bus, circuit switcher, and ground switch for spare transformer will be relocated. - A separate termination yard to transition from the overhead construction to underground will be installed on BGE owned property located between existing circuit numbers 2302, 2310, and 5013 where an underground 230kV cable (Approximately 700') between the new termination station and a new bay at Conastone will be installed. - The termination yard will roughly 100' x 100' and be comprised of an H-frame deadened structure, (3) termination/SA structures and (3) optical CT's.

Substation assumptions

The existing AC station service is assumed to be sufficient to accommodate the new substation equipment. The existing station control enclosure is assumed to be sufficient to accommodate the new transmission line and circuit breaker protection and control relay panels.

Real-estate description

All necessary land rights are acquired.

Construction responsibility

Company confidential and proprietary information

Benefits/Comments

Company confidential and proprietary information

Component Cost Details - In Current Year \$

Engineering & design

Company confidential and proprietary information

Permitting / routing / siting

Company confidential and proprietary information

ROW / land acquisition

Company confidential and proprietary information

Materials & equipment

Company confidential and proprietary information

Construction & commissioning

Company confidential and proprietary information

Construction management

Company confidential and proprietary information

Overheads & miscellaneous costs

Company confidential and proprietary information

Contingency

Company confidential and proprietary information

Total component cost

\$9,000,000.00

Component cost (in-service year)

\$9,834,543.00

Transmission Line Upgrade Component

Component title	Ringgold - Catoctin 138 kV to 230 kV
Project description	Company confidential and proprietary information
Impacted transmission line	Ringgold - Catoctin
Point A	Ringgold Station
Point B	Catoctin Station
Point C	
Terrain description	Terrain within the Study Area, and crossed by the Proposed Solution is hilly to gently rolling in a mostly agricultural landscape with large forested tracts and residential development.

Existing Line Physical Characteristics

Operating voltage	138 KV
Conductor size and type	unknown
Hardware plan description	Its assumed no hardware could be reused.
Tower line characteristics	Currently wood poles serve as the tower structures.

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	230.000000	230.000000
	Normal ratings	Emergency ratings
Summer (MVA)	617.000000	754.000000
Winter (MVA)	699.000000	894.000000
Conductor size and type	unknown	
Shield wire size and type	unknown	

Rebuild line length	10.0 miles
Rebuild portion description	Rebuild/Reconductor the Ringgold - Catoctin 138 kV circuit and upgrade terminal equipment on both ends.
Right of way	Potomac Edison has already completed the CPCN process in MD and all rights for the transmission line rebuild are secured.
Construction responsibility	Company confidential and proprietary information
Benefits/Comments	Company confidential and proprietary information
Component Cost Details - In Current Year \$	
Engineering & design	Company confidential and proprietary information
Permitting / routing / siting	Company confidential and proprietary information
ROW / land acquisition	Company confidential and proprietary information
Materials & equipment	Company confidential and proprietary information
Construction & commissioning	Company confidential and proprietary information
Construction management	Company confidential and proprietary information
Overheads & miscellaneous costs	Company confidential and proprietary information
Contingency	Company confidential and proprietary information
Total component cost	\$47,200,000.00
Component cost (in-service year)	\$51,576,714.00
Transmission Line Upgrade Component	
Component title	Conastone - Northwest
Project description	Company confidential and proprietary information
Impacted transmission line	Conastone - Northwest
Point A	Conastone Station

Point B Northwest Station

Point C

Terrain description Terrain within the Study Area, and crossed by the Proposed Solution is hilly to gently rolling in a mostly agricultural landscape with large forested tracts and residential development.

Existing Line Physical Characteristics

Operating voltage 230

Conductor size and type unknown

Hardware plan description The scope of work includes reconductoring/rebuilding The Conastone - Northwest 230 kV circuit and upgrading terminal equipment on both ends.

Tower line characteristics The condition of the the existing structures is assumed to be in good working order.

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	230.000000	230.000000
	Normal ratings	Emergency ratings
Summer (MVA)	1100.000000	1327.000000
Winter (MVA)	1170.000000	1386.000000
Conductor size and type	unknown	
Shield wire size and type	unknown	
Rebuild line length	25.0 miles	
Rebuild portion description	The scope of work includes reconductoring/rebuilding the two Conastone - Northwest 230 kV lines and upgrading the terminal equipment at both ends.	
Right of way	It is anticipated that the Proposed Solution would not require new ROW; however, current landowners crossed by the existing transmission line would need to be notified of the proposed upgrades.	

