

PPL Load Addition Proposal - Keystone - Susquehanna Dual 500 kV Single Circuits with Jack's Mt.

General Information

Proposing entity name	Confidential Information
Does the entity who is submitting this proposal intend to be the Designated Entity for this proposed project?	Confidential Information
Company proposal ID	Confidential Information
PJM Proposal ID	578
Project title	PPL Load Addition Proposal - Keystone - Susquehanna Dual 500 kV Single Circuits with Jack's Mt.
Project description	Construct two new 500 kV lines from Keystone Substation in MAIT to new reactive support station, Jack's Mountain (MAIT). Construct two new 500 kV lines from Jacks Mountain Station to Susquehanna Substation in PPL territory. These lines should all be constructed single circuit. The Jack's Mountain Station will be a 5 breaker ring bus with a +/-500 Mvar STATCOM. All four new 500 KV lines should connect to Jack's Mountain Station. Expansion will be needed at the Keystone and Susquehanna substations to accommodate the two new 500 kV line terminals. Add an additional 500/230 kV transformer at Susquehanna Substation. Upgrade the following circuits to support this plan: Terminal equipment on South Bend - Keystone 500 kV Line, terminal equipment on Brighton (Exelon) - Doubs 500 kV Line, rebuild the East Towanda - Canyon - North Meshoppen 230 kV Line, rebuild the Carlisle Pike - Gardners 115 kV Line, and replace the #3 230/115 kV transformer at North Meshoppen Substation. Refer to Executive Abstract attached to Market Efficiency simulation modeling files section.
Email	Confidential Information
Project in-service date	06/2030
Tie-line impact	Yes
Interregional project	No
Is the proposer offering a binding cap on capital costs?	Yes
Additional benefits	Confidential Information

Project Components

1. Keystone Substation Expansion (MAIT)
2. Susquehanna Substation Expansion
3. South Bend Substation Terminal Upgrade
4. Keystone Substation: Upgrade the South Bend 500 kV line terminal
5. Brighton Substation: Upgrade the Doubs 500 kV line terminal
6. East Towanda Substation: Upgrade the Canyon 230 kV line terminal
7. Canyon Substation: Upgrade the East Towanda and North Meshoppen 230 kV line terminals
8. North Meshoppen Substation: Upgrade the Canyon 230 kV line terminal
9. North Meshoppen Substation: Replace the #3 230/115 kV Transformer
10. East Towanda - Canyon - North Meshoppen 230 kV Line
11. Carlisle Pike - Roxbury 115 kV Line Rebuild
12. Keystone - Jack's Mountain 500 kV Line #1: Construct new Line
13. Keystone - Jack's Mountain 500 kV Line #2: Construct new Line
14. Carlisle Pike Substation: Upgrade the Roxbury 115 kV line terminal
15. Roxbury Substation: Upgrade the Carlisle Pike 115 kV line terminal
16. Jack's Mountain Station: Create a new 500 kV five breaker ring bus and install a 500 Mvar STATCOM
17. Jacks Mountain - Susquehanna #1 500 kV Line
18. Jacks Mountain - Susquehanna #2 500 kV Line

Substation Upgrade Component

Component title	Keystone Substation Expansion (MAIT)
Project description	Confidential Information
Substation name	Keystone Substation
Substation zone	PENELEC

Substation upgrade scope

-Add a new breaker and a new string with 2 new breakers at the 500 kV breaker-and-a-half switchyard -Connect the new 500 kV lines to the new terminals -Add disconnect switches with SCADA to the line exits at the substation -Upgrade terminal equipment as necessary to make the line conductor the limiting element in circuit ratings -Replace the relaying panels -Replace the limiting circuit breaker -Replace two wave traps with 5000 A units or convert to fiber. -Replace two 3000 A disconnects with 4000 A units -Replace the 2000 SCCIR -Replace the 4 inch pipe

