Generation Interconnection Feasibility Study Report

PJM Generation Interconnection Request Queue Position #T39 Coudersport 46kV

March 2008

Preface

The intent of the Generation Interconnection Feasibility Study is to determine a plan, with ballpark cost and construction time estimates, to connect the subject generation interconnection project to the PJM network at a location specified by the Interconnection Customer. As a requirement for interconnection, the Interconnection Customer may be responsible for the cost of constructing: 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 Interconnection Request must be designed to meet the technical specifications (on PJM web site) for the appropriate transmission owner.

In some instances an Interconnection Customer may not be responsible for 100% of the identified Network Upgrade cost because other transmission network uses, e.g. another generation interconnection or merchant transmission upgrade, 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 Generation Interconnection 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.

General

The Interconnection Customer (IC) has proposed an 18MW Wind generating facility to be installed in Potter County PA near the community of Coudersport. The IC will interconnect with Allegheny Power (AP) at the new Dutch Hill 46kV interconnection Station. The generating facility will consist of Wind Turbine generators. The proposed in-Service date for the projects is December 31 2008.

The project will be connected to a new Allegheny Power Dutch Hill 46kV Station as depicted in Figure No. 1. The scope of work and estimated cost for individual project segments is as follows:

Attachment Facilities

Point of Interconnection: New AP Dutch Hill 46kV switching station on the Mina Jct (AP)-Larch Street (AP) 46kV line section.

Required reinforcements

- No reinforcements are required for this project.

Estimated Cost

Attachment Facilities

- Dutch Hill SS - Construct a new 46kV switching station on property provided by the developer to provide a service point for a proposed generation interconnection facility which will be located in the St Mary's Service Center. This new switching station (Dutch Hill) will be situated on the existing Mina Jct-Larch Street 46kV subtransmission line at a point approximately 1.8 miles from Larch Street SS. Major equipment in the new station will include a 46kV steel bay, 1-46kV circuit breaker, 46kV hookstick disconnect switches, 1-46kV vertical break switch, and 46kV interconnection metering. A dual transfer trip scheme requiring the addition of CVT's and line traps is included. The station will also include a control building, which will house all protective relaying, metering and SCADA RTU communications equipment required to accommodate the electrical facilities. Revenue metering will be located on the feed to the generator. Site preparation including grading and an access road is included. The developer's station will be remote from the AP SS and interconnection is assumed to be overhead line. The assumption is made that the developer's step up transformer is delta on the low side and grounded wye on the high side.

Estimated Cost: 769,000 in 2008 dollars

- Tap the Mina Jct. - Larch Street 46kV line.

Estimated Cost: 135,000 in 2008 dollars

- Potter SS- Install dual transfer trip on the Mina Jct. 46kV terminal.

Estimated Cost: 170,000 in 2008 dollars

- Emporium SS- Install dual transfer trip on the Mina Jct. 46kV terminal

Estimated Cost: 170,000 in 2008 dollars

WHOLESALE DISTRIBUTION CHARGES

The charges below are the wholesale distribution charges. This charge is a rough estimate based on a rolled-in rate methodology, which assumes subtransmission facilities between AP's transmission system and the interconnection point are integrated network facilities.

Estimated Cost: 9,420/month in 2008 dollars

COST AND TIMING SUMMARY

The estimates in this report do not include tax gross-up.

Note that the figures above do not include construction of the line required to interconnect the customer's proposed new generating facility with the Allegheny Power Larch St.-Mina Jct. 46kV line. Route selection, line design, right-of-way acquisition and construction of such lines will be entirely the responsibility of the interconnection customer. No upgrades to the AP system have been identified with this project.

The estimated time to provide for the interconnection of this project is 15 months after the receipt of a signed Interconnection Service Agreement and Interconnection Construction Service Agreement.

While the information in this transmittal is reasonable for the scope of work defined, it should, however, be noted that the cost figures are conceptual in nature at this stage, as an engineering team has not been assigned to the project. Obviously, 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.

Network Impacts

The **#T39 project was studied as a total injection of 18 MW**. Project #T39 was evaluated for compliance with reliability criteria for summer peak conditions in 2012. There were no potential network impacts found in this study.

Generator Deliverability*

(No contingencies, Single or N-1 contingencies for the full energy output)

No base case overloads were identified.

Single Contingency Conditions

No overloads due to single contingency events were identified.

Multiple Contingency Conditions

No overloads due to multiple contingency events were identified.

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 identified

New System Reinforcements

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

None identified

Contribution to Previously Identified System Reinforcements

(Overloads initially caused by prior Queue positions with additional contribution to overloading by this project. This project may have a % allocation cost responsibility which will be calculated and reported for the Impact Study)

None identified

Short Circuit

No breakers were identified as being over their maximum interrupting rating.

Listed below are the positive and zero sequence source equivalent impedance at the proposed Dutch Hill 46 kV site with the GSU and generators OPEN.

Positive: (0.31601+j0.60933)
Zero: (0.37203+j1.19674)

While we can't mandate that our personnel install protective relaying and communications equipment at the generator site, Allegheny Power has responsibility for designing the protection scheme and providing specifications for all relays to be employed on the interconnection breaker terminal at the generation site to assure that the protective relaying equipment will be compatible with that installed on the interconnection breaker terminal at the new switching station. The relaying package will likely include both primary and backup protection. Allegheny Power is also responsible for testing and calibrating all relays and performing all tests to assure that relaying at the generator site is properly installed and functional. The estimated total cost of this engineering and field test effort is **$5,000 in 2008 dollars**.

Note: Purchase and installation of protective relaying and associated equipment at the generation site is not included in this scope of work. This phase of work is the responsibility of the customer.

The estimated cost for Controls Engineering to complete a coordination review of the area, develop new relay settings, and implement the required changes is approximately **$5,000 in 2008 dollars**.

Delivery of Energy Portion of Generation Interconnection Request

PJM also studied the delivery of the energy portion of this interconnection request. Any problems identified below may 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 Merchant Transmission Interconnection request. The following are not required upgrades.

As a result of the aggregate energy resources in the area, the following violations were identified:

1. The Potter – Two Mile 115kV line is overloaded from 94.80% to 101.55% of its normal rating (177 MVA). The project contributes approximately 11.9 MW to the thermal violation. To mitigate this overload condition would require reconductor/upgrade of approximately 13.3 miles of 115 kV transmission line between the Two Mile Run and Potter substations (estimated to cost approximately $4,125,000).

Figure No. 1