

***Generation Interconnection
Feasibility Study Report
Web Version***

For

***PJM Generation Interconnection Request
Queue Position W4-007***

Afton 138kV Project

April, 2011

Overview

Interconnection Custom (IC) has submitted an Attachment N to propose the interconnection of 20 MW energy, 2.6 MW Capacity, of wind generation on a property located in Preston County, West Virginia. This project is an addition of generation to the N33 project at that site and will be selling its energy and Capacity into the PJM market via the Allegheny Power (FirstEnergy) network.

The Commercial Operation date for both this project and for the N33 portion of the project is requested to be December 31, 2014. The analysis was performed using a 2014 base year

PJM Report on the Transmission System

This portion of the report addresses the impacts on and the required reinforcements to that part of the transmission system under PJM jurisdiction.

Network Impacts

Queue project W4-007 was studied as a(n) 20.0 MW (2.6 MW of which was Capacity) injection into APS's system at the N33 C 138.0 kV substation. Project W4-007 was evaluated for compliance with reliability criteria for summer peak conditions in 2014.

Potential transmission network impacts are as follows:

Generator Deliverability

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

No violations identified.

Multiple Facility Contingency

(Double Circuit Tower Line contingencies only with full energy output. Stuck Breaker and Bus Fault contingencies will be applied during the Impact Study)

No violations 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.)

No violations 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 required.

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 required.

Short Circuit

(Report over-dutied breakers.)

None required.

Energy Portion of Interconnection Request

PJM also studied the delivery of the energy portion of the surrounding generation. Any potential problems identified below are likely to 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 Transmission Interconnection request.

Note: Only the most severely overloaded conditions are listed. There is no guarantee of full delivery of energy for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed which analyzes all overload conditions associated with the overloaded element(s) identified. As a result of the aggregate energy resources in the area, the following violations were identified.

No violations identified.

APS (FirstEnergy) Feasibility Analysis Report

This portion of this Feasibility Study Report has been prepared for PJM queue project W4-007 by Allegheny Power (FirstEnergy). It addresses the impacts on and required reinforcements to that portion of the network at the distribution level, including the attachment and direct connection facilities.

Injection into the N33 34.5kV Collector Bus

Attachment Facilities and Related Network Upgrades

- No new Transmission Owner (TO) facilities are required assuming all facilities constructed for the N33 project will be designed to also support the interconnection of the W4-007 project.

The IC will interconnect with onto his 34.5kV collector bus to be constructed as part of the N33 project. It is assumed that the IC's main step up transformer will conform to the TO standard with delta on the low side and grounded wye on the high side.

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

The TO reserves the right to review the electrical protection design and relay settings for IC facilities to ensure that the protective relaying equipment will be compatible with that installed on Potomac Edison facilities. The relaying package will likely include both primary and backup protection. TO personnel must be present at the time of commissioning to inspect and witness proper function of the control 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 IC and is not included in this scope of work.

It is assumed that a fiber optic interface will be used for the protection channel between the TO and IC stations. 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 TO applicable standards.

Overloads and Required Reinforcements

No thermal violations were identified as a result of this project.