Transformer Information

	Name	Capacity (MVA)
Transformer	na	na
	High Side	Low Side Tertiary
Voltage (kV)	na	na
New equipment description	See substation upgrade scope above	
Substation assumptions	All substation upgrades should be able to occur within the confines of the existing fence.	
Real-estate description	All substation upgrades should be able to occur within the confines of the existing fence.	
Construction responsibility	Confidential Information	
Benefits/Comments	Confidential Information	
Component Cost Details - In Current Year \$		
Engineering & design	Confidential Information	
Permitting / routing / siting	Confidential Information	
ROW / land acquisition	Confidential Information	
Materials & equipment	Confidential Information	
Construction & commissioning	Confidential Information	
Construction management	Confidential Information	
Overheads & miscellaneous costs	Confidential Information	

Contingency	Confidential Information		
Total component cost	\$9,772,427.00		
Component cost (in-service year)	\$10,934,746.00		
Substation Upgrade Component			
Component title	Susquehanna Substation Expansion		
Project description	Confidential Information		
Substation name	Susquehanna Substation (PPL)		
Substation zone	PPL		
Substation upgrade scope	Add two new breakers to the 500 kV breaker-and-a-half yard Connect the new 500 kV lines to the new terminals Add a new breaker to the 230 kV breaker-and-a-half yard Connect a new 500/230 kV transformer to this new position Terminate the 500 kV side of the transformer at the North Bus of the 500 kV station Add disconnect switches with SCADA to the line exits at the 500 kV and 230 kV substations Upgrade terminal equipment as necessary to make the line conductor as the limiting element in circuit ratings		
Transformer Information			
	Name		Capacity (MVA)
Transformer	Susquehanna #2 500/230 kV		420
	High Side	Low Side	Tertiary
Voltage (kV)	500	230	na
New equipment description	See substation upgrade scope above		
Substation assumptions	All substation upgrades should be able to occur within the confines of the existing fence.		
Real-estate description	All substation upgrades should be able to occur within the confines of the existing fence.		
Construction responsibility	Confidential Information		
Benefits/Comments	Confidential Information		

Component Cost Details - In Current Year \$

Engineering & design	Confidential Information
Permitting / routing / siting	Confidential Information
ROW / land acquisition	Confidential Information
Materials & equipment	Confidential Information
Construction & commissioning	Confidential Information
Construction management	Confidential Information
Overheads & miscellaneous costs	Confidential Information
Contingency	Confidential Information
Total component cost	\$38,953,277.00
Component cost (in-service year)	\$43,586,363.00

Substation Upgrade Component

Component title	South Bend Substation Terminal Upgrade
Project description	Confidential Information
Substation name	South Bend Substation
Substation zone	APS
Substation upgrade scope	-Replace the relaying panels -Replace the 4000 A wave trap with a 5000 A unit or convert to fiber -Replace the limiting 2032 SCCIR conductor

Transformer Information

	Name	Capacity (MVA)
Transformer	na	na
	High Side	Low Side Tertiary

Voltage (kV)	na	na	na
New equipment description	See substation upgrade scope above		
Substation assumptions	All substation upgrades should be able to occur within the confines of the existing fence.		
Real-estate description	All substation upgrades should be able to occur within the confines of the existing fence.		
Construction responsibility	Confidential Information		
Benefits/Comments	Confidential Information		
Component Cost Details - In Current Year \$			
Engineering & design	Confidential Information		
Permitting / routing / siting	Confidential Information		
ROW / land acquisition	Confidential Information		
Materials & equipment	Confidential Information		
Construction & commissioning	Confidential Information		
Construction management	Confidential Information		
Overheads & miscellaneous costs	Confidential Information		
Contingency	Confidential Information		
Total component cost	\$759,008.00		
Component cost (in-service year)	\$846,286.00		
Substation Upgrade Component			
Component title	Keystone Substation: Upgrade the South Bend 500 kV line terminal		
Project description	Confidential Information		
Substation name	Keystone Substation		
Substation zone	PENELEC		

Substation upgrade scope

-Replace the relaying panels -Replace the limiting circuit breaker -Replace two wave traps with 5000 A units or convert to fiber. -Replace two 3000 A disconnects with 4000 A units -Replace the 2000 SCCIR -Replace the 4 inch pipe

