



**Generation Interconnection  
Feasibility Study Report  
for  
Queue Project AE1-204  
WAUKEGAN 13 KV  
0 MW Capacity / 4.4 MW Energy**

July, 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. Cost allocation rules for network upgrades can be found in PJM Manual 14A, Attachment B. 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.

PJM utilizes manufacturer models to ensure the performance of turbines is properly captured during the simulations performed for stability verification and, where applicable, for compliance with low voltage ride through requirements. Turbine manufacturers provide such models to their customers. The list of manufacturer models PJM has already validated is contained in Attachment B of Manual 14G. Manufacturer models may be updated from time to time, for various reasons such as to reflect changes to the control systems or to more accurately represent the capabilities turbines and controls which are currently available in the field. Additionally, as new turbine models are developed, turbine manufacturers provide such new models which must be used in the conduct of these studies. PJM needs adequate time to evaluate the new models in order to reduce delays to the System Impact Study process timeline for the Interconnection Customer as well as other Interconnection Customers in the study group. Therefore, PJM will require that any Interconnection Customer with a new manufacturer model must supply that model to PJM, along with a \$10,000 fully refundable deposit, no later than three (3) months prior to the starting date of the System Impact Study (See Section 4.3 for starting dates) for the Interconnection Request which shall specify the use of the new model. The Interconnection Customer will be required to submit a completed dynamic model study request form (Attachment B-1 of Manual 14G) in order to document the request for the study.

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 Storage generating facility located in Lake County, Illinois. The installed facilities will have a total capability of 4.4 MW with 0 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is 9/30/2020. This study does not imply a TO commitment to this in-service date.

<b>Queue Number</b>	<b>AE1-204</b>
<b>Project Name</b>	WAUKEGAN 13 KV
<b>State</b>	None
<b>County</b>	Lake
<b>Transmission Owner</b>	ComEd
<b>MFO</b>	4.4
<b>MWE</b>	4.4
<b>MWC</b>	0
<b>Fuel</b>	Storage
<b>Basecase Study Year</b>	2022

## Point of Interconnection

AE1-204 will interconnect with the ComEd distribution system as a tap of the Waukegan – Abbot Labs 13.2 kV line.

## Cost Summary

The AE1-204 project interconnection cost estimate will be included in the ComEd ICC Queue 19-01074 report.

## 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 Section 8 of Attachment O.

## Network Impacts

The Queue Project AE1-204 was evaluated as a 4.4 MW (Capacity 0 MW) injection at the Waukegan; 3C 34.5 kV substation in the ComEd area. Project AE1-204 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AE1-204 was studied with a commercial probability of 53%. Potential network impacts were as follows:

## Summer Peak Load Flow

### Generation 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

## **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

## System Reinforcements

None

## Flow Gate Details

The following appendices contain additional information about each flowgate presented in the body of the report. For each appendix, a description of the flowgate and its contingency was included for convenience. However, the intent of the appendix section is to provide more information on which projects/generators have contributions to the flowgate in question. Although this information is not used "as is" for cost allocation purposes, it can be used to gage other generators impact. It should be noted the generator contributions presented in the appendices sections are full contributions, whereas in the body of the report, those contributions take into consideration the commercial probability of each project.

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## Short Circuit

Not required

## Light Load Flow Analysis

Will be completed in System Impact Study phase.