Construction responsibility	Company confidential and proprietary information
Benefits/Comments	Company confidential and proprietary information
Component Cost Details - In Current Year \$	
Engineering & design	Company confidential and proprietary information
Permitting / routing / siting	Company confidential and proprietary information
ROW / land acquisition	Company confidential and proprietary information
Materials & equipment	Company confidential and proprietary information
Construction & commissioning	Company confidential and proprietary information
Construction management	Company confidential and proprietary information
Overheads & miscellaneous costs	Company confidential and proprietary information
Contingency	Company confidential and proprietary information
Total component cost	\$52,140,000.00
Component cost (in-service year)	\$56,974,786.00
Substation Upgrade Component	
Component title	Dickerson Station Upgrade
Project description	Company confidential and proprietary information.
Substation name	Dickerson Station
Substation zone	PEPCO
Substation upgrade scope	Upgrade both 230 kV Bus Ties between Dickerson and Dickerson Station H in PEPCO to achieve Summer Emergency Ratings in excess of 800 MVA.
Transformer Information	
None	

New equipment description	Upgrade 230 kV Bus Ties.
Substation assumptions	This Proposed Solution assumes that all necessary outages will be available to execute this work.
Real-estate description	It is anticipated that the Proposed Solution would be contained within the existing substation site and be upgraded to the same voltage, so new siting and land purchase will not be required.
Construction responsibility	Company confidential and proprietary information.
Benefits/Comments	Company confidential and proprietary information.
Component Cost Details - In Current Year \$	
Engineering & design	Company confidential and proprietary information.
Permitting / routing / siting	Company confidential and proprietary information.
ROW / land acquisition	Company confidential and proprietary information.
Materials & equipment	Company confidential and proprietary information.
Construction & commissioning	Company confidential and proprietary information.
Construction management	Company confidential and proprietary information.
Overheads & miscellaneous costs	Company confidential and proprietary information.
Contingency	Company confidential and proprietary information.
Total component cost	\$1,000,000.00
Component cost (in-service year)	\$1,092,727.00
Transmission Line Upgrade Component	
Component title	Conemaugh - Hunterstown 500 kV line Tie-in
Project description	Company confidential and proprietary information
Impacted transmission line	Conemaugh - Hunterstown 500 kV line
Point A	Conemaugh Station

Point B	Hunterstown Station
Point C	
Terrain description	Terrain within the Study Area, and crossed by the Proposed Solution is hilly to gently rolling in a mostly agricultural landscape with large forested tracts and residential development.
Existing Line Physical Characteristics	
Operating voltage	500 kv
Conductor size and type	unknown
Hardware plan description	No existing hardware will be utilized.
Tower line characteristics	The condition of the existing line is assumed to be in good working order. Structure loading at adjacent structures would remain unchanged due to proposing structure locations on cL and near existing tower locations.

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	500.000000	500.000000
	Normal ratings	Emergency ratings
Summer (MVA)	2656.000000	3011.000000
Winter (MVA)	3034.000000	3324.000000
Conductor size and type	unknown	
Shield wire size and type	unkown	
Rebuild line length	0.1 miles	
Rebuild portion description	Tie-in Conemaugh (via Vinco) - Hunterstown 500 kV line into Rice Station.	
Right of way	It is anticipated that the Proposed Solution would not require new ROW; however, current landowners that are crossed by the existing transmission line would need to be notified of the proposed upgrades.	

Construction responsibility	Company confidential and proprietary information
Benefits/Comments	Company confidential and proprietary information
Component Cost Details - In Current Year \$	
Engineering & design	Company confidential and proprietary information
Permitting / routing / siting	Company confidential and proprietary information
ROW / land acquisition	Company confidential and proprietary information
Materials & equipment	Company confidential and proprietary information
Construction & commissioning	Company confidential and proprietary information
Construction management	Company confidential and proprietary information
Overheads & miscellaneous costs	Company confidential and proprietary information
Contingency	Company confidential and proprietary information
Total component cost	\$15,200,000.00
Component cost (in-service year)	\$16,609,450.00
Transmission Line Upgrade Component	
Component title	Peach Bottom - Three Mile Island Tie-in
Project description	Company confidential and proprietary information
Impacted transmission line	Peach Bottom - Three Mile Island Station
Point A	Peach Bottom Station
Point B	Furnace Run Station
Point C	Three Mile Island Station
Terrain description	Terrain within the Study Area, and crossed by the Proposed Solution is hilly to gently rolling in a mostly agricultural landscape with large forested tracts and residential development.

Existing Line Physical Characteristics

Operating voltage	500 kv
Conductor size and type	unknown
Hardware plan description	No existing hardware will be utilized.
Tower line characteristics	The condition of the existing line is assumed to be in good working order. Structure loading at adjacent structures would remain unchanged due to proposing structure locations on cL and near existing tower locations.

