

Juniata - Cumberland 230 kV Line Rebuild to DCT

General Information

Proposing entity name	PPLTO
Company proposal ID	PPL-JUNI-CUMB-03
PJM Proposal ID	251
Project title	Juniata - Cumberland 230 kV Line Rebuild to DCT
Project description	Juniata - Cumberland 230 kV Line Rebuild to DCT: Rebuild the existing single circuit Juniata - Cumberland 230 kV tower section (10.6 miles) to double circuit. Add a second circuit to the existing Juniata - Cumberland tower section (3.6 miles) that is presently already built for double circuit. Install double breaker double bus configuration at Juniata for Juniata - Cumberland #1 & #2 lines, and Juniata T2 transformer. At Cumberland, install one 230 kV breaker for Cumberland transformer T3 and install a new single breaker terminal for the Juniata - Cumberland #2 line. Need Date: May 2025
Project in-service date	12/2024
Tie-line impact	No
Interregional project	No
Is the proposer offering a binding cap on capital costs?	No
Additional benefits	Company confidential and proprietary information

Project Components

1. Juniata - Cumberland 230 kV line rebuild existing SCT to be DCT
2. Juniata - Cumberland 230 kV line addition of 2nd circuit to existing DCT
3. Cumberland - Williams Grove 230 kV Line Reconductor
4. Juniata 230 kV Substation Upgrade
5. Cumberland 230 kV Substation Upgrade

Transmission Line Upgrade Component

Component title	Juniata - Cumberland 230 kV line rebuild existing SCT to be DCT
Impacted transmission line	Juniata - Cumberland 230 kV line
Point A	Juniata
Point B	Cumberland
Point C	
Terrain description	10.6 mile section of overall 14.2 mile line. There are 26 line crossings of various kinds (e.g. transmission and distribution line crossings, road and interstate crossings, and pond / creek crossings).

Existing Line Physical Characteristics

Operating voltage	230
Conductor size and type	1033.5 54/7 ACSR "Curlew" Conductor
Hardware plan description	Replace all porcelain assemblies with glass assemblies and all new hardware (replace 96 tension double insulator strings [26 bells per string] and 174 suspension insulator strings [13 bells per string]).
Tower line characteristics	There are 65 existing structures consisting of single circuit design.

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	230.000000	230.000000
	Normal ratings	Emergency ratings
Summer (MVA)	494.000000	624.000000
Winter (MVA)	569.000000	703.000000
Conductor size and type	1590 54/19 ACSR	

Shield wire size and type	144CT OPGW
Rebuild line length	10.6 mile rebuild of existing SCT to DCT
Rebuild portion description	10.6 miles to be rebuilt with all new structures and all new conductor (existing structures in this section are built for single circuit today)
Right of way	No right-of-way expansion is required for this project.
Construction responsibility	PPL
Additional comments	

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	\$29,442,273.06
Component cost (in-service year)	\$31,539,298.97

Transmission Line Upgrade Component

Component title	Juniata - Cumberland 230 kV line addition of 2nd circuit to existing DCT
Impacted transmission line	Juniata - Cumberland 230 kV line
Point A	Juniata

Point B	Cumberland	
Point C		
Terrain description	3.6 mile section of overall 14.2 mile line. There are 26 line crossings of various kinds (e.g. transmission and distribution line crossings, road and interstate crossings, and pond / creek crossings).	
Existing Line Physical Characteristics		
Operating voltage	230	
Conductor size and type	1033.5 54/7 ACSR "Curlew" Conductor	
Hardware plan description	Maintain existing hardware for existing circuit. Add new hardware for 2nd circuit.	
Tower line characteristics	There are 10 existing structures consisting of single circuit, with future double circuit positions available.	
Proposed Line Characteristics		
	Designed	Operating
Voltage (kV)	230.000000	230.000000
	Normal ratings	Emergency ratings
Summer (MVA)	494.000000	624.000000
Winter (MVA)	569.000000	703.000000
Conductor size and type	1033.5 54/7 ACSR "Curlew" Conductor	
Shield wire size and type	144CT OPGW	
Rebuild line length	3.6 miles of new conductor on existing towers	
Rebuild portion description	3.6 miles of new conductor on existing towers. This section is not a rebuild. This is only an addition of a 2nd circuit to existing structures. The new conductor will be the same conductor type as the existing conductor.	
Right of way	No right-of-way expansion is required for this project.	

Construction responsibility	PPL
Additional comments	
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	\$3,763,507.80
Component cost (in-service year)	\$4,031,563.63
Transmission Line Upgrade Component	
Component title	Cumberland - Williams Grove 230 kV Line Reconductor
Impacted transmission line	Cumberland - Williams Grove 230 kV line
Point A	Cumberland
Point B	Williams Grove
Point C	
Terrain description	7.75 mile line. There are several 69 kV line crossings, a highway crossing, and the terrain is mostly rural farm fields.

