

Subregional RTEP Committee - Western FirstEnergy Supplemental Projects

January 19, 2024

Needs

Stakeholders must submit any comments within 10 days of this meeting in order to provide time necessary to consider these comments prior to the next phase of the M-3 process

Need Numbers: APS-2024-008 to APS-2024-018

Process Stage: Need Meeting 01/19/2024

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Projects Global Factors

- System reliability and performance
- Substation/line equipment limits

System Condition Projects

- Substation Condition Rebuild/Replacement

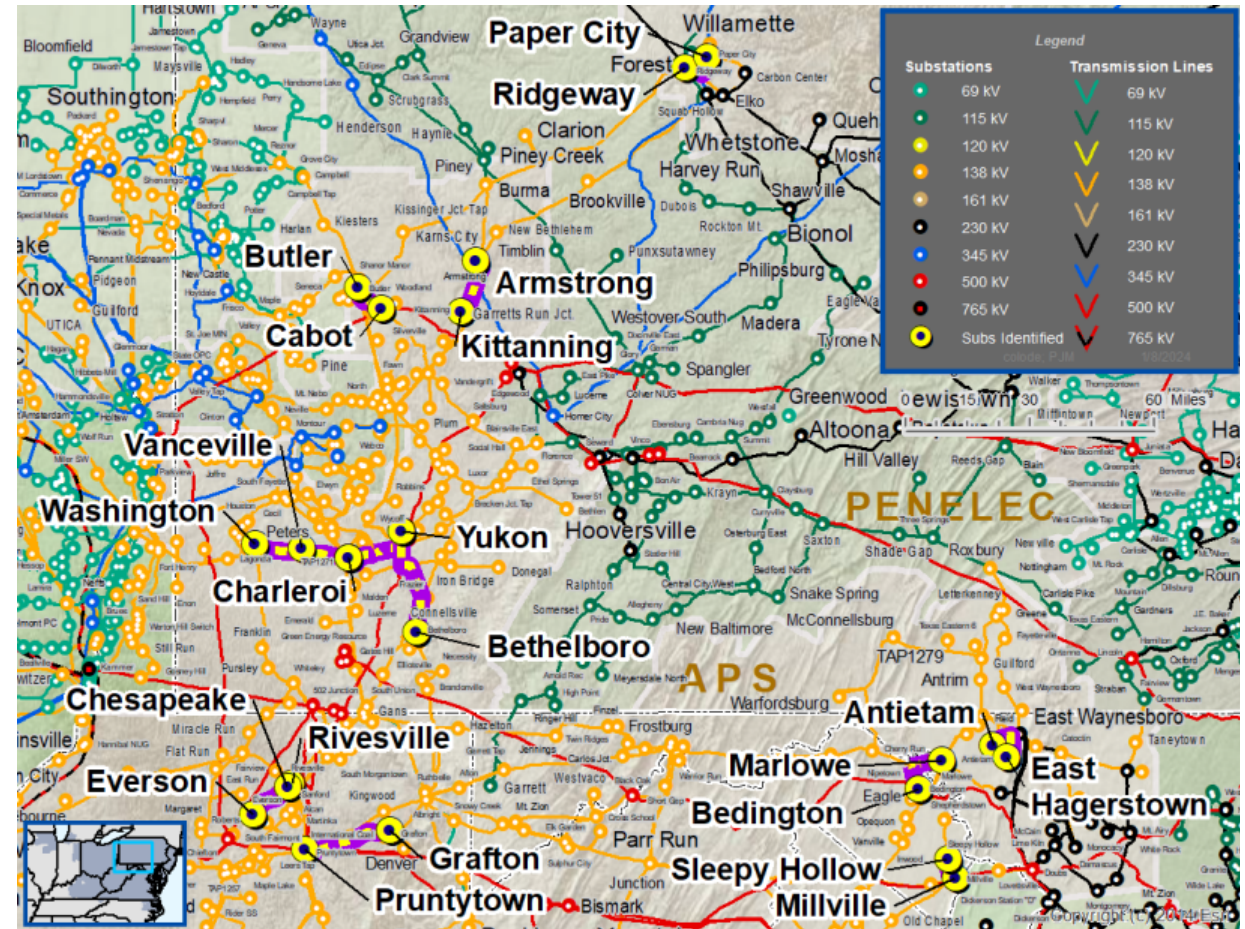
Upgrade Relay Schemes

- Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
- Communication technology upgrades

Problem Statement:

- FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation.
- Proper operation of the protection scheme requires all the separate components perform adequately during a fault.
- In many cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology.
- Transmission line ratings are limited by terminal equipment.

