

Subregional RTEP Committee - Western FirstEnergy Supplemental Projects

June 14, 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-2024-062 to APS-2024-068

Process Stage: Need Meeting 06/14/2024

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

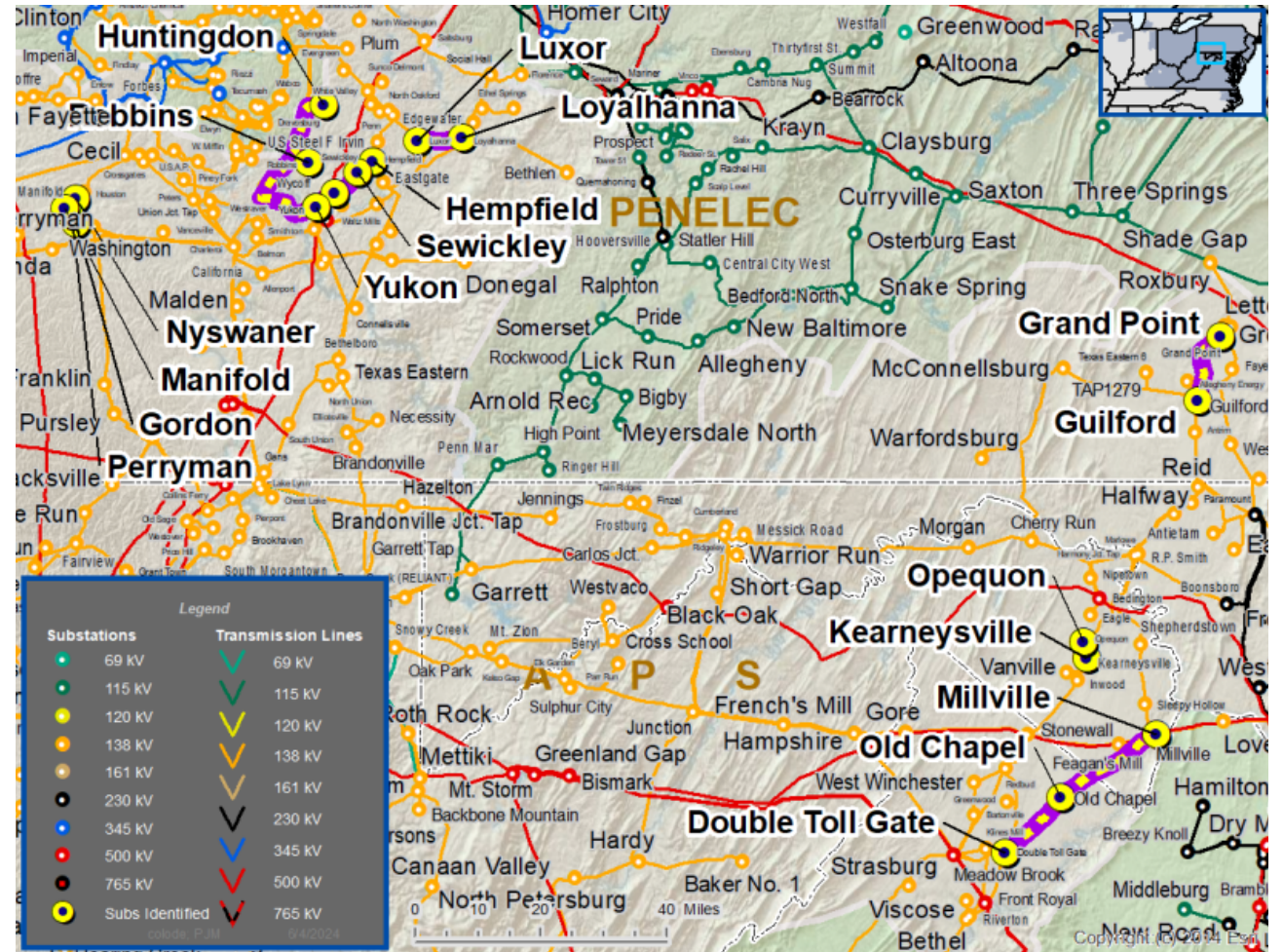
Upgrade Relay Schemes

- 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cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology.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 MVA (SN / SE / WN / WE)	Existing Conductor Rating MVA (SN / SE / WN / WE)
APS-2024-062	Gordon – Perryman 138 kV Line	169 / 213 / 217 / 280	169 / 213 / 217 / 280
	Perryman – Manifold 138 kV Line	169 / 213 / 217 / 280	169 / 213 / 217 / 280
	Manifold – Nyswaner 138 kV Line	300 / 358 / 349 / 410	308 / 376 / 349 / 445
APS-2024-063	Kearneysville – Opequon 138 kV Line	210 / 250 / 250 / 286	221 / 268 / 250 / 317
APS-2024-064	Loyalhanna – Luxor 138 kV Line	141 / 182 / 180 / 215	160 / 192 / 180 / 228
APS-2024-065	Hempfield – Sewickley 138 kV Line	225 / 295 / 325 / 343	282 / 347 / 331 / 425
	Sewickley – Waltz Mills Tap 138 kV Line	282 / 347 / 331 / 425	282 / 347 / 331 / 425
	Waltz Mills Tap – Yukon 138 kV Line	282 / 314 / 325 / 343	282 / 347 / 331 / 425
APS-2024-066	Huntingdon – Robbins 138 kV Line	287 / 287 / 287 / 287	297 / 365 / 345 / 441
	Robbins – Yukon 138 kV Line	295 / 365 / 345 / 441	297 / 365 / 345 / 441
APS-2024-067	Grand Point – Guilford 138 kV Line	195 / 209 / 217 / 229	221 / 268 / 250 / 317
APS-2024-068	Double Toll Gate – Old Chapel 138 kV Line	300 / 358 / 349 / 410	308 / 376 / 349 / 445
	Old Chapel – Millville 138 kV Line	299 / 358 / 353 / 410	353 / 406 / 353 / 428

Solutions

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-2024-039, APS-2024-041 to APS-2024-045, APS-2024-048 to APS-2024-051

