Tycho Substation and 345kV line

General Information

Proposing entity name	Company specific info not to be shared for public view.
Does the entity who is submitting this proposal intend to be the Designated Entity for this proposed project?	Company specific info not to be shared for public view.
Company proposal ID	Company specific info not to be shared for public view.
PJM Proposal ID	993
Project title	Tycho Substation and 345kV line
Project description	This proposal includes the construction of a greenfield 765/345kV substation, a new 345kV double circuit line using existing ROW, and various incumbent upgrades.
Email	Company specific info not to be shared for public view.
Project in-service date	12/2029
Tie-line impact	No
Interregional project	No
Is the proposer offering a binding cap on capital costs?	Yes
Additional benefits	Company specific info not to be shared for public view.
Project Components	
1. Tycho Substation	
2. Tycho 765kV cut-ins	
3. Tycho 345kV greenfield line	

- 4. Jacksons Ferry Station upgrade
- 5. Wyoming Station upgrade

6. Matt Funk Station Upgrade7. Kanawha River Station upgrade8. Matt Funk - Cloverdale span upgrade				
Greenfield Substation Component				
Component title	Tycho Substation			
Project description	Company specific info not to be	e shared for public	c view.	
Substation name	Tycho Substation			
Substation description	Construct a 765/345KV greenfi (three (3) circuit breakers insta and the existing 765kV Jackson bank (3-750MVA single-phase circuit breakers installed initially the existing 345kV Matt Funk li	ield substation wit lled initially) that v ns Ferry line. The units); and a four y) that will interco ne.	h a four (4) circu vill interconnect t station will a 765 (4) circuit breake nnect the existing	it breaker 765kV ring bus design he existing 765kV Wyoming line 5/345KV, 2250MVA transformer er 345kV ring bus design (three (3) g 345kV Kanawha River line and
Nominal voltage	AC			
Nominal voltage	765/345			
Transformer Information				
	Name		Capacity (MVA)
Transformer	Transformer bank 1		2250	
	High Side	Low Side		Tertiary
Voltage (kV)	765	345		34.5

Major equipment description	Major equipment for Tycho will consist of: 3-765kV, 4000A, 50kA circuit breakers; 27-765kV, 4000A single-phase disc. switches; 3-sets of 3-765kV CCVTs; 6-765kV, 4000A line traps; 6-line tuners; 4-sets of 3-765kV arresters; 3-765/345kV, 750MVA single-phase transformers with arresters; 3-345kV, 5000A, 63kA circuit breakers; 8-345kV, 4000A group-operated disc. switches; 3-345kV, 5000A single-phase disc. switches; 3-sets of 3-345kV line CCVTs; 6-345kV, 3000A line traps; 6-line tuners; 3-sets of 3-345kV arresters; AC power system; dual 125VDC batteries & chargers and associated DC power system; and associated bus jumpers, bus tubing & dampening cable, strain bus, insulators, steel structures, foundations, yard lighting, control cables, conduits, cable trench, ground grid, and equipment/fence grounding. The proposed costs include protective relay equipment in a new 16ft x 60ft control house.	
	Normal ratings	Emergency ratings
Summer (MVA)	1200.000000	1379.000000
Winter (MVA)	1200.000000	1379.000000
Environmental assessment	Land use for the new Tycho substation is rural ro Walkers Creek Road, Bland County, Virginia. Th FEMA-mapped floodplains and/or floodways, and streams and low-lying areas. Based on existing a substation route will not have an unmapped weth construction will be executed in accordance with Desktop studies and record reviews for the static streams, hazardous materials, and cultural resour and provided to engineering so that pole location sensitive resources. For example, poles will be p floodplains to the greatest extent possible. Existi locations. If necessary, temporary access roads surveyed for environmental and cultural resources impacts.	Illing lightly forested landscape in the vicinity off e substation will lie adjacent and outside d NWI-mapped wetlands primarily adjacent to aerial photography, the proposed greenfield Tycho and or drainage features. The timing of state and federal agencies' criteria as needed. on and line route will be conducted for wetlands and trces. Following field studies, data will be digitized is and the station is sited to maximize avoidance of laced outside of or span wetlands, streams, and ing access and roads will be identified and field as and will be adjusted to avoid or minimize
Outreach plan	Public outreach is a critical component to the Proposing Entity's siting process, so efforts will include properly informing the public; federal, state, and local agencies; local governments; and other key stakeholders on the need for, and benefits of, this Project. The Proposing Entity's approach to public outreach is to be always candid and transparent, and to offer a variety of tools and means for directly impacted parties to engage with our staff. The Proposing Entity will provide development updates to local government officials, key stakeholders, and impacted parties as the Project progresses. Public outreach also will involve collecting information about landowner properties and communicating with directly affected landowners during the final siting process.	