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APS Transmission Zone M-3 Process Misoperation Relay Projects

Need #	Transmission Line / Substation Locations	Existing Line Rating (SN / SE / WN / WE)	Existing Conductor Rating (SN / SE / WN / WE)
APS-2024-008	Charleroi – Yukon No. 1 138 kV	292 / 314 / 325 / 343	297 / 365 / 345 / 441
APS-2024-009	Charleroi – Vanceville 138 kV	287 / 287 / 287 / 287	297 / 365 / 345 / 441
	Vanceville – Washington 138 kV	292 / 314 / 325 / 343	297 / 365 / 345 / 441
APS-2024-010	Armstrong – Kittanning 138 kV	195 / 209 / 217 / 229	221 / 268 / 250 / 317
APS-2024-011	Ridgway – Paper City 138 kV	169 / 213 / 217 / 229	169 / 213 / 217 / 280
APS-2024-012	Butler – Cabot West 138 kV	224 / 293 / 323 / 343	297 / 365 / 345 / 441
APS-2024-013	Bethelboro – Yukon 138 kV	292 / 314 / 325 / 343	308 / 376 / 349 / 445
APS-2024-014	Sleepy Hollow – Millville 138 kV	292 / 306 / 306 / 306	308 / 376 / 349 / 445
APS-2024-015	Antietam – East Hagerstown 138 kV	287 / 287 / 287 / 287	308 / 376 / 349 / 445
APS-2024-016	Bedington – Marlowe BMA 138 kV	265 / 349 / 349 / 435	308 / 376 / 349 / 445
APS-2024-017	Grafton – Pruntytown 138 kV	292 / 314 / 325 / 343	308 / 376 / 349 / 445
APS-2024-018	Everson – Chesapeake 138 kV	292 / 306 / 306 / 306	308 / 376 / 349 / 445
	Chesapeake – Rivesville 138 kV	176 / 229 / 253 / 285	308 / 376 / 349 / 445

Solutions

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Need Numbers: APS-2023-075, APS-2023-079 to APS-2023-084,
APS-2023-086, APS-2023-087

Process Stage: Solution Meeting 01/19/2024

Previously Presented: Need Meeting 12/15/2023

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Projects Global Factors

- System reliability and performance
- Substation/line equipment limits

System Condition Projects

- Substation Condition Rebuild/Replacement

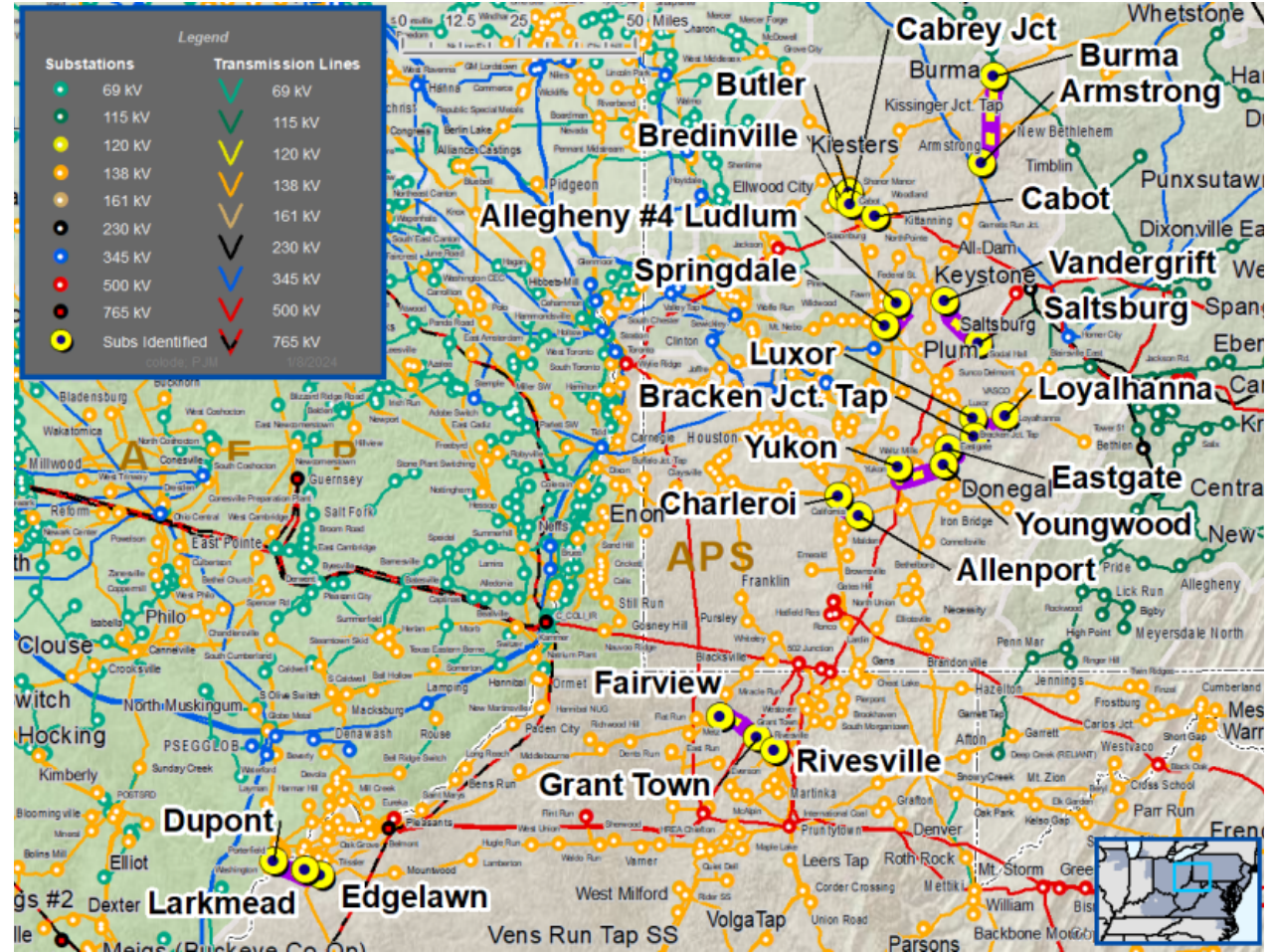
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APS Transmission Zone M-3 Process Misoperation Relay Projects

