

Subregional RTEP Committee - Mid-Atlantic Penelec Supplemental Projects

July 31, 2019

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 Number: PN-2019-035

Process Stage: Need Meeting 7/31/2019

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

- Line Condition Rebuild/Replacement
- Age/condition of wood pole transmission line structures
- System Performance Projects Global Factors
- Substation/line equipment limits

Problem Statement:

The Piney – Haynie – Grandview – Titusville – Union City – Erie South 115 kV line is exhibiting deterioration.

Total line distance is approximately 82.3 miles.

556 out of 697 structures failed inspection (80% failure rate).

Failure reasons include age, woodpecker damage, top rot, phase raised, failed sound test, and weatherization.

Transmission line ratings are limited by terminal equipment.

Piney – Haynie 115 kV line (substation conductor, line relaying, line trap)

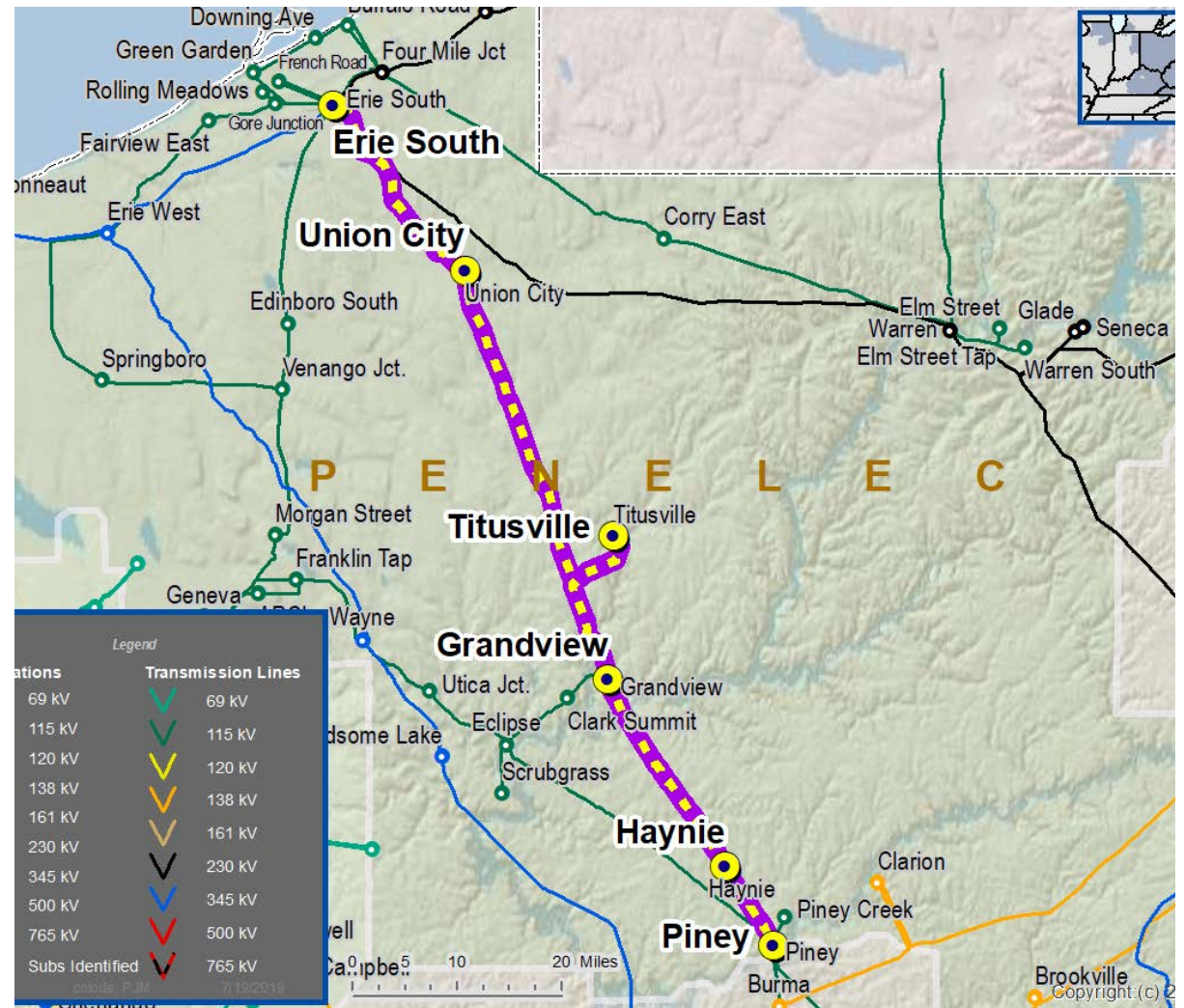
- Existing line rating: 147/190 MVA (SN/SE)
- Existing conductor rating: 202/245 MVA (SN/SE)

Haynie – Grandview 115 kV line (substation conductor, line relaying, line trap)