Process Stage: Need Meeting 05/17/2024

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

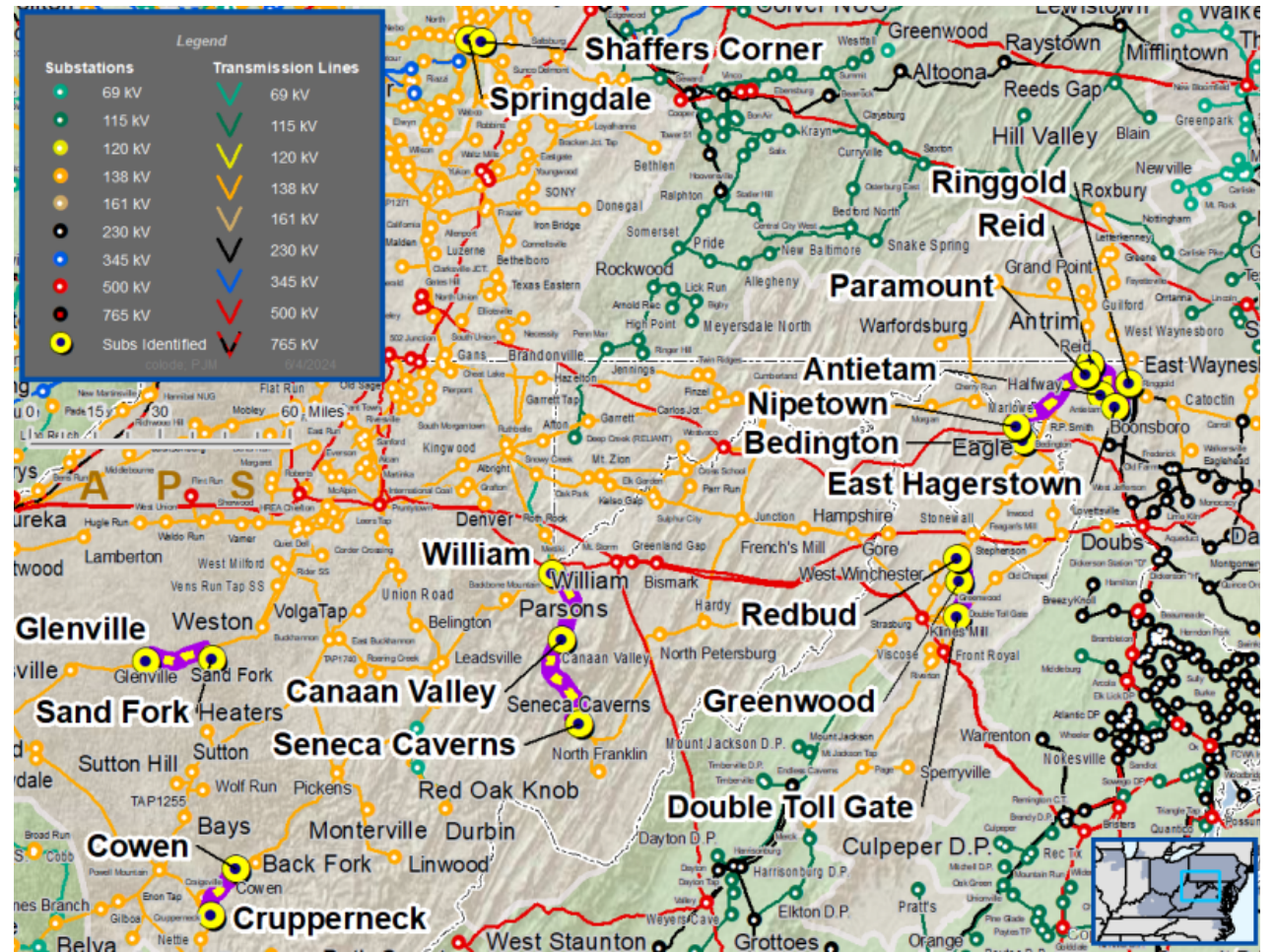
Upgrade Relay Schemes

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- 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 (MVA SN / SE / WN / WE)	Existing Conductor Rating (MVA SN / SE / WN / WE)
APS-2024-039	Shaffers Corner – Springdale 138 kV Line	292 / 314 / 325 / 343	297 / 365 / 345 / 441
APS-2024-041	Antietam – Reid 138 kV Line	287 / 287 / 287 / 287	308 / 376 / 349 / 445
APS-2024-042	Bedington – Nipetown 138 kV Line	459 / 459 / 459 / 459	530 / 611 / 531 / 642
	Nipetown – Reid 138 kV Line	295 / 375 / 349 / 441	308 / 376 / 349 / 445
APS-2024-043	Double Toll Gate – Greenwood 138 kV Line	262 / 314 / 315 / 343	278 / 339 / 315 / 401
APS-2024-044	East Hagerstown – Ringgold 138 kV Line	229 / 229 / 229 / 229	308 / 376 / 349 / 445
APS-2024-045	Greenwood – Redbud 138 kV Line	210 / 250 / 250 / 286	221 / 268 / 250 / 317
APS-2024-048	Paramount No. 1 – Reid 138 kV Line	295 / 375 / 349 / 441	308 / 376 / 349 / 445
APS-2024-049	Glenville – Sand Fork Tap 138 kV Line	195 / 209 / 217 / 229	221 / 268 / 250 / 317
	Sandfork Tap – Weston 138 kV Line	221 / 268 / 250 / 317	221 / 268 / 250 / 317
APS-2024-050	William – Canaan Valley 138 kV Line	204 / 229 / 229 / 229	221 / 268 / 250 / 317
	Canaan Valley – Seneca Caverns 138 kV Line	172 / 172 / 172 / 172	221 / 268 / 250 / 317
APS-2024-051	Cowen – Crupperneck 138 kV Line	164 / 206 / 216 / 229	169 / 213 / 217 / 280
	Back Fork – Crupperneck 138 kV Line	169 / 213 / 217 / 280	169 / 213 / 217 / 280



APS Transmission Zone M-3 Process Misoperation Relay Projects

Proposed Solution:

Need #	Transmission Line / Substation Locations	New MVA Line Rating (MVA SN / SE / WN / WE)	Scope of Work	Estimated Cost (\$ M)	Target ISD
APS-2024-039	Shaffers Corner – Springdale 138 kV Line	297 / 365 / 345 / 441	<ul style="list-style-type: none"> At Springdale, replace line trap, substation conductor and relaying. At Shaffers Corners, replace circuit breaker, disconnect switches, line trap, substation conductor and relaying. 	\$4.0	4/30/2027
APS-2024-041	Antietam – Reid 138 kV Line	308 / 376 / 349 / 445	<ul style="list-style-type: none"> At Antietam, replace circuit breaker, disconnect switches, line trap, substation conductor and relaying. At Reid, replace circuit breaker, line trap, substation conductor and relaying. 	\$5.0	10/31/2027
APS-2024-042	Bedington – Nipetown 138 kV Line	530 / 611 / 531 / 642	<ul style="list-style-type: none"> At Bedington, replace circuit breakers, disconnect switches, line trap and relaying. At Nipetown, replace disconnect switches. 	\$7.0	8/31/2027
	Nipetown – Reid 138 kV Line	308 / 376 / 349 / 445	<ul style="list-style-type: none"> At Nipetown, replace disconnect switches. At Reid, replace circuit breaker, disconnect switches, substation conductor, line trap, and relaying. 		
APS-2024-043	Double Toll Gate – Greenwood 138 kV Line	278 / 339 / 315 / 401	<ul style="list-style-type: none"> At Double Toll Gate, replace line trap, substation conductor and relaying. At Greenwood, replace line trap, disconnect switches, substation conductor and relaying. 	\$3.0	5/31/2026



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-2024-044	East Hagerstown – Ringgold 138 kV Line	308 / 376 / 349 / 445	<ul style="list-style-type: none"> At East Hagerstown, replace circuit breaker, line trap, disconnect switches, substation conductor and relaying. At Ringgold, replace circuit breaker, line trap, disconnect switches, substation conductor and relaying. 	\$5.0	10/31/2026
APS-2024-045	Greenwood – Redbud 138 kV Line	221 / 268 / 250 / 317	<ul style="list-style-type: none"> At Greenwood, replace circuit breaker, disconnect switches, substation conductor, relaying. At Redbud, replace disconnect switches, line trap, substation conductor and relaying. 	\$4.0	3/31/2026
APS-2024-048	Paramount No. 1 – Reid 138 kV Line	308 / 376 / 349 / 445	<ul style="list-style-type: none"> At Paramount, replace circuit breaker, disconnect switches, line trap and relaying. At Reid, replace substation conductor and relaying. 	\$4.0	10/31/2026
APS-2024-049	Glenville – Sand Fork Tap 138 kV Line Sandfork Tap – Weston 138 kV Line	221 / 268 / 250 / 317	<ul style="list-style-type: none"> At Glenville, replace circuit breaker, disconnect switches, line trap and relaying. At Weston, replace circuit breaker, disconnect switches, line trap and relaying. 	\$5.0	5/17/2028

Proposed Solution:

Need #	Transmission Line / Substation Locations	New MVA Line Rating (SN / SE / WN / WE)	Scope of Work	Estimated Cost (\$ M)	Target ISD
APS-2024-050	William – Canaan Valley 138 kV Line	221 / 268 / 250 / 317	<ul style="list-style-type: none"> At William, replace circuit breaker, line trap, disconnect switches and relaying. At Canaan Valley, replace disconnect switches. 	\$5.0	4/1/2027
	Canaan Valley – Seneca Caverns 138 kV Line	221 / 268 / 250 / 317	<ul style="list-style-type: none"> At Canaan Valley, replace disconnect switches. At Seneca Caverns, replace circuit breaker, disconnect switches, line trap and relaying. 		
APS-2024-051	Cowen – Crupperneck 138 kV Line Back Fork – Cowen 138 kV Line	169 / 213 / 217 / 280	<ul style="list-style-type: none"> At Crupperneck, replace circuit breaker, disconnect switches, line trap, substation conductor and relaying. At Cowen, replace disconnect switches. At Back Fork, replace circuit breaker, disconnect switches, line trap, substation conductor and relaying. 	\$5.0	6/30/2027

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

6/4/2024– V1 – Original version posted to pjm.com

6/5/2024 – V2 – Added updated maps