Generation Interconnection

Feasibility Study Report

for

Queue Project AG1-372

NELSON-ELECTRIC JUNCTION 345 KV

20 MW Capacity / 0 MW Energy

January 2021

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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 an uprate to a planned solar generating facility located in Lee, Illinois. This project is an increase to the Interconnection Customer's AF2-200 project, which will share the same point of interconnection. The AG1-372 queue position is a 0 MW storage uprate (20 MW Capacity uprate) to the AF2-200 project. The total installed facilities will have a capability of 200 MW with 140 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this uprate project is November 01, 2024. This study does not imply a TO commitment to this in-service date.

Queue Number	AG1-372
Project Name	NELSON-ELECTRIC JUNCTION 345 KV
State	Illinois
County	Lee
Transmission Owner	ComEd
MFO	200
MWE	0
MWC	20
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

The hybrid solar/storage project AF2-200/AG1-372 will interconnect with the ComEd transmission system utilizing the physical interconnection facilities identified for the AF2-199 project which taps the Nelson to Electric Junction 345 kV line.

5 Cost Summary

The AG1-372 project will be responsible for the following costs:

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

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 50 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 Sections 6 and 11.

8 Transmission Owner Analysis

See Sections 6 and 11.

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 AG1-372 was evaluated as a 0 MW (Capacity 20.0 MW) injection as an uprate to AF2-200 tapping the Nelson to Electric Junction 345 kV line in the ComEd area. Project AG1-372 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-372 was studied with a commercial probability of 53%. 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	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
168488261	270828	NELSON ; B	345.0	CE	943410	AF1-012 TAP	345.0	CE	1	COMED_P1-2_345-L18905__B-R-B	operation	1656.0	125.57	126.94	DC	22.44
168488263	270828	NELSON ; B	345.0	CE	943410	AF1-012 TAP	345.0	CE	1	Base Case	operation	1334.0	120.81	122.54	DC	22.91
169714794	943410	AF1-012 TAP	345.0	CE	965660	AG1-434 TAP	345.0	CE	1	Base Case	operation	1334.0	133.18	134.92	DC	22.91
169714795	943410	AF1-012 TAP	345.0	CE	965660	AG1-434 TAP	345.0	CE	1	COMED_P1-2_345-L18905__B-R-A	operation	1656.0	132.81	134.17	DC	22.44
170001556	965660	AG1-434 TAP	345.0	CE	957470	AF2-041 TAP	345.0	CE	1	Base Case	operation	1334.0	133.06	134.79	DC	22.91
170001557	965660	AG1-434 TAP	345.0	CE	957470	AF2-041 TAP	345.0	CE	1	COMED_P1-2_345-L18905__B-R-A	operation	1656.0	132.71	134.07	DC	22.44

11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

None

11.6 Contingency Descriptions

Contingency Name	Contingency Definition
COMED_P1-2_345-L18905__B-R-B	CONTINGENCY 'COMED_P1-2_345-L18905__B-R-B' / CONTINGENCY # 141B TRIP BRANCH FROM BUS 962700 TO BUS 270916 CKT 1 / AG1-119 TAP 345 WAYNE ; B 345 END
Base Case	
COMED_P1-2_345-L18905__B-R-A	CONTINGENCY 'COMED_P1-2_345-L18905__B-R-A' / CONTINGENCY # 141B TRIP BRANCH FROM BUS 930480 TO BUS 962700 CKT 1 / AB1-089 ; B 345 AG1-119 TAP 345 END

12 Short Circuit Analysis

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

13 Affected Systems

None

Attachment 1: One Line Diagram