

Generation Interconnection Feasibility Study Report Queue Position W2-099

The Interconnection Customer (IC) has proposed a 20 MWE (7.6 MWC) solar powered generating facility consisting of ground mounted fixed panel solar photovoltaic arrays. The project is to be located in Worcester County, Maryland. PJM studied W2-099 as a 20 MW injection into the Delmarva Power and Light (DPL) system at the Kenney 69kV substation. The project was evaluated for compliance with reliability criteria for summer peak conditions in 2014. The planned in-service date, as stated in the Attachment N, is June 1, 2012.

Point of Interconnection

W2-099 will connect to the Delmarva Power and Light transmission system at the Kenney 69kV substation.

Direct Connection Requirements

Transmission Owner Scope of Direct Connection Work

The scope of work and estimated costs for the direct connection facilities is as follows:

Add an additional bus position to the 69kV ring-bus at the Kenney substation. The existing Kenney sub is currently not configured to accept another bus position. In addition to a disconnect switch, a breaker will also be required at the Point of Interconnection if the Customer Facility is greater than 500 feet from the fence line of the Kenney 69kV substation.

The estimated cost to perform this work is **\$2,500,000** and will take an estimated **18 – 24 months** to complete after receipt of a fully executed Interconnection Service Agreement (ISA) and Interconnection Construction Service Agreement (CSA).

Note: the cost does not include the Contribution in Aid of Construction (CIAC) tax.

Interconnection Customer Scope of Direct Connection Work

The IC is responsible for all design and construction related activities on their side of the Point of Interconnection. IC will interconnect W2-099 with the DPL system by constructing a customer owned 69kV circuit from their facility to the Kenney 69kV substation. The above cost estimates do not include construction of that line or bus work. Route selection, line design, right-of-way acquisition, and construction of such lines will be entirely the responsibility of the Interconnection Customer.

The IC will be required to install metering and telemetry equipment to provide revenue metering and real-time telemetry data to PJM. The requirements for this equipment are listed in Appendix 2, Section 8 of Attachment O to the PJM Tariff, as well as PJM Manuals 01 and 14D. Protective

relaying and metering design and installation must comply with Atlantic City Electric's Applicable Standards.

Transmission Network Impacts

Potential transmission network impacts are as follows:

Generator Deliverability

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

None

Multiple Facility Contingency

*(Double Circuit Tower Line contingencies at **Full** energy output. Stuck Breaker and Bus Fault contingencies will be applied during the System Impact Study.*

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

Short Circuit

No problems identified.

Stability Analysis

Not required due to project size.

New System Reinforcements

(Upgrades required to mitigate reliability criteria violations, i.e. "Network Impacts," initially caused by the addition of this project's generation)

None

Contribution to Previously Identified System Reinforcements

(Overloads initially caused by prior Queue positions with additional contribution to overloading by this project.

None

Potential Congestion due to Local Energy Deliverability

(PJM also studied the delivery of the energy portion of the surrounding generation. Any potential 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 Transmission Interconnection Request. Note: Only the most severely overloaded conditions are listed below. There is no guarantee of full deliverability for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed which analyzes all overload conditions associated with the identified overloaded element(s). As a result of the aggregate energy resources in the area, the following violations were identified:

These are *not* required reliability upgrades.

1. The M OLIVE1-PINEY_69 69 kV line (from bus 232839 to bus 232274 ckt 1) loads from 85.32% to 103.85% (DC power flow) of its emergency rating (70 MVA) for the single line contingency ('CKT 13764'). This project contributes approximately 12.97 MW to cause the thermal violation.
2. The KENNEY-M OLIVE1 69 kV line (from bus 232277 to bus 232839 ckt 1) loads from 95.18% to 113.7% (DC power flow) of its emergency rating (70 MVA) for the single line contingency ('CKT 13764'). This project contributes approximately 12.97 MW to cause the thermal violation.
3. The OAK HALL-POCOMOKE 138 kV line (from bus 232132 to bus 232130 ckt 1) loads from 113.16% to 115.58% (DC power flow) of its emergency rating (289 MVA) for the single line contingency ('CKT 13764'). This project contributes approximately 6.99 MW to cause the thermal violation.
4. The PINEY_69-M HERMON 69 kV line (from bus 232274 to bus 232272 ckt 1) loads from 115.26% to 121.51% (DC power flow) of its emergency rating (143 MVA) for the single line contingency ('CKT 23002'). This project contributes approximately 8.93 MW to cause the thermal violation.
5. The POCOMOKE-T-144 TAP 138 kV line (from bus 232130 to bus 292497 ckt 1) loads from 125.46% to 128.29% (DC power flow) of its emergency rating (247 MVA) for the single line contingency ('CKT 13764'). This project contributes approximately 6.99 MW to cause the thermal violation.
6. The T-144 TAP-COSTEN 138 kV line (from bus 292497 to bus 232807 ckt 1) loads from 129.4% to 132.23% (DC power flow) of its emergency rating (247 MVA) for the single line

contingency ('CKT 13764'). This project contributes approximately 6.99 MW to cause the thermal violation.

7. The N_CHURCH-PINEY138 138 kV line (from bus 232131 to bus 232128 ckt 1) loads from 147.3% to 150.25% (DC power flow) of its emergency rating (226 MVA) for the single line contingency ('CKT 13787'). This project contributes approximately 6.66 MW to cause the thermal violation.