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 -1100 MW Injection into the Steel City 500kV substation (E27)

Network Impacts

Potential network impacts for the injection of an additional 1100 MW into the Steel City 500 kV substation were evaluated under summer peak conditions in 2005. The six-wire Martins Creek-Morris Park-Gilbert 230kV circuit, required for project B3, was modeled in the network evaluation.

Normal System

No identified problems.

Multiple Facility Contingency - Tower Line Outages (MAAC Criteria IIC)

· No problems identified

Generator Deliverability

1. The Glendon- Hosensack 115 kV circuit was overloaded at 103 % of its emergency rating (92MVA) due to an outage of the Hosensack-Steel City 500 kV circuit. E27 contributes 37MW to the facility loading.

2. The Glendon -Northwood 115 kV circuit was overloaded at 136 % of its emergency rating (112 MVA) due to an outage of the Hosensack -Steel City 500 kV circuit. E27 contributes 37MW to the facility loading.

3. The Portland- Kittatiny 230 kV circuit was overloaded at 101 % of its emergency rating (888 MVA) due to an outage of the Hosensack - Steel City 500 kV circuit. E27 contributes 140 MW to the facility loading.

4. The Steel City- Quarry 230 kV circuit was overloaded at 139 % of its emergency rating (793 MVA) due to an outage of the Hosensack- Steel City 500 kV circuit. E27 contributes 550 MW to the facility loading.

5. The Steel City 500/230kV transformers #1 & #2 were overloaded at 115 % each of their emergency rating (855 MVA) due to an outage of the Hosensack-Steel City 500 kV circuit. E27 contributes 550 MW to the facility loading.

6. The Northwood-Quarry 230 kV circuit was overloaded at 157 % of its emergency rating (641

MVA) due to an outage of the Hosensack- Steel City 500 kV circuit. E27 contributes 517 MW to the facility loading

7. The Martins Creek- Quarry 230 circuit was overloaded at 136 % of its emergency rating (588MVA) due to an outage of the Hosensack- Steel City 500 kV circuit. E27 contributes 503 MW to the facility loading.

8. The Martins Creek- Northwood-Quarry 230 circuit was overloaded at 136 % of its emergency rating (588MVA) due to an outage of the Hosensack- Steel City 500 kV circuit. E27 contributes 503 MW to the facility loading.

9. The Morris Park - Martins Creek 230 kV circuit was overloaded at 113 % of its emergency rating (1500 MVA) due to an outage of the Hosensack- Steel City 500 kV circuit. E27 contributes 327 MW to the facility loading

10. The Gilbert - Morris Park 230 kV was overloaded at 106 % of its emergency rating (1500 MVA) due to an outage of the Hosensack-Steel City 500 kV tower line. E27 contributes 321MW to the facility loading.
11. The Hosensack-Elroy 500kV circuit was overloaded at 101 % of its emergency rating (3015 MVA) due to an outage of the Alburtis-Branchburg 500 kV circuit. E27 contributes 321MW to the facility loading.

Stability

· Stability studies have not been run. A complete system stability analysis will be performed in the Impact Study stage.

System Reinforcements

The network overloads described in items 1 through 10 above will be alleviated by the construction of a new 500kv line from Steel City to the Susquehanna-Wescosville-Alburtis (SAW). A new 500kv substation would be constructed near Seigfried, to be called Bossards, to split the SAW line and terminate the new 500kv line to Steel City. See Figure #2.

Specific work would include:

· Installation of one additional 500kv CB at Steel City to terminate the new Steel City-Bossards 500kv circuit. The estimated cost is $2.3 million.

· Construction of a 22-mile (approx.) 500kv circuit on existing and new rights - of - way from Steel City substation to Martins Creek substation. The estimated cost is $44 million.

· Construction of a new 500kv Bossards substation, initially operating as a 3-breaker ring, in the vicinity of Siegfried 230kv substation. The estimated cost is $12.4 million.

· Cutting the Susquehanna-Wescosville-Alburtis 500kv line, and reterminating it at Bossards 500 kV substation, creating a Susquehanna-Bossards 500kV circuit and a Bossards-Wescosville-

Alburtis 500kV circuit. The cost for this work is included in the substation estimate above.

· Removal of the existing Martins Creek-Siegfried 500/230kv line from the 230kv substations at Martins Creek and Siegfried, and operating it at 500kv. One end will terminate in Bossards 500kv sub, and the other will tie directly into the new Martins Creek-Steel City 500kv line. The estimated cost is 4.00 million.

· Associated relaying changes at Steel City, Martins Creek, Siegfried, Susquehanna, Wescosville, and Alburtis substations. The estimated cost is $1.0 million.

The network overload described in number 11 above will be alleviated by the following:

· Replacement of the wave trap on the Hosensack terminal of the Hosensack-Elroy 500kV circuit. The estimated cost is $0.1 million

Total system reinforcement cost is $63.8 million. This estimate assumes no involved archaeological or permitting costs, no litigation costs, no condemnation costs, and no land acquisition costs for the new Bossards 500kv sub. After the developer signs the Interconnection Service Agreement contract, a project timeframe of 3-5 years should be expected.