Maliszewski 765/345 kV Upgrades

General Information

Proposing entity name	AEPSCT
Does the entity who is submitting this proposal intend to be the Designated Entity for this proposed project?	Yes
Company proposal ID	AEP_O
PJM Proposal ID	408
Project title	Maliszewski 765/345 kV Upgrades
Project description	Project proposes to establish a 345 kV yard at the existing Maliszewski station and upgrade the 765 kV portion of the station to accommodate and install a 765/345 kV transformer. Line work will be performed to cut the existing Hyatt - West Millersport 345 kV that already crosses physically through the station into the new 345 kV yard. Addition upgrades will be made to facilities in the area to support the proposal.
Email	wrburkett@aep.com
Project in-service date	12/2028
Tie-line impact	No
Interregional project	No
Is the proposer offering a binding cap on capital costs?	No
Additional benefits	In addition to addressing the flowgates identified in the current window as noted as part of the proposal, the project will also significantly reduce loading on the existing 765 kV transformers in the Columbus network, which are starting to approach their rated thermal capacities under certain scenarios. Project proposes ~$38.4M of upgrades to address the 345 kV lines between Bokes Creek, Marysille, and Hyatt that are already highly loaded under various scenarios in the RTEP basecases (some at or above 99%) and become overloaded with the proposed solution. Upgrading these lines now provides additional capacity headroom on the 345 kV network around Columbus instead of leaving facilities highly loaded. Project would offset need for $6.9M of work proposed at Maliszewski under AEP's non-competitive "Maliszewski and Marysville 765 kV Upgrades" proposal.

Project Components

1. Maliszewski 765/345 kV Work
2. Hyatt - West Millersport 345 kV Cut In at Maliszewski
3. Hyatt - West Millersport 345 kV Cut In at Corridor
4. Corridor 345 kV Station Work
5. West Millersport 345 kV Relaying Upgrades
6. Maliszewski - Corridor 345 kV Reconductor
7. Bokes Creek - Marysville Reconductoring
8. Marysville - Hyatt 345 kV Rebuild
9. Hyatt 345 kV Station Work
10. Marysville 345 kV Station Work

Substation Upgrade Component

Component title	Maliszewski 765/345 kV Work
Project description	Reconfigure Maliszewski 765 kV station from 2-4000A breakers to a 6-5000A breaker ring bus ensuring that breaker failure will not take out both 765 kV lines or take out either transformer plus the Vassell 765 kV line. Install new 2250 MVA 765/345 kV transformer. Establish new 345 kV breaker yard with 3 string breaker and a half to include a line exit to Hyatt and a line exit to Corridor.
Substation name	Maliszewski
Substation zone	205
Substation upgrade scope	Reconfigure Maliszewski 765 kV station from 2-4000A breakers to a 6-5000A breaker ring bus ensuring that breaker failure will not take out both 765 kV lines or take out either transformer and the Vassell 765 kV line. Install new 2250 MVA 765/345 kV transformer. Establish new 345 kV breaker yard in a breaker and a half layout to include a line exit to Hyatt and a line exit to Corridor.

