Generation Interconnection
Feasibility Study Report
Queue Position X3-041

The Interconnection Customer (IC) has proposed a 14.9 MWE (5.7 MWC; 14.9 MW MFO) solar powered generating facility to be located in Milton, Delaware. PJM evaluated the X3-041 project's impact on the transmission system by studying it as a 14.9 MW injection into the Delmarva Power and Light (DPL) system at the Lank 69kV substation. The project was evaluated for compliance with reliability criteria for summer peak conditions in 2015. The planned in-service date, as stated in the Attachment N, is April 1, 2012.

Attachment facilities and local upgrades (if required) along with costs, schedule, terms and conditions to interconnect X3-041 will be specified in a separate two party interconnection agreement between the Delaware Electric Cooperative (DEC) and the Interconnection Customer.

Point(s) of Interconnection

X3-041 will interconnect with the Delmarva Power and Light Company's transmission system at the Lank 69kV substation through the Delaware Electric Cooperative's distribution system.

Direct Connection Requirements

Transmission Owner Scope of Work

There is no direct connection scope of work for Delmarva Power and Light Company.

Interconnection Customer Scope of Work

The Interconnection Customer assumes full responsibility for design and construction of all facilities associated with the X3-041 generating station and the direct connection line on the IC side of the Point of Interconnection.

The IC will be required to install metering and telemetry equipment to provide revenue metering and real-time telemetry data to PJM. The requirements for this equipment are listed in Appendix 2, Section 8 of Attachment O to the PJM Tariff, as well as PJM Manuals 01 and 14D. Protective relaying and metering design and installation must comply with PHI.

Transmission Network Impacts

Potential transmission network impacts are as follows:

Generator Deliverability

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

None

Multiple Facility Contingency

*(Double Circuit Tower Line, Line with Failed Breaker and, Bus Fault contingencies for the **Full** energy output.*

None

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)

1. The (DP&L) Milford-Steele 230 kV line (from bus 232004 to bus 232000 ckt 1) loads from 182.66% to 184.09% (DC power flow) of its emergency rating (551 MVA) for the tower contingency 'DBL_4NC'. This project contributes approximately 7.90 MW to the thermal violation.

Short Circuit

No issues identified.

Stability Analysis

Not required due to project size.

New System Reinforcements

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

None

Contribution to Previously Identified System Reinforcements

(Overloads initially caused by prior Queue positions with additional contribution to overloading by this project. The costs identified below represent the total to complete the reinforcement, not necessarily this project's cost. Actual cost allocations will be deferred until the System Impact Study is performed.

1. To mitigate the (DP&L) Milford-Steele 230 kV line (from bus 232004 to bus 232000 ckt 1) overload will require reconductoring the circuit. The estimate cost to perform this work is **$35, 000,000** and will take **30 months** to complete.

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:

These are ***not*** required reliability upgrades.

None