Generation Interconnection
Feasibility Study Report
Queue Position AE1-062

The Interconnection Customer (IC) has proposed a 20 MW Energy (10 MW Capacity) battery storage facility to be located at Latitude: 39.8095 Longitude: -74.9519 in Camden County, New Jersey. PJM studied the AE1-062 project as an injection into the Atlantic City Electric Company (ACE) transmission system at the Silver Lake 69 kV Substation and evaluated it for compliance with reliability criteria for summer peak conditions in 2022. The project was studied at a commercial probability of 53%. The planned in-service date, as requested by the IC during the project kick-off call, is October 30, 2020. This date may not be attainable due to required PJM studies (System Impact and Facilities) and the Transmission Owner's construction schedule.

Point of Interconnection

The Interconnection Customer requested a transmission level Point of Interconnection (POI) be evaluated for the AE1-062 project. As a result, the AE1-062 project will connect with the ACE transmission system at the Silver Lake 69 kV Substation via an open 69 kV line terminal.

Transmission Owner Scope of Attachment Facilities Work

Substation Interconnection Estimate

Scope: At Silver Lake Substation, establish a 69 kV terminal at the open position for Interconnecting Customer.
Estimate: $1,500,000
Construction Time: 24-36 months

Major Equipment Included in Estimate:

- Power Circuit Breaker, 69 kV, 3 cycle Qty. 1
- Double 954 ACSR (325') Qty. 1
- Insulators, 69 kV Qty. 3
- Relay Panel, Bus Differential, FL/BU (20") Qty. 1
- Control Panel, 69 kV Circuit Breaker (10") Qty. 1
- 69kV Underground Riser Qty. 1
- 69 kV Lightning Arresters Qty. 3
- 69 kV Lightning Arresters Stands Qty. 3
- 69kV CVT Stand Qty. 3
- 69kV Group Operated Disconnect Switches Qty. 2

Estimate Assumptions:

- Room in Control Enclosure for New Relay Panel.
- Fiber optic cable necessary is 1,000 linear feet.

- No new land will need to be purchased
- Existing AC system is adequate
- Include DC system study
- 69kV Line must come in underground
- Existing Ground grid and storm water management are adequate

Required Relaying and Communications
New protection relays are required for the new terminal.

Front line and back-up line protection will be required. One 20" relay panel for each generator terminal will be required for front line and back-up protection.

An SEL-451 relay on a 20" breaker control panel will be required for the control and operation of each new 69 kV circuit breaker (1 total).

The project will require re-wiring and adjustment of existing relay schemes to accommodate the new 69 kV substation.

Metering
Three phase 69 kV revenue metering points will need to be established. ACE will purchase and install all metering instrument transformers as well as construct a metering structure. The secondary wiring connections at the instrument transformers will be completed by ACE's metering technicians. The metering control cable and meter cabinets will be supplied and installed by ACE. ACE will install conduit for the control cable between the instrument transformers and the metering enclosure. The location of the metering enclosure will be determined in the construction phase. ACE will provide both the Primary and the Backup meters. ACE's meter technicians will program and install the Primary & Backup solid state multi-function meters for each new metering position. Each meter will be equipped with load profile, telemetry, and DNP outputs. The IC will be provided with one meter DNP output for each meter. ACE will own the metering equipment for the interconnection point, unless the IC asserts its right to install, own, and operate the metering system.

The IC will be required to make provisions for a voice quality phone line within approximately 3 feet of each Company metering position to facilitate remote interrogation and data collection.

It is the IC's responsibility to send the data that PJM and ACE requires directly to PJM. The IC will grant permission for PJM to send ACE the following telemetry that the IC sends to PJM: real time MW, MVAR, volts, amperes, generator status, and interval MWH and MVARH.
The estimate for ACE to design, purchase, and install metering as specified in the aforementioned scope for metering is included in the Substation Interconnection Estimate.

Interconnection Customer Scope of Direct Connection Work
The Interconnection Customer is responsible for all design and construction related to activities on their side of the Point of Interconnection. Site preparation, including grading and an access road, as necessary, is assumed to be by the IC. Route selection, line design, and right-of-way acquisition of the direct connect facilities is not included in this report, and is the responsibility of the IC. Protective

relaying and metering design and installation must comply with ACE's applicable standards. The IC is also required to provide revenue metering and real-time telemetering data to PJM in conformance with the requirements contained in PJM Manuals M-01 and M-14 and the PJM Tariff.

ACE Interconnection Customer Scope of Direct Connection Work Requirements:

- ACE requires that an IC circuit breaker is located within 500 feet of the ACE substation to facilitate the relay protection scheme between ACE and the IC at the Point of Interconnection (POI).

Special Operating Requirements

1. ACE will require the capability to remotely disconnect the generator from the grid by communication from its System Operations facility. Such disconnection may be facilitated by a generator breaker, or other method depending upon the specific circumstances and the evaluation by ACE.

2. ACE reserves the right to charge the Interconnection Customer operation and maintenance expenses to maintain the Interconnection Customer attachment facilities, including metering and telecommunications facilities, owned by ACE.

Summer Peak Analysis - 2022

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, 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

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

Steady-State Voltage Requirements

To be performed during later study phases as required.

Short Circuit

No issues identified.

Stability and Reactive Power Requirement

To be performed during later study phases as required.

Light Load Analysis - 2022

To be performed during later study phases (as required by PJM Manual 14B).

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

Atlantic City Electric Costs
Cost estimates will further be refined as a part of the Impact Study and Facilities Study for this project. The Interconnection Customer will be responsible for all costs incurred by ACE in connection with the AE1-062 project. Such costs may include, but are not limited to, any

transmission system assets currently in ACE's rate base that are prematurely retired due to the AE1-062 project. PJM shall work with ACE to identify these retirement costs and any additional expenses. ACE reserves the right to reassess issues presented in this document and, upon appropriate justification, submit additional costs related to the AE1-062 project.