#V3-010 Delaware-Modoc 138kV

Generation Interconnection

This analysis was completed to assess the reliability impact for the new generation interconnecting to the PJM system as a capacity resource.

Local AEP Impacts

Unlike PJM, AEP performs AC analysis for interconnection projects in the feasibility stage. In analyzing the V2-019A Project with all other Wind Interconnection Projects in the AEP's footprint at 13-20% (based on the queue position) of their total capacity, AEP discovered 153 new overloads on the AEP bulk (100 kV and above) system. Furthermore, there were several contingencies that did not converge and the project contributed to several existing overload conditions on the AEP system. A detailed report of the AC Contingency analysis for V2-019A was shared by AEP. PJM, on the other hand, only recognized 3 of the 153 ***new*** overloads on the AEP system. Considering the extensive differences between AEP's and PJM's analyses and methodologies, AEP is unable to verify or confirm PJM's analyses for V2-019A and the subsequent projects, including V3-010.

AEP is providing the requested information for the V3 interconnection projects without confirming or denying PJM's results to comply with PJM's request on attachment facilities and transmission improvements that address system conditions identified by PJM. Please note that these transmission improvements are based on the information shared by PJM and are therefore preliminary in nature. The extent of improvements needed for the interconnection may vary by type of project and its position in the queue. AEP will work with PJM to resolve the differences in results in the Impact Study stage.

Network Impacts

The queue V3-010 project was studied as a 100MW (13MW of which was capacity) injection into the 345kV AEP system between the Delaware and Modoc substations (circuit #2). Project V3-010 was evaluated for compliance with reliability criteria for summer peak conditions in 2014. Potential network impacts were as follows:

PJM utilizes a DC analysis to determine thermal overloads in the Feasibility Study stage of a project.

Generator Deliverability
(Single or N-1 contingencies for the Capacity portion only of the interconnection)

No problems identified

Multiple Facility Contingency
(Double Circuit Tower Line, Line with Failed Breaker and Bus Fault contingencies for the full energy output)

No problems identified

Short Circuit
(Summary form of Cost allocation for breakers will be inserted here if any)

1. The addition of the V1-010 project causes the short circuit duty on the Delaware "T" 138kV circuit breaker to increase to 100.2% of its rated capability.

Contribution to Previously Identified Overloads

(This project contributes to the following contingency overloads, i.e. "Network Impacts", identified for earlier generation or transmission interconnection projects in the PJM Queue)

None

New System Reinforcements

(Upgrades required to mitigate reliability criteria violations, i.e. Network Impacts, initially caused by the addition of this project generation)

1. The overdutied condition on the Delaware "T" 138kV circuit breaker can be alleviated by replacing the circuit breaker with one of higher interrupting rating. The ccost of replacement (estimated by PJM) is **$200,000.**

Contribution to Previously Identified System Reinforcements

(Overloads initially caused by prior Queue positions with additional contribution to overloading by this project. This project may have a % allocation cost responsibility which will be calculated and reported for the Impact Study)
(Summary form of Cost allocation for transmission lines and transformers will be inserted here if any)

None