



Generation Interconnections

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

Network Impacts -70 MW Injection into the Elm St. 115kV substation

Potential network impacts for the injection of 70 MW into the Elm Street 115 kV bus were evaluated for summer peak conditions in 2004. The analysis performed for this project included a revised breaker configuration at the Erie West 345 kV substation as shown in Figure # 2. This enhancement was determined to be necessary for a previously queued generator interconnection project (A38 - Erie West 345 kV). The analysis also included the addition of two line breakers at the Homer City 345 kV substation. These enhancements were determined to be necessary for previously queued generator interconnection projects (A38 - Erie West 345 kV and B05 Wayne). The analysis also included a larger unit replacing the existing Westfall 115/46 kV transformer and a new 350 MVar SVC at the Juniata 500 kV substation. These enhancements were determined to be necessary for a previously queued generator interconnection project (B10 - Keystone 500 kV).

A summary of the results follows:

Normal System

- No new pre-contingency overloads were observed.
- The new generator contributes 0.2 MVA to the pre-contingency overload on the Westfall 115/46 kV transformer. This overload was previously identified for an earlier queued generator interconnection project (B10), and is what necessitates the new transformer. The new generator will be allocated a percentage of the costs for the upgrade based on its MVA contribution in relation to other new generators.

Single Contingency (MAAC Criteria IIA)

- No new post-contingency overloads were observed.
- The new generator contributes 32 MW to the post-contingency voltage drop problem at Juniata 500 kV for the outage of Hunterstown - Conastone 500 kV and Hunterstown 500/230 kV #1. This overload was previously identified for an earlier queued generator interconnection project (B10), and is what necessitates the new 350 MVar SVC at Juniata 500 kV. The violation is eliminated with the new SVC and, as such, the new generator will be allocated a percentage of the costs for the

upgrade based on its MW contribution in relation to other new generators.

Multiple Facility Contingency (MAAC Criteria IIC)

- The new generator contributes 8.9 MVA to the post-contingency overload on Homer City 345/230 kV #2 for the line fault with stuck breaker condition involving the outage of the Homer City - Watercure 345 kV line and Homer City 345/230 kV #1. This overload was previously identified for an earlier queued generator interconnection project (A38), and is what necessitates a new line breaker at the Homer City 345 kV substation. The overload is eliminated with the additional breaker at Homer City and, as such, the new generator will be allocated a percentage of the costs for the upgrades based on its MVA contribution in relation to other new generators.
- The new generator contributes 9.5 MVA to the post-contingency overload on Homer City 345/230 kV #2 for the line fault with stuck breaker condition involving the outage of the Homer City - Stolle Road 345 kV line and Homer City 345/230 kV #1. This overload was previously identified for an earlier queued generator interconnection project (B05), and is what necessitates a new line breaker at the Homer City 345 kV substation. The overload is eliminated with the additional breaker at Homer City and, as such, the new generator will be allocated a percentage of the costs for the upgrades based on its MVA contribution in relation to other new generators.

Short Circuit Analysis

- No problems were identified.

System Reinforcements

The new generator can expect to either pay a portion or the entire cost for the following system upgrades:

- 1) Replace the Westfall 115/46 kV transformer. Estimated Cost = \$0.7 million.
- 2) Install a line breaker at Homer City 345 kV for the Watercure line. Estimated Cost = \$1.75 million.
- 3) Install a line breaker at Homer City 345 kV for the Stolle Rd. line. Estimated Cost = \$1.75 million.
- 4) Install a 350 MVAR SVC at Juniata 500 kV substation. Estimated Cost = \$14.5 million.

Total cost estimate = \$18.7 million.

Specific cost allocation percentages will be determined at the conclusion of the Impact Study.

It will take approximately 2 years to complete all of the network upgrades required.

[Figure #2 Erie West 345 kV](#)

