

***PJM Generator Interconnection Request
Queue X3-043
Lumberton (Warfield I) 69kV
Feasibility/Impact Study Report***

**February 2012
#684586**

X3-043 Lumberton (Warfield I) 69kV Impact Study

General

Warfield Bros. J.V. has proposed installing a 12.0 MW AC solar project on property located at 315 Red Lion Road, Southampton, Burlington County, New Jersey. The capacity evaluation is based upon 4.56 MW. The commercial operation date is March 31, 2013.

The intent of the Impact Study is to determine system reinforcements and associated costs and construction time estimates required to facilitate the addition of the new generating plant to the transmission system. The reinforcements include the direct connection of the generator to the system and any network upgrades necessary to maintain the reliability of the transmission system.

Direct Connection

The interconnection will consist of a 69-kV single line service from Lumberton Switching Station on circuit B-600 for up to 12 MW

The total interconnection costs of \$568,283 are based upon the most efficient possible route to the qualifying existing infrastructure and are detailed as follows:

<u>Project Item</u>	<u>69-kV Single Line</u>
Inside Plant	
Line Position/Feeder Row	\$0
Relay Protection	-
Manholes/Conduit	-
Other/Misc.	-
Sub Total	\$0
Outside Plant	
Overhead Line	\$451,583
Underground Line	-
Manholes/Conduit	-
Other/Misc.	-
Sub Total	\$451,583
Metering/Monitoring	
Revenue Metering/Telemetry/SCADA	\$116,700
Feeder Metering	-
Other/Misc.	-
Sub Total	\$116,700
Total Cost	\$568,283
Acceptable Generation Level	Up to 12 MW

The cost is exclusive of work required to be performed by the developer as specified in PSE&G's Information & Requirements for Electric Service Handbook. This work includes, but may not be limited to, the following:

- Developer will adhere to specifications detailed in the PSE&G Information and Requirements for electric service handbook
- Developer is responsible for all trenching and the installation of conduits and manholes as normally required and specified by PSE&G
- Developer must obtain all permits and easements required to install the interconnection facilities
- Developer must provide access for the installation, maintenance and operation of all service equipment

It is anticipated that material procurement and construction will require 5-6 months from the date of project approval and authorization.

Project Initiation

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

Long lead time construction material is placed on order

1-2 Weeks from Project Initiation

Developer submits preliminary site plan, 69-kV switchgear one-line diagram and equipment specifications for approval

3-4 Weeks from Project Initiation

PSE&G provides comments on project lay-out and design

6-7 Weeks from Project Initiation

Developer submits final site plan, 69-kV switchgear one-line diagram and equipment specifications for approval

8-10 Weeks from Project Initiation

PSE&G commences line construction

10-12 Weeks from Project Initiation

PSE&G provides final comments and approval of 69-kV switchgear lay-out and design

Developer begins construction based on approved design

18-20 Weeks from Project Initiation

Switchgear inspection and approval by PSE&G

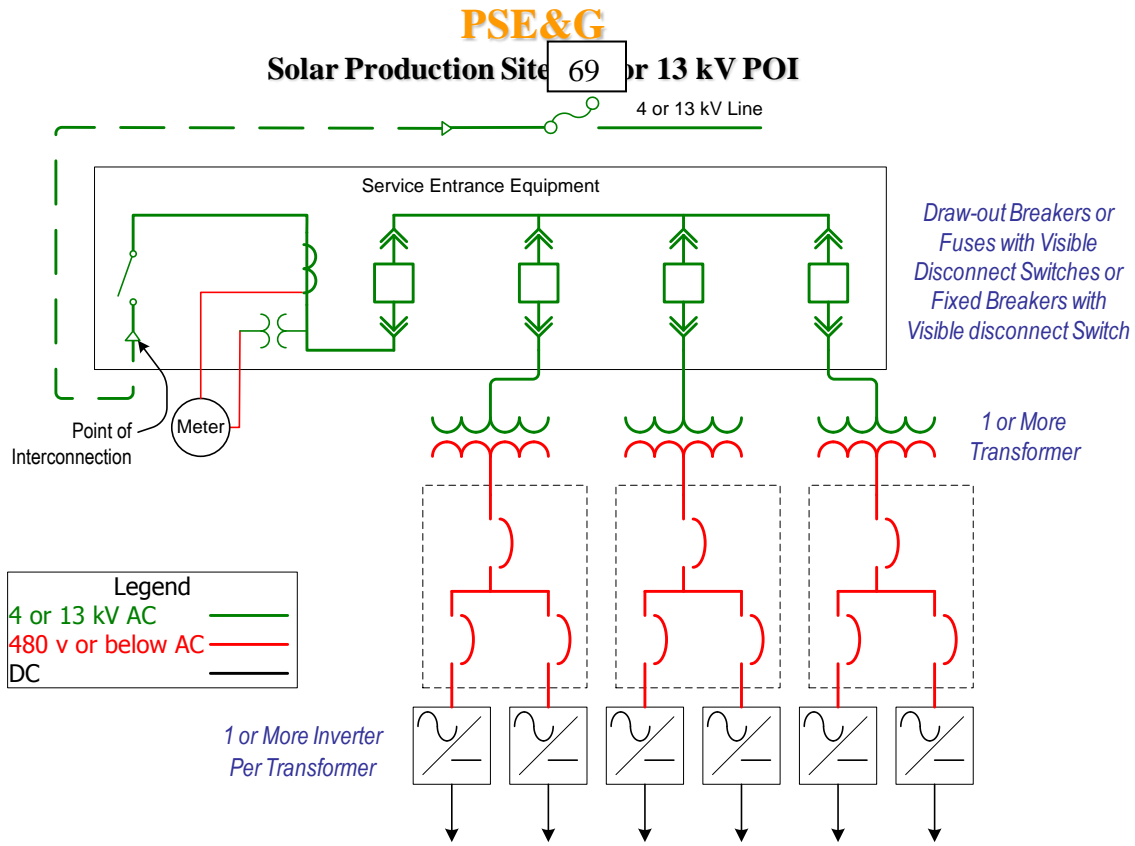
24-26 Weeks from Project Initiation

Completion of interconnection work and service cut-in

Notes:

- 1) Customer will abide by PSE&G Information and Requirements for electric service hand book
- 2) Customer is responsible to provide trench, conduit and manholes were applicable
- 3) Customer is responsible to provide access and easements
- 4) Customer is responsible to provide permits and associated costs.
- 5) Electric service route was based on most efficient route
- 6) Material procurement will be six months from project approval/authorization

Figure #1



Network Impacts

Queue project X3-043 was studied as a(n) 12.0 MW (4.56 MW of which was Capacity) injection into PSEG's system at the Lumberton 230kV substation. The project was studied on a combined feasibility-impact basis which utilizes an AC analysis, and incorporates all contingency types. Project X3-043 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)

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

Energy Portion of Interconnection Request

(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. 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 analyzes all overload conditions associated with the overloaded element(s) identified. As a result of the aggregate energy resources in the area, the following violations were identified.)

None