Generation Interconnection Combined Feasibility and System Impact Study Report

For

PJM Generation Interconnection Request Queue Position Y2-108

"Crisfield 25kV"

February 2013

Preface

The intent of a 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 (cost allocation) with other projects will be identified in the Combined Report.

Study estimates do not include the feasibility, cost, or time required to obtain property rights and permits for construction of the required facilities. The Interconnection Customer 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

Calpine Mid-Atlantic Generation, LLC, the Interconnection Customer (IC), has proposed a 2 MW upgrade to their existing generating facility located in Crisfield, Somerset County, Maryland. The addition of the 2 MWs from Y2-108 will result in a l2 MW Maximum Facility Output; 12 MW Capacity resource. PJM studied the Y2-108 project as a 2 MW injection into the Delmarva Power and Light (DPL) system at the Crisfield 25kV substation and evaluated it for compliance with reliability criteria for summer peak conditions in 2016. The planned in-service date, as stated in the Attachment N, is June 1, 2013.

Point of Interconnection

Y2-108 will utilize the existing Point of Interconnection at the Crisfield 25kV substation (see Attachment 1).

Direct Connection Requirements

Transmission Owner Scope of Work

- **Substation Engineering Estimate**:
  Scope: Procurement and installation of new SEL-451 Relay and required wiring.
  Estimate: $65,000
  Construction Time: 12 months

Assumptions: Potentials needed from potential transformer are already in the site control house junction box and enough space exists in the control house to accommodate additional panel for new SEL-451 relay.

Interconnection Customer Scope of Work

The Interconnection Customer assumes full responsibility for design and construction of all facilities associated with the Y2-108 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 DPL applicable standards.

Special Operating Requirements

1. The Company (the 'Company' referring to ACE, DPL, or PEPCO) will require the capability to remotely disconnect the generator from the grid by communication from its System Operations facility. Such disconnection may be facilitated by either a generator breaker, a line recloser, or other method depending upon the specific circumstances and the evaluation of the Company.

2. It is the Interconnection Customer's responsibility to send the data that PJM and the Company requires directly to PJM. The Interconnection Customer will grant permission for PJM to send the Company the following telemetry that the Interconnection Customer sends to PJM: real time MW, MVAR, volts, amperes, generator/status, and interval MWH and MVARH.

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.

4. A mutually acceptable means of interrupting and disconnecting the generator with a visible break, able to be tagged and locked out, shall be worked out with Company Distribution Engineering.

5. The Company reserves the right to charge the Interconnection Customer operation and maintenance expenses to maintain the Interconnection Customer attachment facilities, including metering and telecommunications facilities, owned by Company.

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 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.

None

ATTACHMENT 1