Transformer Information

	Name	Capacity (MVA)
Transformer	TR 2	2742/3097/3190/3097/3372/3709

	High Side	Low Side	Tertiary
Voltage (kV)	765	345	34.5
New equipment description	o Install 765/345 kV transformer (2250 MVA nameplate) with foundation. (Include 345kv transformer mounted arrester) 2742/3097/3190/3097/3372/3709 MVA o Install (6) 5000A breakers (3 poles, control mech) 765 kV, 63 kA breakers 6903/6903/7111/8556/8556/8813 MVA o Install (5) 345kv 5000A 63 kA breakers along with foundations and cable/conduit assemblies 3113/3113/3207/3858/3858/3974 MVA		
Substation assumptions	Existing breaker foundations will need to be removed. Existing cables will be abandoned in place (~23 year old cables), new cables pulled for new breaker. Existing cable trench and/or control house entrance fill not an issue. Assume existing breaker pier foundations will be removed completely as foundation design for 5000A breaker is not known, but will be estimated based similar foundation for 4000A breaker. All digging by hand. Assume trap structures, foundations, and jumpers will need to be replaced due to unknown size of larger traps. Assume existing breaker disconnect switch structures, foundations, and jumpers will need removed and replaced due to unknown size of larger switches. Assume grounding study will need run for addition of transformer #2. Assume all structures added to include structure grounds. Assume existing 765kv transformer secondary storage tank able to tie in new units. Assume jumpers will need to be configured to install spare transformer when needed.		
Real-estate description	No new real estate is required for the work. All work will be completed on land already owned by AEP at the existing station.		
Construction responsibility	AEP		
Benefits/Comments	All work to be performed at existing 765/138 kV station. The project will lay the station out to be able to accommodate a second 765/345 kV transformer and additional 345 kV lines that are nearby without the need for a station expansion or additional ROW/land purchases. Work would offset need for $6.9M of work proposed at Maliszewski under AEP's non-competitive "Maliszewski and Marysville 765 kV Upgrades" proposal.		
Component Cost Details - In Current Year $			
Engineering & design	Detailed cost breakdown		
Permitting / routing / siting	Detailed cost breakdown		
ROW / land acquisition	Detailed cost breakdown		
Materials & equipment	Detailed cost breakdown		

Construction & commissioning	Detailed cost breakdown
Construction management	Detailed cost breakdown
Overheads & miscellaneous costs	Detailed cost breakdown
Contingency	Detailed cost breakdown
Total component cost	$79,735,552.12
Component cost (in-service year)	$79,735,552.12

Transmission Line Upgrade Component

Component title	Hyatt - West Millersport 345 kV Cut In at Maliszewski
Project description	The existing Hyatt - West Millersport 345 kV line, which currently runs through Maliszewski station, will be cut in and out of the new established 345 kV yard at the station.
Impacted transmission line	Hyatt - West Millersport 345 kV
Point A	Hyatt
Point B	West Millersport
Point C	
Terrain description	The area is mostly Industrial and flat. All of the line work will be performed inside the existing Maliszewski station.
Existing Line Physical Characteristics	
Operating voltage	345
Conductor size and type	1414 ACSR/PE 62/19
Hardware plan description	N/A. Existing line will remain in place.
Tower line characteristics	The existing line utilizing steel lattice structures primarily installed in 1955.
Proposed Line Characteristics	

	Designed	Operating

Voltage (kV)	345.000000	345.000000
	Normal ratings	Emergency ratings
Summer (MVA)	1402.000000	1947.000000
Winter (MVA)	1772.000000	2185.000000
Conductor size and type	2-954 ACSR Cardinal 54/7	
Shield wire size and type	Existing shield wire will be used	
Rebuild line length	0.1 (Single spans in station)	
Rebuild portion description	The existing Hyatt - West Millersport 345 kV line currently runs through Maliszewski station. The proposed project will cut the line in and out of the new established 345 kV yard at the station.	
Right of way	N/A. All work to be performed is within Maliszewski station.	
Construction responsibility	AEP	
Benefits/Comments	Since all of the work is being completed within Maliszewski station the costs are actually captured on the Maliszewski 765/345 component. This aspect of the component was separated out to help try and provide clarity of the work being completed.	
Component Cost Details - In Current Year $		
Engineering & design	Detailed cost breakdown	
Permitting / routing / siting	Detailed cost breakdown	
ROW / land acquisition	Detailed cost breakdown	
Materials & equipment	Detailed cost breakdown	
Construction & commissioning	Detailed cost breakdown	
Construction management	Detailed cost breakdown	
Overheads & miscellaneous costs	Detailed cost breakdown	
Contingency	Detailed cost breakdown	

Total component cost	$.00
Component cost (in-service year)	$.00

Greenfield Transmission Line Component

Component title	Hyatt - West Millersport 345 kV Cut In at Corridor
Project description	Project will establish a 0.18 mile double circuit 345 kV line extension to cut the existing Hyatt - West Millersport 345 kV line in and out of Corridor station.
Point A	Hyatt
Point B	Corridor
Point C	West Millersport

	Normal ratings	Emergency ratings
Summer (MVA)	1402.000000	1947.000000
Winter (MVA)	1772.000000	2185.000000

