Network Impacts

Potential network impacts for the injection of 750 MW into the existing Essex to Hudson 230 kV circuit was evaluated for summer peak conditions in 2005.

Normal System

- The N. Milford – Maywood 230 kV circuit was normally overloaded at 140 %.
- The Bayonne – Marion 3 138 kV circuit was normally overloaded at 100 %.
- The Linden – North Avenue 138 kV circuit was normally overloaded at 100 %
- The Saddle Brook – Maywood 230 kV circuit was normally overloaded at 120 %.
- The Bergen – Leona Tap 230 kV circuit was normally overloaded at 150 %.

Multiple Facility Contingency (MAAC Criteria IIC)

- The Hudson 1-6 – S. Waterfront 230 kV circuit was overloaded at 160 % of its emergency rating due to the tower line outage involving the Roseland 5-7 – Kearny 1-3 138 kV coupled with the Athenia – NJT Meadows 230 kV circuit.
- The Bergen – Leona Tap 230 kV circuit was identified to be overloaded at 130 % of its emergency rating due to the following tower line contingency involving the outage of the Roseland 5-7 – Kearny 1-3 138 kV coupled with the Athenia – NJT Meadows 230 kV circuit.
- The E01 project - Hudson 1-6 230 kV circuit was overloaded at 160 % of its emergency rating due to the tower line outage involving the Roseland 5-7 – Kearny 1-3 138 kV coupled with the Athenia – NJT Meadows 230 kV circuit.

Generator Deliverability

- The Hudson 1-6 – S. Waterfront 230 kV circuit was overloaded at 170% of its emergency rating due to the single contingency involving the outage of the Essex – NJT Meadow, Kearny 12 13kV and the Essex 230/138 kV transformer #2.
- The Athenia – Saddle Brook 230 kV circuit was identified to be overloaded at 110 % of its emergency rating due to the outage of the NJT Meadow – Essex, Kearny 12 13kV generator and the Essex 230/138 kV transformer #2.

- The Kearny – Kingsland 230 kV circuit was identified to be loaded at 100% of its emergency rating due to the single line outage of the S. Water Front – Hudson 1-6 230 kV circuit.
- The E01 project – Hudson 1-6 230 kV circuit was overloaded at 140% of its emergency rating due to the single contingency involving the outage of the Essex – NJT Meadow and the Essex 230/138 kV transformer #2.

Short Circuit Analysis

- The E1 project causes 10-15, 138 and 230 kV circuit breakers to exceed the interrupting capability.

System Reinforcements

To eliminate the overdutied circuit breakers identified above, the following system upgrades are required. Replace the 10-15, 138 and 230 kV circuit breakers at a cost of approximately $ 4 million and take 2 years to complete. In addition, the E1 project is expected to contribute to several other circuit breakers identified to be replaced for previous generation projects. The cost contribution should not substantially impact the $4 million estimate.

The following set of system reinforcements will alleviate all of the overloads described above.

1. Upgrade of the Kearny – Roseland 138 kV circuit (D-1304) to 230 kV operation and terminate one end at Roseland 230 kV substation and the other end at the new Kearny 230 kV substation. The conversion of the line is estimated to cost $6 million and take 2 years to complete.
2. Install a new 230 kV cable circuit between Bergen and Athenia substations. Install a 1% reactor, with bypass switch, at Bergen in series with the new cable. The reactor is being added to this new circuit path to provide impedance that will optimize transmission circuit flows. Provide for termination of the circuit at both Bergen and Athenia. The cost is estimated at $37 million with a 3 year lead time.
3. The upgrade of the Hudson – S. Waterfront 230 kV cable to obtain a higher rating. The cost is estimated at $7 million and will take approximately 2 years to complete.
4. Provide forced cooling circulation on the Bergen – Leona Tap 230 kV underground circuit to increase the cable rating. The cost is estimated at $ 2 million and will take 2 years to complete.

Total estimated system reinforcement cost is $56 million. After the developer signs the Interconnection Service Agreement contract, a project timeframe of 3 - 4 years should be expected.

Cost allocation percentages are not provided as part of the Feasibility Study analysis, however, cost allocation will be provided at the conclusion of the Queue D, E & F Impact Study evaluations.