

***Generation Interconnection
Combined Feasibility / System Impact Study
Report***

For

***PJM Generation Interconnection Request
Queue Position AB1-166***

***Wilson 23kV
0MW Capacity / 20MW Energy***

March / 2016

Introduction

This Feasibility Study has been prepared in accordance with the PJM Open Access Transmission Tariff, 36.2, as well as the Feasibility Study Agreement between Wilson Battery Storage LLC, the Interconnection Customer (IC), and PJM Interconnection, LLC (PJM), Transmission Provider (TP). The Interconnected Transmission Owner (ITO) is Duquesne Light Company (DL).

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 IC. The IC may request the interconnection of generation as a capacity resource or as an energy-only resource. As a requirement for interconnection, the IC 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, 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 IC is responsible for the right of way, real estate, and construction permit issues. For properties currently owned by ITO, the costs may be included in the study.

General

The IC has proposed a battery storage generating facility located in Jefferson Hills, PA (Allegheny County). The installed facilities will have a total capability of 20 MW with 0 MW of this output being recognized by PJM as capacity. The proposed in-service date for this project is 12/31/2016. **This study does not imply an ITO commitment to this in-service date.**

Point of Interconnection

AB1-166 will interconnect with the ITO distribution system at one of the following points of interconnection:

Option 1 will connect via a tap into a new bus position at Wilson substation 23kV.

Option 2 will connect via a tap onto a 23kV circuit from Wilson 138/23kV substation.

Transmission Owner Scope of Work

PJM analyzed this request the PJM's Open Access Transmission Tariff (OATT) section 111. Furthermore, the IC requested that PJM to evaluate the project to determine with it was eligible to enter the Alternate Queue Process. The result of this analysis determined that this queue was eligible for the Alternate Queue Process and there was no impact to any PJM Monitored Facility.

Attachment facilities and local upgrades (if required) along with terms and conditions to interconnect AB1-166 will be specified in a separate two party Interconnection Agreement (IA) between ITO and the IC as this project is considered FERC non-jurisdictional per the PJM OATT. From the transmission system perspective, no network impacts were identified as detailed below. The single line is shown below in Attachment 1.

Interconnection Customer Requirements

ITO's Facility Connection Requirements as posted on PJM's website

<http://www.pjm.com/planning/design-engineering/to-tech-standards/private-duquesne.aspx>

Revenue Metering and SCADA Requirements

PJM Requirements

The IC 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.

Network Impacts

The Queue Project AB1-166 was evaluated as a 20.0 MW (Capacity 0.0 MW) injection at the Wilson 138kV substation in the ITO area. Project AB1-166 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AB1-166 was studied with a commercial probability of 100%. Potential network impacts were as follows:

Contingency Descriptions

The following contingencies resulted in overloads:

None

Summer Peak Analysis - 2019

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)

To be determined during Impact Study

Stability and Reactive Power Requirement for Low Voltage Ride Through

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

IF Alternate Queue Process then “To be determined by ITO (PJM Manual 14A section 3.1.2)”

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 IC 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

Light Load Analysis - 2019

Light Load Studies to be conducted during later study phases (as required by PJM Manual 14B).

Attachment 1.
System Configuration

