PJM Generator Interconnection Request
Queue #V3-050
Penns Neck 13kV
Feasibility/Impact Study Report

May 2010
#594171

V3-050 Penns Neck 13kV Feasibility/Impact Study

General

NRG isproposing to install a 4.6 MW natural gas fired turbine generator at the new Princeton Hospital complex being built on Route #1 in Plainsboro, New Jersey. The hospital complex will be connected to two new 13kV distribution circuits that will emanate from the Penns Neck 69/13 kV station. Penns Neck is connected via 69kV circuits to the Lawrence 230/69kV station. The maximum demand at the hospital is expected to be 5.2 MW.

NRG expects to dispatch the turbine generator in the most economic fashion, serving hospital load when that is most economic and selling generation output into PJM when that is most economic. During peak demand the chillers at the hospital will be turned off, using stored chilled water, so that power can be sold back to the grid.

Since part of the hospital load will be served from each of the two new feeders, bi-directional revenue metering will need to be installed at both points of interconnection. Revenue metering and instantaneous metering will need to be installed on the generator.

Direct Connection

The diesel generator is being installed as part of the hospital complex. The costs associated with the generator installation are for the transfer trip relaying on both new distribution feeders at Penns Neck, the fiber optic communications and metering/SCADA at the Hospital.

The estimated cost for the instsallation is $356,000. Details are shown in the Table #1. A typical interconnection single-line-diagram is shown in Figure #1.

There will be a small solar installation at the hospital. Output from this unit will be used to reduce hospital load and is not part of the 4.6 MW synchronous machine installation.

Table #1

PRINCETON UNIVERSITY MEDICAL CENTER - COGENERATION INTERCONNECTION
PJM INTERCONNECTION PROJECT V3-050
PLAINSBORO, NEW JERSEY

Feasibility Study Estimates

Project Item		Option 1 13-Kv Duplicate Service
Inside Plant		
Line Position/Feeder Row		-
Relay Protection		$71,000
Manholes/Conduit		-
Other/Misc.		-
	Sub Total	$71,000
Outside Plant		
Overhead Line		-
Underground Line (Fiber Communications)		$254,000
Manholes/Conduit		-
Other/Misc.		-
	Sub Total	$254,000
Metering/Monitoring		
Revenue Metering		$31,000
Telemetering/SCADA		-
Feeder Metering		-
Other/Misc.		-
	Sub Total	$31,000
Total Cost		**$356,000**

Developer to purchase and install compatible remote transfer trip equipment at Princeton University Medical Center to PSE&G specifications.

The time line for completing the work for the project is shown below.

PRINCETON MEDICAL CENTER COGENERATION INTERCONNECTION
PJM PROJECT V3-050

August 1, 2010

WMPA is fully executed and authorization is received to proceed with construction

Long lead time construction material is placed on order

September 1, 2010

Developer submits final cogeneration 13-kV switchgear one-line diagram and transfer trip receiver equipment specifications for approval

September 15, 2010

PSE&G provides final comments and approval of cogeneration 13-kV switchgear lay-out, equipment and design

October 1, 2010

PSE&G commences line construction

Developer installs compatible relay equipment at Princeton Medical Center

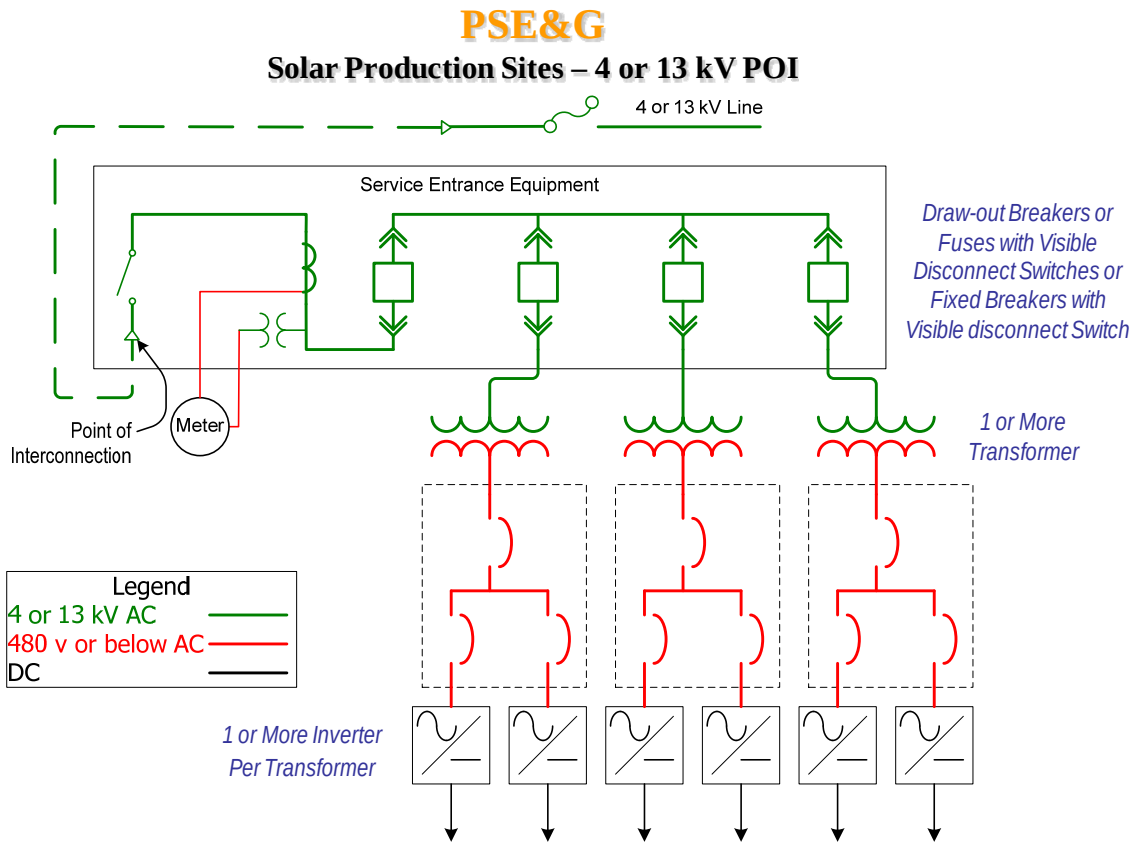
November 15, 2010

Switchgear and relay inspection and approval by PSE&G

December, 2010

Completion of interconnection work, testing and cogeneration cut-in

Figure #1



Network Impacts

The queue V3-050 project was studied as a 4.6MW injection (4.6MW of which was capacity) into PSEG's system at the Lawrence 230kV substation. The project was studied on a combined feasibility-impact basis which utilizes an AC analysis, and incorporates all contingency types. Project V3-050 was evaluated for compliance with reliability criteria for summer peak conditions in 2014. Potential network impacts were as follows:

Generator Deliverability

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

No problems identified

Multiple Facility Contingency
(Double Circuit Tower Line, Line with Failed Breaker and Bus Fault contingencies for the full energy output)

No problems identified

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

No problems identified

Stability

Not required because the project is less than 30 MW.

System Reinforcements

None.