Transformer Information

	Name	Capacity (MVA)
Transformer	na	na
	High Side	Low Side Tertiary
Voltage (kV)	na	na
New equipment description	See substation upgrade scope above	
Substation assumptions	All substation upgrades should be able to occur within the confines of the existing fence.	
Real-estate description	All substation upgrades should be able to occur within the confines of the existing fence.	
Construction responsibility	Confidential Information	
Benefits/Comments	Confidential Information	
Component Cost Details - In Current Year \$		
Engineering & design	Confidential Information	
Permitting / routing / siting	Confidential Information	
ROW / land acquisition	Confidential Information	
Materials & equipment	Confidential Information	
Construction & commissioning	Confidential Information	
Construction management	Confidential Information	
Overheads & miscellaneous costs	Confidential Information	
Contingency	Confidential Information	

Total component cost	\$759,009.00
Component cost (in-service year)	\$849,286.00

Substation Upgrade Component

Component title	Brighton Substation: Upgrade the Doubs 500 kV line terminal
Project description	Confidential Information
Substation name	Brighton Substation
Substation zone	PEPCO
Substation upgrade scope	Upgrade the Doubs 500 kV line terminal at Brighton Substation (PEPCO) replace the breaker, disconnect switches, relaying, and terminal equipment to eliminate the thermal constraints.

Transformer Information

	Name	Capacity (MVA)	
Transformer	na	na	
	High Side	Low Side	Tertiary
Voltage (kV)	na	na	na
New equipment description	See substation upgrade scope above		
Substation assumptions	All substation upgrades should be able to occur within the confines of the existing fence.		
Real-estate description	All substation upgrades should be able to occur within the confines of the existing fence.		
Construction responsibility	Confidential Information		
Benefits/Comments	Confidential Information		
Component Cost Details - In Current Year \$			
Engineering & design	Confidential Information		
Permitting / routing / siting	Confidential Information		

ROW / land acquisition	Confidential Information												
Materials & equipment	Confidential Information												
Construction & commissioning	Confidential Information												
Construction management	Confidential Information												
Overheads & miscellaneous costs	Confidential Information												
Contingency	Confidential Information												
Total component cost	\$2,967,037.00												
Component cost (in-service year)	\$3,319,934.00												
Substation Upgrade Component													
Component title	East Towanda Substation: Upgrade the Canyon 230 kV line terminal												
Project description	Confidential Information												
Substation name	East Towanda Substation												
Substation zone	PENELEC												
Substation upgrade scope	At East Towanda Substation: -Replace the wave trap with a 3000 A unit -Replace the limiting substation conductor												
Transformer Information													
	<table><tr><td colspan="2">Name</td><td>Capacity (MVA)</td></tr><tr><td colspan="2">na</td><td>na</td></tr><tr><td>High Side</td><td>Low Side</td><td>Tertiary</td></tr><tr><td>na</td><td>na</td><td>na</td></tr></table>	Name		Capacity (MVA)	na		na	High Side	Low Side	Tertiary	na	na	na
Name		Capacity (MVA)											
na		na											
High Side	Low Side	Tertiary											
na	na	na											
Transformer													
Voltage (kV)													
New equipment description	See substation upgrade scope above												
Substation assumptions	All substation upgrades should be able to occur within the confines of the existing fence.												

Real-estate description	All substation upgrades should be able to occur within the confines of the existing fence.
Construction responsibility	Confidential Information
Benefits/Comments	Confidential Information
Component Cost Details - In Current Year \$	
Engineering & design	Confidential Information
Permitting / routing / siting	Confidential Information
ROW / land acquisition	Confidential Information
Materials & equipment	Confidential Information
Construction & commissioning	Confidential Information
Construction management	Confidential Information
Overheads & miscellaneous costs	Confidential Information
Contingency	Confidential Information
Total component cost	\$.00
Component cost (in-service year)	\$.00
Substation Upgrade Component	
Component title	Canyon Substation: Upgrade the East Towanda and North Meshoppen 230 kV line terminals
Project description	Confidential Information
Substation name	Canyon Substation
Substation zone	PENELEC
Substation upgrade scope	Canyon Substation: Upgrade the East Towanda and North Meshoppen 230 kV line terminals -Replace the 1200 A disconnects with 2000 A units on both line terminals -Replace the 1033 ACSR conductor

