



Sub Regional RTEP Committee Western Region DEOK

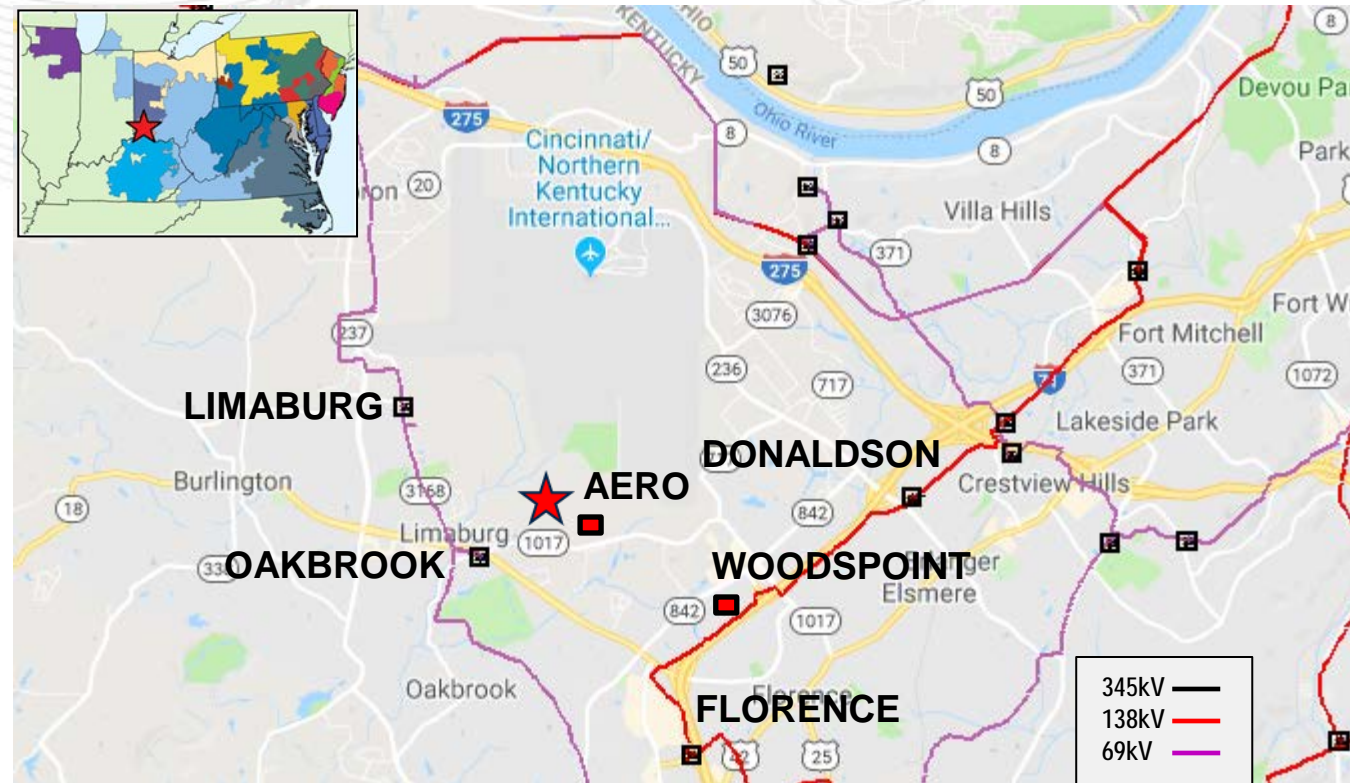
January 11, 2019

Need Number: DEOK-2018-001
Process Stage: Solutions Meeting
Date: 01-11-2019

Supplemental Project Driver: Customer Service

Specific Assumptions Reference: Serving new customer load

Problem Statement: Amazon Prime Air has requested distribution service (13kV) for a new air hub to be located at the Cincinnati/Northern Kentucky International Airport. Initial demand is projected to be 30 MW with phased growth to 80 MW.