Conductor size and type	2-954 ACSR 54/7 Cardinal
Nominal voltage	AC
Nominal voltage	345
Line construction type	Overhead
General route description	The new line will be built on land already owned by AEP around Corridor station.
Terrain description	Flat. The new line will be built on land already owned by AEP.
Right-of-way width by segment	ROW will be 150 feet on land already owned by AEP.
Electrical transmission infrastructure crossings	N/A
Civil infrastructure/major waterway facility crossing plan	N/A
Environmental impacts	N/A

Tower characteristics	The line construction will involve the installation of two new 345 kV steel monopole double circuit towers.
Construction responsibility	AEP
Benefits/Comments	
Component Cost Details - In Current Year $	
Engineering & design	Detailed cost breakdown
Permitting / routing / siting	Detailed cost breakdown
ROW / land acquisition	Detailed cost breakdown
Materials & equipment	Detailed cost breakdown
Construction & commissioning	Detailed cost breakdown
Construction management	Detailed cost breakdown
Overheads & miscellaneous costs	Detailed cost breakdown
Contingency	Detailed cost breakdown
Total component cost	$3,101,223.16
Component cost (in-service year)	$3,101,223.16

Substation Upgrade Component

Component title	Corridor 345 kV Station Work
Project description	Install three new 345 kV breakers at Corridor station in order to accommodate the cut in of the Hyatt - West Millersport 345 kV line.
Substation name	Corridor
Substation zone	205
Substation upgrade scope	Install three new 345 kV breakers at Corridor station in order to accommodate the cut in of the Hyatt - West Millersport 345 kV line.

Transformer Information

None

New equipment description	Install (3) 345kv 5000A breakers along with foundations and cable/conduit assemblies approx. 700ft of cable per breaker (note: ~360ft of cable trench lids will need removed for cable installation) 3113/3113/3207/3858/3858/3974 MVA
Substation assumptions	N/A
Real-estate description	N/A. All work to be performed within the existing Corridor station.
Construction responsibility	AEP
Benefits/Comments	

Component Cost Details - In Current Year $

Engineering & design	Detailed cost breakdown
Permitting / routing / siting	Detailed cost breakdown
ROW / land acquisition	Detailed cost breakdown
Materials & equipment	Detailed cost breakdown
Construction & commissioning	Detailed cost breakdown
Construction management	Detailed cost breakdown
Overheads & miscellaneous costs	Detailed cost breakdown
Contingency	Detailed cost breakdown
Total component cost	$5,520,500.00
Component cost (in-service year)	$5,520,500.00

Substation Upgrade Component

Component title	West Millersport 345 kV Relaying Upgrades

Project description	Relaying and associated equipment will be upgraded at West Millersport station to coordinate with the cut in work to Corridor station.
Substation name	West Millersport
Substation zone	205
Substation upgrade scope	Relaying and associated equipment will be upgraded at West Millersport station to coordinate with the cut in work to Corridor station.

Transformer Information

None

New equipment description	Relaying and associated equipment will be upgraded at West Millersport station to coordinate with the cut in work to Corridor station.
Substation assumptions	N/A
Real-estate description	N/A. All work in the existing staiton
Construction responsibility	AEP
Benefits/Comments	
Component Cost Details - In Current Year $	
Engineering & design	Detailed cost breakdown
Permitting / routing / siting	Detailed cost breakdown
ROW / land acquisition	Detailed cost breakdown
Materials & equipment	Detailed cost breakdown
Construction & commissioning	Detailed cost breakdown
Construction management	Detailed cost breakdown
Overheads & miscellaneous costs	Detailed cost breakdown
Contingency	Detailed cost breakdown
Total component cost	$409,528.30

Component cost (in-service year)	$409,528.30

Transmission Line Upgrade Component

Component title	Maliszewski - Corridor 345 kV Reconductor
Project description	10.2-mile reconductor of Maliszewski-Corridor 345 kV using 2-954 ACSR Cardinal 54/7 to replace the existing 1414 ACSR/PE 62/19 & 2303.5 ACAR 54/37.
Impacted transmission line	Maliszewski - Corridor 345 kV (Hyatt - West Millersport 345 kV line)
Point A	Maliszewski
Point B	Corridor
Point C	
Terrain description	Suburban flat terrain.
Existing Line Physical Characteristics	
Operating voltage	345
Conductor size and type	1414 ACSR/PE 62/19 & 2303.5 ACAR 54/37
Hardware plan description	Hardware will be replaced to accommodate new bundled conductor.
Tower line characteristics	Structures are primarily steel lattice towers originally installed in 1955.
Proposed Line Characteristics	

