Network Impacts

Potential network impacts for the injection of 246 MW into the existing Essex 230 kV system and 29 MW into the Essex 138 kV system was evaluated for summer peak conditions in 2005.

Normal System

- No identified problems.

Multiple Facility Contingency (MAAC Criteria IIC)

- The Hudson 1-6 – S. Waterfront 230 kV circuit was overloaded at 108 % of its emergency rating due to the outage involving the Roseland 5-7 – Kearny 1-3 138 kV coupled with the Athenia – NJT Meadows 230 kV circuit. Project E18 contributes approximately 100 MW to the facility loading.

- The Foundry Street – Newark 138 kV circuit was overloaded at 112 % of its emergency rating due to the following tower line contingency involving the outage of the Essex – NJT Meadows and the Essex – Hudson 230 kV circuit. Project E18 contributes approximately 97 MW to the facility loading.

- The Bayonne – Marion 138 kV circuit was overloaded at 124 % of its emergency rating due to the tower line outage involving the Essex – NJT meadows and the Essex – Hudson 230 kV circuit. Project E18 contributes 107 MW to the facility loading.

- The Bayonne – Passaic Valley 138 kV circuit was overloaded at 116% of the emergency rating due to the following tower line contingency involving the outage of the Essex – NJT Meadows and the Essex – Hudson 230 kV circuit. Project E18 contributes 108 MW to the facility loading.

- The North Avenue – Passaic Valley 138 kV circuit was overloaded at 102 % of the emergency rating due to the tower line contingency involving the outage of the Essex – NJT Meadows and the Essex – Hudson 230 kV circuit. Project E18 contributes approximately 108 MW to the facility loading.

Generator Deliverability

- The Hudson 1-6 – S. Waterfront 230 kV circuit was overloaded at 102% of its emergency rating due to the single contingency involving the outage of the Hudson – Farragut 345 kV circuit. Project E18 contributes 60 MW to the facility loading.

- The Hudson 1–6 – S. Waterfront 230 kV circuit was overloaded at 101 % of its emergency rating due to the outage of the NJT Meadow – Essex 230 kV circuit. Project E18 contributes 60 MW to the facility loading.

- The E01 project – Hudson 1-6 230 kV circuit was overloaded at 101% of its emergency rating due to the single contingency involving the outage of the Essex – NJT Meadow 230 kV circuit. Project E18 contributes 125 MW to the facility loading.

Short Circuit Analysis

- The E18 project and associated reinforcements identified below causes 15 - 20, 138 kV and 230 kV circuit breakers to exceed their interrupting capability.

System Reinforcements

To eliminate the over-dutied circuit breakers identified above, the following system upgrades are required. Replace the 15 - 20 138 kV and 230 kV circuit breakers at a cost of approximately $6 million with a 3 year lead-time. In addition, the E18 project is expected to contribute to several other circuit breakers identified to be replaced for previous generation projects. The cost contribution for the other circuit breakers should not substantially impact the $6 million estimate. The estimated cost does not include a tax gross – up which will be addressed in the Interconnection Agreement. The current tax rate is 38 % in New Jersey.

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

1. Convert the Kearny – Roseland, G-1307-7, 138 kV circuit to 230 kV. Provide new line terminal at Roseland and Essex for the converted 230 kV circuit. The cost is estimated at $10 million and takes three years to complete.

2. Construct a new 230 kV four breaker ring bus close to Hudson that connects the existing Essex- Hudson and Hudson - Belleville circuits. The cost is estimated at $6 million with a 4-year lead-time.

Total estimated system reinforcement cost is $22 million. After the developer signs the Interconnection Service Agreement contract, a project timeframe of 4 years should be expected.

The new generator will be allocated a percentage of the costs for the previously identified network reinforcements as follows:

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 three-year lead-time.

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.