Generation Interconnection Combined Feasibility/System Impact Study Report

For

PJM Generation Interconnection Request Queue Position X1-001

South Millville 69kV

August 2011

Preface

The intent of the Combined Feasibility/System Impact Study is to determine a plan, with approximate cost and construction time estimates, to connect the subject generation interconnection project to the PJM network at a location specified by the Interconnection Customer. As a requirement for interconnection, the Interconnection Customer may be responsible for the cost of constructing: Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM system. All facilities required for interconnection of a generation interconnection project must be designed to meet the technical specifications (on PJM web site) for the appropriate transmission owner.

In some instances an Interconnection Customer may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g. another generation interconnection or merchant transmission upgrade, may also contribute to the need for the same network reinforcement. The possibility of sharing the reinforcement costs with other projects may be identified in the Feasibility Study, but the actual allocation will be deferred until the System Impact Study is performed.

Study estimates do not include the feasibility, cost, or time required to obtain property rights and permits for construction of the required facilities. The project developer may be responsible for the right of way, real estate, and construction permit issues. For properties currently owned by Transmission Owners, the costs may be included in the study.

General

CEG Power and Gas LLC, the Interconnection Customer (IC), has proposed a 9 MWE (9 MWC; 9 MW MFO) methane gas fueled generating facility consisting of a single simple cycle combustion turbine. The project is to be located in Millville, New Jersey. PJM studied X1-001 as a 9 MW injection into the Atlantic City Electric (ACE) system at the South Millville 69 substation. 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, 2011.

Point of Interconnection

X1-001 will interconnect with the Atlantic City Electric transmission system at a new 69kV terminal at the South Millville 69kV substation (see Attachment 1).

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 new 69kV terminal at South Millville.
Estimate: $1,300,000
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
Estimate: $125,000
Construction Time: 24 months.

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

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)*

1. The (AE) Wheaton Alt Tap-Second Street #1 69 kV line (from bus 228233 to bus 228225 ckt 1) loads from 99.14% to 109.25% (DC power flow) of its emergency rating (74 MVA) for the single contingency 'SO MIL-BUT_W2-039B'. This project contributes approximately 7.48 MW to the thermal violation.

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 (AE) South Millville-Ball Foster North Tap 69 kV line (from bus 228228 to bus 228215 ckt 1) loads from 101.96% to 112.35% (DC power flow) of its emergency rating (72 MVA) for the single contingency 'SO MIL-BUT_W2-039B'. This project contributes approximately 7.48 MW to the thermal violation.

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)

1. To mitigate the Wheaton Alt Tap-Second Street #1 69 kV line overload will require an upgrade to a 69 kV strand bus and current transformer at the Second Street substation. The estimated cost to perform this work is **$250,000** and will take **18 to 24 months** to complete after receipt of a fully executed Interconnection Service Agreement and Interconnection Construction Service Agreement.

Contribution to Previously Identified System Reinforcements

(Overloads initially caused by prior Queue positions with additional contribution to overloading by this project.

1. To mitigate the (AE) South Millville-Ball Foster North Tap 69 kV line overload will require an increase in the relay rating from 74 to 79 MVA. The cost to perform this work is expected to be minimal and will be provided in a future report.

Attachment 1

X1 – 001
South Millville 69kV