- Existing line rating: 147/190 MVA (SN/SE)
- Existing conductor rating: 202/245 MVA (SN/SE)

Union City – Erie South 115 kV line (substation conductor, line relaying)

- Existing line rating: 176/224 MVA (SN/SE)
- Existing conductor rating: 232/282 MVA (SN/SE)



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 Number: PN-2019-022 to 025, PN-2019-027 to 031, and APS-2019-009

Process Stage: Solutions Meeting 7/31/2019

Previously Presented:

Need Meeting 6/28/2019

Need Meeting 7/24/2019 (APS-2019-009)

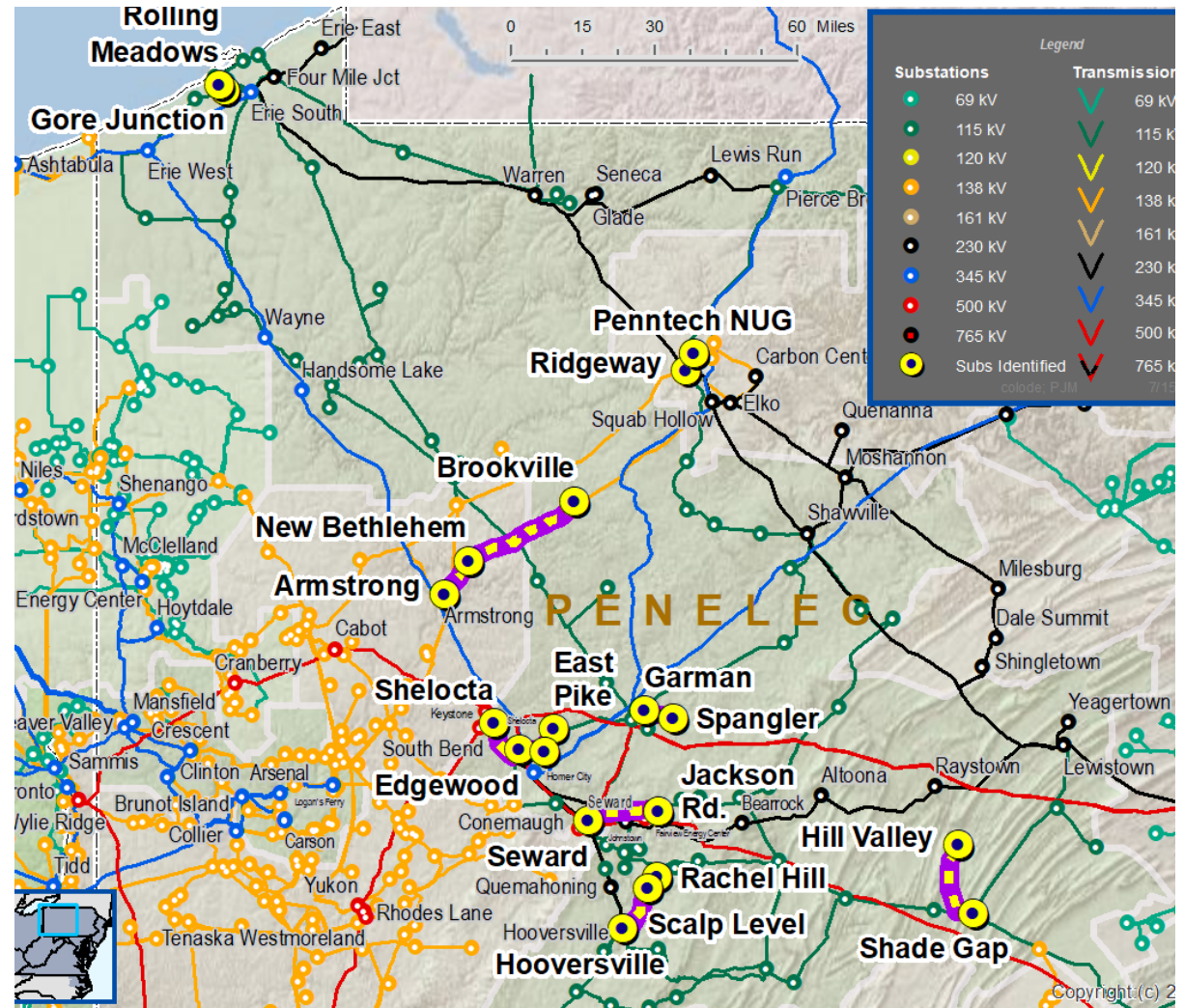
Project Driver:

Equipment Material Condition, Performance and Risk
Operational Flexibility and Efficiency

Specific Assumption Reference:

- System Performance Projects Global Factors
- System reliability and performance
- Substation/line equipment limits
- Upgrade Relay Schemes
- Relay schemes that have a history of misoperation
- Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
- Communication technology upgrades
- Bus protection schemes

Continued on next slide...



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 part and available expertise in the outdated technology.
- Transmission line ratings are limited by terminal equipment.