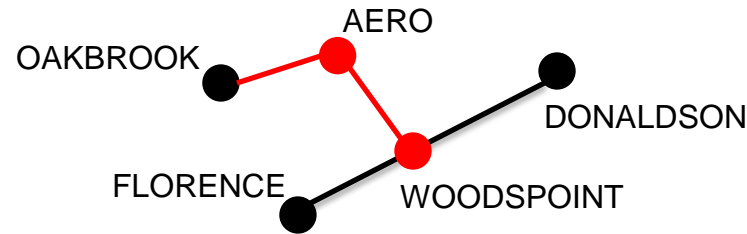
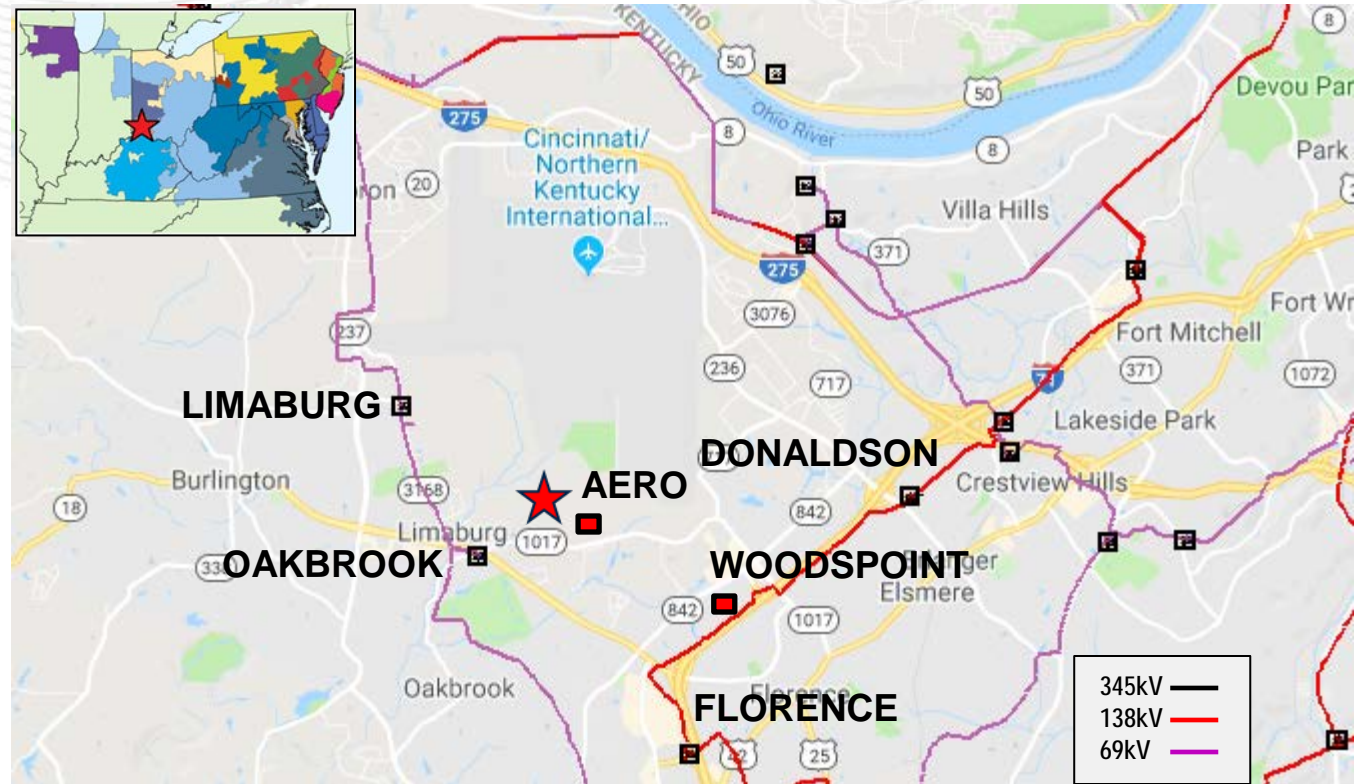


Need Number: DEOK-2018-001
Process Stage: Solutions Meeting
Date: 01-11-2019

Proposed Solution: Install a new 138kV, 3-breaker ring bus substation, Woodspoint. Install a new 138kV, 6-breaker ring bus, Aero, near Amazon Prime Hub. Install new 138kV lines from Woodspoint to Aero, and from Aero to Oakbrook. The lines will be rated at 301MVA. At AERO install four 138/13kV, 22MVA transformers. At Oakbrook install one 138/69kVA, 150MVA transformer with high side and low side breakers.

Alternatives: The 69kV system in the area does not have the capacity to serve the requested 80MWs.