Transformer Information

	Name	Capacity (MVA)
Transformer	na	na
	High Side	Low Side Tertiary
Voltage (kV)	na	na
New equipment description	See substation upgrade scope above	
Substation assumptions	All substation upgrades should be able to occur within the confines of the existing fence.	
Real-estate description	All substation upgrades should be able to occur within the confines of the existing fence.	
Construction responsibility	Confidential Information	
Benefits/Comments	Confidential Information	
Component Cost Details - In Current Year \$		
Engineering & design	Confidential Information	
Permitting / routing / siting	Confidential Information	
ROW / land acquisition	Confidential Information	
Materials & equipment	Confidential Information	
Construction & commissioning	Confidential Information	
Construction management	Confidential Information	
Overheads & miscellaneous costs	Confidential Information	
Contingency	Confidential Information	
Total component cost	\$.00	
Component cost (in-service year)	\$.00	

Substation Upgrade Component

Component title	North Meshoppen Substation: Upgrade the Canyon 230 kV line terminal
Project description	Confidential Information
Substation name	North Meshoppen Substation
Substation zone	PENELEC
Substation upgrade scope	North Meshoppen Substation: Upgrade the Canyon 230 kV line terminal -Replace the wave trap with a 3000 A unit -Replace the limiting substation conductor -Adjust Relay Settings

Transformer Information

	Name	Capacity (MVA)
Transformer	na	na
	High Side	Low Side Tertiary
Voltage (kV)	na	na
New equipment description	See substation upgrade scope above	
Substation assumptions	All substation upgrades should be able to occur within the confines of the existing fence.	
Real-estate description	All substation upgrades should be able to occur within the confines of the existing fence.	
Construction responsibility	Confidential Information	
Benefits/Comments	Confidential Information	
Component Cost Details - In Current Year \$		
Engineering & design	Confidential Information	
Permitting / routing / siting	Confidential Information	
ROW / land acquisition	Confidential Information	
Materials & equipment	Confidential Information	

Construction & commissioning	Confidential Information		
Construction management	Confidential Information		
Overheads & miscellaneous costs	Confidential Information		
Contingency	Confidential Information		
Total component cost	\$.00		
Component cost (in-service year)	\$.00		
Substation Upgrade Component			
Component title	North Meshoppen Substation: Replace the #3 230/115 kV Transformer		
Project description	Confidential Information		
Substation name	North Meshoppen Substation		
Substation zone	PENELEC		
Substation upgrade scope	-Replace the existing #3 230/115 kV transformer with a new 375 MVA transformer.		
Transformer Information			
	Name		Capacity (MVA)
Transformer	North Meshoppen #3		375
	High Side	Low Side	Tertiary
Voltage (kV)	230	115	na
New equipment description	See substation upgrade scope above		
Substation assumptions	All substation upgrades should be able to occur within the confines of the existing fence.		
Real-estate description	All substation upgrades should be able to occur within the confines of the existing fence.		
Construction responsibility	Confidential Information		

Benefits/Comments	Confidential Information
Component Cost Details - In Current Year \$	
Engineering & design	Confidential Information
Permitting / routing / siting	Confidential Information
ROW / land acquisition	Confidential Information
Materials & equipment	Confidential Information
Construction & commissioning	Confidential Information
Construction management	Confidential Information
Overheads & miscellaneous costs	Confidential Information
Contingency	Confidential Information
Total component cost	\$4,692,058.00
Component cost (in-service year)	\$5,250,129.00
Transmission Line Upgrade Component	
Component title	East Towanda - Canyon - North Meshoppen 230 kV Line
Project description	Confidential Information
Impacted transmission line	East Towanda - Canyon - North Meshoppen 230 kV Line
Point A	East Towanda Substation
Point B	Canyon Substation
Point C	North Meshoppen Substation
Terrain description	This line traverses several mountain ranges with their peaks, valleys, and associated water crossings. The line already exists and is planned to be primarily rebuilt in the existing right of way, which should assist with the constructability aspects of this line.

