Generation Interconnection

System Impact Study Report

for

Queue Project AG1-513

AURORA 138 KV

4 MW Capacity / 10 MW Energy

Revised January 2022

August 2021

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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 ComEd.

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.

An Interconnection Customer with a proposed new Customer Facility that has a Maximum Facility Output equal to or greater than 100 MW shall install and maintain, at its expense, phasor measurement units (PMUs). See Section 8.5.3 of Appendix 2 to the Interconnection Service Agreement as well as section 4.3 of PJM Manual 14D for additional information.

3 Revision History

Revision	Date	Revision Description
1	August 2021	Original Issue
2	January 2022	Updated MFO to reflect correct sequence of uprates

4 General

The Interconnection Customer (IC) has proposed an uprate to an existing natural gas generating facility located in Will County, Illinois. This project is an increase to the Interconnection Customer's AC1-109/AC1-111 project, which will share the same point of interconnection. The AG1-513 queue position is a 10 MW storage generation uprate (4 MW Capacity uprate) to the previous project. The total installed facilities will have a capability of 1056 MW with 948 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this uprate project is June 01, 2024. This study does not imply a TO commitment to this in-service date.

Queue Number	**AG1-513**
Project Name	AURORA 138 KV
State	Illinois
County	Will
Transmission Owner	ComEd
MFO	1056
MWE	10
MWC	4
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.

5 Point of Interconnection

AG1-513 will interconnect with the ComEd transmission system at the TSS 951 Aurora EC 138 kV substation by utilizing the same attachment facilities identified in AC1-109/AC1-111, as shown in the one-line diagram.

6 Cost Summary

The AG1-513 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	$ 250,000
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

Description	Total Cost
Total Costs	$ 250,000

*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.

7 Transmission Owner Scope of Work

The addition of a 10 MW storage facility behind the meter will require review and possible upgrade of SCADA, Communication, relays and metering. The estimated cost is $250,000. ComEd would take approximately 18-months to review and possibly upgrade SCADA, Communication, relays and metering after the ISA / ICSA are signed.

8 Schedule

See section 6.

9 Interconnection Customer Requirements

The Interconnection Customer is responsible for all design and construction related activities on the Interconnection Customer's side of the Point of Interconnection.

10 Revenue Metering and SCADA Requirements

10.1 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.

10.2 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/

11 Summer Peak Analysis

The Queue Project AG1-513 was evaluated as a 10.0 MW (Capacity 4.00 MW) injection at the Aurora EC 138 kV substation in the ComEd area. Project AG1-513 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-513 was studied with a commercial probability of 100.0 %. Potential network impacts were as follows:

11.1 Generation Deliverability

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

None

11.2 Multiple Facility Contingency

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

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 Steady-State Voltage Requirements

None

11.5 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.

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

11.6 System Reinforcements

None

12 Light Load Analysis

The Queue Project AG1-513 was evaluated as a 10.0 MW injection at the Aurora EC 138 kV substation in the ComEd area. Project AG1-513 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-513 was studied with a commercial probability of 100.0 %. Potential network impacts were as follows:

12.1 Light Load Deliverability

(Single or N-1 contingencies)

None

12.2 Multiple Facility Contingency

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

None

12.3 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

12.4 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

12.5 System Reinforcements

None

13 Short Circuit Analysis

The following Breakers are overdutied:

None

13.1 System Reinforcements - Short Circuit

None

14 Stability and Reactive Power

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

Not Required.

15 Affected Systems

15.1 MISO

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

16 Attachment 1: One Line Diagram