	Designed	Operating
Voltage (kV)	345.000000	345.000000
	Normal ratings	Emergency ratings
Summer (MVA)	1478.000000	2056.000000
Winter (MVA)	1867.000000	2307.000000
Conductor size and type	2-954 ACSR 54/7 Cardinal	

Shield wire size and type	Shield wire will not be replaced
Rebuild line length	10.2 miles
Rebuild portion description	10.2-mile reconductor of Maliszewski-Corridor 345 kV using 2-954 ACSR Cardinal 54/7 to replace the existing 1414 ACSR/PE 62/19 & 2303.5 ACAR 54/37. There will be some dead end structures on the line that need replaced as part of the reconductor to support the larger conductor.
Right of way	Existing ROW to be predominately used with some supplementing in certain locations.
Construction responsibility	AEP
Benefits/Comments	Work will replace Paper Expanded (PE) type conductor that AEP has identified as a an asset renewal concern due to deterioration concerns discovered in the field.

Component Cost Details - In Current Year $

Engineering & design	Detailed cost breakdown
Permitting / routing / siting	Detailed cost breakdown
ROW / land acquisition	Detailed cost breakdown
Materials & equipment	Detailed cost breakdown
Construction & commissioning	Detailed cost breakdown
Construction management	Detailed cost breakdown
Overheads & miscellaneous costs	Detailed cost breakdown
Contingency	Detailed cost breakdown
Total component cost	$18,301,185.60
Component cost (in-service year)	$18,301,185.60

Transmission Line Upgrade Component

Component title	Bokes Creek - Marysville Reconductoring

Project description	Project proposes to reconductor 4.75-miles of the existing Bokes Creek-Marysville 345 kV circuit to replace 1-1275 ACSR/PE 54/19 & 1-2156 ACSR 84/19 Bluebird line conductor. Relay settings associated with the line settings will be updated as needed.
Impacted transmission line	Bokes Creek - Marysville 345 kV.
Point A	Bokes Creek
Point B	Marysville
Point C	
Terrain description	Rural flat terrain.
Existing Line Physical Characteristics	
Operating voltage	345
Conductor size and type	1-1275 ACSR/PE 54/19 & 1-2156 ACSR 84/19 Bluebird
Hardware plan description	Hardware will be replaced to accomodate new bundled conductor
Tower line characteristics	Structures are primarily steel lattice double circuit towers originally installed in 1955.

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	345.000000	345.000000
	Normal ratings	Emergency ratings
Summer (MVA)	1385.000000	1841.000000
Winter (MVA)	1750.000000	2155.000000

Conductor size and type	2-954 ACSR Cardinal (54/7)
Shield wire size and type	Existing shield wire will not be replaced.
Rebuild line length	4.75 miles

Rebuild portion description	Project proposes to reconductor 4.75-miles of the existing Bokes Creek-Marysville 345 kV circuit to replace 1-1275 ACSR/PE 54/19 & 1-2156 ACSR 84/19 Bluebird line conductor. Some Dead End structures will be replaced and modifications will be made to some Tangent structures to account for bundled conductor.
Right of way	No significant ROW anticipated. Existing ROW to be used and supplemented if/as needed.
Construction responsibility	AEP
Benefits/Comments	The Bokes Creek - Marysville 345 kV line is already heavily loaded in the 2029 RTEP basecases to close to 99%. The reconfigurations proposed as part of the project will slightly increase the loadings on the branch to just exceed 100%. This component will address that concern. Work will also replace Paper Expanded (PE) type conductor that AEP has identified as a an asset renewal concern due to deterioration concerns discovered in the field.
Component Cost Details - In Current Year $	
Engineering & design	Detailed cost breakdown
Permitting / routing / siting	Detailed cost breakdown
ROW / land acquisition	Detailed cost breakdown
Materials & equipment	Detailed cost breakdown
Construction & commissioning	Detailed cost breakdown
Construction management	Detailed cost breakdown
Overheads & miscellaneous costs	Detailed cost breakdown
Contingency	Detailed cost breakdown
Total component cost	$6,667,836.50
Component cost (in-service year)	$6,667,836.50

Transmission Line Upgrade Component

Component title	Marysville - Hyatt 345 kV Rebuild
Project description	Project proposes to rebuild 4.4-miles of the existing Marysville - Hyatt 345 kV double circuit line where it extends into Marysville station to replace the existing 2-954 ACSR Rail 45/7 line conductor.

