

U2-088 Meadow Brook 500kV Transmission Interconnection

General

The Interconnection Customer (IC) has proposed the installation of a 500 MVAR Dynamic Reactive Device (SVC) at the Allegheny Power Meadow Brook 500 kV substation. The planned in-service date for the project is January 31, 2011. U2-088 will interconnect with the Allegheny Power transmission system at either the future Rio 500kV substation (option 1), or at the existing Meadow Brook 500kV substation (option 2).

Option 1

Point of Interconnection

U2-088 option 1 will interconnect with the AP transmission system at the future Rio 500kV substation. Option 1 was studied as a 500 MVAR SVC at the Meadow Brook 500kV substation.

Direct Connection Requirements

Transmission Owner Scope of Direct Connection Work

The Transmission Owner's (Allegheny Power) scope of work for the direct connection facility includes:

- Obtain property at no cost to AP and cut the existing Greenland Gap-Meadow Brook 500kV line. Construct a one (1) span line loop into the proposed 500kV Rio substation.

Estimated Cost: \$1,154,000 in 2010 dollars

- Rio 500kV substation. Obtain property for an approximate 800' x 355' fenced area and access roads at no cost to AP. Grade the site, install fence, ground grid, cable trough, and yard stone. Construct a 500kV ring bus for three (3) initial and one (1) future 500kV breakers. Install three (3) 500kV breakers, ten (10) 500kV disconnects, 500kV CVT's, line traps and arresters. Install a 32' x 52' metal control building, a 32' x 52' maintenance building, emergency generator, SCADA and communications, station service, control panels and associated equipment.

Estimated Cost: \$13,812,000 in 2010 dollars

Interconnection Customer Scope of Direct Connection Work

The Interconnection Customer (IC) has assumed full responsibility for the design and construction of all facilities associated with the U2-088 facility and the 500kV direct connection line on the IC side of the Point of Interconnection (POI). The IC will interconnect U2-088 with the AP transmission system by constructing a customer-owned 500kV line from the facility to AP's future Rio 500kV substation. Route selection, line design, right-of-way acquisition and construction of such lines will be entirely the responsibility of the IC. Cost estimates do not include construction of that line.

Cost and Timing Summary

While the information in this transmittal is reasonable for the scope of work defined, it should be noted that the cost figures are conceptual in nature at this stage and that an engineering team has not yet 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.

The cost estimates in this report do not include tax gross-up, land acquisition, or any network upgrades which may have been identified and required by this project.

The estimated time to provide for the interconnection of this project is **30 months** after the receipt of a signed Interconnection Service Agreement and Construction Service Agreement.

Option 2

Point of Interconnection

U2-088 option 2 will interconnect with the AP transmission system at the Meadow Brook 500kV substation. Option 2 was studied as a 500 MVAR SVC at the Meadow Brook 500kV substation.

Direct Connection Requirements

Transmission Owner Scope of Direct Connection Work

The Transmission Owner's (Allegheny Power) scope of work for the direct connection facility includes:

- Meadow Brook 500kV substation. Purchase additional property required for substation expansion. Grade and fence an approximate 350'x 650' area for the AP portion of the project. Extend the existing 500 kV bus. Install two (2) 500kV

breakers, five (5) 500kV disconnects, control panels, cables and equipment, and associated facilities.

Estimated Cost: \$8,372,000 in 2010 dollars

Interconnection Customer Scope of Direct Connection Work

The Interconnection Customer (IC) has assumed full responsibility for the design, construction and operation of facilities associated with U2-088 including the 500kV direct connection line on the IC side of the Point of Interconnection (POI). The IC will interconnect U2-088 with the AP transmission system by constructing a customer-owned 500kV line from the facility to AP's Meadow Brook 500kV substation. Route selection, line design, right-of-way acquisition and construction of such lines will be entirely the responsibility of the IC. Cost estimates do not include construction of that line.

Cost and Timing Summary

While the information in this transmittal is reasonable for the scope of work defined, it should be noted that the cost figures are conceptual in nature at this stage and that an engineering team has not yet 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.

The cost estimates in this report do not include tax gross-up or any network upgrades which may have been identified and required by this project. Property purchase costs for this option is included in the above estimate. The costs and schedule in this report also assume that PJM queue project U2-028 and the TRAIL 500kV cross bus extension are completed prior to, or in conjunction with, this project. The developer will construct, own, and operate the SVC.

The estimated time to provide for the interconnection of this project is **30 months** after the receipt of a signed Interconnection Service Agreement and Construction Service Agreement.

Network Impacts

The queue U2-088 project was studied as a 500 MVAR SVC at the Meadow Brook 500kV substation. U2-088 was evaluated for compliance with reliability criteria for summer peak conditions in 2012. 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

Stability and Reactive Power Requirement

Not required.

Short Circuit

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