

T128 Masontown 500kV **Generation Interconnection**

General

The Interconnection Customer has proposed a 700 MW IGCC generating facility to be located in Masontown, Fayette County, Pennsylvania. T128 was studied as a 700 MW injection into the Allegheny Power (AP) transmission system at the Ronco 500 kV switching station. The project was evaluated for compliance with reliability criteria for summer peak conditions in 2012. The planned commercial in service date is 2012.

Point of Interconnection: The Allegheny Power's Ronco 500 kV switching station.

Direct Connection Requirements

Transmission Owner Scope of Direct Connection Work

The scope of work and estimated costs for the direct connection facilities is as follows:

- 1) Install a 500kV circuit breaker in the existing AP Ronco switching station ring bus to establish a new line terminal position for interconnection of T128.
- 2) Install 500kV metering and associated facilities.

The estimated cost to perform this work is **\$2,500,000**. The estimated time to complete this work is **30 months** after the receipt of an executed Interconnection Service Agreement and Construction Service Agreement.

Interconnection Customer Scope of Direct Connection Work

The customer will interconnect to the Allegheny Power Ronco substation via a short customer-owned 500 kV circuit from the customer facility. The above cost estimates do not include construction of that line. Route selection, line design, right-of-way acquisition and construction of such lines will be entirely the responsibility of the interconnection customer.

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 2010 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 Allegheny Power Controls Engineering to complete a coordination review of the area, develop new relay settings, and implement the required changes is approximately **\$5,000 in 2010 dollars**.

It is assumed that a fiber optic interface will be used for the protection channel between the AP and developer's stations. The Interconnection Customer 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.

Network Impacts

Generator Deliverability

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

None

Multiple Facility Contingency

(Double Circuit Tower Line contingencies only for the full energy output. Stuck breaker and bus fault contingencies will be performed for the System Impact Study)

None

Short Circuit

No breakers were found to be over their duty rating as a result of this project.

Listed below are the positive and zero sequence source equivalent impedance at the Ronco 500 kV bus with the generator T128 OPEN.

Positive: (0.00011+j0.00323)

Zero: (0.00027+j0.00295)

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)

1. The 01KEMPTN-N-NWEST 500kV (BGE) line loads from 186.80% to 188.88% (DC power flow) of its emergency rating (2901MVA) for the tower line outage (19). This project contributes approximately 60.3MW to the thermal violation.

Steady-State Voltage Requirements

No problems identified.

Stability and Reactive Power Requirements

Will be performed during the Queue T128 System Impact Study.

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 System Impact Study)

1. To mitigate the 01KEMPTN-N-NWEST 500kV (BGE) line overload would require the following:

Line work

Construct 2 single circuit lines.

The estimated cost to perform this work is **\$279,000,000** (in 2012 dollars) with an estimated time of **10 years** to complete.

Substation work

- 1) Install a 3 circuit breaker bay at North-Northwest (NNW)
- 2) Install a 3 circuit breaker bay at Kemptown

The estimated cost to perform this work is **\$15,400,000** (in 2012 dollars) with an estimated time of **10 years** to complete.

Assumptions

New 350 ft. wide Right of Way (ROW) parallels existing Northwest to Mt Airy Tap ROW
Total ROW length = 28.3 miles
3 - bundle 1,590 kcm conductor
Kemptown is located 1/4 mile west of Mt Airy Tap
North Northwest is located 4 miles north of Northwest

Delivery of Energy Portion of Interconnection Request

(PJM also studied the delivery of the energy portion of this interconnection request. Any 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).

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

None