Impacted transmission line	Marysville - Hyatt 345 kV
Point A	Marysville
Point B	Hyatt
Point C	
Terrain description	Rural flat terrain.
Existing Line Physical Characteristics	
Operating voltage	345
Conductor size and type	2-954 ACSR Rail 45/7
Hardware plan description	Line section will be rebuit using new hardware
Tower line characteristics	Existing towers are primarily 1974 vintage double circuit steel lattice construction.
Proposed Line Characteristics	

	Designed	Operating
Voltage (kV)	345.000000	345.000000
	Normal ratings	Emergency ratings
Summer (MVA)	2572.000000	3600.000000
Winter (MVA)	3249.000000	4041.000000

Conductor size and type	4-795 ACSR 26/7 Drake
Shield wire size and type	96 FIBER OPGW, DC Shield Wire
Rebuild line length	4.4 miles.
Rebuild portion description	Project proposes to rebuild 4.4-miles of the existing Marysville - Hyatt 345 kV double circuit line to replace the existing 2-954 ACSR Rail 45/7 line conductor. The new conductor will be a quad bundled 795 ACSR 26/7 Drake design.

Right of way	No significant ROW anticipated. Existing ROW to be used and supplemented if/as needed.
Construction responsibility	AEP
Benefits/Comments	The Marysville - Hyatt 345 kV line is already heavily loaded in the 2029 RTEP basecases to close to at least 94%. The reconfigurations proposed as part of the project will slightly increase the loadings on the branch to exceed 100%. This component along with the associated station components will address that concern. Line section is being rebuilt rather than reconductored in order to match conductor proposed as part of s3006 which will be rebuilding the remaining 19 miles of the circuit to address asset renewal concerns on that section of the line. Reconductoring options would have only been able to provide slight increases in the circuits capacity without requiring significant structure replacements.
Component Cost Details - In Current Year $	
Engineering & design	Detailed cost breakdown
Permitting / routing / siting	Detailed cost breakdown
ROW / land acquisition	Detailed cost breakdown
Materials & equipment	Detailed cost breakdown
Construction & commissioning	Detailed cost breakdown
Construction management	Detailed cost breakdown
Overheads & miscellaneous costs	Detailed cost breakdown
Contingency	Detailed cost breakdown
Total component cost	$26,256,437.38
Component cost (in-service year)	$26,256,437.38

Substation Upgrade Component

Component title	Hyatt 345 kV Station Work
Project description	Project will upgrade 345 kV breakers K & K1 along with associated switches and conductor to 5000A at Hyatt Station.
Substation name	Hyatt

Substation zone	205
Substation upgrade scope	Project will upgrade 345 kV breakers K & K1 along with associated switches and conductor to 5000A at Hyatt Station.

Transformer Information

None

New equipment description	o Install (2) 5000A breakers along with foundations. 3113/3113/3207/3858/3858/3974 MVA
Substation assumptions	Assume cables can be all/partially reused
Real-estate description	N/A. All work within existing station footprint
Construction responsibility	AEP
Benefits/Comments	The Marysville - Hyatt 345 kV line is already heavily loaded in the 2029 RTEP basecases to close to at least 94%. The reconfigurations proposed as part of the project will slightly increase the loadings on the branch to exceed 100%. This component along with the associated station and line components will address that concern.

Component Cost Details - In Current Year $

Engineering & design	Detailed cost breakdown
Permitting / routing / siting	Detailed cost breakdown
ROW / land acquisition	Detailed cost breakdown
Materials & equipment	Detailed cost breakdown
Construction & commissioning	Detailed cost breakdown
Construction management	Detailed cost breakdown
Overheads & miscellaneous costs	Detailed cost breakdown
Contingency	Detailed cost breakdown
Total component cost	$2,943,851.62
Component cost (in-service year)	$2,943,851.62

Substation Upgrade Component

Component title	Marysville 345 kV Station Work
Project description	Project will upgrade 3000A 345 kV breaker 'L2' along with associated terminal elements to 5000A at Marysville.
Substation name	Marysville
Substation zone	205
Substation upgrade scope	Project will upgrade 3000A 345 kV breaker 'L2' along with associated terminal elements to 5000A at Marysville.

