Generation Interconnection Feasibility Study Report

For

PJM Generation Interconnection Request Queue Position V3-016

Greenville-West Milton 138kV

January 2010
DOCS 576894v1

General

The Developer, has proposed the construction of a 300 MW (39 MW Capacity) wind powered generation facility in Darke County, Ohio. The proposed in-service date for this facility is August 1, 2012.

Network Impacts

The queue V3-016 project was studied as a 300MW (39MW of which was capacity) injection into the 138kV Dayton system between the Greenville and West Milton substations. Project V3-016 was evaluated for compliance with reliability criteria for summer peak conditions in 2014. 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 contingencies only for the full energy output. Stuck breaker and bus fault contingencies will be performed for the Impact Study)

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.

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

There were no reinforcements required as a result of the analysis of the transmission system performed by PJM.

The Transmission Owner's analysis of this project revealed 2 new overloads caused by V3-016. These overloads are caused by a tower line contingency for the full energy output (300MW). The first of these overloads is on the Greenville-Hursch Rd. facility. The second is on the Hursch Rd.-West Manchester facility. To complete this project, upgrades to the conductors at these facilities would be required at a cost of $3,804,000 – $5,072,000. These cost estimates include the Tax Gross-up. The schedule for

completion of this work is eight (8) months from start of work to energizing of the facilities.

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)

None.

Short Circuit

PJM has completed the short circuit analysis of the V3-016 queue project Greenville-West Milton 138kV. One option was considered during this study: the option was a tap of the Greenville-West Milton 138kV line. Our analysis found no new breakers to be over-duty in the Dayton transmission area.

The study also showed no significant fault current contribution to the breakers which have already been identified as over-duty. This study was performed on the 100kV and above system.

Dayton also found no new breakers to be over-duty in its transmission area for this project. The study also showed no significant fault current contributions.

Potential Congestion due to Local Energy Deliverability
(PJM also studied the delivery of the energy portion of the surrounding generation. Any potential 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 Transmission Interconnection Request. Note: Only the most severely overloaded conditions are listed below. There is no guarantee of full deliverability for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed which analyzes all overload conditions associated with the identified overloaded element(s). As a result of the aggregate energy resources in the area, the following violations were identified:

1. The 09GRNVIL 138/69kV transformer (from bus 253029 to bus 253028 ckt 1) loads from 0.06% to 181.76% (DC power flow) of its emergency rating (165MVA) for the operational contingency ('OUTAGE_32A_V3-016A') as a result of V3-016. This project contributes approximately 300MW to cause this thermal violation.

2. The 09WMILTN-09MIAMI 138kV line (from bus 253089 to bus 253046 ckt 1) loads from 68.07% to 104.89% (DC power flow) of its emergency rating (330MVA) for the operational contingency ('OUTAGE_20') as a result of V3-016. This project contributes approximately 121.6MW to cause this thermal violation.

3. The 09CVNGTN-09PIQUA 69kV line (from bus 253016 to bus 253064 ckt 1) loads from 46.53% to 113.27% (DC power flow) of its emergency rating (81MVA) for the operational contingency ('OUTAGE_32A_V3-016A') as a result of V3-016. This project contributes approximately 54.1MW to cause this thermal violation.

4. The V3-016 TAP-09WMILTN 138kV line (from bus 293354 to bus 253089 ckt 1) loads from 0.04% to 109.45% (DC power flow) of its emergency rating (274MVA) for the operational contingency ('899_B3') as a result of V3-016. This project contributes approximately 300MW to cause this thermal violation.

Direct Connections/Attachment Facilities

The estimate of the cost to develop a tapped substation with metering and a single breaker with proper relaying is approximately $750,000. The schedule for this work is estimated to be 12 months.

SINGLE LINE DIAGRAM