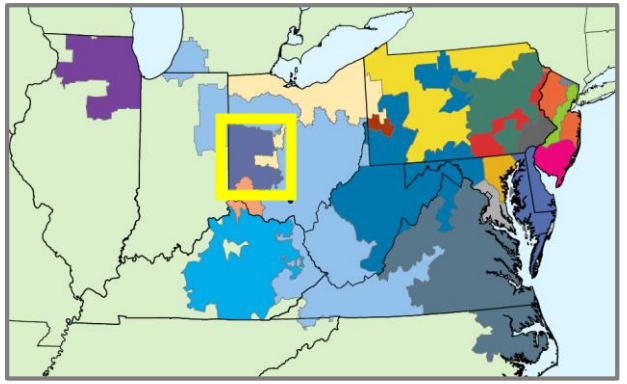
Sub Regional RTEP Committee: Western Dayton Supplemental Projects

October 16, 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-2020-009
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

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

Dayton Transmission Zone M-3 Process
North Dayton Zone

Need Number: Dayton-2020-006

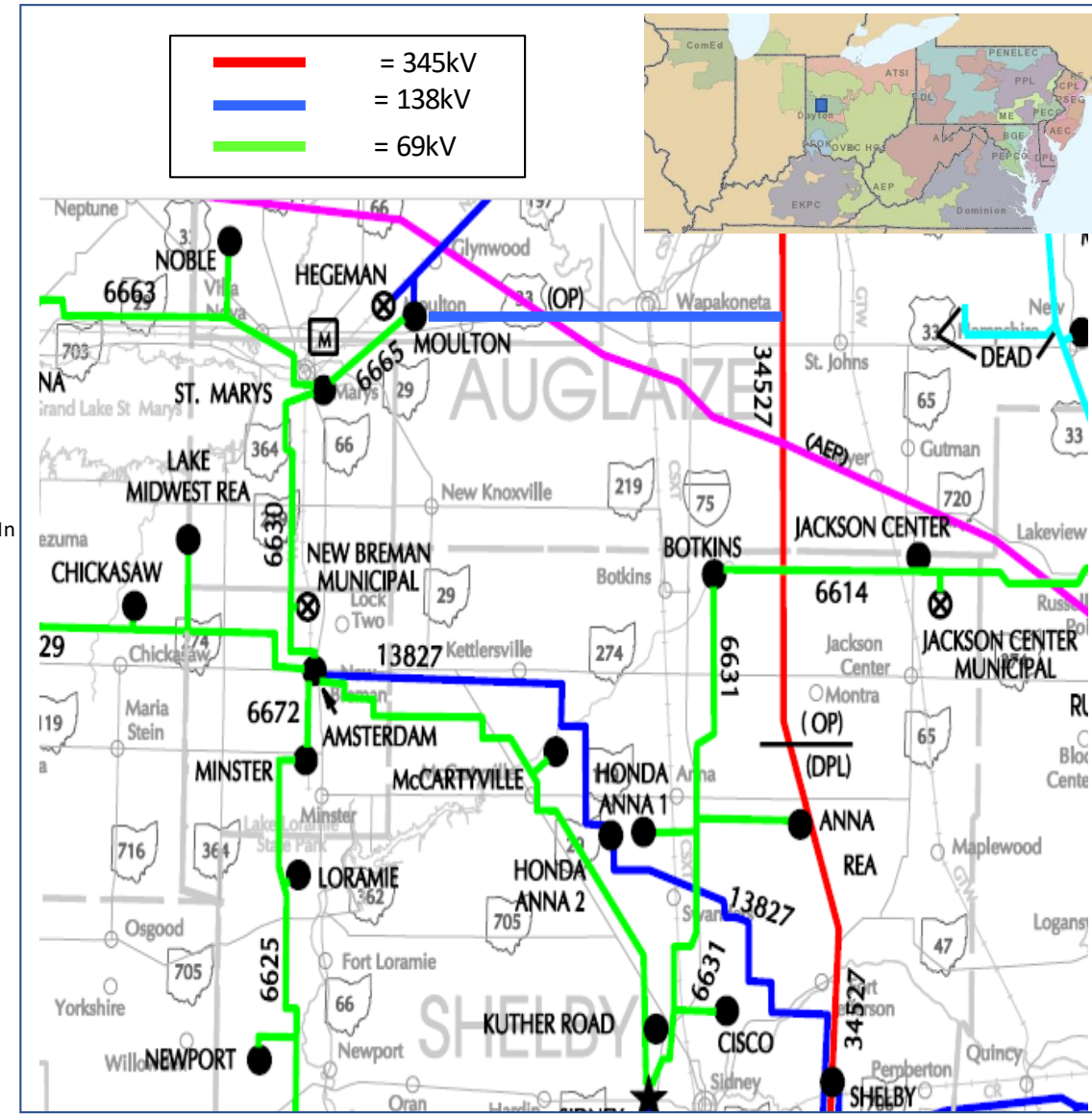
Process Stage: Need Meeting 3/19/2020

Project Driver:
Requested customer upgrade, Operational performance

Specific Assumption Reference:
Dayton Local Plan Assumptions (Slide 5)

Problem Statement:

- The Amsterdam-Shelby 138kV transmission line (13827) is approximately 26 miles long and was constructed in 1974 with wood poles.
  - A fault on any portion of this circuit will result in an outage to a large 55MW industrial customer. Depending on system conditions permanent faults on the Shelby side of the line could lead to reduced capacity to serve load for an extended duration.
  - The Amsterdam-Shelby 138kV line has experienced 2 permanent and 4 momentary outages since 2016. The permanent outages were caused by galloping conductors and an auto accident, while the momentary outages were caused by lightning and an animal.
  - The Amsterdam-Shelby 138kV line is critical in providing a 138kV source into the NW area of the DP&L transmission system. In this rural area, there are limited sources and an outage to this source combined with other area outages can lead to operational voltage and loading issues. This contingency is regularly trending in real-time operations and has occurred. Galloping conductors have been problematic in this area causing multiple 69kV outages over the past 2 years causing operational issues to surface.
- Transmission line equipment issues have been identified along the Amsterdam-New Bremen-St Marys 69kV line (6630) related to vintage cross-arm design and bracing of transmission poles at the base.
  - The 6630 line was constructed in 1970 and is ~8 miles long.
  - This line has experienced 2 permanent and 2 momentary outages since 2016. The majority of the outages were caused by equipment failure.
  - The Village of New Bremen has a peak load of ~20MW of load
  - This corridor serves as a key tie between the Ohio Power and Dayton systems in this area.
- The Village of Minster is served from two sources, the Covington-Minster-Rossburg 69kV line (6625) and the Amsterdam-Minster 69kV line (6672). During winter storm conditions and with galloping lines in this area, Minster has lost both transmission feeds.
  - The Village of Minster serves ~1,500 customers and has a peak load of ~25MW of load.
  - The 6672 line is ~1.7 miles long and is 1970's cross-arm design and ties into the strongest area source at Amsterdam Sub.
  - The 6672 line has experienced 5 outages, 4 momentary and 1 permanent, since 2016. The majority of the outages were caused by weather, including the permanent outage which was the result of galloping conductors.



Potential Solution Slide

Need Number: Dayton-2020-006
Process Stage: Solutions Meeting 10/16/2020
Proposed Solution:

Amsterdam-West Moulton 138kV & Sidney-Honda Anna 138kV: The proposed solution is to rebuild the Amsterdam-St. Marys-West Moulton and Sidney-Amsterdam transmission corridors to double circuit which will help enhance reliability to customers in the North Dayton Area. The project will entail rebuilding existing 69kV transmission line facilities, replacing terminal equipment, and adding new 138kV circuits to each corridor. The rebuild of the Amsterdam-St. Marys-West Moulton corridor and replacement of in-line 69kV switches will be 13 miles and the rebuild of the Sidney-Amsterdam corridor will be 8 miles long stopping near Honda Anna where a single circuit 138kV will be extended to the new substation. At Sidney Substation, a 138kV ring bus will be created which will help alleviate a single outage taking out the source to the Sidney area and provides a diverse additional source to the North Dayton area. The additional sources and rebuild of critical infrastructure will help avoid potential extended outages and improves service to customers in this area. Further these improvements will provide operational flexibility and capacity to handle outage scenarios in the North portion of our service territory which has been prone to multiple and extended outage scenarios during winter ice storms.
Estimated Transmission Cost, Amsterdam-St. Marys-West Moulton: $23.9M, ISD 06/01/2024
Estimated Transmission Cost, Sidney-Honda Anna & Sidney Sub: $17.8M , ISD 12/31/2024

Honda Anna Substation: Construct a new Honda Anna 138kV ring bus substation. This new substation in combination with the other area improvements will increase the reliability of service to the customer and provide greater operational flexibility to the NW system. The additional source into Honda Anna will allow greater flexibility to take system maintenance outages and increases reliability to the currently tapped load. **Estimated Transmission Cost: $7.9M, ISD 06/01/2024**

Amsterdam Substation: This solution will expand the Amsterdam substation to include the new 138kV line and 13827 line in a ring bus arrangement. Also, it will replace the existing Amsterdam transformer and add a second 138/69kV transformer to the substation to ensure redundancy for the 138kV source being added to the area. The 69kV bus would be reconfigured to ensure adequate bus ties and to convert to a more standard design. The existing capacitor will be replaced with two smaller 16MVAR capacitors which will help minimize area voltage changes when the capacitors are switched online. **Estimated Transmission Cost: $9.3M, ISD 06/01/2024**

6672 Rebuild: To address the condition issues on 6672, the solution is to rebuild the 69kV line and associated terminal equipment replacements at Amsterdam and Minster Substations. The new line will help ensure more resilience during winter weather events. **Estimated Transmission Cost: $2.7M, ISD 6/1/2024**

West Moulton Substation : AEP will install an additional 3000A, 63kA circuit breaker to their ring bus being constructed as part of the City of Wapakoneta Project (s1856) **Estimated Transmission Cost: $3.5M, ISD 06/01/2024** AEP will also install a pole outside of West Moulton Substation and a single span of line to connect the West Moulton-Amsterdam 138kV circuit. **Estimate Transmission Cost: $0.25M, ISD 06/01/2024**

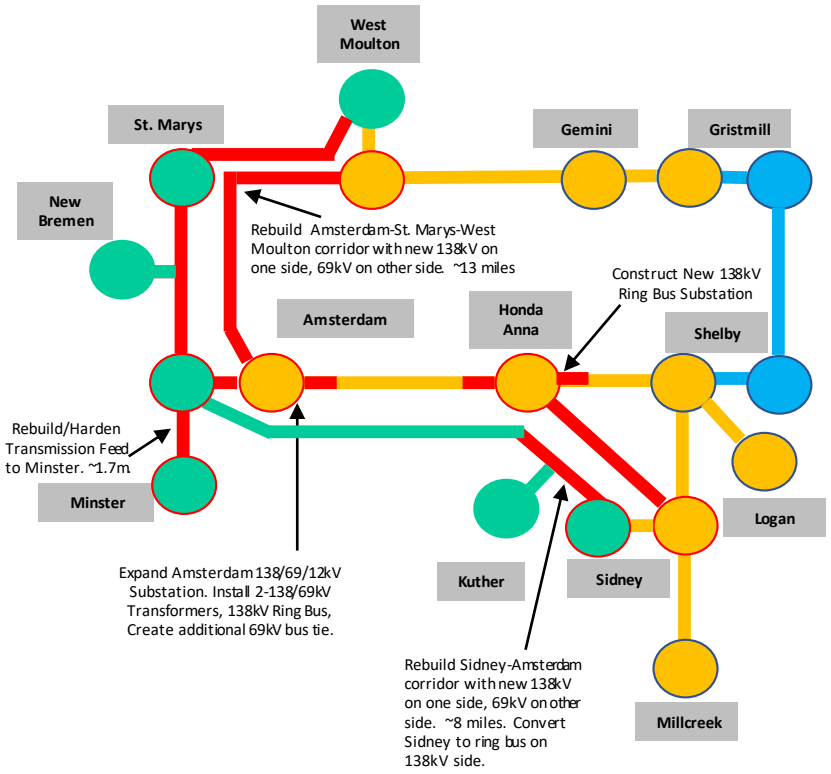
Total Estimated Cost: $65.35M
Alternatives Considered:

1. New Double Circuit 138kV line from West Moulton to Amsterdam, Honda Anna & Amsterdam Sub Upgrades, 6630 Amsterdam-New Bremen Rebuild, 6672 Rebuild. Not Selected due to lack of redundancy and does not address condition/performance issues. **Estimated Cost $61.9M**
2. New Double Circuit from West Moulton to Amsterdam (69kV on one side (6630/65), 138kV West Moutlon-Amsterdam), Second Shelby-Honda 138kV, Honda Anna, Shelby, West Moulton, & Amsterdam Sub Upgrades, 6672 Rebuild. Not Selected due to lack of redundancy and does not address condition/performance issues. Estimated Cost $66.6M

Projected In-Service: 12/31/2024

Project Status: Conceptual

Model: 2019 RTEP – 2024 Summer Case



Need Number: Dayton-2020-008
Process Stage: Needs Meeting
Date: 7/17/2020

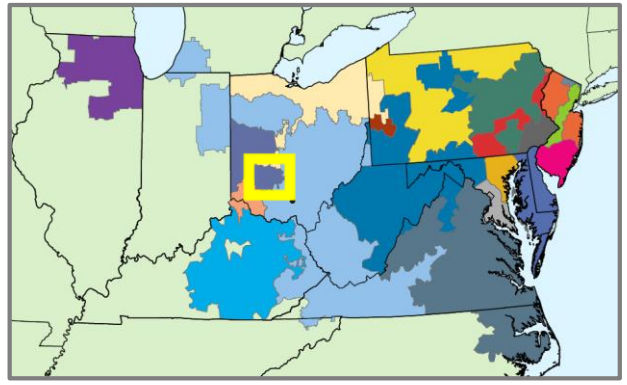
Supplemental Project Driver(s):
New Customer Delivery Point

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

Problem Statement:

- Buckeye Power, on behalf of South Central Power, has requested a new transmission delivery point in Fayette County, Ohio.
- The primary function of this new delivery point will be to serve existing load that is presently being served from another substation roughly 12 miles away.
- The proposed delivery point is located immediately east of DP&L's Washington Courthouse-Greenfield 69kV (6649) transmission line.
- Washington Courthouse and Greenfield substations are shown in Figure 1 where the 69kV lines are marked in green and the approximate location of the new delivery point is highlighted with a yellow star on the map.
- Initial loading of the proposed delivery point is projected to be 3 MW and emergency loading could be up to 5MW.
- Service to the new delivery point is required by June 2022.