Transformer Information

None

New equipment description	Install 345kv 5000A breaker along with foundations and ~650ft of control cable assembly. *Note: approximately 600ft of existing cable trench lids will need to be removed to install this new cable 3113/3113/3207/3858/3858/3974 MVA
Substation assumptions	N/A
Real-estate description	N/A. All work within existing station
Construction responsibility	AEP
Benefits/Comments	The Marysville - Hyatt 345 kV line is already heavily loaded in the 2029 RTEP basecases to close to at least 94%. The reconfigurations proposed as part of the project will slightly increase the loadings on the branch to exceed 100%. This component along with the associated station and line components will address that concern.

Component Cost Details - In Current Year $

Engineering & design	Detailed cost breakdown
Permitting / routing / siting	Detailed cost breakdown
ROW / land acquisition	Detailed cost breakdown
Materials & equipment	Detailed cost breakdown

Construction & commissioning	Detailed cost breakdown
Construction management	Detailed cost breakdown
Overheads & miscellaneous costs	Detailed cost breakdown
Contingency	Detailed cost breakdown
Total component cost	$2,557,850.62
Component cost (in-service year)	$2,557,850.62

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
2024W1-32GD-S30	242926	05MALIS	246751	05VASSEL	1	765	205	N/A	Excluded
2024W1-32GD-S29	242926	05MALIS	246751	05VASSEL	1	765	205	N/A	Excluded
2024W1-N11-ST39	243513	05GENOA	243590	05WESTAR	1	138	205	Summer N-1-1 Thermal	Included
2024W1-32GD-S28	242926	05MALIS	246751	05VASSEL	1	765	205	N/A	Excluded
2024W1-N11-ST16	243537	05MALIS	243538	05MALISX	ZB	138	205	Summer N-1-1 Thermal	Excluded
2024W1-N11-ST15	243537	05MALIS	243553	05POLARS	1	138	205	Summer N-1-1 Thermal	Included
2024W1-GD-S438	242926	05MALIS	246751	05VASSEL	1	765	205	Summer Gen Deliv	Excluded
2024W1-N11-ST33	243513	05GENOA	243590	05WESTAR	1	138	205	Summer N-1-1 Thermal	Included
2024W1-GD-S439	242926	05MALIS	246751	05VASSEL	1	765	205	Summer Gen Deliv	Excluded
2024W1-N11-ST21	243537	05MALIS	243553	05POLARS	1	138	205	Summer N-1-1 Thermal	Included
2024W1-GD-S395	242926	05MALIS	246751	05VASSEL	1	765	205	Summer Gen Deliv	Excluded
2024W1-N11-ST20	243537	05MALIS	243553	05POLARS	1	138	205	Summer N-1-1 Thermal	Included
2024W1-GD-S437	242926	05MALIS	246751	05VASSEL	1	765	205	Summer Gen Deliv	Excluded
2024W1-32GD-S31	242926	05MALIS	246751	05VASSEL	1	765	205	N/A	Excluded
2024W1-N11-ST4	243537	05MALIS	243538	05MALISX	ZB	138	205	Summer N-1-1 Thermal	Excluded

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2024W1-N11-ST3	243537	05MALIS	243538	05MALISX	ZB	138	205	Summer N-1-1 Thermal	Excluded
2024W1-N11-ST13	243537	05MALIS	243553	05POLARS	1	138	205	Summer N-1-1 Thermal	Included
2024W1-GD-S450	243538	05MALISX	243537	05MALIS	ZB	138	205	Summer Gen Deliv	Excluded
2024W1-GD-S92	243538	05MALISX	243537	05MALIS	ZB	138	205	Summer Gen Deliv	Excluded

New Flowgates

None

Financial Information

Capital spend start date	01/2025
Construction start date	08/2027
Project Duration (In Months)	47

Additional Comments

None