Generation Interconnection

System Impact Study Report

for

Queue Project AG1-263

GLOUCESTER 230 KV

8 MW Capacity / 20 MW Energy

August 2021

Table of Contents

1 Introduction

This System Impact Study has been prepared in accordance with the PJM Open Access Transmission Tariff, 205, as well as the System Impact Study Agreement between the Interconnection Customer (IC), and PJM Interconnection, LLC (PJM), Transmission Provider (TP). The Interconnected Transmission Owner (ITO) is PSEG.

2 Preface

The intent of the 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.

The System Impact 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.

3 General

The Interconnection Customer (IC), Camden Cogen, L.P, has proposed a Storage generating facility co-located with the Camden Cogeneration Facility in Camden County, New Jersey. The installed facilities will have a total capability of 20 MW with 8 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is October 31, 2021. This study does not imply a TO commitment to this in-service date.

Queue Number	AG1-263
Project Name	GLOUCESTER 230 KV
State	New Jersey
County	Camden
Transmission Owner	PSEG
MFO	20
MWE	20
MWC	8
Fuel	Storage
Basecase Study Year	2024

Any new service customers who can feasibly be commercially operable prior to June 1st of the basecase study year are required to request interim deliverability analysis.

4 Point of Interconnection

AG1-263 will interconnect with the PSEG on transmission system at the Gloucester 230 kV substation, behind the same Point of Interconnection as the existing Camden Cogeneration Facility.

The Point of Interconnection will be at the termination of the existing Underground cable at the Camden Cogen 230 kV substation.

5 Cost Summary

The AG1-263 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	$ 380,000
Allocation towards System Network Upgrade Costs (PJM Identified - Summer Peak)*	$ 0
Allocation towards System Network Upgrade Costs (PJM Identified - Light Load)*	$ 0
Allocation towards System Network Upgrade Costs (TO Identified)*	$ 0
Total Costs	$ 380,000

*As your project progresses through the study process and other projects modify their request or withdraw, then your cost allocation could change.

This cost excludes a Federal Income Tax Gross Up charges. This tax may or may not be charged based on whether this project meets the eligibility requirements of IRS Notice 88-129. If at a future date it is determined that the Federal Income Tax Gross charge is required, the Transmission Owner shall be reimbursed by the Interconnection Customer for such taxes.

Note 1: PJM Open Access Transmission Tariff (OATT) section 217.3A outline cost allocation rules. The rules are further clarified in PJM Manual 14A Attachment B. The allocation of costs for a network upgrade will start with the first Queue project to cause the need for the upgrade. Later queue projects will receive cost allocation contingent on their contribution to the violation and are allocated to the queues that have not closed less than 5 years following the execution of the first Interconnection Service Agreement which identifies the need for this upgrade.

6 Transmission Owner Scope of Work

The total physical interconnection costs is given in the table below:

Description	Total Cost
Attachment Facilities Installation of revenue grade metering. Relay modification at Gloucester Switching Station	$380,000
Direct Connection Network Upgrades	$0
Non-Direct Connection Network Upgrades	$0 -
Total Physical Interconnection Costs	$380,000

7 Schedule

Based on the scope of work for the interconnection facilities, it is expected to take a minimum of **15 months** after the signing of an Interconnection Construction Service Agreement (or "Interconnection Agreement" if non-FERC) and construction kickoff call to complete the installation of the physical connection work. This assumes that there will be no environmental issues with any of the new properties associated with this project, that there will be no delays in acquiring the necessary permits for implementing the defined interconnection work, and that all system outages will be allowed when requested.

The Interconnection Customer must obtain these approvals prior to Transmission Owner installation. Transmission Owner's schedule assumes reasonable efforts will be made by the Interconnection Customer to meet the proposed schedule. Consequently, delays to the Interconnection Customer's activities may lead to delays/changes to the Transmission Owner's schedule as well.

8 Interconnection Customer Requirements

The IC will be required to comply with all Interconnected Transmission Owner's Interconnection Customer requirements for generation interconnection customers located at the following link:

http://www.pjm.com/planning/design-engineering/to-tech-standards/

9 Revenue Metering and SCADA Requirements

9.1 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 Section 8 of Attachment O.

9.2 Meteorological Data Reporting Requirements

9.3 Interconnected Transmission Owner Requirements

The IC will be required to comply with all Interconnected Transmission Owner's revenue metering requirements for generation interconnection customers located at the following link:

http://www.pjm.com/planning/design-engineering/to-tech-standards/

10 Summer Peak Analysis

The Queue Project AG1-263 was evaluated as a 20 MW (Capacity 8 MW) injection at the Camden 230 kV bus in the PSEG area. Project AG1-263 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-263 was studied with a commercial probability of 100.0 %. Potential network impacts were as follows:

10.1 Generation Deliverability

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

None

10.2 Multiple Facility Contingency

(Double Circuit Tower Line, Fault with a Stuck Breaker, and Bus Fault contingencies for the full energy output)

None

10.3 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

10.4 Steady-State Voltage Requirements

To be determined

10.5 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.

None

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.

10.6 System Reinforcements

None

10.7 Queue Dependencies

None

11 Light Load Analysis

The Queue Project AG1-263 was evaluated as a 20 MW injection/withdrawal at the Camden 230 kV in the PSEG area. Project AG1-263 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-263 was studied with a commercial probability of 100.0 %. Potential network impacts were as follows:

11.1 Light Load Deliverability

(Single or N-1 contingencies)

None

11.2 Multiple Facility Contingency

(Double Circuit Tower Line, Fault with a Stuck Breaker, and Bus Fault contingencies)

None

11.3 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

11.4 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.

None

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.

11.5 System Reinforcements

None

12 Short Circuit Analysis

The following Breakers are overdutied:

None

12.1 System Reinforcements - Short Circuit

None

13 Stability and Reactive Power

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

Not Required

14 Affected Systems

14.1 NYISO

NYISO Impacts to be determined during later study phases (as applicable).

15 Attachment 1: One Line Diagram