Land acquisition plan	The proposed Tycho Substation will be 65 acre forested landscape in rural Bland County, Virgi and will be established on a property roughly lo	s in size and located on undeveloped rolling lightly nia. The proposed station will be purchased in fee cated at GPS coordinates (37.115761, -81.016919).
Construction responsibility	Company specific info not to be shared for pub	lic view.
Benefits/Comments	Company specific info not to be shared for pub	lic view.
Component Cost Details - In Current Year \$		
Engineering & design	Company specific info not to be shared for pub	lic view.
Permitting / routing / siting	Company specific info not to be shared for pub	lic view.
ROW / land acquisition	Company specific info not to be shared for pub	lic view.
Materials & equipment	Company specific info not to be shared for pub	lic view.
Construction & commissioning	Company specific info not to be shared for pub	lic view.
Construction management	Company specific info not to be shared for pub	lic view.
Overheads & miscellaneous costs	Company specific info not to be shared for pub	lic view.
Contingency	Company specific info not to be shared for pub	lic view.
Total component cost	\$126,214,351.00	
Component cost (in-service year)	\$142,055,364.00	
Greenfield Transmission Line Component		
Component title	Tycho 765kV cut-ins	
Project description	Company specific info not to be shared for pub	lic view.
Point A	Jacksons Ferry	
Point B	Wyoming	
Point C		
	Normal ratings	Emergency ratings

Normal ratings

Emergency ratings

Summer (MVA)	5300.000000	5300.000000
Winter (MVA)	5300.000000	5300.000000
Conductor size and type	6-bundle 795 ACSR Tern	
Nominal voltage	AC	
Nominal voltage	765	
Line construction type	Overhead	
General route description	Each 765kVV cut-in will be approximately 0.75 r County, Virginia. The cut-ins will extend southwe Jacksons Ferry – Wyoming 765kV Line.	niles from the proposed Tycho Substation in Bland est from the substation to tie in to the existing
Terrain description	The topography for the 765 kV tie-in is flat and r County, Virginia. The line crosses low density de	ural rolling lightly forested landscape land in Bland eveloped areas.
Right-of-way width by segment	The 765 kV tie-in ROW will be 150 feet in width include interstates, roads, railroad, existing trans minimizes potential impacts to the natural and h	and will parallel/cross existing rights-of-way to smission lines/utilities, existing pipelines and best uman environments.
Electrical transmission infrastructure crossings	The tie-ins will not impact electrical transmission	infrastructure crossings.
Civil infrastructure/major waterway facility crossing plan	The tie-ins will not impact civil infrastructure or n	najor waterways.
Environmental impacts	The tie-ins lines have undergone a robust siting	analysis.
Tower characteristics	This 765kV line utilize self-supporting galvanized horizontally configured. All structures will utilize	d steel lattice towers. All 765kV construction will be pyramid grillages to support foundation loads.
Construction responsibility	Company specific info not to be shared for public	c view.
Benefits/Comments	Company specific info not to be shared for public	c view.
Component Cost Details - In Current Year \$		
Engineering & design	Company specific info not to be shared for public	c view.
Permitting / routing / siting	Company specific info not to be shared for public	c view.
ROW / land acquisition	Company specific info not to be shared for public	c view.

Materials & equipment	Company specific info not to be shared for public view.	
Construction & commissioning	Company specific info not to be shared for public view.	
Construction management	Company specific info not to be shared for public view.	
Overheads & miscellaneous costs	Company specific info not to be shared for public view.	
Contingency	Company specific info not to be shared for public view.	
Total component cost	\$8,000,000.00	
Component cost (in-service year)	\$9,004,070.00	
Greenfield Transmission Line Component		
Component title	Tycho 345kV greenfield line	
Project description	Company specific info not to be shared for public view.	
Point A	Tycho Substation	
Point B	Kanawha River Substation	
Point C	Matt Funk Substation	
	Normal ratings	Emergency ratings
Summer (MVA)	1178.000000	1178.000000
Winter (MVA)	1495.000000	1495.000000
Conductor size and type	2-bundle 954 kcmil ACSR Cardinal	
Nominal voltage	AC	
Nominal voltage	345	
Line construction type	Overhead	

