PJM Generator Interconnection Request
Queue #N27
Pequest River (Warren County Landfill) 34.5kV
Feasibility/Impact Study Report

September 2005
#335489

Pequest River (Warren County Landfill) 34.5kV (N27) Feasibility Study

General

WC Landfill Energy, LLC has received by assignment a project proposed by The Pollution Control Financing Authority of Warren County for a 4 MW project consisting of two 1.908 MW generators to be installed at the Warren County Landfill in Oxford, Warren County, New Jersey that will use landfill gas (methane) as fuel. This project has been assigned position N27 in the PJM Generation Interconnection Queue. The project is to be evaluated as a capacity resource. The proposed in-service date is April1, 2006.

The intent of the feasibility / 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 generators are to be connected to the Jersey Central system by a radial tap to the existing C705 34.5 kV circuit spur tap that emanates from the Hazen Switching Point (see Figure #1). The C705 line connects the Pequest River and Washington 34.5kV substations. As shown in Figure #1, the 34.5 kV radial feed from Hazen Switching point serves load customers in addition to providing for an attachment of the existing Warren County Resource Recovery (10 MW) generation.

Two disconnect switches will be installed at the interconnecting point on the 34.5kV circuit and a direct transfer trip (DTT) scheme will be installed to trip the proposed generators whenever the Pequest River and Washington C705 34.5 kV substation breakers open. For such a condition the connected generation on the radial 34.5 kV spur from the Hazen Switching Point can approximate the load that is connected.

Based on the above discussion, the following is a summary of the Jersey Central facilities required for the Warren County Generation Project attachment:

The FE direct connection and system upgrade costs (excluding CIAC and taxes) are estimated as:

- 34.5 kV Transmission Tap – Install a steel pole and two manually controlled disconnect switches for the project attachment at an estimated cost of **$120,000**.

- FirstEnergy will provide current transformers, potential transformers and an enclosure with a meter socket to be installed on the JCP&L side of the interrupting device at the customer substation for metering data to be sent to JCP&L at an estimated cost of **$40,000.**
- Pequest/Washington/ Warren County Generation Substations – Install a direct transfer trip scheme to disconnect each generator when both the Pequest and Washington 34.5 kV breakers open at an estimated cost of **$137,000.**
- Warren County Generation Sub – Substation, metering, SCADA & protection checkout by Jersey Central personnel at an estimated cost of **$13,000.**

The total estimated cost for the direct connection facilities to be supplied by FirstEnergy/Jersey Central is estimated to be **$310,000** and it is estimated that it will take 9 months to design and install the above facilities from the signing of an Interconnection or Construction Service Agreement.

The estimate for work at the interconnection tap assumes that:

- WC Landfill Energy will restore access (readily accessible) to the existing easements on both sides of the road. This shall include the required culverts.

- Interconnect point will be on the load side of the new tap switch at the edge of the easement. WC Landfill Energy will engineer/design, provide and maintain the line from the tap point to the facility major electrical equipment, in accordance with JCP&L's practices. WC Landfill Energy will construct a suitable road to the interconnect point also In accordance with JCP&L's requirements.

- The pricing is suitable to provide the tap point on either side of the road, a decision as to which side will be coordinated during final design.

The Interconnection Customer will be responsible for installing all of the local facilities that are needed for compliance with the FirstEnergy “Requirements for Transmission Connected Facilities" document (see PJM website). Since backup 34.5 kV service has been requested, the Interconnection Customer will execute a tariff agreement with Jersey Central that will specify the charges for any capacity and energy load service that is provided.

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 including:

- The purchase and installation of a fully rated three-phase fault interrupting device (not fuses) on the Developer’s side of the point of interconnection.