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	500.000000	500.000000
	Normal ratings	Emergency ratings
Summer (MVA)	2920.000000	3706.000000
Winter (MVA)	3592.000000	4403.000000
Conductor size and type	unknown	
Shield wire size and type	unknown	
Rebuild line length	0.2 miles	
Rebuild portion description	Tie-in Peachbottom - Three Mile Island 500 kV Line into Furnace Run. There will also need to be remote-end work at both Peach Bottom Station and Three Mile Island Station. The scope also includes Furnace Run 500 kV Terminal equipment at Peachbottom and upgrading the 500 kV Peachbottom 2S and Peachbottom 1N CKT 2 Bus-Tie at Peach Bottom Station in PECO to achieve Summer Emergency Ratings in excess of 3300 MVA	
Right of way	It is anticipated that the Proposed Solution would not require new ROW; however, current landowners that are crossed by the existing transmission line would need to be notified of the proposed upgrades.	
Construction responsibility	Company confidential and proprietary information	

Benefits/Comments

Company confidential and proprietary information

Component Cost Details - In Current Year \$

Engineering & design

Company confidential and proprietary information

Permitting / routing / siting

Company confidential and proprietary information

ROW / land acquisition

Company confidential and proprietary information

Materials & equipment

Company confidential and proprietary information

Construction & commissioning

Company confidential and proprietary information

Construction management

Company confidential and proprietary information

Overheads & miscellaneous costs

Company confidential and proprietary information

Contingency

Company confidential and proprietary information

Total component cost

\$15,200,000.00

Component cost (in-service year)

\$16,609,450.00

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
2022W1-GD-S651	1235187	01GRANDP	235180	01FAYETT	1	138	201	Summer Gen Deliv	Excluded
2022W1-GD-W33	204538	27STRABAN	204529	27GERMANTN	1	115	227	Winter Gen Deliv	Included
2022W1-GD-S14	204538	27STRABAN	204529	27GERMANTN	1	115	227	Summer Gen Deliv	Included
2022W1-GD-S10	204544	27LINCOLN	204538	27STRABAN	1	115	227	Summer Gen Deliv	Included
2022W1-GD-W38	235484	01MESSCK	235490	01MORGAN	1	138	201	Winter Gen Deliv	Excluded
2022W1-GD-S578	204538	27STRABAN	204529	27GERMANTN	1	115	227	Summer Gen Deliv	Included
2022W1-GD-W38	235484	01MESSCK	235490	01MORGAN	1	138	201	Winter Gen Deliv	Excluded

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2022W1-GD-W39	204544	27LINCOLN	204538	27STRABAN	1	115	227	Winter Gen Deliv	Included
2022W1-GD-W42	220963	CONASTON	220961	NWEST326	1	230	232	Winter Gen Deliv	Included
2022W1-GD-W62	208069	PPL-BGE TIE	220964	GRACETON	1	230	229/232	Winter Gen Deliv	Included
2022W1-GD-S104	208069	PPL-BGE TIE	220964	GRACETON	1	230	229/232	Summer Gen Deliv	Included
2022W1-GD-W36	200016	3 MILE I	204514	27TMI	1	500/230	227	Winter Gen Deliv	Included
2022W1-GD-W37	204544	27LINCOLN	204538	27STRABAN	1	115	227	Winter Gen Deliv	Included
2022W1-GD-S570	204544	27LINCOLN	204538	27STRABAN	1	115	227	Summer Gen Deliv	Included
2022W1-GD-W39	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Winter Gen Deliv	Excluded
2022W1-GD-S29	200016	3 MILE I	204514	27TMI	1	500/230	227	Summer Gen Deliv	Included
2022W1-GD-S558	235484	01MESSCK	235490	01MORGAN	1	138	201	Summer Gen Deliv	Excluded
2022W1-GD-W37	204538	27STRABAN	204529	27GERMANTN	1	115	227	Winter Gen Deliv	Included
2022W1-GD-S634	200016	3 MILE I	204514	27TMI	1	500/230	227	Summer Gen Deliv	Included
2022W1-GD-S559	235484	01MESSCK	235490	01MORGAN	1	138	201	Summer Gen Deliv	Excluded
2022W1-GD-W35	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Winter Gen Deliv	Excluded
2022W1-GD-W53	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Winter Gen Deliv	Excluded
2022W1-GD-S38	220963	CONASTON	220961	NWEST326	1	230	232	Summer Gen Deliv	Included
2022W1-GD-W41	208069	PPL-BGE TIE	220964	GRACETON	1	230	229/232	Winter Gen Deliv	Included
2022W1-GD-W55	208069	PPL-BGE TIE	220964	GRACETON	1	230	229/232	Winter Gen Deliv	Included
2022W1-GD-W57	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Winter Gen Deliv	Excluded
2022W1-GD-W60	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Winter Gen Deliv	Excluded

New Flowgates

Company confidential and proprietary information

Financial Information

Capital spend start date 07/2023

Construction start date 03/2025

Project Duration (In Months) 44

Cost Containment Commitment

Cost cap (in current year) Company confidential and proprietary information

Cost cap (in-service year) Company confidential and proprietary information

Components covered by cost containment

1. Rice – Ringgold 230 kV - Transource
2. Rice Station - Transource
3. Furnace Run Station - Transource

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 Yes

Escalation Yes

Additional Information Company confidential and proprietary 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?

Company confidential and proprietary information

Additional Comments

None