

Generation Interconnection Feasibility Study Report Queue Position X1-076

The Interconnection Customer (IC) has proposed an 18 MWE (6.84 MWC; 18 MW MFO) solar powered generating facility consisting of ground mounted, fixed panel, solar photovoltaic arrays. The project is to be located in East Greenwich, New Jersey. PJM studied X1-076 as an 18 MW injection into the Atlantic City Electric (ACE) system at a tap of the Deepwater -Paulsboro 69kV circuit. The project was evaluated for compliance with reliability criteria for summer peak conditions in 2015. The proposed in-service date, as stated in Attachment N, is December 31, 2012.

Point of Interconnection

X1-076 will interconnect with the Atlantic City Electric transmission system at a new 69kV three (3) breaker ring bus substation adjacent to the Deepwater-Paulsboro 69kV circuit.

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:

Substation Engineering Estimate:

Scope: Construct a 69kV three-breaker ring bus substation adjacent to the Deepwater to Paulsboro 69kV line, inclusive of a terminal position for X1-076.

Estimate: \$3,800,000

Construction Time: 24 – 36 months

Transmission Engineering Estimate:

Scope: Install a self-supporting 69kV steel pole with a concrete foundation, motor operated disconnects and a short span to PHI substation. In addition, loop the current 69kV line in and out of the new substation a distance of ¼ mile each way.

Estimate: \$425,000

Construction Time: 24 months.

Note: If location of generator is greater than 500 feet from substation, circuit breaker will be necessary.

System Protection Estimate:

Scope: Relays need to be replaced at the Deepwater and Paulsboro substations.

Estimate: \$600,000

Additional costs upon further engineering review may result. Contribution in Aid of Construction (CIAC) tax will be included upon further study.

Interconnection Customer Scope of Direct Connection Work

The Interconnection Customer (IC) is responsible for all design and construction related activities 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. Route selection, line design, and right-of-way acquisition of the direct connect facilities is not included in this report, and is the responsibility of the IC. The Interconnection Customer will be responsible for contributing to future O & M costs associated with the direct connect facilities.

Protective relaying and metering design and installation must comply with PHI's applicable standards. The IC is also required to provide revenue metering and real-time telemetering data to PJM in conformance with the requirements contained in PJM Manuals M-01 and M-14 and the PJM Tariff.

Special Operating Requirements

1. The Company will require the capability to remotely trip the generator from its System Operations facility. Such tripping may be facilitated by either a generator breaker, inverter (if so equipped), or a line recloser, depending upon the specific circumstances and the evaluation of the Company.
2. The Interconnection Customer will grant its permission to PJM for PJM to send the Company the following telemetry data that the Interconnection Customer sends to PJM: real time megawatts, megavars, volts, amperes and status, and interval megawatt-hours, and megavar-hours. For generation larger than 10 MW, a direct telemetry connection to PHI System Operations will be required via a radial connection to PHI's telecommunications system or a rented data circuit, at the Interconnection Customer's cost.
3. 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.

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

No problems 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.

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