Estimated Transmission Cost: \$ 30,159,604
Projected In-Service: 12-31-2020



Need Number: DEOK-2018-002

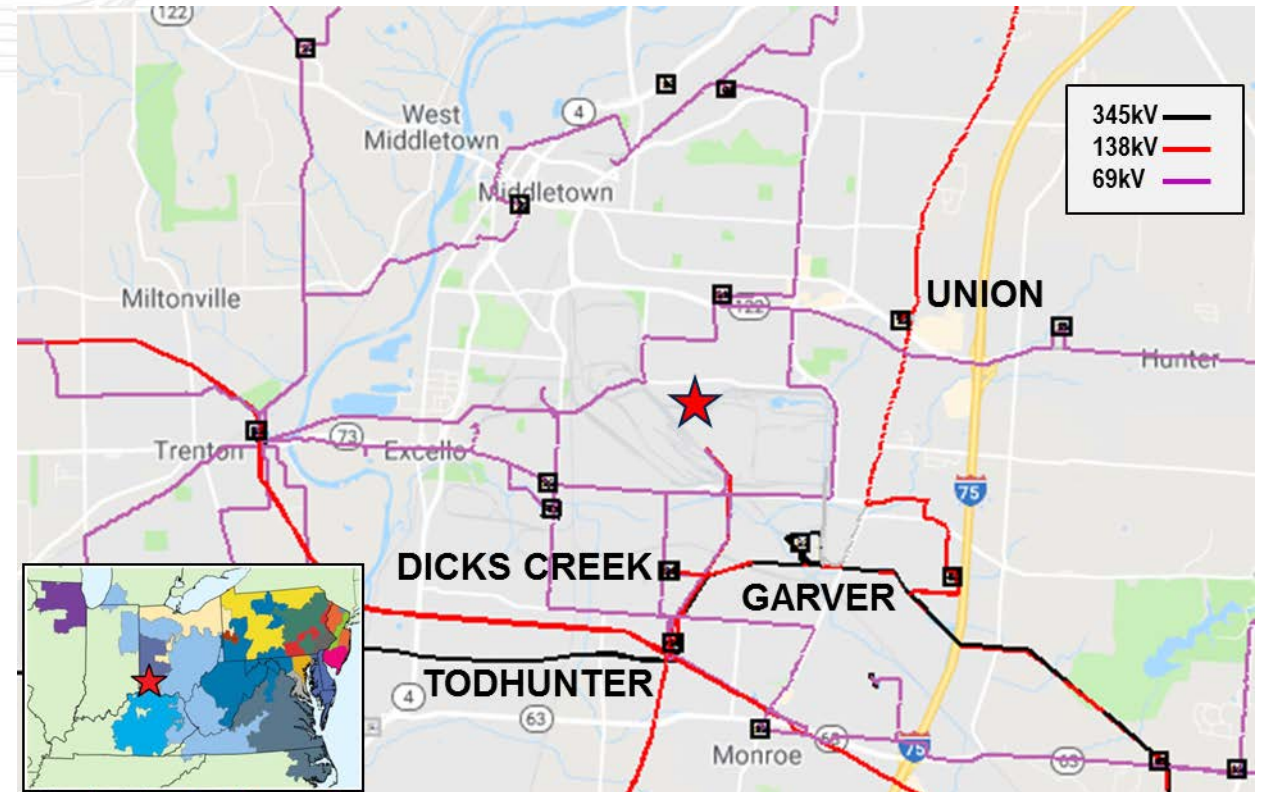
Process Stage: Solutions Meeting

Date: 01-11-2019

Supplemental Project Driver: Operational Flexibility and Efficiency, Infrastructure Resilience, Customer Service

