

SRRTEP - Western Committee DP&L Supplemental Projects

December 18, 2020

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: Dayton-2020-011

Process Stage: Needs Meeting

Date: 12/18/2020

Supplemental Project Driver(s):

Requested Customer Upgrade, Operational Performance

Specific Assumption Reference(s):

DP&L 2020 RTEP Assumptions, Slide 5

Problem Statement:

- Buckeye Power, on behalf of Darke Rural Electric Cooperative, has requested reliability upgrades on the West Manchester–Brookville 69kV 6639 and the West Manchester–Garage Road 69kV 6656 lines located in Preble and Montgomery Counties.

Area Transmission Configuration:

- The 6639 line is a 20-mile 69kV wood pole line serving three Dayton substations (Brookville, Lewisburg, West Manchester), one Darke REA Delivery Point at West Sonora, and one 69kV industrial customer.
 - Lewisburg & West Senora Stations are both served via a 3.2-mile tap from the 6639 line.
- The 6656 line is a 16-mile 69kV wood pole line built to 138kV standards connecting Dayton substations at Garage Road and West Manchester .
- Lewisburg & West Senora utilize a 4.61-mile 69kV tap from the 6656 line as a normally open tie for emergency situations. Due to protection limitations, this normally open tie cannot be closed in during normal operations.

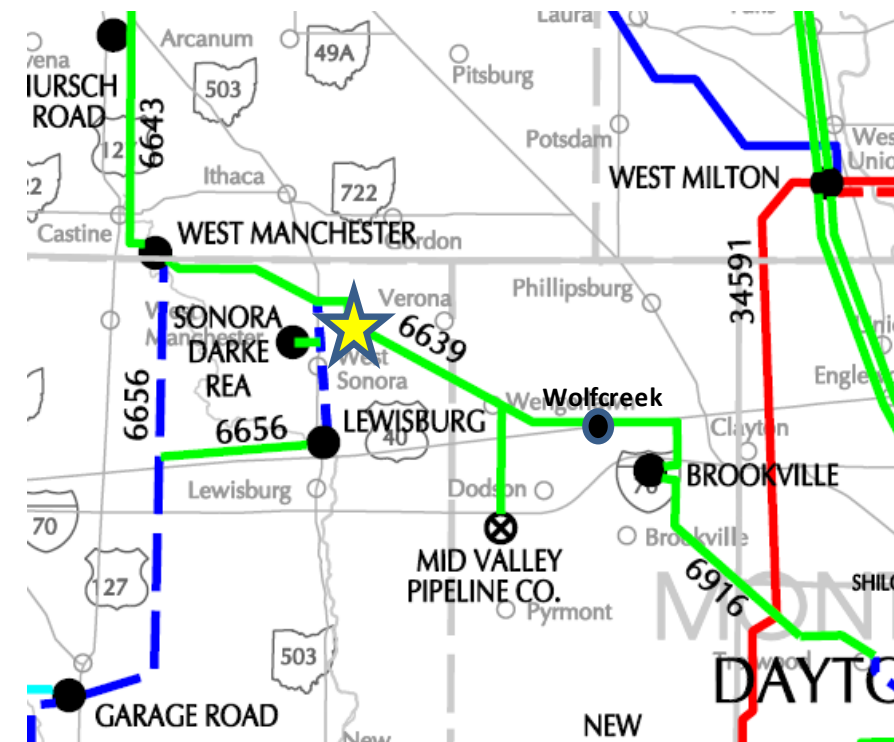
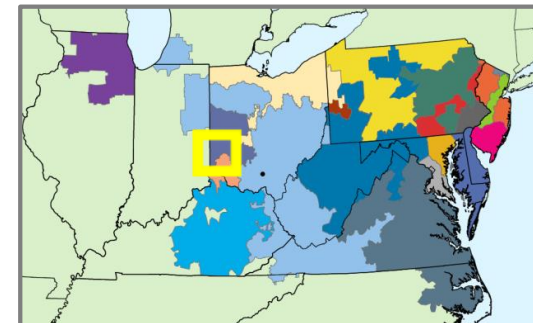


Figure 1 : Area Map

Historical Performance

- West Manchester – Brookville 69kV 6639
 - Constructed primarily in 1953
 - Wood pole, crossarm design, 477 ACSR 18/1 conductor
 - 10 permanent outages over last five years
 - The primary causes are equipment failures with broken crossarms being the leading outage cause.
 - 18 momentary outages over last five years
 - The primary causes are lightning, static wire issues, and wind related events.