Existing Line Physical Characteristics

Operating voltage	230
Conductor size and type	1033 ACSR 54/7
Hardware plan description	The line will be created using all new hardware and structures. It is not anticipated any equipment will be reused or salvaged.
Tower line characteristics	Wood pole H-frame construction built in the late 1950s.

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	230.000000	230.000000
	Normal ratings	Emergency ratings
Summer (MVA)	896.000000	896.000000
Winter (MVA)	1032.000000	1086.000000
Conductor size and type	1113 ACSS	
Shield wire size and type	OPGW	
Rebuild line length	22.3 miles	
Rebuild portion description	Rebuild the entire 22.3 miles of 230 kV line	
Right of way	No additional ROW is anticipated to be needed.	
Construction responsibility	Confidential Information	
Benefits/Comments	Confidential Information	
Component Cost Details - In Current Year \$		
Engineering & design	Confidential Information	
Permitting / routing / siting	Confidential Information	

ROW / land acquisition	Confidential Information
Materials & equipment	Confidential Information
Construction & commissioning	Confidential Information
Construction management	Confidential Information
Overheads & miscellaneous costs	Confidential Information
Contingency	Confidential Information
Total component cost	\$82,249,014.00
Component cost (in-service year)	\$92,031,669.00
Transmission Line Upgrade Component	
Component title	Carlisle Pike - Roxbury 115 kV Line Rebuild
Project description	Confidential Information
Impacted transmission line	Carlisle Pike - Roxbury 115 kV Line
Point A	Carlisle Pike Substation
Point B	Roxbury Substation
Point C	na
Terrain description	Mountains and forests with several stream crossings
Existing Line Physical Characteristics	
Operating voltage	115
Conductor size and type	336 ACSR 26/7
Hardware plan description	No hardware is planned to be reused.
Tower line characteristics	Wood pole H-frame construction built in the 1950s

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	115.000000	115.000000
	Normal ratings	Emergency ratings
Summer (MVA)	373.000000	430.000000
Winter (MVA)	374.000000	452.000000
Conductor size and type	795 ACSS 26/7	
Shield wire size and type	OPGW	
Rebuild line length	~9.2 miles	
Rebuild portion description	The entire 9.2 miles of the line will be rebuilt.	
Right of way	No additional ROW is anticipated to be needed.	
Construction responsibility	Confidential Information	
Benefits/Comments	Confidential Information	
Component Cost Details - In Current Year \$		
Engineering & design	Confidential Information	
Permitting / routing / siting	Confidential Information	
ROW / land acquisition	Confidential Information	
Materials & equipment	Confidential Information	
Construction & commissioning	Confidential Information	
Construction management	Confidential Information	
Overheads & miscellaneous costs	Confidential Information	

Contingency	Confidential Information	
Total component cost	\$53,763,162.00	
Component cost (in-service year)	\$60,157,726.00	
Greenfield Transmission Line Component		
Component title	Keystone - Jack's Mountain 500 kV Line #1: Construct new Line	
Project description	Confidential Information	
Point A	Keystone Substation	
Point B	Jacks Mountain Station	
Point C	na	
	Normal ratings	Emergency ratings
Summer (MVA)	4512.000000	5433.000000
Winter (MVA)	6288.000000	7217.000000
Conductor size and type	3x 1113 ACSS	
Nominal voltage	AC	
Nominal voltage	500	
Line construction type	Overhead	
General route description	The line is presumed to follow the existing Keystone - Juniata 500 kV path from the west to the Jacks Mountain Station.	
Terrain description	This path is hundreds of miles long and will traverse multiple different types of terrain. The most challenging will be the multiple ridges of the Appalachian Mountains that will need to be traverse. At the base of each mountain is typically a moving body of water. Most notably there will be crossings of the branches and tributaries of the Susquehanna and Juniata rivers.	
Right-of-way width by segment	170 feet	

