

S45 – Mechanicsburg North Generation Interconnection

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

Network Impacts

The Queue S45 project was studied as an injection of 140 MW (28 MW of capacity) at Kings Creek 69 kV substation. Project S45 was evaluated for compliance with reliability criteria for summer peak conditions in 2012. Potential network impacts were as follows:

Generator Deliverability

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

1. The Woodstock – Marysville 69 kV line is overloaded to 109 % of its emergency rating (55 MVA) for the outage of the Darby 138/69 kV transformer.

Multiple Facility Contingency

(Double Circuit Tower Line contingencies only for the full energy output. Stuck breaker and bus fault contingencies will be performed for the Impact Study)

2. The Kings Creek – Logan 69 kV line is overloaded from 68% to 113% of its emergency rating (117 MVA) for the **tower** outage of Miami – Bath 345 kV line and the New Carlisle – Miami 138 kV line DTCL (Contingency ID: DAYTON_TOWER_11). This project contributes approximately 52 MW to cause the thermal violation.
3. The Woodstock – Marysville 69 kV line is overloaded to 163% of its emergency rating (55 MVA) for the **tower** contingency outaging the Greene – Beatty & Adkins – Beatty circuits.

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)

No problems were identified.

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 Kingscreek-Logan 69 kV circuit was identified as requiring an upgrade to mitigate reliability criteria violations with the proposed wind farm in place.

2. The Woodstock – Marysville 69 kV circuit was identified as requiring an upgrade to mitigate reliability criteria violations with the proposed wind farm in place.

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)

3. This project contributes to the following upgrade previously caused by the R52 project and may share a cost allocation:

Short Circuit

3 of the 4 breakers identified as over-duty as a result of Queue R52 generation will be further overdutied by the S45 project:

1. Urbana 69kV breakers DB-BH1, DB-BH3E, and DB-BH3W.

Delivery of Energy Portion of Interconnection Request

PJM also studied the delivery of the energy portion of this interconnection request. Any problems identified below are likely to result in operational restrictions to the project under study. The developer can proceed with network upgrades to eliminate the operational restriction at their discretion by submitting a Merchant Transmission Interconnection request.

As a result of the aggregate energy resources in the area, the following violations were identified:

1. Contribution of 52 MW further overloads the Kingscreek – Logan 69 kV line from 54% to 108% of its normal rating (96 MVA).
2. Contribution of 56 MW further overloads the Kingscreek – Logan 69 kV line from 65% to 113% of its emergency rating (117 MVA) for the outage of Urbana – Clark 138 kV line.