Juniata - TMIS 500 kV DCT line

General Information

Proposing entity name	Proprietary Information
Does the entity who is submitting this proposal intend to be the Designated Entity for this proposed project?	Proprietary Information
Company proposal ID	Proprietary Information
PJM Proposal ID	386
Project title	Juniata - TMIS 500 kV DCT line
Project description	Proposer Scope: Rebuild the existing single circuit Juniata – Three Mile Island (TMIS) 500kV line as double circuit 500 kV for 16.8 miles from Juniata substation to the PPL/METED demarcation point. Utilize triple bundle 1590 ACSR (for both circuits) with a minimum rating of 3,637 MVA SN, 4,503 MVA SE, 4,156 MVA WN, and 5,022 MVA WE. Install dual 144 count OPGW. Expand ROW to the west as needed to allow for the line to be rebuilt offset with the new circuit constructed on the west side. Install two 4000 A breakers, four 4000 A MODs, a 500 kV dead-end structure, and associated bay equipment in Bay #3 in the Juniata 500kV yard. Terminate the new Juniata – TMIS 500 kV # 2 line into Bay #3 at Juniata 500 kV. Relocate as needed the Juniata – Shermansdale #1 & #2 69kV lines. Other Scope: Rebuild the existing single circuit Juniata – TMIS 500kV line as double circuit 500 kV for 27.2 miles from the PPL/METED demarcation point to Three Mile Island 500 kV substation. Install one new 500 kV 4000 A breaker and two 500 kV 4000 A MODs at TMIS in the bay the Lauschtown line is presently terminated in. Move the termination point of the Lauschtown 500 kV line to the east position, and terminate the new Juniata - TMIS # 2 line into the position Lauschtown was in. (Note that despite all ratings shown in this proposal being the intended final ratings for these upgrades, all 500 kV IDEVs provided to PJM by Proposer presently have Proposer standard 500 kV line ratings of 2707 MVA SN, 3112 MVA SE, 3207 MVA WN, and 3566 MVA WE in case equipment limitations are encountered during pursuit of this project that cause the anticipated ratings to be reduced. If standard ratings are exceeded during PJM assessment, Proposer would like to be made aware of 500 kV elements that must be held to proposed ratings.)
Email	Proprietary Information
Project in-service date	03/2030
Tie-line impact	Yes

Interregional project	No
Is the proposer offering a binding cap on capital costs?	Yes
Additional benefits	Proprietary Information

Project Components

1. Juniata - Three Mile Island 500 kV DCT line (PPL segment)
2. Juniata 500 kV yard upgrade
3. Three Mile Island 500 kV yard upgrade
4. Juniata - Three Mile Island 500 kV DCT line (METED segment)

Transmission Line Upgrade Component

Component title	Juniata - Three Mile Island 500 kV DCT line (PPL segment)
Project description	Proprietary Information
Impacted transmission line	Juniata - Three Mile Island 500 kV line
Point A	Juniata
Point B	Three Mile Island (TMIS)
Point C	
Terrain description	Existing transmission corridor. Rolling hills with congestion due to urban areas around ROW.
Existing Line Physical Characteristics	
Operating voltage	500
Conductor size and type	Double Bundle 2493 ACAR 54/37
Hardware plan description	Line will be completely removed. All new hardware will be installed.
Tower line characteristics	See attachment entitled DC 500kV.pdf for illustration of double circuit tower design.
Proposed Line Characteristics	

