

***Generation Interconnection
System Impact Study Report***

For

***PJM Generation Interconnection Request
Queue Position X4-005***

Raritan River 230kV

May 2012

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.

General

The Interconnection Customer (IC), has proposed an increase to a proposed natural gas generating facility located in Woodbridge, New Jersey. The installed facilities will have a total capability of 785 MW with 725 MW of this output being recognized by PJM as capacity. This means that the remaining 60 MW will be curtailable should a system reliability constraint occur.

Note that this project is an increase to the Interconnection Customer's W4-009 project, which will share the same property and connection point. The W4-009 project will have a capability of 725 MW with 725 MW being recognized as capacity. The X4-005 project will have a capability of 60 MW with 0 MW being recognized as capacity

Point of Interconnection

X4-005 will interconnect with the Jersey Central Power & Light transmission system at the Raritan River 230kV substation.

Attachment Facilities

No new Attachment Facilities are required.

Direct Connection Facilities Cost Estimate

No new Direct Connection Facilities are required.

Non-Direct Connection Facilities Cost Estimate

No new Non Direct Connection Facilities are required.

Revenue Metering and SCADA Requirements

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 Sections 24.1 and 24.2.

FirstEnergy Requirements

The Interconnection Customer will be required to comply with all FE Revenue Metering Requirements for Generation Interconnection Customers. The Revenue Metering Requirements may be found within the "FirstEnergy Requirements for Transmission Connected Facilities" document located at the following links:

<http://www.firstenergycorp.com/feconnect>

<http://www.pjm.com/planning/design-engineering/to-tech-standards.aspx>

Network Impacts

The Queue Project #X4-005 was studied as a(n) 60.0MW(Capacity 0.0MW) injection at Raritan River 230kV station in the JCPL area. Project #X4-005 was evaluated for compliance with reliability criteria for summer peak conditions in 2015. Potential network impacts were 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, Line with Failed Breaker and Bus Fault contingencies for the full energy output)

None.

Short Circuit

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

Not required.

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.

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None.

Steady-State Voltage Requirements

(Results of the steady-state voltage studies should be inserted here)

To be determined during the System Impact Study phase.

Stability and Reactive Power Requirement

(Results of the dynamic studies should be inserted here)

To be determined during the System Impact Study phase.

New System Reinforcements

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

None required.

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 required.

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.