Existing Line Physical Characteristics

Operating voltage	230
Conductor size and type	1033.5 54/7 ACSR "Curlew" Conductor
Hardware plan description	Replace all porcelain assemblies with glass assemblies and all new hardware double insulator strings.
Tower line characteristics	Line consists of 43 structures, 13 double circuit lattice towers, 24 single circuit lattice towers, 4 single circuit monopoles, and 2 H-frame structures.

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	230.000000	230.000000
	Normal ratings	Emergency ratings
Summer (MVA)	721.000000	814.000000
Winter (MVA)	799.000000	911.000000
Conductor size and type	ACSS/TW/HS285-1272MCM "PHEASANT" conductor	
Shield wire size and type	Existing shield wires will remain	
Rebuild line length	7.75 mile reconductor	
Rebuild portion description	No portion of the line will be rebuilt as part of this project. This is a reconductor only.	
Right of way	No right-of-way expansion is required for this project.	
Construction responsibility	PPL	
Additional comments		

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	\$5,268,664.01
Component cost (in-service year)	\$5,888,234.73

Substation Upgrade Component

Component title	Juniata 230 kV Substation Upgrade
Substation name	Juniata
Substation zone	PPL EU
Substation upgrade scope	Juniata 230 kV Substation Upgrade: Summary: Convert the Juniata 230 kV bus from a radial bus to a double breaker double bus configuration by adding four new 230 kV 3000 A circuit breakers and nine new 230 kV 3000 A MODs. Complete two new double bus double breaker bays for termination of the two lines (one existing and one new) from Cumberland, and one new double bus double breaker bay for termination of the existing Juniata T2 transformer. Detailed Description: Divide existing Bus # 2 into a # 2 and a # 3 bus. Add one breaker to complete a two breaker bay in Bay 3L that will connect buses 2 and 3. This bay will be the termination point for the Juniata T2 transformer. Add one breaker to complete a two breaker bay in Bay 3R that will similarly connect buses 2 and 3. This bay will accommodate the existing Juniata - Cumberland 230 kV # 1 line. Install two new breakers in a new bay in bay position 1R, again in double bus / double breaker configuration between Bay 2 and Bay 3. This location will receive the new Juniata - Cumberland 230 kV # 2 line. The substation equipment will not be the limiting component.

Transformer Information

None

New equipment description	Convert the Juniata 230 kV bus from a radial bus to a double breaker double bus configuration by adding four new 230 kV 3000 A circuit breakers and nine new 230 kV 3000 A MODs. Complete two new double bus double breaker bays for termination of the two lines (one existing and one new) from Cumberland. Install new breaker in T2 bay and make T2 a double breaker – double bus arrangement. Existing 230kV Bus 2 will be split and a new Bus 3 will be created.
Substation assumptions	The substation is owned by PPL and space is available to accommodate the work scope. No assumptions were made for this substation component.
Real-estate description	No additional real estate is required.
Construction responsibility	PPL
Additional comments	There is no substation expansion required beyond the existing fence line, so no real-estate plan is provided.

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	\$2,749,571.50
Component cost (in-service year)	\$2,945,409.73

Substation Upgrade Component

Component title	Cumberland 230 kV Substation Upgrade
Substation name	Cumberland

Substation zone	PPL EU
Substation upgrade scope	At the Cumberland 230 kV Station a new bay with one new 230 kV 3000 A circuit breaker and two new 230 kV 3000 A MODs will be added to accommodate termination of the second line to Juniata (between Bays 2R and 4R). A new 230 kV 3000 A circuit breaker and one new 230 kV 3000 A MOD will be added on the high side of the Cumberland # 3 transformer. (Bay 4R) The addition of a new relay and control panel will be required.

Transformer Information

None	
New equipment description	Install a new circuit breaker in new bay position, install new circuit breaker for T3. Install three 230 kV disconnect switches, relay panels, associated high-side jumpers, control cables, power cables, conduit, new foundation for new equipment, associated grounding. The substation equipment will not be the limiting component.
Substation assumptions	This is a PPL EU owned substation and the scope of work does not require expansion of the fence line. No assumptions were made for this project component.
Real-estate description	No additional real-estate is required.
Construction responsibility	PPL
Additional comments	As the scope of this component does not require expansion of the substation, no real-estate plan is provided.

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 \$4,336,956.11

Component cost (in-service year) \$4,645,855.80

Congestion Drivers

CD #	From Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type
ME-7	207950	CUMB TR2	208004	JUNI BU1	1	230	229	Market Efficiency

Existing Flowgates

None

New Flowgates

None

Financial Information

Capital spend start date 03/2022

Construction start date 04/2023

Project Duration (In Months) 33

Additional comments

None