

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 -550 MW Injection into the Hooversville 230kV transmission line (H09)

Network Impacts

The #H09 project was studied as 550 MW capacity injection into the Hooversville 230kV substation. Project # H09 was evaluated for compliance with reliability criteria for summer peak conditions in 2006. Potential network impacts were as follows:

Generator Deliverability

1. The Hooversville 230/115 kV transformer is overloaded at **150%** of the normal rating (232 MVA). The Hooversville 230/115 kV transformer is also overloaded for several contingencies and the worst is **157%** of the emergency rating (263 MVA) for the outage of the Homer City – Shelocta – Keystone 230kV circuit. The H09 project contributes approximately 211MW to the normal and 235MW to the contingency loading on this circuit.
2. The Homer City – Shelocta 230 kV circuit is overloaded at **116%** of the normal rating (694 MVA). The Homer City – Shelocta 230kV circuit is also overloaded for several contingencies and the worst was at **118%** of the emergency rating (854 MVA) for the outage of the Homer City – Watercure Road 345 kV circuit. The H09 project contributes approximately 194MW to the normal and 204MW to the contingency loading on this circuit.
3. The Keystone – Shelocta 230 kV circuit is contingency overloaded at **107%** of the emergency rating (854 MVA) for the outage of Homer City – Watercure Road 345 kV circuit. The H09 project contributes approximately 224MW to the loading on this circuit.
4. The Keystone 500/230 kV transformer is contingency overloaded at **100%** of the emergency rating (499 MVA) for the outage of either the Erie West – Wayne 345 kV circuit or the Homer City – Wayne 345 kV circuit. The H09 project contributes approximately 118MW to the loading on this circuit.
5. The Altoona – Johnstown 230 kV circuit is overloaded at **108%** of the normal rating (499 MVA). The Altoona – Johnstown 230 kV circuit is also overloaded at **100%** of the emergency rating (617 MVA) for outage of the Homer City – Shelocta – Keystone 230kV circuit. The H09 project contributes approximately 41 MW to the normal and 65MW to the contingency loading on this circuit.
6. The Hilltop –Rosedale 115 kV circuit is contingency overloaded at **190%** of the emergency rating (179 MVA) for the outage of Johnstown – G31 230 kV circuit and G31 – Bon Air 230/115 kV transformer. The H09 project contributes approximately 45 MW to the loading on this circuit.
7. The Keystone – G09 500 kV circuit is contingency overloaded at **106%** of the emergency rating (3013 MVA) for the outage of Juniata – Keystone 500 kV circuit. The H09 project contributes approximately 104MW to the loading on this circuit.
8. The Conemaugh – G09 500 kV circuit is contingency overloaded at **129%** of the emergency rating (3013 MVA) for the outage of Juniata – Keystone 500 kV circuit. The H09 project contributes approximately 104MW to the loading on this circuit.

9. The Juniata – Keystone 500 kV circuit is overloaded for several contingencies and the worst is at **114%** of the emergency rating for the outage of the Conemaugh – G09 500 kV circuit. The H09 project contributes approximately 97MW to the loading on this circuit.

Note: Problems # 6, 7, 8, and 9, were initiated by previous projects. However due to the merge of the Allegheny Power generation queue effective April 1, 2002 and the withdrawal of several projects, the problems were not identified for previously completed feasibility studies. In any event, the H09 project will share costs for the reinforcements required to correct the problems.

Multiple Facility Contingency – Tower Line Outages (MAAC Criteria IIC)

10. The Homer City – Shelocta 230 kV circuit is overloaded at **110%** of the emergency rating (854 MVA) for the Juniata – Dauphin and Juniata – Lewistown tower line outage. The H09 project contributes approximately 205MW to the loading on this circuit.

Short Circuit

Short circuit analysis was not performed due to the magnitude of reinforcements required to eliminate the identified problem. Any required breaker replacements are not expected to materially alter the total network reinforcement cost.

New System Reinforcements

Due to the number and severity of the identified overloads this project will either be the first project to require, or share cost allocation for, a new 500 kV west to east circuit. The details of the new 500 kV circuit will be identified during Impact studies but the **cost is estimated at over \$100 million with a lead time exceeding 5 years.** Installation of the new 500kV circuit may not resolve every one of the overloads identified above. Any remaining overloads will need to be resolved by individual system upgrades that will be identified in the Impact Study.