

Generation Interconnection

This analysis was completed to assess the reliability impact for a new generator interconnecting to the PJM system as a Capacity Resource.

Network Impacts

The P07 project was studied as an injection of 122 MW into Middle 138kV substation. Project P07 was evaluated for compliance with reliability criteria for summer peak conditions in 2010. Potential network impacts were as follows:

Generator Deliverability

No problem identified.

Multiple Facility Contingency

No problem identified.

Short Circuit

1. The addition of Queue P07 generation interconnection causes the fault current interrupting capability of the following circuit breakers to be exceeded.

Substation	Breaker	% of Rating before P06	% of rating after P06 is added
Middle 69kV	T		

The above circuit breaker must be replaced to achieve adequate short circuit current interrupting capability.

Note: The short circuit calculation was performed in accordance with IEEE STD C37.010 – 1999 total current methodology. Separate X and R values were determined to calculate X/R ratios.

New System Reinforcements

1. The cost to replace the 69kV circuit breaker at Middle substation is \$275,000. The circuit breaker replacement can be completed in approximately 18 months from the time “Notice to Proceed” is given after the ISA and CSA are executed.

Contribution to Previously Identified Overloads

- The Graceton – Raphael 230 kV circuit is overloaded at 115.4% of its emergency rating (659 MVA) for the tower outage of the Brighton – Doubs 500kV line and Brighton - Conastone 500 kV. The P07 project contributes approximately 9 MW to the contingency facility loading. The total cost to reconductor the Graceton – Raphael Rd. 230 kV circuit is estimated to cost \$17,900,000. This work will take approximately 30-36 months to complete.

- The Northwest – Conastone 230 kV circuit (#2322) is overloaded at 104.7% of its emergency rating (819 MVA) for the tower outage of the Brighton – Doubs 500kV line and Brighton - Conastone 500 kV. The P07 project contributes approximately 7 MW to the contingency facility loading. The total cost to reconductor the Northwest – Conastone 230 kV (#2322) circuit is estimated at \$7,970,000. This work will take approximately 24 - 36 months to complete.
- The Graceton – P05 tap 230 kV circuit is overloaded at around 113.4% of its emergency rating (627 MVA) for the outage of the Conastone – Peach Bottom 500 kV circuit. The P07 project contributes approximately 9 MW to the contingency facility loading. The total estimated cost to mitigate this overload is \$1,655,200.

(BGE Portion of the P05 to Graceton line) Reconductor 230 kV line 220-08 from Graceton to the Pennsylvania / Maryland state line (220-08). The estimated cost is \$835,200. This work will take approximately 18-36 months to complete depending on whether a CPN filing is required.

(PECO portion of the P05 to Graceton line) Reconductor 230kV line 220-08 from the Pennsylvania / Maryland state line to Queue P05 tap point. The estimated cost is \$820,000. This work will take approximately 24 months to complete.

Potential Issues

- The Parrish – Grays Ferry 230 kV line (emergency rating is 874 MVA) may be overloaded for the outage of the East Windsor – Salem 500 kV circuit. The P07 project contributes approximately 6 MW to the contingency facility loading. The cost to reconductor the Grays Ferry – Parrish 230kV circuit 220-27 was estimated to be \$2,630,000 per the Queue #A27 Facilities Study performed in 2002. A better estimate will be developed if Queue P06 is found to cause or contribute to this contingency overload during the Impact Study.

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