Electrical transmission infrastructure crossings	TBD
Civil infrastructure/major waterway facility crossing plan	TBD
Environmental impacts	TBD
Tower characteristics	Single circuit steel monopoles with a delta configuration
Construction responsibility	Confidential Information
Benefits/Comments	Confidential Information
Component Cost Details - In Current Year \$	
Engineering & design	Confidential Information
Permitting / routing / siting	Confidential Information
ROW / land acquisition	Confidential Information
Materials & equipment	Confidential Information
Construction & commissioning	Confidential Information
Construction management	Confidential Information
Overheads & miscellaneous costs	Confidential Information
Contingency	Confidential Information
Total component cost	\$442,483,546.00
Component cost (in-service year)	\$492,959,515.00
Greenfield Transmission Line Component	
Component title	Keystone - Jack's Mountain 500 kV Line #2: Construct new Line
Project description	Confidential Information
Point A	Keystone Substation
Point B	Jack's Mountain Station

Point C	na	
	Normal ratings	Emergency ratings
Summer (MVA)	4512.000000	5433.000000
Winter (MVA)	6288.000000	7217.000000
Conductor size and type	3 x 1113 ACSS	
Nominal voltage	AC	
Nominal voltage	500	
Line construction type	Overhead	
General route description	The line is presumed to follow the existing Keystone - Juniata 500 kV path from the west to the east. Then we expect the line to turn North presumably following the Juniata - Sunbury 500 kV corridor. A diagonal northeastern route will need to be determined to its final termination at Susquehanna	
Terrain description	This path is hundreds of miles long and will traverse multiple different types of terrain. The most challenging will be the multiple ridges of the Appalachian Mountains that will need to be traverse. At the base of each mountain is typically a moving body of water. Most notably there will be crossings of the branches and tributaries of the Susquehanna and Juniata rivers.	
Right-of-way width by segment	170 feet	
Electrical transmission infrastructure crossings	See information below. Each crossing will not be listed as the route is subject to change.	
Civil infrastructure/major waterway facility crossing plan	TBD	
Environmental impacts	TBD	
Tower characteristics	Single circuit steel monopoles with a delta configuration	
Construction responsibility	Confidential Information	
Benefits/Comments	Confidential Information	
Component Cost Details - In Current Year \$		
Engineering & design	Confidential Information	

Permitting / routing / siting	Confidential Information												
ROW / land acquisition	Confidential Information												
Materials & equipment	Confidential Information												
Construction & commissioning	Confidential Information												
Construction management	Confidential Information												
Overheads & miscellaneous costs	Confidential Information												
Contingency	Confidential Information												
Total component cost	\$442,483,546.00												
Component cost (in-service year)	\$492,959,515.00												
Substation Upgrade Component													
Component title	Carlisle Pike Substation: Upgrade the Roxbury 115 kV line terminal												
Project description	Confidential Information												
Substation name	Carlisle Pike Substation												
Substation zone	PENELEC												
Substation upgrade scope	-Replace the limiting conductors -Replace the three limiting disconnect switches with 2000 A units. -Replace the relaying or convert to fiber communications.												
Transformer Information													
	<table><tr><td colspan="2">Name</td><td>Capacity (MVA)</td></tr><tr><td colspan="2">na</td><td>na</td></tr><tr><td>High Side</td><td>Low Side</td><td>Tertiary</td></tr><tr><td>na</td><td>na</td><td>na</td></tr></table>	Name		Capacity (MVA)	na		na	High Side	Low Side	Tertiary	na	na	na
Name		Capacity (MVA)											
na		na											
High Side	Low Side	Tertiary											
na	na	na											
Transformer													
Voltage (kV)													
New equipment description	See substation upgrade scope above												