	Designed	Operating
Voltage (kV)	500.000000	500.000000
	Normal ratings	Emergency ratings
Summer (MVA)	3637.000000	4503.000000
Winter (MVA)	4156.000000	5022.000000
Conductor size and type	triple bundle 1590 ACSR	
Shield wire size and type	dual 144 count OPGW	
Rebuild line length	16.8	
Rebuild portion description	Rebuild the existing single circuit Juniata – Three Mile Island (TMIS) 500kV line as double circuit 500 kV for 16.8 miles from Juniata substation to the PPL/METED demarcation point. Utilize triple bundle 1590 ACSR (for both circuits) with a rating of 3637 MVA SN, 4503 MVA SE, 4156 MVA WN, and 5022 MVA WE. Install dual 144 count OPGW. Expand ROW to the west as needed to allow for the line to be rebuilt offset with the new circuit constructed on the west side. Relocate as needed the Juniata – Shermansdale #1 & #2 69kV lines.	
Right of way	Rebuild the existing single circuit Juniata – Three Mile Island (TMIS) 500kV line as double circuit 500 kV for 16.8 miles from Juniata substation to the PPL/METED demarcation point. Utilize triple bundle 1590 ACSR (for both circuits) with a rating of 3637 MVA SN, 4503 MVA SE, 4156 MVA WN, and 5022 MVA WE. Install dual 144 count OPGW. Expand ROW to the west as needed to allow for the line to be rebuilt offset with the new circuit constructed on the west side. Relocate as needed the Juniata – Shermansdale #1 & #2 69kV lines.	
Construction responsibility	Proprietary Information	
Benefits/Comments	Proprietary Information	
Component Cost Details - In Current Year $		
Engineering & design	Proprietary Information	
Permitting / routing / siting	Proprietary Information	
ROW / land acquisition	Proprietary Information	

Materials & equipment	Proprietary Information
Construction & commissioning	Proprietary Information
Construction management	Proprietary Information
Overheads & miscellaneous costs	Proprietary Information
Contingency	Proprietary Information
Total component cost	$126,895,922.01
Component cost (in-service year)	$145,522,275.44

Substation Upgrade Component

Component title	Juniata 500 kV yard upgrade
Project description	Proprietary Information
Substation name	Juniata 500/230 kV Substation
Substation zone	PPL
Substation upgrade scope	Install two 4000 A breakers, four 4000 A MODs, a 500 kV dead-end structure, and associated bay equipment in new Bay #3 in the Juniata 500 kV yard. All substation conductors and equipment will have a minimum rating of 3609 MVA SN, 4149 MVA SE, 4276 MVA WN, and 4755 MVA WE. Terminate the new Juniata – TMIS 500 kV # 2 line into Bay #3 at Juniata 500 kV.

Transformer Information

None

New equipment description	Two 4000 A breakers Four 4000 A MODs One 500 kV dead-end structure Associated bay equipment
Substation assumptions	Substation owned by Proposer. Space is available that is sufficient to accommodate this upgrade.
Real-estate description	No station expansion required.
Construction responsibility	Proprietary Information
Benefits/Comments	Proprietary Information

Component Cost Details - In Current Year $

Engineering & design	Proprietary Information
Permitting / routing / siting	Proprietary Information
ROW / land acquisition	Proprietary Information
Materials & equipment	Proprietary Information
Construction & commissioning	Proprietary Information
Construction management	Proprietary Information
Overheads & miscellaneous costs	Proprietary Information
Contingency	Proprietary Information
Total component cost	$9,675,000.00
Component cost (in-service year)	$11,095,139.96

Substation Upgrade Component

Component title	Three Mile Island 500 kV yard upgrade
Project description	Proprietary Information
Substation name	Three Mile Island 500/230 kV Station (TMIS)
Substation zone	METED
Substation upgrade scope	Install one new 500 kV 4000 A breaker and two 500 kV 4000 A MODs at TMIS in the bay the Lauschtown line is presently terminated in. Move the termination point of the Lauschtown 500 kV line to the east position, and terminate the new Juniata - TMIS # 2 line into the position Lauschtown was in.

Transformer Information

None

New equipment description	One new 500 kV 4000 A circuit breaker Two 500 kV 4000 A MODs

Substation assumptions	Assumed that the Lauschtown 500 kV line can be moved to the east bay position of the bay it is presently in at TMIS to allow for termination of the new line to Juniata in the present Lauschtown line location. Assumed based on drawings and Google Earth images that room is available to add one new breaker and two MODs in the Lauschtown bay at TMIS.
Real-estate description	No station expansion anticipated to be necessary as the open position is present in the existing station layout.
Construction responsibility	Proprietary Information
Benefits/Comments	Proprietary Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary Information
Permitting / routing / siting	Proprietary Information
ROW / land acquisition	Proprietary Information
Materials & equipment	Proprietary Information
Construction & commissioning	Proprietary Information
Construction management	Proprietary Information
Overheads & miscellaneous costs	Proprietary Information
Contingency	Proprietary Information
Total component cost	$9,425,000.00
Component cost (in-service year)	$10,172,389.63