Need #	Transmission Line / Substation Locations	Existing Line Rating (SN / SE / WN / WE)	Existing Conductor Rating (SN / SE / WN / WE)
APS-2023-075	Butler – Cabrey JCT 138 kV	224 / 293 / 323 / 343	297 / 365 / 345 / 441
	Bredinville – Cabrey JCT 138 kV	225 / 287 / 287 / 287	297 / 365 / 345 / 441
	Cabot – Cabrey JCT 138 kV	287 / 287 / 287 / 287	297 / 365 / 345 / 441
APS-2023-079	All Ludlum 4 JCT – Springdale 138 kV	292 / 306 / 306 / 306	297 / 365 / 345 / 441
APS-2023-080	Charleroi – Allenport 138 kV	274 / 314 / 325 / 343	501 / 577 / 501 / 607
APS-2023-081	Loyalhanna – Bracken JCT 138 kV	195 / 209 / 217 / 229	308 / 376 / 349 / 445
	Luxor – Bracken JCT 138 kV	141 / 147 / 162 / 162	160 / 192 / 180 / 228
	Youngwood – Eastgate T 138 kV	265 / 314 / 325 / 343	289 / 357 / 339 / 435
APS-2023-082	Saltsburg – Vandergrift 138 kV	225 / 229 / 229 / 229	237 / 301 / 306 / 398
APS-2023-083	Armstrong – Burma 138 kV	292 / 314 / 325 / 343	308 / 376 / 349 / 445
APS-2023-084	Youngwood – Yukon 138 kV	234 / 287 / 287 / 287	234 / 297 / 301 / 392
APS-2023-086	Fairview – Grant Town 138 kV	175 / 209 / 217 / 229	221 / 268 / 250 / 317
	Rivesville – Grant Town 138 kV	176 / 229 / 250 / 285	221 / 268 / 250 / 317
APS-2023-087	Dupont – Larkmead 138 kV	292 / 314 / 325 / 343	308 / 376 / 349 / 445
	Larkmead – Edgelawn 138 kV	292 / 314 / 325 / 343	308 / 376 / 349 / 445

Proposed Solution:

Need #	Transmission Line / Substation Locations	New MVA Line Rating (SN / SE / WN / WE)	Scope of Work	Estimated Cost (\$ M)	Target ISD
APS-2023-075	Butler – Cabrey JCT 138 kV	294 / 350 / 345 / 401	<ul style="list-style-type: none"> At Butler, replace circuit breaker, disconnect switches, line trap, substation conductor and relaying 	\$4.9	12/31/2026
	Bredinville – Cabrey JCT 138 kV	297 / 358 / 345 / 410	<ul style="list-style-type: none"> At Bredinville, replace circuit breaker, disconnect switches, line trap, substation conductor and relaying 		
	Cabot – Cabrey JCT 138 kV	297 / 365 / 345 / 441	<ul style="list-style-type: none"> At Cabot, replace circuit breaker, disconnect switches, line trap, substation conductor and relaying 		
APS-2023-079	All Ludlum 4 JCT – Springdale 138 kV	292 / 314 / 325 / 343	<ul style="list-style-type: none"> At Springdale, replace relaying 	\$0.8	12/01/2025



APS Transmission Zone M-3 Process Misoperation Relay Projects

Proposed Solution:

Need #	Transmission Line / Substation Locations	New MVA Line Rating (SN / SE / WN / WE)	Scope of Work	Estimated Cost (\$ M)	Target ISD
APS-2023-080	Charleroi – Allenport 138 kV	501 / 577 / 501 / 607	<ul style="list-style-type: none"> At Charleroi, replace circuit breaker, disconnect switches, line trap, substation conductor and relaying At Allenport, replace circuit breaker, disconnect switches, line trap, line turner and coax, substation conductor and relaying 	\$3.4	12/01/2025
APS-2023-081	Loyalhanna – Bracken JCT 138 kV	308 / 376 / 349 / 445	<ul style="list-style-type: none"> At Loyalhanna, replace circuit breaker, disconnect switches, line trap, substation conductor and relaying 	\$4.0	05/15/2026
	Luxor – Bracken JCT 138 kV	160 / 192 / 180 / 228	<ul style="list-style-type: none"> At Luxor, replace circuit breaker, disconnect switches, line trap, substation conductor and relaying 		
	Youngwood – Eastgate T 138 kV	289 / 357 / 339 / 435	<ul style="list-style-type: none"> At Youngwood, replace circuit breaker, disconnect switches, line trap, substation conductor and relaying 		

Proposed Solution:

Need #	Transmission Line / Substation Locations	New MVA Line Rating (SN / SE / WN / WE)	Scope of Work	Estimated Cost (\$ M)	Target ISD
APS-2023-082	Saltsburg – Vandergrift 138 kV	237 / 301 / 306 / 398	<ul style="list-style-type: none"> At Saltsburg, replace disconnect switches, line trap, and relaying At Vandergrift, replace circuit breaker, disconnect switches, line trap, substation conductor and relaying 	\$2.9	12/31/2025
APS-2023-083	Armstrong – Burma 138 kV	308 / 376 / 349 / 445	<ul style="list-style-type: none"> At Armstrong, replace disconnect switches, line trap, substation conductor and relaying At Burma, replace circuit breaker, disconnect switches, line trap, substation conductor and relaying 	\$3.0	6/1/2026
APS-2023-084	Youngwood – Yukon 138 kV	234 / 297 / 301 / 392	<ul style="list-style-type: none"> At Youngwood, replace circuit breaker, line trap, substation conductor and relaying At Yukon, replace line trap and relaying 	\$2.1	3/28/2026

Proposed Solution:

Need #	Transmission Line / Substation Locations	New MVA Line Rating (SN / SE / WN / WE)	Scope of Work	Estimated Cost (\$ M)	Target ISD
APS-2023-086	Fairview – Grant Town 138 kV	221 / 268 / 250 / 317	<ul style="list-style-type: none"> At Fairview, replace circuit breaker, disconnect switches, line trap, substation conductor and relaying At Grant Town, replace circuit breaker, disconnect switches, line trap and relaying 	\$4.2	5/15/2026
	Rivesville – Grant Town 138 kV	221 / 268 / 250 / 317	<ul style="list-style-type: none"> At Rivesville, replace circuit breaker, line trap, substation conductor and relaying At Grant Town, replace circuit breaker, disconnect switches, line trap and relaying 		
APS-2023-087	Dupont – Larkmead 138 kV	308 / 376 / 349 / 445	<ul style="list-style-type: none"> At Dupont, replace circuit breaker, line trap, substation conductor and relaying At Larkmead, replace disconnect switches and relaying 	\$4.8	12/31/2025
	Larkmead – Edgelawn 138 kV	308 / 376 / 349 / 445	<ul style="list-style-type: none"> At Edgelawn, replace circuit breaker, line trap, substation conductor and relaying At Larkmead, replace disconnect switches and relaying 		

Alternatives Considered: Maintain equipment in existing condition with elevated risk of equipment misoperation

Project Status: Conceptual

Model: 2023 RTEP model for 2028 Summer (50/50)

Appendix

High Level M-3 Meeting Schedule

Assumptions	Activity	Timing
	Posting of TO Assumptions Meeting information	20 days before Assumptions Meeting
	Stakeholder comments	10 days after Assumptions Meeting
Needs	Activity	Timing
	TOs and Stakeholders Post Needs Meeting slides	10 days before Needs Meeting
	Stakeholder comments	10 days after Needs Meeting
Solutions	Activity	Timing
	TOs and Stakeholders Post Solutions Meeting slides	10 days before Solutions Meeting
	Stakeholder comments	10 days after Solutions Meeting
Submission of Supplemental Projects & Local Plan	Activity	Timing
	Do No Harm (DNH) analysis for selected solution	Prior to posting selected solution
	Post selected solution(s)	Following completion of DNH analysis
	Stakeholder comments	10 days prior to Local Plan Submission for integration into RTEP
	Local Plan submitted to PJM for integration into RTEP	Following review and consideration of comments received after posting of selected solutions

Revision History

1/X/2024– V1 – Original version posted to pjm.com

1/8/2024 – V2 – Updated to include Maps