Merchant Transmission Interconnection Feasibility Study Report Web Version

For

PJM Merchant Transmission Interconnection Request Queue Position W1-027

502 Jct.-Meadow Brook 500 kV Project

PJM DOCS No. 605704 v1
July, 2010

Overview

Interconnection Customer (IC) has submitted an Attachment S to propose the interconnection of a 500 kV, 500 MVAR SVC on the 502 Junction-Meadowbrook 500 kV line at a new sub-station to be built in West Virginia. This project is a re-submittal of the V3-022 Merchant Transmission project that had been withdrawn. The In-Service date for this project was requested to be in 2013. The analysis was performed using a 2014 base year. .

PJM Feasibility Analysis Report

The report below was prepared by PJM engineers for the V3-022 Merchant Transmission Project. It is presented here again because no changes to the base case occurred between the time the V3-022 analysis was performed, and the start of the W1 queue studies.

Network Impacts

The queue V3-022 (now W1-027) project was studied as a 500MVAR SVC which connects to the system as a 500kV double line tap. The two line segments that are tapped are the Meadow Brook – Welton Spring 500kV, and the Meadow Brook – Green Gap 500kV. U2-088 is modeled at the same interconnection point, and their new connection facility ties these two 500kV lines together. The project was evaluated for compliance with reliability criteria for summer peak conditions in 2014. Potential network impacts were as follows:

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

No problems identified.

Multiple Facility Contingency
(Double Circuit Tower Line, Stuck breaker and Bus Fault contingencies for the full energy output)

No problems 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 problems 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.

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.

Short Circuit

Not required.

APS Feasibility Study Report

This portion of this Feasibility Study Report has been prepared for PJM queue project W1-027 by Allegheny Power.

Injection into the future 500kV Rio Switching Station

Attachment Facilities and Related Network Upgrades

- Assume Rio Switching Station project (U2-088) has been completed prior to the project start, including grading and fence for this project. Install grounding, cable trough, and foundations, 2-500kV deadend structures, 500kv bus work and associated steel structures in the existing double bus, double breaker station. Install 6-3000A, 500kV breakers, 13-3000A, 500kV motor-operated disconnect switches, 500kV metering, 500kV CVT's, line traps, and arresters. Install control panels and cables, and associated equipment. Note: All property associated with this station must be obtained by the IC and conveyed to AP, at no cost, in the form of either a perpetual lease or direct ownership. All rights-of-way must be obtained by the IC and transferred, at no cost, to AP.

Estimated Cost: $11,461,127 in 2013 dollars *(NOTE: Tax gross-up is not included.)*

- Loop the Mt. Storm-Meadowbrook (future) TRAIL 500kV line into Rio SS. Construct a one span steel pole 500kV loop line with 2-2032 ACSR, and 6-500kV steel poles with pad and pier foundations.

Estimated Cost: $1,195,647 in 2013 dollars *(NOTE: Tax gross-up is not included.)*

The estimated project duration is **21 months** after the receipt of an executed Interconnection Service Agreement and 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 IC will be charged for actual costs. Any under-runs or over-runs will be reconciled at the conclusion of the project. The estimates in this report do not include tax gross-up.

The IC will interconnect with the Allegheny Power (AP) system via overhead line from a customer owned substation located adjacent to the new Rio switching station. The above cost estimates do not include construction of that line. Route selection, line design, rights-of-way acquisition and construction of such lines will be entirely the responsibility of the IC. It is assumed that the IC's main 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 .

AP 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 at the new switching station. The relaying package will likely include both primary and backup protection. AP 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 **$10,000 in 2013 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 AP 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 AP applicable standards.

Overloads and Required Reinforcements

No Generator Deliverability overloads were identified.

Please note, AP and PJM have not studied the full impact of the installation of this SVC on their respective systems. This level of study will be performed during the Impact Study Phase.