Substation assumptions	All substation upgrades should be able to occur within the confines of the existing fence.
Real-estate description	All substation upgrades should be able to occur within the confines of the existing fence.
Construction responsibility	Confidential Information
Benefits/Comments	Confidential Information
Component Cost Details - In Current Year \$	
Engineering & design	Confidential Information
Permitting / routing / siting	Confidential Information
ROW / land acquisition	Confidential Information
Materials & equipment	Confidential Information
Construction & commissioning	Confidential Information
Construction management	Confidential Information
Overheads & miscellaneous costs	Confidential Information
Contingency	Confidential Information
Total component cost	\$.00
Component cost (in-service year)	\$.00
Substation Upgrade Component	
Component title	Roxbury Substation: Upgrade the Carlisle Pike 115 kV line terminal
Project description	Confidential Information
Substation name	Roxbury Substation
Substation zone	PENELEC
Substation upgrade scope	-Replace the limiting conductors -Replace the three limiting disconnect switches with 2000 A units. -Replace the relaying or convert to fiber communications.

Transformer Information

None

New equipment description

See substation upgrade scope above

Substation assumptions

All substation upgrades should be able to occur within the confines of the existing fence.

Real-estate description

All substation upgrades should be able to occur within the confines of the existing fence.

Construction responsibility

Confidential Information

Benefits/Comments

Confidential Information

Component Cost Details - In Current Year \$

Engineering & design

Confidential Information

Permitting / routing / siting

Confidential Information

ROW / land acquisition

Confidential Information

Materials & equipment

Confidential Information

Construction & commissioning

Confidential Information

Construction management

Confidential Information

Overheads & miscellaneous costs

Confidential Information

Contingency

Confidential Information

Total component cost

\$.00

Component cost (in-service year)

\$.00

Substation Upgrade Component

Component title

Jack's Mountain Station: Create a new 500 kV five breaker ring bus and install a 500 Mvar STATCOM

Project description

Confidential Information

Substation name	Jack's Mountain Station		
Substation zone	PENELEC		
Substation upgrade scope	Construct a new 500 kV switching station, via five breaker ring bus • The station should facilitate future breaker and a half configuration • Loop the new 500 kV lines into the station • Install (1) STATCOM +/- 500 Mvar for reactive support		
Transformer Information			
	Name		Capacity (MVA)
Transformer	na		na
	High Side	Low Side	Tertiary
Voltage (kV)	na	na	na
New equipment description	See description above		
Substation assumptions	It is assume the majority of the station can be constructed on the 98 acre parcel already owned by FirstEnergy at this location.		
Real-estate description	It is assume the majority of the station can be constructed on the 98 acre parcel already owned by FirstEnergy at this location.		
Construction responsibility	Confidential Information		
Benefits/Comments	Confidential Information		
Component Cost Details - In Current Year \$			
Engineering & design	Confidential Information		
Permitting / routing / siting	Confidential Information		
ROW / land acquisition	Confidential Information		
Materials & equipment	Confidential Information		
Construction & commissioning	Confidential Information		

Construction management	Confidential Information
Overheads & miscellaneous costs	Confidential Information
Contingency	Confidential Information
Total component cost	\$166,283,238.00
Component cost (in-service year)	\$186,060,881.00

Greenfield Transmission Line Component

Component title	Jacks Mountain - Susquehanna #1 500 kV Line	
Project description	Confidential Information	
Point A	Jack's Mountain Station	
Point B	Susquehanna Substation	
Point C	na	
	Normal ratings	Emergency ratings
Summer (MVA)	4512.000000	5433.000000
Winter (MVA)	6288.000000	7217.000000
Conductor size and type	3x1113ACSS	
Nominal voltage	AC	
Nominal voltage	500 KV	
Line construction type	Overhead	
General route description	The line is presumed to follow the existing Keystone - Juniata 500 kV path from the Jacks Mountain Station to the east. Then we expect the line to turn North presumably following the Juniata - Sunbury 500 kV corridor. A diagonal northeastern route will need to be determined to its final termination at Susquehanna Substation	

