PJM Generation Interconnection Request
System Impact Study Report

for

Queue Position AD1-116

"Nevada 345 kV"

Revision 0: January 2021
Revision 1: July 2022

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.

The Interconnection Customer seeking to interconnect a wind or solar generation facility shall maintain meteorological data facilities as well as provide that meteorological data which is required per Schedule H to the Interconnection Service Agreement and Section 8 of Manual 14D.

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.

Revision History

Revision 0: Issued January 2021

Revision 1: This revised report (1) updates the Transmission Owner scope to show that there are no new attachment Facilities required. (2) Updates the "MISO Impacts" section of the report. There are no MISO impacts identified.

General

Queue Project AD1-116 is a proposal to add a 20.0 MW Energy (7.6 MW Capacity) solar generating facility to the existing AA1-018 wind facility in LaSalle County, IL.

Point of Interconnection

AD1-116 will utilize the same Point of Interconnection and generator lead line as AA1-018 into the TSS 98 Nevada Substation.

Transmission Owner Scope of Work

Attachment Facilities

None.

Direct Connection Network Upgrades

None

Non-Direct Connection Network Upgrades

None

Network Impacts

Queue Project AD1-116 was evaluated as a 20.0 MW Energy (7.6 MW Capacity) injection into the AA1-018 Tap 345 kV substation (which is a tap of the Powerton – Goodings Grove 345 kV line) in the ComEd area. Project AD1-116 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AD1-116 was studied with a commercial probability of 100%. Potential network impacts were as follows:

Summer Peak Analysis - 2021

Generator 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

Steady-State Voltage Requirements
(Results of the steady-state voltage studies should be inserted here)

None

Short Circuit
(Summary of impacted circuit breakers)

No issues.

Affected System Analysis & Mitigation

MISO Impacts:

None.

Delivery of Energy Portion of Interconnection Request
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.
Only the most severely overloaded conditions are listed. 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 will study all overload conditions associated with the overloaded element(s) identified.

None

Light Load Analysis - 2021

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

None

System Reinforcements

Short Circuit
(Summary form of Cost allocation for breakers will be inserted here if any)

No issues.

Stability and Reactive Power Requirement

The reactive power capability of AA1-018 and AD1-116 meets the 0.95 leading but does NOT meet the lagging PF requirement at the high side of the main 345/34.5kV transformer.

No mitigations were found to be required due to instability, however it was observed that AD1-116 plant is deficient in lagging power factor requirement by 38.62 MVAr. This would be addressed through recent AA1-018 retool by adding additional 40 MVAr switched shunt capacitors and 24 MVAr STATCOM. See full report for details.

Summer Peak Load Flow Analysis Reinforcements

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

Light Load Load Flow Analysis Reinforcements

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)
(Summary form of Cost allocation for transmission lines and transformers will be inserted here if any)

None

ATTACHMENT 1

AD1-116