PJM Generator Interconnection Request
Queue #O55
PEI Power 69 kV
Four 2.96 MVA Gas Turbines
Feasibility/Impact Study Report

PEI Power 69 kV Feasibility/Impact Study

General

PEI Power Corporation has submitted a proposal for an additional 9.6 MW of gas generation (Queue position O55). The addition will consist of four 2.4 MW gas turbines that will be installed in Archbald, Lackawanna County, Pennsylvania. PEI Power had proposed an in-service date for the project of January 1, 2007.

The intent of this combined feasibility and system impact study is to determine system reinforcements and associated magnitude cost and construction time estimates required to facilitate the addition of the new generation to the PJM system. The reinforcements include the direct connection of the generator to the system and any network upgrades necessary to maintain the reliability of the PJM system.

Direct Connection Requirements

The new generating facilities will be connected to the Peckville-Varden 69 kV transmission line (point of interconnection is near grid 60480N48760). This line is supplied by the Peckville 230-69 kV Substation. At the PEI Power plant, the four generating units will be tied to an existing 69 kV bus through a 9.1 MVA, 4.16kV/69 kV step-up transformer. The new units will share the 69 kV bus along with existing generator Units 1 & 2, 25.9 MVA and 71.2 MVA, respectively. See Figure #1 below.

PPL EU facilities are of sufficient capability to permit connection of an additional 9.6 MW of generation from PEI Power in Archbald.

Transmission Portion:
No transmission line work is required for this connection. Existing transmission infrastructure will facilitate this new generation. Therefore, no dollars will be required for transmission line work.

Substation Portion:
At the IPP site, PPL EU will:

- Review revised and new IPR drawings.
- Test new IPR cabinet.
- Install new metering equipment.

The magnitude estimate to review IPR cabinet drawings and to test the new IPR relay protection scheme is **$40,000** plus applicable taxes. No additional work would be required at any PPL EU owned substations to accommodate this proposed generation.

If PPL EU is asked to provide the metering equipment, the metering cost is estimated to be **$75,000** (material and labor, plus applicable taxes). Included in this cost is one spare metering unit because the devices will be unique to this installation. If PEI decides against a system spare, accepting any

consequences of meter failure, approximately $13,000 can be subtracted from the metering estimate. Other metering service costs may apply depending on PEI's choice of metering options.

The total estimated cost for the connection of this IPP (transmission, substation, metering and construction) is **$115,000** plus applicable taxes. Income tax gross-ups are not included in the feasibility study but will be addressed in the Interconnection Service Agreement as an indemnification clause.

Regulation Requirements of the Generation Project:

PEI Power has indicated that the four new units will be synchronous generators. The two existing generating units at PEI Power operate at unity power factor. In order to eliminate significant voltage deviation at the 69 kV bus, it is assumed that the new units will also need to operate at unity power factor. PPL EU will study the voltage regulation requirements further in future studies should PEI choose to proceed with this installation. Future studies would be based on the following data provided by PEI Power unless otherwise directed:

- Four gas turbine-generators, 2.966 MVA each, terminal voltage of 4.16 kV, sub-transient reactance of 15%
- Unit step-up transformer for all four generating units, 9.1 MVA, 69/4.16 kV, impedance of 7% and an X/R ratio of 20.

Network Impacts

Potential network impacts for the injection of 9.6 MW into the Peckville-Varden 69 kV circuit are listed below:

Normal System:
No identified problems.

Multiple Facility Contingency (MAAC Criteria IIC):
No identified problems.

Generator Deliverability:
No identified problems.

Short Circuit Analysis:
No identified problems.

System Reinforcements:
None identified.

Schedule

Activity	Start	Finish
Impact/ Facilities Study		15-Mar-06
Interim Agreement to Procure Equipment & Begin Engineering		1-Apr-06
PPL- Long Lead Time Material Order (30 wks. if necessary):	Apr-06	Dec-06
Interconnection Agreement Complete		1-May-06
PPL Engineering:		
IPP provides Design Drawings for PPL EU Review	Apr-06	Jun-06
PPL Drawing Release to Field:		Jun-06
PPL Construction/ Relay Test:	Sep-06	Nov-06
Meter Install		Dec-06
Complete As-Built Drawing Review		Dec-06
Commercial In-Service Date:		1-Jan-07

Notes concerning the Schedule:

- The ISA/CSA or an Interim Agreement must be signed by PEI Power, PJM and PPL EU before any PPL EU activities may commence.
- PPL EU recommends that an Interim ISA/CSA be completed by April 1st to address long lead-time purchases. To meet schedule requirements, meter design, procurement and installation schedules must be implemented accordingly. Procurement lead-times for metering equipment may extend to 30 weeks.
- The use of additional resources, such as overtime, premiums for expedited material, and/or contractor labor, may enable PPL EU schedule requirements.
- The schedule is completely under the control of the IPP. PPL EU will turn drawings around in a reasonable timeframe; however, PPL cannot start work until the first set of drawings is received.

Direct and Indirect Costs

Description	Totals for the PPL EU Portion of the Project
Direct Labor	$ 31,916
Indirect Labor	$ 16,991
Direct Material	$ 57,035
Indirect Material	$ 9,696
Total	**$115,638**

Note concerning the Costs:

The costs given above assumes that the IPP will use a similar IPR cabinet design as used previously and the drawings will be in good order.

FIGURE 1