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 - 472 MW Injection at Portland

Potential network impacts for the injection of 472 MW into the Portland 230 kV substation were evaluated for summer peak conditions in 2004. Several generation scenarios were studied in an attempt to bracket expected system conditions in 2004. A summary of results follows:

A) Normal Conditions

· Overload on the Portland-Greystone 230 kV line. The new generation at Portland contributes approximately 90MVA to the circuit loading.

B) Single Contingency

· Contingency overload on the Portland - Kittatinny 230 kV for outage of Portland - Greystone 230 kV. The new generation at Portland contributes 150 MVA to the circuit loading.

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C) Tower Line Contingency

· Contingency overload on the Kittatinny - Newton 230 kV line for the tower line outage of Portland - Greystone 230 kV and Kittatinny - Pohatcong 230 kV. The new generation at Portland contributes 50MVA to the circuit loading.

· Contingency overload on the Belvidere - Pequest 115 kV and the Morris Park - Martins Creek 230 kV for the tower line outage of Portland - Kittatinny and Portland - Greystone 230 kV. The new generation at Portland contributes 30 MVA to the Belvidere - Pequest 115 kV circuit and 110 MVA to the Morris Park - Martins Creek 230 kV circuit.

D) Short Circuit Analysis

· The fault duty was evaluated at all bulk power substations that had a greater than 5% increase in fault current due to a 472 MW generator at the Portland 230 kV substation. The fault duty was below all circuit breaker interrupting capabilities.

The rating of the Portland - Greystone 230 kV line can be increased sufficiently by upgrading from a 140 degree conductor rating to a 150 degree conductor rating and by upgrading terminal equipment on the line. This will require replacing two transmission

towers, #11 and #12, to obtain the required clearances at a cost of $600,000. The 1600 amp wave trap at Greystone will have to be replaced with one rated 2000 amp. Two current transformers at Greystone need to be upgraded from 1600/5 to 2000/5 and two line disconnect switches need to be replaced. The total for the substation upgrades at Greystone is $150,000.

The rating of the Portland - Kittatinny line can be increased sufficiently by upgrading from a 140 degree conductor rating to 160 degree conductor rating and by upgrading terminal equipment on the line. This will require replacing two towers at a cost of $600,000 (these are towers #11 and # 12 listed above). Upgrade the current transformer at Portland from 1500/5 to 2000/5 at a cost of $5000 and replace a 1600 amp disconnect switch at Kittatinny with a 2000 amp switch at a cost of $50,000. This work can be completed within two years.

The rating of the Martins Creek - Morris Park 230 kV line can be increased sufficiently by rerating for 170 degrees and replacing 2000 amp wave traps at Martins Creek and Morris Park at a cost of $60,000 each.

The Belvidere Tap - Pequest 115 kV line rating can be upgraded by replacing conductor compression accessories, joints and dead ends, at a cost of $21,000.

Upgrade of the Kittatinny - Newton 230 kV circuit is estimated to cost $3 Million to $15 Million and take 18 to 24 months. Cost and time estimates reflect the uncertainty of whether sections of this 230 kV path can be upgraded to adequate thermal capability without replacing existing transmission line structures. Upgrade requirements will be determined in more detail during the Impact Study.

It should be noted that the flows on the northern Jersey Central Power & Light transmission system are directly impacted by connection of new generation on either side of the system. Due to the number of generation interconnection requests that impact the northern Jersey Central system, it is not reasonable at this time to suggest what, if any, transmission reinforcements will finally be required. The northern Jersey Central transmission system will be extensively evaluated in the development of the Regional Transmission Expansion Plan.