

***Generation Interconnection
Feasibility Study Report***

For

***PJM Generation Interconnection Request
Queue Position Y1-056***

TMI

May 2013

Preface

The intent of the feasibility study is to determine a plan, with ballpark cost and construction time estimates, to connect the subject generation to the PJM network at a location specified by the Interconnection Customer. The Interconnection Customer may request the interconnection of generation as a capacity resource or as an energy-only resource. As a requirement for interconnection, the Interconnection Customer may be responsible for the cost of constructing: (1) Direct Connections, which are new facilities and/or facilities upgrades needed to connect the generator to the PJM network, and (2) Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM system.

In some instances a generator interconnection may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g. another generation interconnection, 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 impact study is performed.

The Feasibility 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 a 19.0 MW increase to an existing nuclear generating facility located in Londonderry Township, Dauphin County, Pennsylvania. The installed facilities will have a total capability of 879 MW with 844 MW of this output being recognized by PJM as capacity. The proposed in-service date for this project is June 30, 2013. **This study does not imply a First Energy commitment to this in-service date.**

Point of Interconnection

Y1-056 is interconnected with the Metropolitan Edison transmission system at Three Mile Island substation.

Cost Summary

The Y1-056 project will be responsible for the following costs:

Description	Total Cost
Attachment Facilities	\$ 0
Direct Connection Network Upgrades	\$ 0
Non Direct Connection Network Upgrades	\$ 0
Total Costs	\$ 0

In addition, the Y1-056 project may be responsible for a contribution to the following costs:

Description	Total Cost
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Description	Total Cost
New System Upgrades	\$ 0
Previously Identified Upgrades	\$ 0
Total Costs	\$ 0

Cost allocations for these upgrades will be provided in the System Impact Study Report.

Direct Connection Cost Estimate

In compliance with the Regional Transmission Expansion Planning (RTEP) protocol, the Interconnection Customer has submitted a "Generation Interconnection Feasibility Study Agreement" to PJM that identifies its plan to implement the Three Mile Island 1 (Y1-056) Generation Project to the existing TMI Nuclear Generation plant located just off of Route 441S in Middletown, PA (see Attachment 2). The project upgrade will increase the total capability by 19 MW with 19 MW of this output being recognized by PJM as capacity. The proposed effective date for this Three Mile Island 1 (Y1-056) Generation Project is June 30, 2013.

The point of connection (POI) for the Three Mile Island 1 (Y1-056) Generation Project is existing and will remain unchanged. The Interconnection Customer will not incur any Direct Connection costs for the Three Mile Island 1 (Y1-056) Project. Attachment 1 is a one-line diagram showing the existing point of interconnection of the Three Mile Island substation.

System Protection Analysis

Since the Three Mile Island 1 (Y1-056) Project only consisted of increasing the generation output to an existing unit, no system protection analysis was required.

FE Facility Upgrades and Costs

The results of the FE analysis indicates that there are no direct connection or load flow network upgrades required for the Three Mile Island 1 (Y1-056) Project for the conditions studied. Upgrades and costs associated with the identified power factor compliance issue will be finalized prior to the signing of the ISA.

Interconnection Customer Requirements

Compliance Issues

The Interconnection Customer will be responsible for meeting all FE criteria as defined in the FE Requirements for Transmission Connected Facilities document referenced above. This includes the provision of a reactive power capability sufficient to maintain a composite power delivery for the facility at the interconnection point at a power factor from unity to .90 lagging (producing MVARs).

The proposed increase in energy and capacity output for the existing TMI Unit #1 does not comply with the power factor requirements identified above. The Power Factor information is currently under discussion and will be finalized prior to signing the Interconnection Service Agreement (ISA).

The Interconnection Customer will also be required to meet all PJM, ReliabilityFirst and NERC reliability criteria and operating procedures for standards compliance. This includes the need to properly locate and report the over and under-voltage and over and under-frequency system protection elements for its units as well as the submission of the generator model and protection

data required to satisfy the PJM and ReliabilityFirst audits. Failure to comply with these requirements may result in a disconnection of service if the violation is found to compromise the reliability of the FE system.

Other Requirements

In addition to the FE facilities, the Interconnection Customer will be responsible for meeting all criteria as specified in the applicable sections of the "FE Requirements for Transmission Connected Facilities" document.

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.

First Energy 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>

Summary

The connection of the Three Mile Island 1 (Y1-056) Project to the FE transmission system will require no direct connection or load flow network upgrades. This project will require upgrades associated with the identified power factor compliance issue. The power factor reinforcement and associated costs are to be finalized prior to signing the ISA.