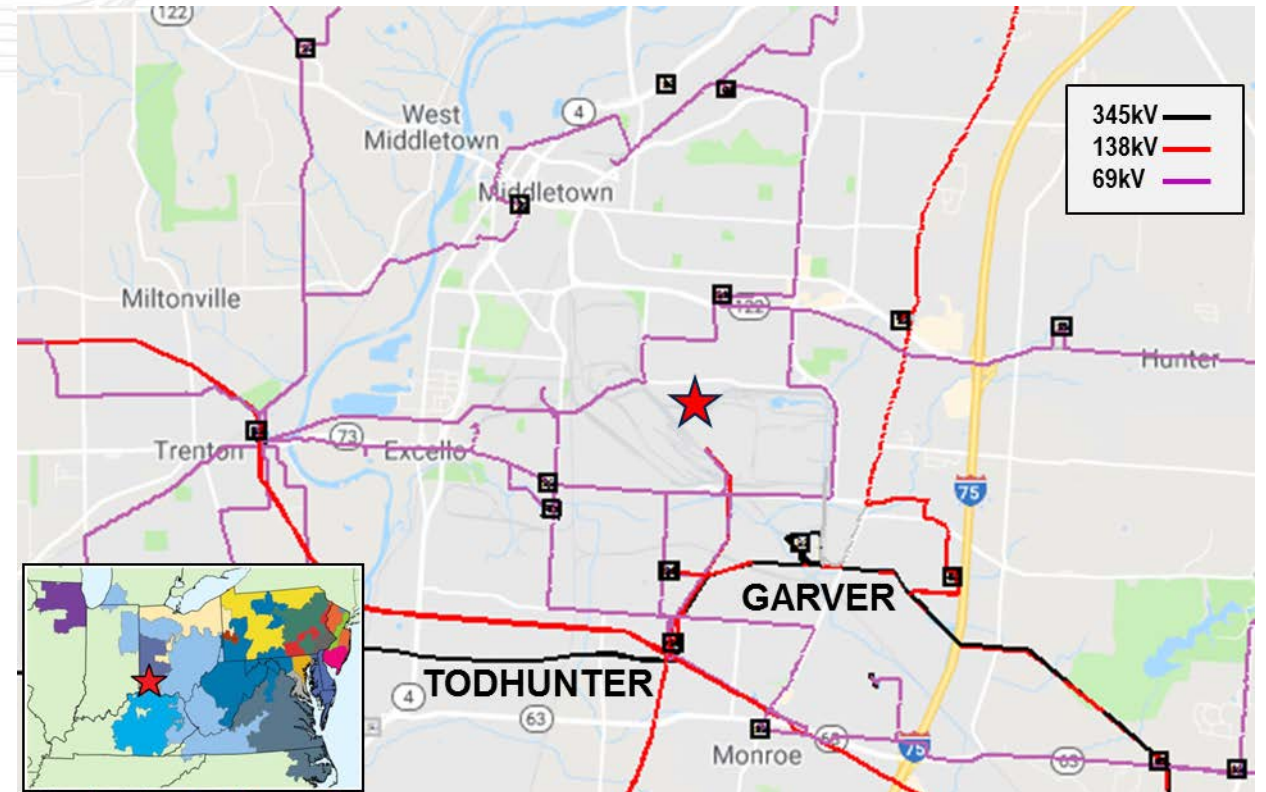
Specific Assumptions Reference: Operational options for switching, Diversify sources and source paths to load areas

Problem Statement: Large industrial customer (200+ MW) is supplied by two 138 kV circuits. The circuits are fed from Todhunter on shared towers. Planned maintenance work on each circuit will require extended outages. The customer is at risk of complete interruption if the remaining circuit experiences an outage. Customer advises that complete interruption would have grave consequences on customer's processes potentially leading to ceasing operations (closure of plant). Customer also advises that a minimum of 75MWs is required for a safe shutdown of equipment



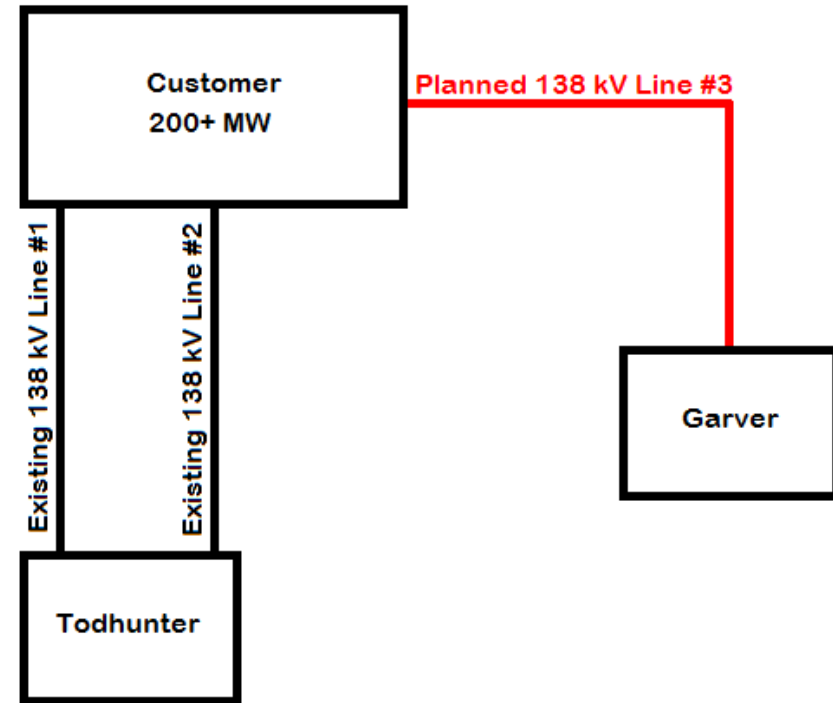
Need Number: DEOK-2018-002
Process Stage: Solutions Meeting
Date: 01-11-2019