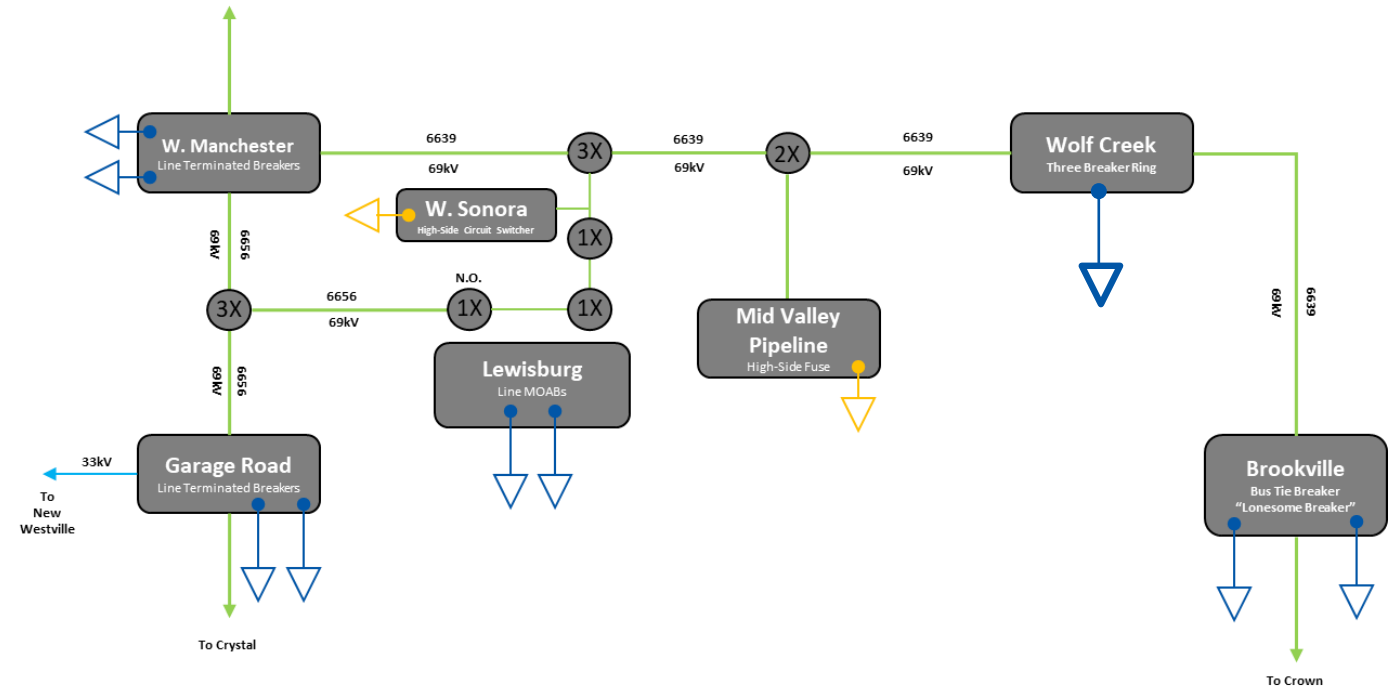


Figure 2 : Area Bubble Diagram

Dayton Transmission Zone M-3 Process Dayton, Ohio

Need Number: Dayton-2020-012

Process Stage: Need Meeting 12/18/2020

Project Driver:

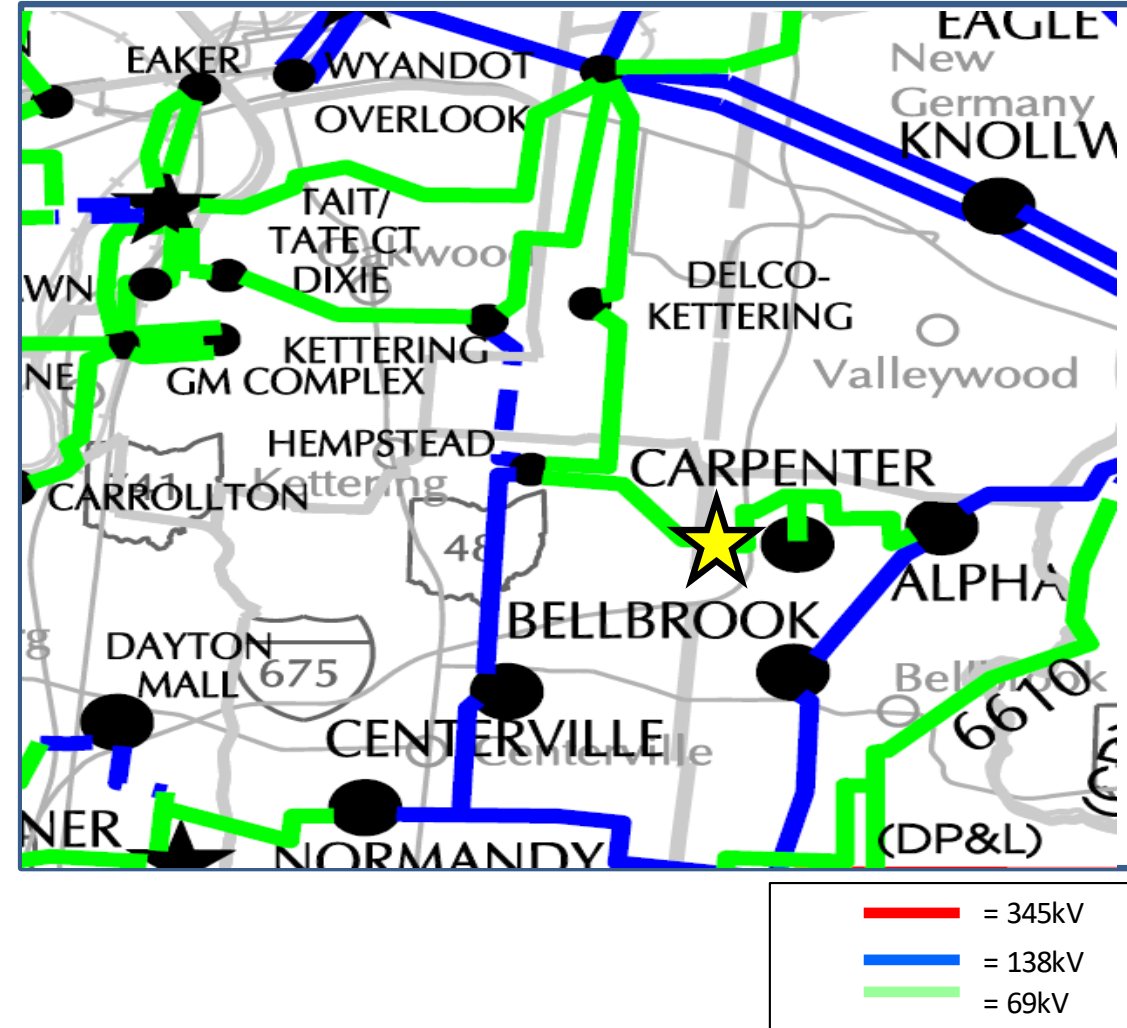
Source for underlying distribution

Specific Assumption Reference:

Dayton Local Plan Assumptions (Slide 5)

Problem Statement:

- A large new senior community featuring a mix of residential and retail is being constructed in the Cornerstone Development located in Centerville, OH. This area, served from Dayton's Carpenter Substation, has experienced growth in recent years and this load addition of 5MVA will require additional capacity. Dayton must develop a solution to have capacity to serve distribution load in this load center or risk overloading existing equipment and not having sufficient distribution capacity to serve growing load.
- Carpenter Substation is served via a short 0.1 mile tap from the Alpha-Hempstead 6622 69kV transmission line. Carpenter Substation provides distribution service to the 3,4000 customers served in this area via a single 69/12kV 30MVA transformer. A single outage to the 6622 transmission line or distribution transformer at Carpenter would result in a complete loss of service to the 3400 customers.
- The current load (24.4 MVA) and reserved emergency switching capacity (3.5 MVA) place the current 69/12kV 30MVA transformer at Carpenter above 90% of its rating during peak times before the 5MVA load addition.
- Additional circuit ties exist in the area but do not have enough capacity for significant load transfers and would further limit the ability to conduct circuit switching during outages.



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: Dayton-2020-009
Process Stage: Needs Meeting
Date: 10/16/2020

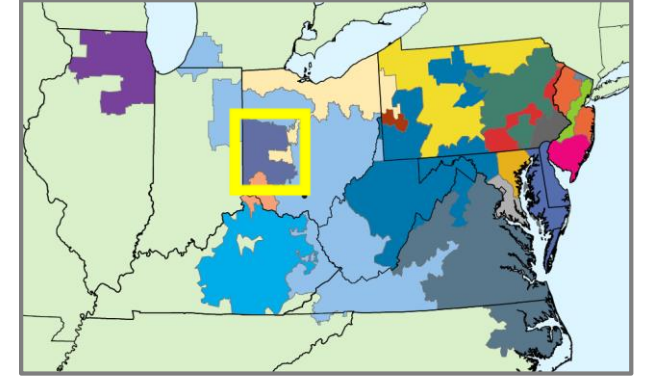
Supplemental Project Driver(s):
System Configuration Improvements, Operational Performance

Specific Assumption Reference(s):
DP&L 2020 RTEP Assumptions, Slide 5

Problem Statement:

- Historically Dayton assumed a 50/50 current split in our ratings methodology.
- Under certain outage conditions, lines or transformers may be isolated on a single element with 100% of the flow through that facility.
- After reviewing industry best practices, DP&L plans to move from a 50/50 current split assumption to a 100/0 current split assumption starting January 1, 2023.
- Modeling single elements derates in the planning model is in implementation and will require contingency change updates in the future, but modeling these specific scenarios in the operations model was not a feasible long-term plan for DP&L.
- Certain terminal equipment changes will be made at DP&L substations to maintain current ratings and other facilities will take the derate from the change in methodology based on reviews of historical loading, contingency loading, and criticality as reviewed by planning and operations.
- The decision to proceed with the changes was driven by the desire to avoid unplanned facility outages due to potential loading issues and the low cost of making terminal equipment upgrades to avoid these scenarios.

Model: 2020 RTEP Series, 2025 Summer Case



Potential Solution Slide



Proposed Solution:

Substation Terminal Equipment Replacements: Dayton will complete terminal equipment replacements at the substations listed in the bullets below to facilitate the transition to a 100/0 current split methodology. These changes will involve the replacement of breakers, breaker terminal pads, and switches that could become a limiting element once the shift is made in the ratings methodology. The upgrades on these facilities will ensure ratings are kept the same as today.

- Bath Substation – Replace GL-EE, GL-FF, GL-HH, GL-JJ 345kV circuit breaker terminal pads
- Clinton Substation – Replace HE-EE 345kV circuit breaker terminal pads
- Greene Substation – Replace circuit breaker terminal pads on GJ-AA, GJ-BB, GJ-CC, GJ-DD, GJ-EE, GJ-FF and disconnect switches
- Miami Substation - Replace circuit breaker terminal pads on OB-GG, OB-HH, disconnects, and increase metering limit
- Shelby Substation – Replace BC-B and BC-D circuit breakers and the disconnect switches. Replace BC-JJ, BC-HH 345kV circuit breaker terminal pads
- Stuart Substation – Replace circuit breaker terminal pads on ST-JJ, ST-KK, ST-HH, ST-GG, ST-VV, ST-WW
- Sugarcreek Substation – Replace RS-BB, RS-DD, RS-EE, RS-FF, RS-HH, RS-JJ 345kV circuit breaker terminal pads.
- West Manchester Substation – Replace MC-6643E and MC-6643W 69kV circuit breakers and disconnect switches
- Wilmington Substation – Replace HB-2 and HB-7 circuit breakers, disconnect switches, and bus.

Equipment replacements

Substation	Line(s)
Bath	34598/34526/34525
Clinton	34509/34522
Greene	34503/34506/34522/34525
Miami	34525
Shelby	BK-S, 34527
Stuart	34509, 34510, 34511, 34553
Sugarcreek	34524
West Manchester	6643
Wilmington	6673

Note: No ratings changes on these facilities.

Transmission Line Derates: Once the new methodology is put in place starting 1/1/2023, the transmission circuits in the table below will be derated since equipment replacements will be completed. Based on engineering review, there are no anticipated issues from the planned derates.

Estimated Transmission Cost, \$4.0M TOTAL ISD 12/31/2022

Facilities that will be derated

Alternatives Considered:

1. Replace all limiting terminal equipment to maintain current ratings. This was not selected due to the extensive outages that will be required and engineering review of the facilities and magnitude of the ratings change.

Estimated Cost \$16M

Project Status: Conceptual

Model: 2020 RTEP – 2025 Summer Case

Line	SN Before Rating	SN After Rating	SE Before Rating	SE After Rating	WN Before Rating	WN After Rating	WE Before Rating	WE After Rating
34528	1255	1099	1374	1195	1255	1195	1374	1195
13805	196	196	241	241	270	270	301	287
6666	151	126	187	143	201	143	220	143
6674	95	95	117	117	132	132	147	143
6677	151	151	187	187	209	202	234	225
6905	151	143	165	143	151	143	165	143
Overlook Bk-7	200	187	220	216	200	200	220	220
Amsterdam 138/69kV	150	143	165	143	150	143	165	143
Trebein 138/69kV	200	193	220	220	200	200	200	220
Staunton 138/69kV	187	165	216	192	200	200	220	220
Bath 345/138kV	450	450	495	478	450	450	495	478
Miami 345/138kV	450	450	495	478	450	450	495	478
W. Milton 345/138kV	450	440	496	478	450	450	495	478
Sugarcreek 345/138kV N	448	448	493	478	448	448	493	478
Sugarcreek 345/138kV S	450	450	495	478	450	450	495	478

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

12/8/2020 – V1 – Original version posted to pjm.com