Network Impacts

The Queue Project #Y1-056 was studied as a 19.0MW (Capacity19.0MW) injection at the TMI 1GEN 19 kV substation in the ME area. Project #Y1-056 was evaluated for compliance with reliability criteria for summer peak conditions in 2015. Potential network impacts were as follows:

Contingency Descriptions

The following contingencies resulted in overloads:

None.

Generator Deliverability

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

None.

Multiple Facility Contingency

(Double Circuit Tower Line contingencies were studied for the full energy output. The contingencies of Line with Failed Breaker and Bus Fault will be performed for the Impact Study.)

None.

Short Circuit

(Summary of impacted circuit breakers)

New circuit breakers found to be over-duty:

None.

Contributions to previously identified circuit breakers found to be over-duty:

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

(Summary of the VAR requirements based upon the results of the steady-state voltage studies)

To be determined.

Stability and Reactive Power Requirement for Low Voltage Ride Through

(Summary of the VAR requirements based upon the results of the dynamic studies)

To be determined during the System Impact Study.

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.

Potential Congestion due to Local Energy Deliverability

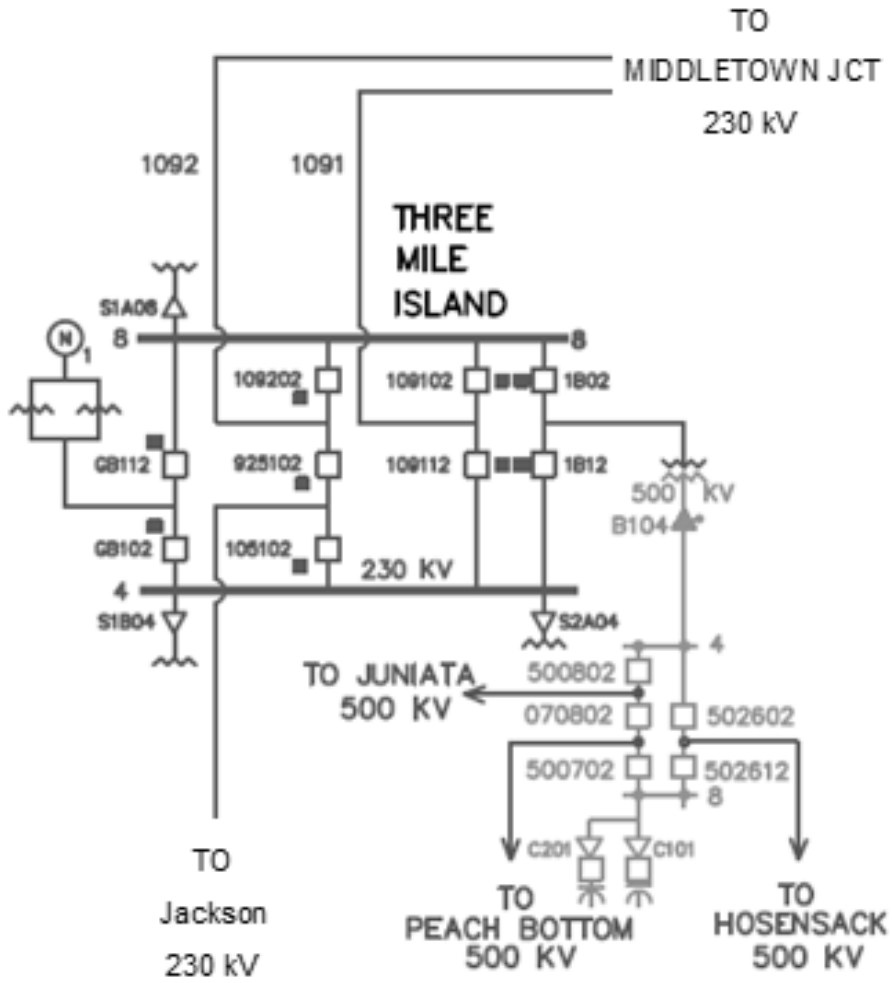
PJM also studied the delivery of the energy portion of this interconnection request. Any problems identified below are likely to result in operational restrictions to the project under study. The developer can proceed with network upgrades to eliminate the operational restriction at their discretion by submitting a Merchant Transmission Interconnection request.

Note: Only the most severely overloaded conditions are listed below. 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 shall study all overload conditions associated with the overloaded element(s) identified.

None.

Attachment 1

System Configuration



Attachment 2
Y1-056 Project Location

