

# U4-002 Pickens-Monterville 138kV Generation Interconnection

## General

The Interconnection Customer (IC) has proposed a 100 MW wind power generating facility to be located near Monterey, Randolph County, West Virginia. The project was evaluated for compliance with reliability criteria for summer peak conditions in 2013. The in-service date, as identified in the Generation Interconnection Feasibility Study Agreement, is December 31, 2012.

U4-002 will interconnect to the Allegheny Power (AP) transmission system via either a tap of the Pickens-Monterville 138kV circuit or as a direct connection into the existing Pickens 138kV substation.

## Option 1

### Point of Interconnection

U4-002 Option 1 will interconnect with the AP transmission system at the new Turkey Bone 138kV substation which is a tap of the Pickens-Monterville 138kV circuit. Option 1 was studied as a 100 MW injection into the AP transmission system at the Pickens-Monterville 138kV circuit.

### 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:

- Turkey Bone 138kV substation: Obtain property in the form of a permanent lease from the developer at no cost to AP. Grade the site and install an access road for a fenced area of approximately 200' x 210'. Construct a 138kV ring bus switching station consisting of: three (3) 138kV breakers, seven (7) 138kV switches, 138kV metering, 138kV bus supports, two (2) 138kV dead-end structures, one (1) 138kV power VT, foundations, a 16' x 36' metal control building, battery, control cables, panels, and associated equipment. It is assumed that the connection will be a tubing over the fence type to the developer's facility.

The estimated cost to perform this work is **\$3,443,000** in 2009 dollars.

- Cut the Pickens-Monterville 138kV circuit and loop the line through the new Turkey Bone 138kV switching station. Construct a 0.1 mile 954 kcmil ACSR 138kV loop line.

The estimated cost to perform this work is **\$240,400** in 2009 dollars.

- Install facilities for transfer trip at the Pickens 138kV substation.

The estimated cost to perform this work is **\$166,100** in 2009 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 U4-002 generating facility and the 138kV direct connection line on the IC side of the Point of Interconnection (POI). The IC will interconnect U4-002 with the AP transmission system by constructing a customer-owned 138kV line from the generating facility site to AP's Turkey Bone 138kV 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. It is assumed that the ICs step up transformer will conform to the AP standard of delta on the low side and grounded wye on the high side.

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**

The estimated time to provide for the interconnection of this project is **18 months** after the receipt of a signed Interconnection Service Agreement and Construction Service Agreement.

### **Network Impacts**

Potential network impacts are as follows:

#### **Generator Deliverability**

*(Single or N-1 contingencies for the **Capacity** output portion 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**

None

#### **Short Circuit**

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

#### **Stability and Reactive Power Requirements**

Will be performed during the Queue U4-002 System Impact Study.

### **New System Reinforcements**

None

### **Contribution to Previously Identified System Reinforcements**

None

### **Delivery of Energy Portion of Interconnection Request**

None

## **Option 2**

### **Point of Interconnection**

U4-002 Option 2 will interconnect with the AP transmission system at the existing Pickens 138kV substation. Option 2 was studied as a 100 MW injection into the AP transmission system at the Pickens 138kV 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:

- Pickens 138kV substation: Expand the existing north fence and yard by approximately 25 feet. Install one (1) 138kV breaker, three (3) 138kV switches, 138kV steel structures, one (1) 138kV dead-end structure, 138kV metering, 138kV line traps and CVTs, 138kV transfer trip facilities, control cables, panels, foundations, grounding, and associated material. The AP station interconnection will be to the developer's 138kV line.

The estimated cost to perform this work is **\$973,000** in 2009 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 U4-002 generating facility and the 138kV direct connection line on the IC side of the POI. The IC will interconnect U4-002 with the AP system by constructing a customer-owned 138kV line from the generating facility site to AP's Pickens 138kV 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. It is assumed that the ICs step up transformer will conform to the AP standard of delta on the low side and grounded wye on the high side. It is further assumed that a fiber optic interface will be used for the protection channel between the AP and developer's 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 Allegheny Power Applicable Standards.

### **Cost and Timing Summary**

The estimated time to provide for the interconnection of this project is **21 months** after the receipt of a signed Interconnection Service Agreement and Construction Service Agreement.

### **Network Impacts**

Potential network impacts are as follows:

#### **Generator Deliverability**

*(Single or N-1 contingencies for the **Capacity** output portion 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**

None

#### **Short Circuit**

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

#### **Stability and Reactive Power Requirements**

Will be performed during the Queue U4-002 System Impact Study.

#### **New System Reinforcements**

None

#### **Contribution to Previously Identified System Reinforcements**

None

#### **Delivery of Energy Portion of Interconnection Request**

None