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 - 750 MW Injection at Hudson

Potential network impacts for the injection of 750 MW at the Hudson 230 kV substation were evaluated for summer peak conditions in 2004. Six cases were developed for the Celtic Project. Three pre-project cases at a uniform, high east and high west generation scenarios, and post-project at the same generation outage patterns.

The post-project uniform Celtic base case, just the 750 MW unit in service, no transmission reinforcements are installed, showed the Bergen-Leonia-New Milford-Saddlebrook-Athenia 230 kV underground cable to be a limit. The worst being the New Milford-Maywood section at 63% over its normal rating. The Saddlebrook-Maywood followed close behind at 40% over its rating. In addition, other circuits shown to be over their normal ratings were the Kearny-NJT Meadows circuit at 24.9%, the Roseland-Cedar Grove F 230 kV at 18.6%, the Athenia-Cook Rd. at 20.0% and both Bergen-Leonia 230 kV circuits at 21.6% each.

The Post High East and High West base cases had similar results as the Uniform case did.

Based upon this analysis, the 750 MW injection at Hudson results in the following system upgrades that are required to maintain the reliability of the PJM system.

The completion of an Aldene-Bayway-Essex 230 kV circuit with a Phase Angle Regulator at Essex.

The installation of a 2% reactor on the Aldene-Springfield Rd. and 2% reactors on each of the Bergen-Leonia 230 kV circuits.

It is estimated that the completion of the Aldene-Bayway-Essex transmission line will cost approximately $ 27 million and the substation requirements, including the phase angle regulator at Essex, termination of the new line and installation of the reactors described will cost approximately $22 million. It is anticipated the work will be completed in two years.

The transmission upgrades described alleviate all of the overloads described

above.

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.