

Generation Interconnection Feasibility Study Report Queue Position AC2-088

General

Interconnection Customer has proposed a 70 MW solar photovoltaic generating facility located near Leonard Road, Brown County, Ohio; please refer to the Facilities Location map in Appendix 1. For the AC2-088 project, PJM recognizes 38.4 MW as Capacity Interconnection Rights. The proposed in-service date for this project is May 31, 2019. **This study does not imply a Duke Energy (“Transmission Owner”) commitment to this in-service date.**

Point of Interconnection

AC2-088 will interconnect with the Duke Energy sub-transmission system by tapping the South Bethel-Brown 69 kV line via a new 69 kV switching substation configured as a three breaker ring bus and is located adjacent to the 69 kV line. This Option #1 Point of Interconnection is located where Duke Energy’s overhead line from the new substation terminates to the Interconnection Customer’s pole mounted switch, approximately 25 feet outside the new substation fence; please refer to the single-line diagram in Appendix 2.

An alternate Point of Interconnection (or Option #2 POI) is also proposed as direct injection at the South Bethel 69 kV substation.

The impacts of both POIs are studied and the results are presented in the Network Impacts section of this report. Please note that only the costs associated with Option #1 POI are stated in this report.

Network Impacts

Option #1 Point of Interconnection

The Queue Project AC2-088 was evaluated as a 70.0 MW (Capacity 38.4 MW) injection tapping the South Bethel – Brown 69 kV line in the DEOK area. Project AC2-088 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AC2-088 was studied with a commercial probability of 53%. Potential network impacts were as follows:

Summer Peak Analysis - 2020

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)

To be determined at a later study stage.

Short Circuit

None.

Affected System Analysis & Mitigation

LGEE Impacts:

There are potential impacts in LGEE's area; the impacts will be determined during later study phases.

MISO Impacts:

There are potential impacts in MISO's area; the impacts will be determined during later study phases.

OVEC Impacts:

There are potential impacts in OVEC's area; the impacts will be determined during later study phases.

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 - 2020

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

System Reinforcements

Short Circuit

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

None

Stability and Reactive Power Requirement

To be determined

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)

None

Network Impacts

Option #2 Point of Interconnection

The Queue Project AC2-088 was evaluated as a 70.0 MW (Capacity 38.4 MW) injection at the South Bethel 69 kV substation in the DEOK area. Project AC2-088 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AC2-088 was studied with a commercial probability of 53%. Potential network impacts were as follows:

Summer Peak Analysis - 2020

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

To be determined at later study stage.

Short Circuit

None.

Affected System Analysis & Mitigation

LGEE Impacts:

There are potential impacts in LGEE's area; the impacts will be determined during later study phases.

MISO Impacts:

There are potential impacts in MISO's area; the impacts will be determined during later study phases.

OVEC Impacts:

There are potential impacts in OVEC's area; the impacts will be determined during later study phases.

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 - 2020

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

System Reinforcements

Short Circuit

None.

Stability and Reactive Power Requirement

To be determined

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

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None