

#U4-001 Howard-Fostoria Central 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.

Network Impacts

The Queue Project #U4-001 was studied as a(n) 200.0MW (Capacity 26.0MW) injection at Howard 138 kV substation in the AEP area. Project #U4-001 was evaluated for compliance with reliability criteria for summer peak conditions in 2013. Potential network impacts were as follows:

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)

No problems identified.

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 identified except for the local network problems identified above.

New System Reinforcements

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

None

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

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.

Note: Only the most severely overloaded conditions are listed below. There is no guarantee of full delivery of energy for this project by fixing only the conditions listed in this section. With a Transmission Interconnection the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed that shall study all overload conditions associated with the overloaded element(s) identified.

There is the potential that the U4-001 project could have a cost allocation toward the network upgrade that alleviate the overloads listed below.

1. **(APS)** The Sammis-Wylie Ridge 345kV line (from bus 239092 to bus 20709 ckt 1) loads from 100.98% to 101.18% (DC power flow) of its emergency rating (1483MVA) for the single line contingency outage ('APS-SB-682'). This project contributes approximately 22.3MW to the thermal congestion.

The mitigation for this overload is to install 6.9 miles of high temperature conductor on the empty side of the Sammis-Wylie Ridge 345kV circuit. The cost of this upgrade as estimated by PJM is **\$10.5 million**.

Reactive Requirements

PJM requires a power factor correction to 95% lead/lag at the point of interconnection for wind generating facilities. It is expected that BP Alternative Energy will adhere to this standard

MISO Impacts

Any impacts on the MISO transmission system will be identified in the Impact Study.