General route description	The Proposing Entity assessed environmental and land use constraints and opportunities within an area that included the Tycho – Matt Funk and Kanawha River line as the two endpoints. The evaluation resulted in the Bid Route of approximately 22 miles of greenfield line through three counties: Giles & Bland, Virginia and Mercer County, West Virginia. The 345kV line exits the existing Matt Funk and Kanawha River line from the south, then travels in a predominantly southwestern direction until it reaches the greenfield Tycho substation from the south. No habitable structures are present within the proposed ROW. Additionally, a significant portion (76%) of the proposed transmission line will utilize the existing ROW currently occupied by the Progress Park – Glen Lyn 138kV single-circuit line. Overall, the Route selected is the most direct route between the existing line and proposed substation and has the least overall impact on land use and environmental resources based on the Proposing Entity's qualitative review. The Route significantly reduces the number of new access roads, reducing overall constructability impacts.
Terrain description	The topography along the Tycho – Matt Funk/Kanawha River 345kV line is relatively mountainous. Land use in the area encompasses mostly forested and agricultural, with few residential parcels in rural Virginia and West Virginia. The line crosses low density developed areas, a significant amount of highly vegetated (wooded) rural land, state/county highways, railroad, streams, and existing utilities.
Right-of-way width by segment	The Tycho – Matt Funk/Kanawha River 345kV route ROW will be 150 feet in width and will utilize the existing 100' ROW currently occupied by the Progress Park – Glen Lyn 138kV single-circuit line. The route will parallel/cross existing rights-of-way to include interstates, roads, railroads, existing transmission lines/utilities, existing pipelines and best minimizes potential impacts to the natural and human environments.
Electrical transmission infrastructure crossings	Lat: 37°21'41.31"N, Lon: 80°51'22.39"W, Lat: 37°21'45.93"N, Lon: 80°51'18.92"W, Lat: 37°22'11.96"N, Lon: 80°50'49.88"W
Civil infrastructure/major waterway facility crossing plan	The greenfield Tycho – Matt Funk/Kanawha River 345kV route crosses one railroad, one water crossing facility, and several underground pipelines. The most notable water crossing is the New River located at Lat: 37°23'16.05"N, Lon: 80°50'11.07"W. The Norfolk Southern railroad crossing is located at Lat: 37°23'02.68"N, Lon: 80°50'08.21"W. The transmission line crosses several pipelines.

Environmental impacts	Land use along the Bid Route corridor is predominantly highly vegetated (wooded) rural land and rural agricultural landscape with pockets of residential development. The route intersects FEMA-mapped floodplains and/or floodways, and NWI-mapped wetlands primarily adjacent to streams and low-lying areas. The route also crosses named and unnamed streams also bisect the route in various locations. Based on existing aerial photography, the proposed route likely has unmapped wetland or drainage features. The timing of construction will be executed in accordance with state and federal agency criteria as needed. Desktop studies and record reviews for the station parcel and line route will be conducted for wetlands and streams, hazardous materials, and cultural resources. Following field studies, data will be digitized and provided to engineering so that pole locations and the station is sited to maximize avoidance of sensitive resources. For example, poles will be placed outside of or span wetlands, streams, and floodplains to the greatest extent possible. Existing access and roads will be utilized to access pole locations. If necessary, temporary access roads to pole locations will be identified and field surveyed for environmental and cultural resources and will be adjusted to avoid or minimize impacts.
Tower characteristics	The proposed 345kV greenfield line utilizes a combination of self-supporting steel lattice towers, in a vertical double circuit configuration. The towers will utilize pyramid grillage foundations.
Construction responsibility	Company specific info not to be shared for public view.
Benefits/Comments	Company specific info not to be shared for public view.
Component Cost Details - In Current Year \$	
Engineering & design	Company specific info not to be shared for public view.
Permitting / routing / siting	Company specific info not to be shared for public view.
ROW / land acquisition	Company specific info not to be shared for public view.
Materials & equipment	Company specific info not to be shared for public view.
Construction & commissioning	Company specific info not to be shared for public view.
Construction management	Company specific info not to be shared for public view.
Overheads & miscellaneous costs	Company specific info not to be shared for public view.
Contingency	Company specific info not to be shared for public view.
Total component cost	\$104,610,231.00
Component cost (in-service year)	\$117,739,737.00

