Generation Interconnection
Feasibility Study Report
Queue Position X2-056

The Interconnection Customer (IC), has proposed a 1.94 MWE (0 MWC; 1.94 MW MFO) solar powered generating facility consisting of ground mounted fixed panel solar arrays to be located in Greenwich, New Jersey. PJM studied X2-056 as a 1.94 MW injection into the Atlantic City Electric (ACE) system at the Roadstown 12kV substation and evaluated the project for compliance with reliability criteria for summer peak conditions in 2015. The planned in-service date, as stated in the Attachment N, is December 31, 2012.

Point(s) of Interconnection

X2-056 will interconnect with the Atlantic City Electric system at a new transformer in the Roadstown 69/12kV substation.

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. Establish one new 12 kV feeder with 954 aluminum conductor from the Roadstown Substation to the generating site – approximately 4.9 miles. The preliminary estimate includes 25,000 ft of 954 AAC distribution overbuild.
2. Install a new 37 MVA transformer at Roadstown.
3. A utility operated recloser will be required on the customer tap that will have proper relaying and communication.
4. Utility grade primary metering will be required.
5. Generation telemetry and remote trip capabilities will be provided to the control center.
6. Perform a detailed time based study.
7. Protection, Planning, and other engineering departments will perform studies, design work, and prepare engineering estimates.
8. Transfer trip may be required.

The estimated cost to perform this work is:

Estimated Costs			
Roadstown Substation Tx			
New Transformer			$4,332,000
954 AAC Express Feeder		Miles	$2,800,000
Fiber Installation	4.7	Miles	$235,000
Recloser w/ Relaying and Communications			$50,000
Utility Grade Metering			$20,000
SCADA Integration into EMS			$10,000
Detailed Time Based Study			$30,000
Various Departments Work			$20,000
Subtotal Cost			$7,497,000
Subtotal Cost with 18% Overheads			$8,846,460
Approximate Total Cost with 15% Contingency			$10,173,429

The estimated time to complete this work is **12-18 months** for the new substation after receipt of a fully executed interconnection agreement.

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

Special Operating Requirements

1. The Interconnection Customer will grant its permission to PJM for PJM to send PHI the following telemetry data that the Interconnection Customer sends to PJM: real time megawatts, megavars, 3 phase volts, 3 phase amperes and status, and interval megawatt-hours, and megavar-hours.

2. The Interconnection Customer will be required to make provisions for a voice quality phone line within approximately 3 feet of each Company metering position to facilitate remote interrogation and data collection.

Interconnection Customer Scope of Direct Connection Work

The Interconnection Customer (IC) assumes full responsibility for design and construction of all facilities on their side of the Point of Interconnection. Site preparation including grading and an access road, as 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's Applicable Standards.

Inverter Requirements and Capabilities

The Interconnection Customer's inverter shall have the following capabilities:

- Voltage flicker reduction through set non-unity power factor settings between 0.95 lead and 0.95 lag

It is the responsibility of the Developer to obtain inverters that can operate with these requirements while also meeting all applicable requirements of IEEE and UL standards such as but not limited to IEEE 1547 and UL 1741.

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)

None

Short Circuit

None

Stability Analysis

Not required due to project size.

Dynamic Analysis

A time-based dynamic study will commence during the System Impact Study phase of the project. Once complete, the results of the study will be reviewed and the proposed project will be evaluated for protection and coordination issues. Other required upgrades may be identified at that time.

Other Charges

ACE reserves the right to charge the Interconnection Customer operation and maintenance expenses to maintain the Inter Connection Customer attachment facilities, including metering and telecommunications facilities, owned by ACE.

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.

None