Transmission Line Upgrade Component

Component title	Juniata - Three Mile Island 500 kV DCT line (METED segment)
Project description	Proprietary Information
Impacted transmission line	Juniata - Three Mile Island 500 kV line
Point A	Juniata

Point B	Three Mile Island (TMIS)
Point C	
Terrain description	Existing transmission corridor. Rolling hills with congestion due to urban areas around ROW.
Existing Line Physical Characteristics	
Operating voltage	500
Conductor size and type	Double Bundle 2493 ACAR 54/37
Hardware plan description	Line will be completely removed. All new hardware will be installed.
Tower line characteristics	See attachment entitled DC 500kV.pdf for illustration of double circuit tower design.
Proposed Line Characteristics	

	Designed	Operating
Voltage (kV)	500.000000	500.000000
	Normal ratings	Emergency ratings
Summer (MVA)	3637.000000	4503.000000
Winter (MVA)	4156.000000	5022.000000

Conductor size and type	triple bundle 1590 ACSR conductor
Shield wire size and type	dual 144 count OPGW
Rebuild line length	27.2
Rebuild portion description	Rebuild the existing single circuit Juniata – TMIS 500kV line as double circuit 500 kV for 27.2 miles from the PPL/METED demarcation point to Three Mile Island 500 kV substation. Utilize triple bundle 1590 ACSR conductor with a rating of 3637 MVA SN, 4503 MVA SE, 4156 MVA WN, and 5022 MVA WE.
Right of way	No ROW expansion required. Work to take place in existing ROW.
Construction responsibility	Proprietary Information

Benefits/Comments	Proprietary Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary Information
Permitting / routing / siting	Proprietary Information
ROW / land acquisition	Proprietary Information
Materials & equipment	Proprietary Information
Construction & commissioning	Proprietary Information
Construction management	Proprietary Information
Overheads & miscellaneous costs	Proprietary Information
Contingency	Proprietary Information
Total component cost	$207,716,539.01
Component cost (in-service year)	$224,188,176.92

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
2024W1-GD-S490	208004	JUNI	207955	DAUP TR2	1	230	229	Summer Gen Deliv	Included
2024W1-GD-S492	208004	JUNI	207955	DAUP TR2	1	230	229	Summer Gen Deliv	Included
2024W1-GD-S491	208004	JUNI	207955	DAUP TR2	1	230	229	Summer Gen Deliv	Included
2024W1-GD-S493	208004	JUNI	207955	DAUP TR2	1	230	229	Summer Gen Deliv	Included
2024W1-IPD-S104	200009	JUNI	208004	JUNI	2	500/230	229	Summer IPD	Included
2024W1-GD-S390	200009	JUNI	208004	JUNI	2	500/230	229	Summer Gen Deliv	Included
2024W1-GD-S102	208004	JUNI	207955	DAUP TR2	1	230	229	Summer Gen Deliv	Included

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2024W1-GD-S441	208004	JUNI	207955	DAUP TR2	1	230	229	Summer Gen Deliv	Included
2024W1-IPD-W2	200009	JUNI	208004	JUNI	2	500/230	229	Winter IPD	Included
2024W1-GD-W106	200009	JUNI	208004	JUNI	2	500/230	229	Winter Gen Deliv	Included
2024W1-N1-WT1	200009	JUNI	208004	JUNI	2	500/230	229/229	Winter Thermal	Included

New Flowgates

Proprietary Information

Financial Information

Capital spend start date	06/2025
Construction start date	02/2028
Project Duration (In Months)	57

Cost Containment Commitment

Cost cap (in current year)	Proprietary Information
Cost cap (in-service year)	Proprietary Information

Components covered by cost containment

1. Juniata - Three Mile Island 500 kV DCT line (PPL segment) - PPL
2. Juniata 500 kV yard upgrade - PPL

Cost elements covered by cost containment

Engineering & design	Yes
Permitting / routing / siting	Yes
ROW / land acquisition	No

Materials & equipment	Yes
Construction & commissioning	Yes
Construction management	Yes
Overheads & miscellaneous costs	No
Taxes	No
AFUDC	No
Escalation	No
Additional Information	Proprietary Information
Is the proposer offering a binding cap on ROE?	No
Is the proposer offering a Debt to Equity Ratio cap?	Proprietary Information

Additional Comments

None