Substation Upgrade Component

Component title	Jacksons Ferry Station upgrade
Project description	Company specific info not to be shared for public view.
Substation name	Jacksons Ferry Substation
Substation zone	APCo (AEP)
Substation upgrade scope	The component captures to cost to install new relays and perform relays settings work at Jacksons Ferry Substation for the addition of Tycho Substation.
Transformer Information	
None	
New equipment description	New primary and back-up line relays at Jacksons Ferry Substation.
Substation assumptions	The DC system is sized to accommodate this relay replacement project. The new relays will be installed inside the existing control house.
Real-estate description	No new real estate will be required at Jacksons Ferry Substation.
Construction responsibility	Company specific info not to be shared for public view.
Benefits/Comments	Company specific info not to be shared for public view.
Component Cost Details - In Current Year \$	
Engineering & design	Company specific info not to be shared for public view.
Permitting / routing / siting	Company specific info not to be shared for public view.
ROW / land acquisition	Company specific info not to be shared for public view.
Materials & equipment	Company specific info not to be shared for public view.
Construction & commissioning	Company specific info not to be shared for public view.
Construction management	Company specific info not to be shared for public view.
Overheads & miscellaneous costs	Company specific info not to be shared for public view.

Contingency	Company specific info not to be shared for public view.
Total component cost	\$100,000.00
Component cost (in-service year)	\$112,551.00
Substation Upgrade Component	
Component title	Wyoming Station upgrade
Project description	Company specific info not to be shared for public view.
Substation name	Wyoming
Substation zone	APCo (AEP)
Substation upgrade scope	The component captures to cost to install new relays and perform relays settings work at Wyoming Substation for the addition of Tycho Substation.
Transformer Information	
None	
New equipment description	New primary and back-up line relays at Wyoming Substation.
Substation assumptions	The DC system is sized to accommodate this relay replacement project. The new relays will be installed inside the existing control house.
Real-estate description	No new real estate will be required at Wyoming Substation.
Construction responsibility	Company specific info not to be shared for public view.
Benefits/Comments	Company specific info not to be shared for public view.
Component Cost Details - In Current Year \$	
Engineering & design	Company specific info not to be shared for public view.
Permitting / routing / siting	Company specific info not to be shared for public view.
ROW / land acquisition	Company specific info not to be shared for public view.
Materials & equipment	Company specific info not to be shared for public view.

Construction & commissioning	Company specific info not to be shared for public view.
Construction management	Company specific info not to be shared for public view.
Overheads & miscellaneous costs	Company specific info not to be shared for public view.
Contingency	Company specific info not to be shared for public view.
Total component cost	\$100,000.00
Component cost (in-service year)	\$112,551.00
Substation Upgrade Component	
Component title	Matt Funk Station Upgrade
Project description	Company specific info not to be shared for public view.
Substation name	Matt Funk Substation
Substation zone	APCo (AEP)
Substation upgrade scope	The component captures to cost to install new relays and perform relays settings work at Matt Funk Substation for the addition of Tycho Substation.
Transformer Information	
None	
New equipment description	New primary and back-up line relays at Matt Funk Substation.
Substation assumptions	The DC system is sized to accommodate this relay replacement project. The new relays will be installed inside the existing control house.
Real-estate description	No new real estate will be required at Matt Funk Substation.
Construction responsibility	Company specific info not to be shared for public view.
Benefits/Comments	Company specific info not to be shared for public view.
Component Cost Details - In Current Year \$	
Engineering & design	Company specific info not to be shared for public view.

Permitting / routing / siting	Company specific info not to be shared for public view.
ROW / land acquisition	Company specific info not to be shared for public view.
Materials & equipment	Company specific info not to be shared for public view.
Construction & commissioning	Company specific info not to be shared for public view.
Construction management	Company specific info not to be shared for public view.
Overheads & miscellaneous costs	Company specific info not to be shared for public view.
Contingency	Company specific info not to be shared for public view.
Total component cost	\$100,000.00
Component cost (in-service year)	\$112,551.00
Substation Upgrade Component	
Component title	Kanawha River Station upgrade
Project description	Company specific info not to be shared for public view.
Substation name	Kanawha River Substation
Substation zone	APCo (AEP)
Substation upgrade scope	The component captures to cost to install new relays and perform relays settings work at Kanawha River Substation for the addition of Tycho Substation.
Transformer Information	
None	
New equipment description	New primary and back-up line relays at Kanawha River Substation.
Substation assumptions	The DC system is sized to accommodate this relay replacement project. The new relays will be installed inside the existing control house.
Real-estate description	No new real estate will be required at Kanawha River Substation.
Construction responsibility	Company specific info not to be shared for public view.