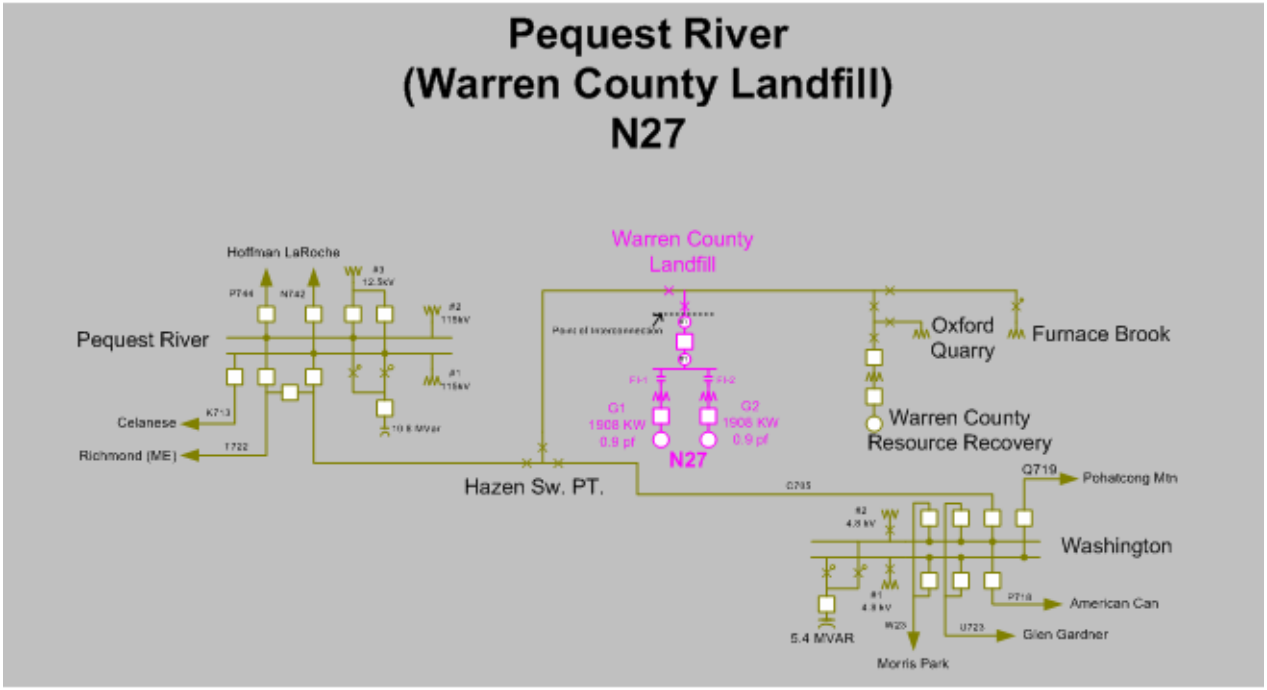
- The purchase and installation of the minimum required FirstEnergy generation interconnection relaying and control facilities.
- FirstEnergy will provide the metering current transformers, potential transformers and an enclosure with the metering socket mounted within. A dedicated voice line will have to be provided to this enclosure for communication by WC Landfill Energy. WC Landfill Energy shall provide 1 1/2" RGS conduit from the metering transformers to the enclosure for the meter. A 1" RGS conduit will also be furnished by the WC Landfill Energy for communications.

    - Visible lockable disconnect will be required on both sides of, and adjacent to the metering transformers.

    - Clear access, a minimum of 20', shall be provided on all sides of the metering structure. No equipment shall be located below the metering transformers. An access road shall be provided to the structure.

    - The primary and secondary lockable disconnect switches shall be located such that they will not hinder the access to the metering transformers from all sides and will be provided with the necessary safety clearances required by the NESC from the live parts.
- The purchase and installation of supervisory control and data acquisition (SCADA) equipment to provide information in a compatible format to the FirstEnergy System Control Center.
- The establishment of dedicated communication circuits for direct transfer trip relaying, for SCADA communication to the transmission system control center, and for dialup access to revenue metering

Figure #1



Network Impacts

The #N27 project was studied as an injection of 4 MW into the Hazen Sitch Point tap of the Pequest River – Washington 34.5 kV circuit. Project #N27 was evaluated for compliance with reliability criteria for summer peak conditions in 2008. Potential network impacts were as follows:

Generator Deliverability

No identified problems

Multiple Facility Contingency – Tower Line Outages

No identified problems

Contribution to Previously Identified Overloads

None

Short Circuit

No identified problems.

New System Reinforcements

None

Contribution to Previously Identified System Reinforcements

None.