Generation Interconnection Feasibility Study Report Queue Position V4-014

General

The Interconnection Customer (IC) has proposed a 6.5 (energy only) methane fueled generating facility to be located at the Greenridge Landfill in Scottdale, PA. The project will consist of four (4) reciprocating engine drive generators. V4-014 was studied as a 6.5 MW injection into the Allegheny Power System at the Iron Bridge 25kV substation and evaluated for compliance with reliability criteria for summer peak conditions in 2014. The in-service date, as stated in the Attachment N, is December 31, 2010.

Point of Interconnection

V4-014 will interconnect with the Allegheny Power (AP) distribution system at the new Greenridge 25kV switching station.

Direct Connection Requirements

Transmission Owner Scope of Direct Connection Work

The Transmission Owner's (AP) scope of work includes:

Attachment Facilities
Greenridge 25kV switching station

- Construct the Greenridge 25kV switching station. Grade and install an access road for a fenced in area of approximately 80' x 80'. Install a ground grid, foundations, and yard stone. Install one (1) 25kV initial bay, one (1) 1200A 25kV breaker, six (6) 1200A 25kV hookstick disconnect switches, one (1) 1200A 25kV vertical break switch. Three (3) 25kV voltage transformers (VTs), 25kV station service, 25kV fuses, 25kV metering, and 25kV arresters will also be installed. A 16' x 20' metal control building to house batteries, SCADA, telephone service, control cables and panels, PLC transfer trip, and associated equipment will be installed at the switching station.

- Tap the Alverton Tap - Alverton 25kV circuit at a point 1.2 miles (AP pole #709243) from the Iron Bridge-Hillis Jct 25kV circuit and conenct it to the new Greenridge 25kV switching station via an overhead 25kV line.

  Note: All property required to provide for this interconnection must be obtained by the IC at no cost to AP and conveyed to AP via a perpetual lease or deed. All rights-of-way must be obtained by the IC and transferred at no cost to AP.

The estimated cost to perform this work is **$1,316,956** in 2011 dollars.

Local Network Upgrades

- Install 25kV transfer trip facilities at Greensburg Substation.

  The estimated cost to perform this work is **$103,929** in 2011 dollars.

- Install 25kV transfer trip facilities at Youngwood Substation.

  The estimated cost to perform this work is **$103,929** in 2011 dollars.

- Install 25kV transfer trip facilities at Iron Bridge Substation.

  The estimated cost to perform this work is **$103,929** in 2011 dollars.

Allegheny Power reserves the right to review the electrical protection design and relay settings for the Interconnecting Customer facilities to ensure that the protective relaying equipment will be compatible with that installed at the new switching station. The relaying package will likely include both primary and backup protection. Allegheny Power personnel must be present at the time of commissioning to witness proper function of the protection scheme and related coordination. The estimated cost to perform this engineering review and field test effort is **$5,000 in 2011 dollars**.

Note: The purchase and installation of protective relaying and associated equipment at the generation site is the responsibility of the interconnecting customer and is not included in this scope of work.

Interconnection Customer Scope of Direct Connection Work

The Interconnection Customer will interconnect V4-014 with the APS system by constructing an overhead customer owned 25kV circuit from their generating site to the new Greenridge 25kV switching station. The above cost estimates do not include construction of that line or bus work. Route selection, line design, right-of-way acquisition and construction of such lines will be entirely the responsibility of the Interconnection Customer. It's assumed that the Interconnection Customer's step up transformer will conform to the AP standard with delta on the low side and grounded wye on the high side as illustrated in the AP Facility Connection Manual:

http://www.alleghenypower.com/Bus2Bus/Gen%20Trans%20AP%20Facility%20Connection%20Requirements.pdf

It is assumed that a fiber optic interface will be used for the protection channel between the AP and IC's station. The IC will be required to install metering and telemetry equipment to provide revenue metering and real-time telemetry data to PJM. The requirements for this equipment are listed in Appendix 2, Section 8 of Attachment O to the PJM Tariff, as well as PJM Manuals 01 and 14D. Protective relaying and metering design and installation must comply with the Allegheny Power Applicable Standards.

Cost and Timing Summary

While the information in this transmittal is reasonable for the scope of work defined, it should be noted however, that the cost figures are conceptual in nature at this stage, and that an engineering team has not yet been assigned to the project. Any change to the scope of work will require that the estimates be revisited. The costs are a best estimate, but the developer will be charged for actual costs. Any under-runs or over-runs will be reconciled at the conclusion of the project. The cost estimates in this report **do not** include tax gross-up.

The estimated time to provide for the interconnection of this project is **15 months** after the receipt of a fully executed Interconnection Service Agreement and Interconnection Construction Service Agreement. The requested in-service date of December 31, 2010 probably cannot be met. A May 2011 in-service date was assumed for the purpose of preparing the above estimates. Permitting issues and completion of the remaining required PJM studies may delay this estimated project duration.

Network Impacts

Potential network impacts are as follows:

Generator Deliverability

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

None

Multiple Facility Contingency

*(Double Circuit Tower Line, Line with Failed Breaker and, Bus Fault contingencies for the **Full** energy output.*

None

Contribution to Previously Identified Overloads

(This project contributes to the following contingency overloads, i.e. "Network Impacts", identified for earlier generation or transmission interconnection projects in the PJM Queue)

None

Short Circuit

No problems identified.

New System Reinforcements

(Upgrades required to mitigate reliability criteria violations, i.e. "Network Impacts," initially caused by the addition of this project's generation)

None

Contribution to Previously Identified System Reinforcements

(Overloads initially caused by prior Queue positions with additional contribution to overloading by this project.

None

Stability Analysis

Not required.

Other Supporting Facilities Charge

The Other Supporting Facilities Charge (OSFC) may include non-transmission facilities directly assigned and/or a general (rolled-in) facilities charge. The guidelines apply to all wholesale customers and all generators selling into or through the PJM market, regardless of capacity, not connected directly to the AP Transmission System.

The Other Supporting Facilities Charge for the V4-014 generator interconnection project has been estimated to be **$3,952/month** in 2010 dollars. The estimate is based on a direct assigned rate and an average (or rolled-in) rate for West Penn's sub-transmission system.