

Generation Interconnection Feasibility Study Report Queue Position V4-009

General

The Interconnection Customer (IC), has proposed a 20 MWE (7.6 MWC) solar powered generating facility consisting of fixed panel solar arrays to be located in Upper Deerfield Township, Cumberland County, New Jersey. PJM studied V4-009 as a 20 MW injection into the Atlantic City Electric's transmission system at the Laurel 12.9 kV substation and evaluated the project for compliance with reliability criteria for summer peak conditions in 2014. The planned in-service date as identified in the Attachment N is June 30, 2010.

Point of Interconnection

V4-009 will interconnect with the Atlantic City Electric distribution system at the Carll's Corner and Laurel St. 69/12kV substations.

Direct Connection Requirements

Transmission Owner Scope of Direct Connection Work

The scope of work and estimated costs for the direct connection facilities is as follows:

1. Construct three (3) new dedicated 12kV feeders with 500 CU PAC aerial cables between the Interconnection Customer's (IC) generating site and the Carll's Corner and Laurel St. 69/12kV substations. The estimated cost to perform this work is **\$3,978,000**.
2. Install a 42/45 MVA 69/12kV transformer and feeder terminal at the Laurel St. 69/12kV substation. The estimated cost to perform this work is **\$2,500,000**.
3. Install two (2) new feeder terminals at the Carll's Corner 69/12kV substation for the new dedicated 12kV feeders. The estimated cost to perform this work is **\$200,000**.
4. Install a utility operated recloser with relaying and communication equipment on each feeder. The estimated cost to perform this work is **\$150,000**.
5. Install utility grade primary metering on each feeder. The estimated cost to perform this work is **\$60,000**.
6. Install a SCADA point addition to the Control Center for each feeder with disconnect capability. The estimated cost to perform this work is **\$30,000**.

7. Perform system protection planning, transfer trip work, and dynamic study. The estimated cost to perform this work is **\$80,000**.

The total estimated cost to perform the above work is **\$6,998,000**. The estimated time to complete the work is **6 to 12 months** following receipt of a fully executed Interconnection Services Agreement and Interconnection Construction Service Agreement.

Note: the above cost does not include the Contribution in Aid of Construction (CIAC) tax.

Interconnection Customer Scope of Direct Connection Work

The Interconnection Customer assumes full responsibility for design and construction of all facilities associated with the V4-009 generating station on their side of the POI. Site preparation including grading and an access road, if necessary, is assumed to be by the IC.

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 Atlantic City Electric Applicable Standards.

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)

None

Short Circuit

Not required.

Dynamic Analysis

A time based dynamic study will be completed during the System Impact Study phase of V4-009.

AC injection into the grid must follow a ramp up rate that does not negatively affect the distribution system. An inverter capable of dynamic VAR output with Drop and Time Delay settings will be required. Further study will be required to review the impact to the grid under all output scenarios and grid load profiles. The proposed project will be reviewed for protection and coordination issues and any other required upgrades will be identified in future studies.

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.)

None

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.

1. The Gloucester 230/138kV transformer (from bus 219110 to bus 219117 ckt 1) loads from 99.97% to 100.03% (DC power flow) of its emergency rating (341MVA) for the operational contingency ('PJM89_A') as a result of V4-009. This project contributes approximately 0.2MW to cause this thermal violation.