Proposed Solution: Install a 138kV feeder from Garver substation to the customer. This 3rd feeder has enough capacity to allow full production or safe shutdown of the plant without the loss of equipment. This will also allow planned maintenance or emergent work to be preformed at Todhunter substation without the need to wait for a plant shutdown, benefitting all customers. Scope: Build 1.2 mile, 138kV, 301MVA feeder on an existing Duke right of way to the customer's property. Install two 138kV breakers and associated equipment at Garver substation.



Need Number: DEOK-2018-002
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Alternatives: Provide an emergency source from the local 69kV system for plant shutdown. The minimum requirement of 75 MW was too close to the 78 MVA capacity of the Duke mobile transformer (which has no overload capacity), necessitating the installation of the Duke spare 150 MVA transformer. The temporary installation of the spare transformer on the customer's site would have presented many technical and operational challenges. It would have made unavailable the Duke spare transformer for at least 6-8 months. The 69 kV system in the area would have to be operated in a non-standard configuration for the entire time the temporary transformer was installed to enable back-up service to be supplied quickly if needed. Although feasible in theory, supplying the back-up demands from the 69 kV system would heavily stress the system. While a total cost was not calculated, it was expected it would easily exceed seven figures, which would have been a sunk cost providing no long term value after completion of the project.

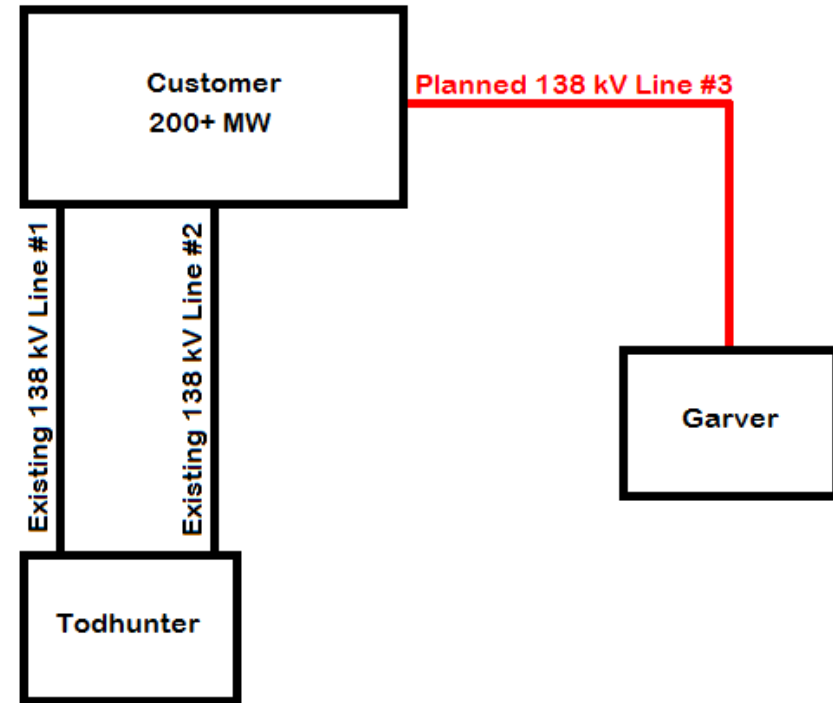




DEOK: Supplemental Garver

Need Number: DEOK-2018-002
Process Stage: Solutions Meeting
Date: 01-11-2019

Estimated Transmission Cost: \$ 7,560,154
Projected In-Service: 12-31-2019





Revision History

12/26/2018 – V1 – Original version posted to pjm.com

3/19/2019 – V2

- Slides #2, 3, Change to DEOK-2018-0001 to DEOK-2018-001
- Slides #4-7, Change to DEOK-2018-0002 to DEOK-2018-002