Generation Interconnection

Combined Feasibility / System Impact Study Report

for

Queue Project AF2-168

Princeton University 69 KV

0 MW Capacity / 5 MW Energy

Revised December 2020

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.

The Interconnection Customer seeking to interconnect a wind or solar generation facility shall maintain meteorological data facilities as well as provide that meteorological data which is required per Schedule H to the Interconnection Service Agreement and Section 8 of Manual 14D.

3 Revision History

This December 2020 revision updates Section 4 – General to clarify that the AF2-168 request adds new Solar generators to the existing Behind the Meter Facility.

4 General

The Interconnection Customer (IC), **Princeton University**, has proposed a Generating Facility located in Mercer County, New Jersey. The existing Behind the Meter Facility is comprised of multiple generating resources including Natural Gas and Solar. The AF2-168 request adds new Solar generators to the existing facility. A portion of the Generating Facility output will be Behind the Meter. AF2-168 request proposes to inject up to a total capability of 5 MW unto PSEG transmission system, with 0 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is June 01, 2021. This study does not imply a TO commitment to this in-service date.

Queue Number	**AF2-168**
Project Name	WEST WINDSOR 69 KV
State	New Jersey
County	Mercer
Transmission Owner	PSEG
MFO	5
MWE	5
MWC	0
Fuel	Solar
Basecase Study Year	2023

New Service Customer proposing queue projects that can feasibly be commercially operable prior to June 1st of the basecase study year are required to request interim deliverability analysis.

5 Point of Interconnection

AF2-168 will interconnect with the PSEG on transmission system at the **Princeton University 69 kV** substation.

6 Cost Summary

The AF2-168 project will be responsible for the following costs:

Description	**Total Cost**
Total Physical Interconnection Costs	$126,000
Allocation towards System Network Upgrade Costs	$0
Total Costs	$126,000

7 Transmission Owner Scope of Work

PSEG scope of work is for the installation of Settlement and Real-Time Metering with telemetry.
The total physical interconnection costs is given in the table below:

Description	Total Cost
Attachment Facilities: Real time metering with telemetry	$126,000
Direct Connection Network Upgrades	$0
Non-Direct Connection Network Upgrades	$0
Total Physical Interconnection Costs	$126,000

8 Schedule

The estimated schedule for completion of the Transmission Owner scope of work above is **8 months**.

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

The solar generation facility shall provide the Transmission Provider with site-specific meteorological data including:

- Temperature (degrees Fahrenheit)
- Atmospheric pressure (hectopascals)
- Irradiance
- Forced outage data

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 AF2-168 was evaluated as a 5.0 MW (Capacity 0.0 MW) injection at the **Princeton University 69 kV** substation in the PSEG area. Project AF2-168 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-168 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 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

11 Stability and Reactive Power

No mitigations are required.

12 Attachment 1: One Line Diagram

Princeton University West Windsor 69 kV Substation