2025-ME1-993

Benefits/Comments

Component Cost Details - In Current Year \$	
Engineering & design	Company specific info not to be shared for public view.
Permitting / routing / siting	Company specific info not to be shared for public view.
ROW / land acquisition	Company specific info not to be shared for public view.
Materials & equipment	Company specific info not to be shared for public view.
Construction & commissioning	Company specific info not to be shared for public view.
Construction management	Company specific info not to be shared for public view.
Overheads & miscellaneous costs	Company specific info not to be shared for public view.
Contingency	Company specific info not to be shared for public view.
Total component cost	\$100,000.00
Component cost (in-service year)	\$112,551.00
Transmission Line Upgrade Component	
Component title	Matt Funk - Cloverdale span upgrade
Project description	Company specific info not to be shared for public view.
Impacted transmission line	Matt Funk - Cloverdale 345kV line
Point A	Matt Funk
Point B	Cloverdale
Point C	
Terrain description	The topography for the 345 kV re-conductor/rebuild is located along a gently rolling forested ridge in Giles County, Virginia. The line is in existing ROW.

Company specific info not to be shared for public view.

Existing Line Physical Characteristics

Operating voltage	345			
Conductor size and type	Single conductor 1414 ACSR/PE 62/19			
Hardware plan description	The existing conductor hardware is 1960s vintage and will be replaced for the span rebuild.			
Tower line characteristics	The existing towers are steel lattice towers and are planned to be used.			
Proposed Line Characteristics				
	Designed	Operating		
Voltage (kV)	345.000000	345.000000		
	Normal ratings	Emergency ratings		
Summer (MVA)	1161.000000	1367.000000		
Winter (MVA)	1474.000000	1628.000000		
Conductor size and type	2-bundle 954 kcmil ACSR Rail			
Shield wire size and type	NA - the existing shield wire to be used			
Rebuild line length	Single span ~1000 ft			
Rebuild portion description	The existing towers will be re-used with new conductor.			
Right of way	The existing ROW is expected to be sufficient for the re-conductor/rebuild. If additional ROW is deemed necessary, funds accounted for in Permitting / siting / routing and Contingency will be utilized.			
Construction responsibility	Company specific info not to be shared for public view.			
Benefits/Comments	Company specific info not to be shared for public view.			
Component Cost Details - In Current Year \$				
Engineering & design	Company specific info not to be shared for public	c view.		
Permitting / routing / siting	Company specific info not to be shared for public view.			

2025-ME1-993

ROW / land acquisition	Company specific info not to be shared for public view.
Materials & equipment	Company specific info not to be shared for public view.
Construction & commissioning	Company specific info not to be shared for public view.
Construction management	Company specific info not to be shared for public view.
Overheads & miscellaneous costs	Company specific info not to be shared for public view.
Contingency	Company specific info not to be shared for public view.
Total component cost	\$744,436.24
Component cost (in-service year)	\$837,870.00
Congestion Drivers	

None

Existing Flowgates

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	СКТ	Voltage	TO Zone	Analysis type	Status
2025W1-ME1	290234	05MUSEVILLE	242802	05SMITHMTN	1	138	205	Market Efficiency	Included

New Flowgates

Company specific info not to be shared for public view.

Financial Information

Capital spend start date	12/2025
Construction start date	12/2028
Project Duration (In Months)	48

Cost Containment Commitment

Cost cap (in current year)	Company specific info not to be shared for public view.
Cost cap (in-service year)	Company specific info not to be shared for public view.
Components covered by cost containment	
 Tycho Substation - Transource Tycho 345kV greenfield line - Transource 	
Cost elements covered by cost containment	
Engineering & design	Yes
Permitting / routing / siting	No
ROW / land acquisition	No
Materials & equipment	No
Construction & commissioning	No
Construction management	No
Overheads & miscellaneous costs	No
Taxes	No
AFUDC	No
Escalation	No
Additional Information	Company specific info not to be shared for public view.
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?

Additional Comments

Proposal completed with all available fields checked in redacated view. Thank you.