Model: 2020 RTEP Series, 2025 Summer Case



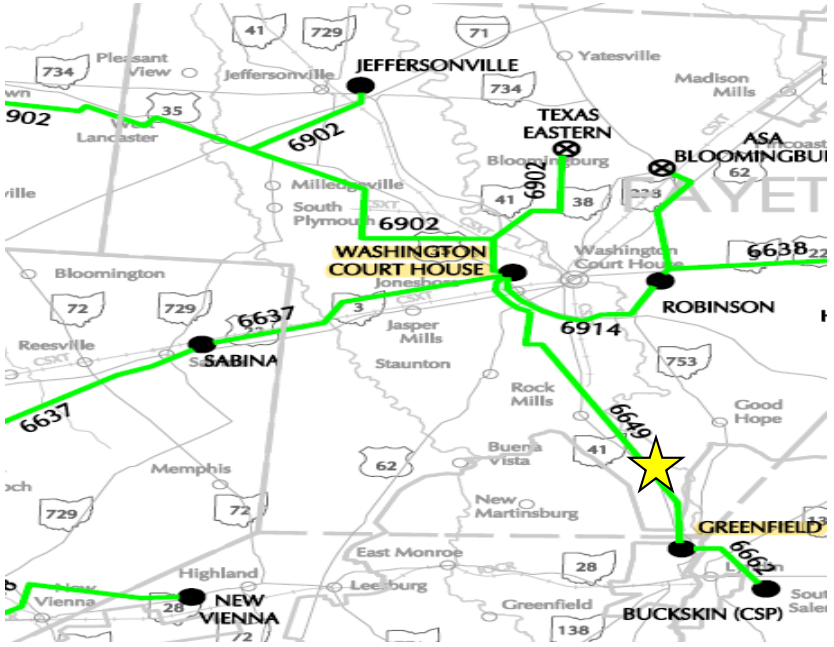


Figure 1 : Area Map

Need Number: Dayton-2020-008

Process Stage: Solutions Meeting 10/16/2020

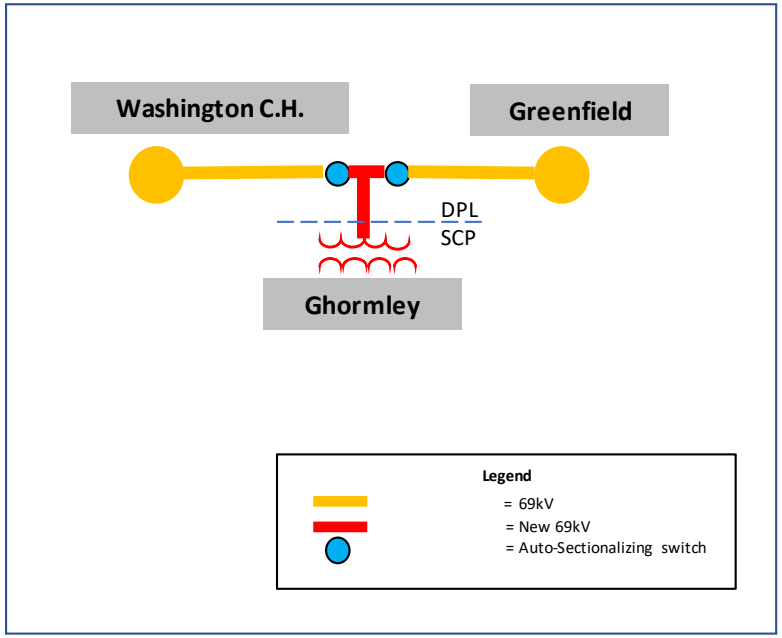
Proposed Solution:

- DP&L plans to tap the Greenfield-Washington Courthouse 6649 69kV line and will install 3 new poles with a set of 1-way switches on each new structure to serve a new South Central Power Ghormley Delivery Point.
- The new switch installation will have automatic sectionalizing controls to restore to the Ghormley Delivery Point for faults on either the Washington Courthouse or Greenfield side of the line.

The project is estimated to cost $350k.

Alternatives Considered:

- Build a new 3-breaker 69kV ring bus substation tapping the existing Greenfield-Washington Courthouse 6649 DP&L transmission line to service the Ghormley Delivery Point. This option was not selected due to the higher cost, $3.5M



Projected In-Service: 6/1/2022

Project Status: Conceptual

Model: 2020 RTEP – 2025 Summer Case

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

10/6/2020 – V1 – Original version posted to pjm.com

10/13/2020 – V2 – Slide #6, Corrected solution date, Updated bubble diagram, Added total estimated cost

2/23/2021 – V3 – Slide #6, Corrected “Shelby-Honda Anna” to “Sidney-Honda Anna”