PN-2019-	Transmission Line / Substation Locations	Existing Line Rating (SN / SE)	Existing Conductor Rating (SN / SE)	Limiting Terminal Equipment
022	Lucerne – Edgewood 115 kV Line Edgewood – Shelocta 115 kV Line	147/190 125/143	202/245 202/245	Line Relaying, Line Trap, Substation Conductor Line Relaying, Line Trap, Substation Conductor
023	East Pike – Lucerne 115 kV Line	163/185	202/245	Line Relaying, Line Trap, Substation Conductor
024	Jackson Road – Seward 115 kV Line	175/191	232/282	Line Relaying, Substation Conductor
025 / APS-2019-009	Armstrong – New Bethlehem 138 kV Line New Bethlehem – Brookville 138 kV Line	293/332 295/342	308/376 308/376	Line Trap, Substation Conductor Line Trap, Substation Conductor, Circuit Breaker
027	Hooversville – Scalp Level 115 kV Line Scalp Level – Rachel Hill 115 kV Line	164/190 164/190	202/245 202/245	Line Relaying, Line Trap, Substation Conductor Line Relaying, Line Trap, Substation Conductor
028	Penn Tech – Ridgway 115 kV Line	135/155	232/282	Line Relaying, Substation Conductor
029	Gore Junction – Rolling Meadows 115 kV Line	137/172	202/245	Disconnect Switch, Line Relaying, Substation Conductor
030	Hill Valley – Shade Gap 115 kV Line	55/55	202/245	Line Relaying, Substation Conductor
031	Garman – Spangler 115 kV Line	126/149	232/282	Line Relaying, Substation Conductor



Penelec Transmission Zone M-3 Process Misoperation Relay Projects

Need Number: PN-2019-022 to 025, PN-2019-027 to 031, and APS-2019-009

Process Stage: Solutions Meeting 7/31/2019

Proposed Solution:

PN-2019-	Transmission Line / Substation Locations	New MVA Line Rating (SN / SE)	Scope of Work	Estimate Costs (\$ M)	Target ISD
022	Lucerne – Edgewood 115 kV Line Edgewood – Shelocta 115 kV Line	202/245 202/245	<ul style="list-style-type: none"> Shelocta 115 kV Substation – Replace line relaying, line trap, and substation conductor Edgewood 115 kV Substation – Replace substation conductor Lucerne 115 kV Substation – Replace line relaying, line trap, and substation conductor 	\$0.9M	6/1/2020
023	East Pike – Lucerne 115 kV Line	202/245	<ul style="list-style-type: none"> East Pike 115 kV Substation – Replace line relaying, line trap, and substation conductor Lucerne 115 kV Substation – Replace line relaying, line trap, and substation conductor 	\$0.7M	4/1/2020
024	Jackson Road – Seward 115 kV Line	232/282	<ul style="list-style-type: none"> Jackson Road 115 kV Substation – Replace line relaying and substation conductor Seward 115 kV Substation – Replace line relaying and substation conductor 	\$0.8M	6/1/2020
025 / APS-2019-009	Armstrong – New Bethlehem 138 kV Line New Bethlehem – Brookville 138 kV Line	308/376 308/376	<ul style="list-style-type: none"> Brookville 138 kV Substation – Replace line relaying, line trap, substation conductor, and circuit breaker 	\$0.5M	4/1/2020
027	Hooversville – Scalp Level 115 kV Line Scalp Level – Rachel Hill 115 kV Line	202/245 202/245	<ul style="list-style-type: none"> Hooversville 115 kV Substation – Replace line relaying and line trap Scalp Level 115 kV Substation – Replace substation conductor Rachel Hill 115 kV Substation – Replace line relaying, line trap, and substation conductor 	\$0.9M	12/1/2020
028	Penn Tech – Ridgway 115 kV Line	232/282	<ul style="list-style-type: none"> Ridgway 115 kV Substation – Replace line relaying and substation conductor 	\$0.2M	12/1/2021
029	Gore Junction – Rolling Meadows 115 kV Line	202/245	<ul style="list-style-type: none"> Gore Junction 115 kV Substation – Replace line relaying and substation conductor Rolling Meadows 115 kV Substation – Replace line relaying, substation conductor, and disconnect switch 	\$0.5M	4/1/2021
030	Hill Valley – Shade Gap 115 kV Line	202/245	<ul style="list-style-type: none"> Shade Gap 115 kV Substation – Replace line relaying and substation conductor 	\$0.8M	6/1/2021
031	Garman – Spangler 115 kV Line	232/282	<ul style="list-style-type: none"> Garman 115 kV Substation – Replace line relaying and substation conductor Spangler 115 kV Substation – Replace line relaying and substation conductor 	\$0.9M	4/1/2021

Alternatives Considered:

- Maintain existing condition and elevated risk of failure
No topology changes, no bubble diagram required.

Project Status: All projects are in the Conceptual phase.

Model: 2018 Series 2023 Summer RTEP 50/50

QUESTIONS?



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

7/19/2019 – V1 – Original version posted to pjm.com