Generation Interconnection Feasibility Study Report

For

PJM Generation Interconnection Request Queue Position AE1-083

Busselton 13 kV

May 2019

Preface

The intent of the feasibility study is to determine a plan, with ballpark cost and construction time estimates, to connect the subject generation to the PJM network at a location specified by the Interconnection Customer. The Interconnection Customer may request the interconnection of generation as a capacity resource or as an energy-only resource. As a requirement for interconnection, the Interconnection Customer may be responsible for the cost of constructing: (1) Direct Connections, which are new facilities and/or facilities upgrades needed to connect the generator to the PJM network, and (2) Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM system.

In some instances a generator interconnection may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g. another generation interconnection, 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 impact study is performed.

The Feasibility 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 may be included in the study.

General

The Interconnection Customer (IC), has proposed a Solar generating facility located in Burlington County, New Jersey. The installed facilities will have a total capability of 5 MW with 2.1 MW of this output being recognized by PJM as capacity. The proposed in-service date for this project is May 31, 2019. **This study does not imply a PSE&G commitment to this in-service date.**

Point of Interconnection

AE1-083 will interconnect with the PSE&G distribution system by tapping the Busselton 8021 13.2kV circuit.

Cost Summary

The AE1-083 project will be responsible for the following costs:

Description	Total Cost
Transmission Owner facilities	$ 3,166,399
Transmission Upgrades	$ 0
Total Costs	**$ 3,166,399**

Transmission Owner Scope of Work

As of the end of the Feasibility study, the total estimated cost for the AE1-083 interconnection to the BUS8021 circuit is: $3,166,399. However, please note that PSEG has identified the need for additional studies during the system impact study phase for this project before being able to validate the project is feasible. Further scope may be identified during the Impact study phase that could impact the estimate of this project. The following analysis will be performed at the Impact Study stage : This site is physically close to the substation, thus the need for a 3d party study.

- Potential Reliability Impacts
- Excessive Voltage Regulation Equipment (capacitors, transformer Load Tap Changer) Operations
- Power Quality Concerns
- Additional studies as required This study enables PSE&G to maintain the reliability of the grid.

Interconnection Customer Requirements

1. The Interconnection Customer may be required to install and/or pay for metering as necessary to properly track real time output of the facility as well as installing metering which shall be used for billing purposes. See Section 8 of Appendix 2 to the Interconnection Service Agreement as well as Section 4 of PJM Manual 14D for additional information.

2. The power factor requirement is as follows: Due to the high voltage in the PSEG 13kV distribution zone during certain times, The Interconnection Customer shall design its Customer Facility with the ability to maintain a power factor of at least 0.95 leading to 0.95 lagging measured at the Point of Interconnection. The specific operational power factor requirement 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).

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

4. PSE&G Customer Equipment Requirements – Primary Service https://www.pseg.com/business/builders/new_service/before/pdf/pepp/sec03.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 (PSE&G) 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 AE1-083 was evaluated as a 5 MW (Capacity 2.1 MW) injection at the Busselton 13.2kV Substation in the PSEG area. Project AE1-083 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AE1-083 was studied with a commercial probability of 100%. Potential network impacts were as follows:

Summer Peak Analysis – 2022

Generator Deliverability

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

None.

Multiple Facility Contingency

(Double Circuit Tower Line, Fault with a Stuck 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

(Summary of impacted circuit breakers)

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.

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.

Attachment 1. Single Line Diagram