



**Generation Interconnection
Feasibility Study Report
for
Queue Project AG1-460
KINCAID-PANA 345 KV
12 MW Capacity / 30 MW Energy**

January 2021

Table of Contents

- 1 Introduction..... 3
- 2 Preface..... 3
- 3 General 3
- 4 Point of Interconnection..... 4
- 5 Cost Summary 4
- 6 Transmission Owner Scope of Work..... 5
- 7 Schedule..... 5
- 8 Transmission Owner Analysis..... 5
- 9 Interconnection Customer Requirements..... 5
- 10 Revenue Metering and SCADA Requirements 5
 - 10.1 PJM Requirements 5
 - 10.2 Interconnected Transmission Owner Requirements..... 5
- 11 Summer Peak - Load Flow Analysis 5
 - 11.1 Generation Deliverability 6
 - 11.2 Multiple Facility Contingency 6
 - 11.3 Contribution to Previously Identified Overloads..... 6
 - 11.4 Potential Congestion due to Local Energy Deliverability 6
 - 11.5 System Reinforcements - Summer Peak Load Flow - Primary POI..... 6
 - 11.6 Contingency Descriptions..... 7
- 12 Short Circuit Analysis..... 7
- 13 Affected Systems 7
 - 13.1 MISO 7
- Attachment 1: One Line Diagram..... 8

1 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 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 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.

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.

3 General

The Interconnection Customer (IC), has proposed a Storage generating facility located in Christian County, Illinois. The installed facilities will have a total capability of 30 MW with 12 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is June 01, 2022. This study does not imply a TO commitment to this in-service date.

Queue Number	AG1-460
Project Name	KINCAID-PANA 345 KV
State	Illinois
County	Christian
Transmission Owner	ComEd
MFO	30
MWE	30
MWC	12
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

AG1-460 proposes to interconnect with the ComEd transmission system by utilizing the same attachment facilities as AE2-261 which will tap the Kincaid to Pana 345 kV line, as shown in the one-line diagram.

5 Cost Summary

The AG1-460 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	\$ 250,000
Total System Network Upgrade Costs	\$ 0
Total Costs	\$ 250,000

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 2016-36, 2016-25 I.R.B. (6/20/2016). 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.

Cost allocations for any System Upgrades will be provided in the System Impact Study Report.

6 Transmission Owner Scope of Work

The addition of a 30 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.

7 Schedule

See Section 6.

8 Transmission Owner Analysis

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:

ComEd interconnection requirements can be found at <https://www.pjm.com/planning/design-engineering/to-tech-standards/private-comed.aspx>

11 Summer Peak - Load Flow Analysis

The Queue Project AG1-460 was evaluated as a 30.0 MW (Capacity 12.0 MW) injection tapping the Kincaid to Pana 345 kV line in the ComEd area. Project AG1-460 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-460 was studied with a commercial probability of 53.0 %. 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 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.

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC/D C	MW IMPACT
168537049	270796	KINCAID ; B	345.0	CE	347955	7AUSTIN	345.0	AMIL	1	COMED_P1-2_345-L2105-S-D	operation	1319.0	149.26	150.38	DC	14.69
168537331	270797	KINCAID ; R	345.0	CE	942480	AE2-261 TAP	345.0	CE	1	COMED_P1-2_345-L2106-S	operation	1201.0	101.09	102.56	DC	17.64
169765413	944220	AF1-090 TAP	345.0	CE	347945	7PANA	345.0	AMIL	1	COMED_P1-2_345-L2106-S	operation	1201.0	133.57	134.6	DC	12.36

11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

None

11.6 Contingency Descriptions

Contingency Name	Contingency Definition
COMED_P1-2_345-L2106___-S	CONTINGENCY 'COMED_P1-2_345-L2106___-S' TRIP BRANCH FROM BUS 270796 TO BUS 347955 CKT 1 345 END / CONTINGENCY # 442 / KINCAID ; B 345 AUSTIN
COMED_P1-2_345-L2105___-S-D	CONTINGENCY 'COMED_P1-2_345-L2105___-S-D' TRIP BRANCH FROM BUS 944220 TO BUS 347945 CKT 1 345 END / CONTINGENCY # 441 / AF1-090 TAP ; R 345 7PANA

12 Short Circuit Analysis

No breakers were identified as over-dutied as part of this analysis.

13 Affected Systems

13.1 MISO

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

Attachment 1: One Line Diagram