Terrain description	This path is hundreds of miles long and will traverse multiple different types of terrain. The most challenging will be the multiple ridges of the Appalachian Mountains that will need to be traverse. At the base of each mountain is typically a moving body of water. Most notably there will be crossings of the branches and tributaries of the Susquehanna and Juniata rivers.
Right-of-way width by segment	170 feet
Electrical transmission infrastructure crossings	TBD
Civil infrastructure/major waterway facility crossing plan	TBD
Environmental impacts	TBD
Tower characteristics	Single circuit steel monopoles with a double circuit configuration
Construction responsibility	Confidential Information
Benefits/Comments	Confidential Information
Component Cost Details - In Current Year \$	
Engineering & design	Confidential Information
Permitting / routing / siting	Confidential Information
ROW / land acquisition	Confidential Information
Materials & equipment	Confidential Information
Construction & commissioning	Confidential Information
Construction management	Confidential Information
Overheads & miscellaneous costs	Confidential Information
Contingency	Confidential Information
Total component cost	\$586,547,955.00
Component cost (in-service year)	\$653,457,962.00
Greenfield Transmission Line Component	

Component title	Jacks Mountain - Susquehanna #2 500 kV Line	
Project description	Confidential Information	
Point A	Jack's Mountain Station	
Point B	Susquehanna Substation	
Point C		
	Normal ratings	Emergency ratings
Summer (MVA)	4512.000000	5433.000000
Winter (MVA)	6288.000000	7217.000000
Conductor size and type	3x1113 ACSS	
Nominal voltage	AC	
Nominal voltage	500	
Line construction type	Overhead	
General route description	The line is presumed to follow the existing Keystone - Juniata 500 kV path from the Jacks Mountain Station to the east. Then we expect the line to turn North presumably following the Juniata - Sunbury 500 kV corridor. A diagonal northeastern route will need to be determined to its final termination at Susquehanna Substation	
Terrain description	This path is hundreds of miles long and will traverse multiple different types of terrain. The most challenging will be the multiple ridges of the Appalachian Mountains that will need to be traverse. At the base of each mountain is typically a moving body of water. Most notably there will be crossings of the branches and tributaries of the Susquehanna and Juniata rivers.	
Right-of-way width by segment	170 feet	
Electrical transmission infrastructure crossings	TBD	
Civil infrastructure/major waterway facility crossing plan	TBD	
Environmental impacts	TBD	
Tower characteristics	Single circuit steel monopoles with a delta configuration	

Construction responsibility	Confidential Information
Benefits/Comments	Confidential Information
Component Cost Details - In Current Year \$	
Engineering & design	Confidential Information
Permitting / routing / siting	Confidential Information
ROW / land acquisition	Confidential Information
Materials & equipment	Confidential Information
Construction & commissioning	Confidential Information
Construction management	Confidential Information
Overheads & miscellaneous costs	Confidential Information
Contingency	Confidential Information
Total component cost	\$586,547,956.00
Component cost (in-service year)	\$653,457,962.00

Congestion Drivers

None

Existing Flowgates

None

New Flowgates

Confidential Information

Financial Information

Capital spend start date	03/2026
Construction start date	06/2028
Project Duration (In Months)	51

Cost Containment Commitment

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

Components covered by cost containment

1. Keystone - Jack's Mountain 500 kV Line #1: Construct new Line - MAIT
2. Keystone - Jack's Mountain 500 kV Line #2: Construct new Line - MAIT
3. Jack's Mountain Station: Create a new 500 kV five breaker ring bus and install a 500 Mvar STATCOM - MAIT
4. Jacks Mountain - Susquehanna #1 500 kV Line - MAIT
5. Jacks Mountain - Susquehanna #2 500 kV Line - MAIT

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	No

AFUDC

No

Escalation

No

Additional Information

Confidential Information

Is the proposer offering a binding cap on ROE?

No

Is the proposer offering a Debt to Equity Ratio cap?

Confidential Information

Additional Comments

Ready for submission. Contact us with any questions.