

***PJM Generator Interconnection Request
Queue #N06
Hamilton (Pine Hurst Acres) 12 kV
Feasibility/Impact Study Report***

October 2004
283923

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. All facilities required for interconnection of a generation project must be designed to meet the technical specifications (on PJM web site) for the appropriate transmission owner. The process for evaluating the interconnection of a generator to the PJM system is defined in the manuals posted on the PJM Generation Interconnection web page.

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.

Hamilton (Pine Hurst Acres) 12 kV Feasibility/Impact Study

General

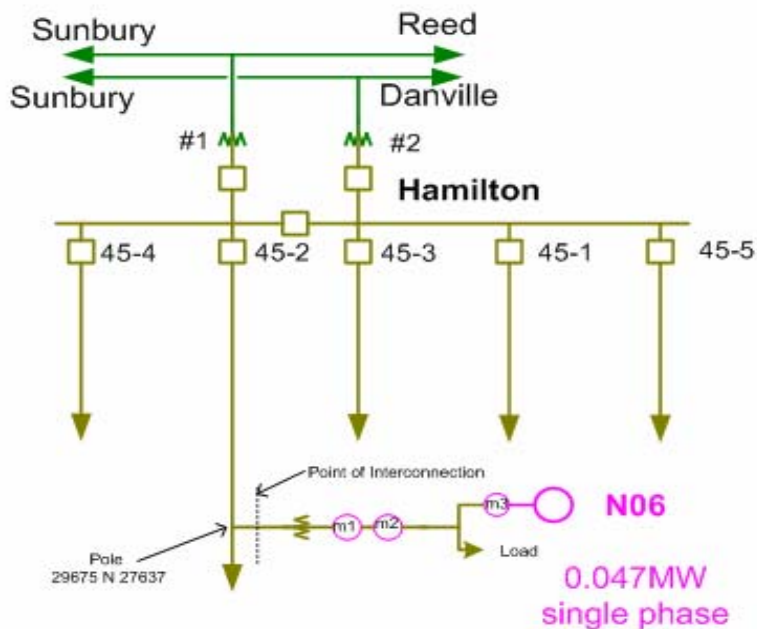
Pine Hurst Acres has submitted a proposal for a 0.047 MW single phase methane digester generation project. The generator is to be installed at a swine facility located at 3029 Sunbury Road, Danville, Northumberland County, Pennsylvania. The proposed in-service date for the generation facility is October 25, 2004.

Direct Connection

The project will be connected to the 45-02 PPL EU distribution circuit that is connected to the Hamilton 69/12 kV substation near pole 29765 N 27637. See Figure #1.

Figure #1

Hamilton (Pine Hurst Acres) 69/12kV N06



In order to connect the generator the following relay protection needs to be installed at the customer site.

27 undervoltage will be set for 85% voltage DO at a 3 cycle delay
81 underfrequency will be set at 59.3 Hz with a 3 cycle time delay
81 overfrequency will be set 60.5 at a 3 cycle delay
32 reverse power relay will be set at approximately 49.9Kw with a 3 cycle delay
25 synch check Basler BE3-25 will be set for 20 deg 0.1 slip

In addition to the relay requirements, metering needs to be installed to account for the power flow into the utility system. Three Landis & Gyr S4 form 2, class 320 meters will be installed. One will measure power out to the system, one will measure power into the customer and the third will measure gross generator output.

The estimated cost of the work to accommodate the interconnection of the generator is **\$6,200** consisting of \$3700 for the metering, \$1500 for field commissioning tests and relay calibration and \$1000 for drawing review and engineering support

Network Impacts

The N06 Hamilton (Pine Hurst Acres) project was studied as a 0.047 MW energy only single-phase injection into the Hamilton 12kV substation. Project # N06 was evaluated for compliance with reliability criteria for summer peak conditions in 2008. Potential network impacts were as follows:

Single Contingency (MAAC Criteria IIA)

No identified problems.

Second Contingency (MAAC Criteria IIB)

No identified problems.

Multiple Facility Contingency (MAAC Criteria IIC)

No identified problems.

Stability (MAAC Criteria IV)

Stability analysis was not performed because of the small size of the generator.

Short Circuit Analysis

No identified problems.

Multiple Facility Contingency (MAAC Criteria IIC)

No identified problems

New System Reinforcements

None

Contribution to Previously Identified System Reinforcements

None.