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 -120 MW Injection at Bayonne

Potential network impacts for the injection of an additional 120 MW at the Bayonne 138 kV substation were evaluated for summer peak conditions in 2004. Six cases were developed for the Bayonne project. Three pre-project cases at a uniform, high east and high west generation scenarios, and post-project at the same generation outage patterns. These cases had all generation, queued prior to the subject project, and the necessary transmission enhancements required for those projects modeled.

A summary of the load flow analysis for addition of the subject project follows:

A) Normal Conditions

- Results in a normal overload of 20% on the Bayonne-Marion 138 kV circuit.
- Results in a normal overload of 2% on the Bergen-East Rutherford 138 kV circuit for the high west generator outage pattern.
- Results in a normal overload of 3% on the Bergen-Fairlawn 138 kV circuit for the high east generator outage pattern.

All but the Bayonne-Marion 138 kV circuit overload can be alleviated by adjustment of phase angle regulators.

B) Single Contingency

- Contingency overload 30% on one Roseland-Athenia 230 kV circuit for the outage of the other Roseland-Athenia 230 kV circuit.

C) Tower Line Contingency

- Contingency overload of 12% on the Aldene 230/138 kV transformer and 4% on the Aldene-Springfield Rd 138 circuit for outage of the Roseland-Athenia 230 kV tower line.

The following list of reinforcements will alleviate the overloads described.

- Construct a second Bayonne-Marion 138 kV underground circuit.

- Convert the Roseland-West Caldwell circuit to 230 kV operation and extend to a termination at Athenia.

It is estimated that the transmission line upgrades described above will cost approximately $17 million and the associated substation enhancements will cost approximately $5 million. The construction of all the above facilities would require two-year lead-time.

A short circuit evaluation was not completed for this installation due to the uncertainty of the number of projects to be installed in this area. The more generation that is added the greater potential for breaker replacements. It is estimated that replacement of a 230 kV breaker will cost approximately $350,000. A complete short circuit analysis will be performed in the Impact Study.