Generation Interconnection Combined Feasibility/System Impact Study Report

For

PJM Generation Interconnection Request Queue Position Z2-001

Burlington 26 kV

August 2014

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, if any, is included in the System Impact Study.

The 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 is responsible for the right of way, real estate, and construction permit issues. For properties currently owned by Transmission Owners, the costs associated with them will be addressed when seeking an Interconnection Agreement as outlined below. . Developer will also be responsible for providing and installing metering equipment in compliance with applicable PJM and Transmission Owner standards.

General

A&S Transportation, the Interconnection Customer (IC), has proposed a solar generating facility located at in Burlington County, New Jersey. The installed facilities will have a total capability of 7.1 MW with 2.7 MW of this output being recognized by PJM as capacity. The proposed in-service date for this project is July 1, 2015. **This study does not imply a PSE&G commitment to this in-service date.**

Attachment facilities and local upgrades (if required) along with terms and conditions to interconnect Z2-001 will be specified in a separate two party Interconnection Agreement (IA) between PSE&G and the Interconnection Customer as this project is considered FERC non-jurisdictional per the PJM Open Access Transmission Tariff (OATT). From the transmission system perspective, no network impacts were identified as detailed below.

Point of Interconnection

Z2-001 will interconnect with the PSE&G distribution system on the Z-130 26 kV line out of Burlington substation.

Cost Summary

The Z2-001 project will be responsible for the following costs:

Description	Total Cost

Transmission Owner facilities	$	4,577,234
Allocation for Transmission Upgrades	$	0
Total Costs	**$**	**4,577,234**

Transmission Owner Scope of Work

Cost

The following are estimates (including risk and contingencies) for the interconnection of 7.10 MW of Solar to A&S Transportation Solar Project in Florence, New Jersey. The interconnection will consist of one option; a 26-kV primary interconnection from Z-130 to the location of the project. The total interconnection cost will be as shown below:

Project	**A&S Transportation Solar Interconnection Project**		
Location	**Recovery Road**		
City	**Florence, NJ 08505**		
PJM Queue	**Z2-001**		
Target Back feed	**7/1/2015**		
Developer			
Service			**26 kV Z-130**
Service Capacity	**kW**		**7,100**
Inside Plant			
	Line Position/Feeder Row		-
	Relay Protection		-
	Manholes/Conduit		-
	Other/Misc.		-
	Sub Total		$0
Outside Plant			
	Overhead Line		$4,507,934
	Underground Line		-
	Manholes/Conduit		-
	Other/Misc.		-
	Sub Total		$4,507,934
Metering/Monitoring			
	Revenue Metering/Telemetering/SCADA		$69,300
	Feeder Metering		
	Other/Misc.		-
	Sub Total		$69,300
	Total Cost		**$4,577,234**

This cost is exclusive of work required to be performed by the developer as specified in PSE&G's Information & Requirements for Electric Service Handbook. This work includes, but may not be limited to, the following:

- Developer will adhere to specifications detailed in the PSE&G Information and Requirements for electric service handbook
- Developer is responsible for all trenching and the installation of conduits and manholes as normally required and specified by PSE&G
- Developer must obtain all permits and easements required to install the interconnection facilities
- Developer must provide access for the installation, maintenance and operation of all service equipment

It is anticipated that material procurement and construction will require 5-6 months from the date of project approval and authorization.

Schedule

Attached are our estimates and timeline to interconnect A&S Transportation Solar Project to our 26-kV system in the area.

November 15, 2014
ISA and CSA are fully executed and authorization is received to proceed with construction
Long lead time construction material is placed on order

January 1, 2015
Developer submits preliminary site plan, 26-kV switchgear one-line diagram and equipment specifications for approval

February 1, 2015
PSE&G provides comments on project lay-out and design

March 1, 2015
Developer submits final site plan, 26-kV switchgear one-line diagram and equipment specifications for approval

March 15, 2015
PSE&G provides final comments and approval of 26-kV switchgear lay-out and design
Developer begins construction based on approved design

April 1, 2015
PSE&G commences line construction

May 15, 2015
Switchgear inspection and approval by PSE&G

July 1, 2015
Completion of interconnection work and service cut-in

Interconnection Customer Requirements

PSE&G's Information & Requirements for Electric Service Handbook
http://www.pseg.com/business/builders/new_service/before/pdf/RequirementsElecSvc2005.pdf

PSE&G General Specifications for a Customer-Owned 26.4 kV Metal-Clad Substation
http://www.pseg.com/business/builders/new_service/before/pdf/pepp/sec05.pdf

Revenue Metering and SCADA Requirements

PJM Requirements

The Interconnection Customer will be required to install equipment necessary to provide Revenue Metering (KWH, KVARH) and real time data (KW, KVAR) for IC's generating Resource. See PJM Manuals M-01 and M-14D, and PJM Tariff Sections 24.1 and 24.2.

Public Service Electric and Gas Requirements

The Interconnection Customer will be required to comply with all PSE&G Revenue Metering Requirements for Generation Interconnection Customers. The Revenue Metering Requirements may be found within the "Information and Requirements for Electric Service" document located at the following links:

http://www.pseg.com/business/builders/new_service/before/
http://www.pjm.com/planning/design-engineering/to-tech-standards.aspx

Network Impacts

The Queue Project Z2-001 was studied as a 7.1 MW (Capacity 2.7 MW) injection at the Burlington 26 kV substation in the PSEG area. Project Z2-001 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project Z2-001 was studied with a commercial probability of 100%. Potential network impacts were as follows:

Contingency Descriptions

The following contingencies resulted in overloads:

None.

Generator Deliverability

(Single or N-1 contingencies for the Capacity portion only of the interconnection)

None.

Multiple Facility Contingency

(Double Circuit Tower Line contingencies were studied for the full energy output. The contingencies of Line with Failed Breaker and Bus Fault will be performed for the Impact Study.)

None.

Short Circuit

(Summary of impacted circuit breakers)

New circuit breakers found to be over-duty:

None.

Contributions to previously identified circuit breakers found to be over-duty:

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.

Steady-State Voltage Requirements

(Summary of the VAR requirements based upon the results of the steady-state voltage studies)

None.

Stability and Reactive Power Requirement for Low Voltage Ride Through

(Summary of the VAR requirements based upon the results of the dynamic studies)

None.

New System Reinforcements

(Upgrades required to mitigate reliability criteria violations, i.e. Network Impacts, initially caused by the addition of this project generation)

None.

Contribution to Previously Identified System Reinforcements

(Overloads initially caused by prior Queue positions with additional contribution to overloading by this project. This project may have a % allocation cost responsibility which will be calculated and reported for the Impact Study)

None.

Potential Congestion due to Local Energy Deliverability

PJM also studied the delivery of the energy portion of this interconnection request. Any 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 Merchant Transmission Interconnection request.

Note: Only the most severely overloaded conditions are listed below. There is no guarantee of full delivery of energy for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed which shall study all overload conditions associated with the overloaded element(s) identified.

None.

Attachment 1

System Configuration