

Generation Interconnection

This analysis was completed to assess the reliability impact for a new generator interconnecting to the PJM system as a Capacity resource.

Network Impacts - 10MW Injection

Injection of 622 MW into the Croydon-Cox's Corner 230kV line was evaluated for network impacts. The following potential impacts were identified:

Generator Deliverability

- Holmesburg- Richmond 230 kV circuit was overloaded at 147 % of the emergency rating (538 MVA) for the outage of G12-Mount Laurel 230 kV and Mount Laurel – Cox's corner 230 kV line. The project contributes 300 MW to the flows on the facility loading.
- Eddington – Holmesburg Tap 230 kV circuit was overloaded at 138 % of the emergency rating (853 MVA) for the outage of the G12-Mount Laurel 230 kV and Mount Laurel – Cox's corner 230 kV line. The project contributes 375 MW to the flows on the facility loading.
- Richmond –Waneeta 230 kV circuit was overloaded at 122 % of the emergency rating (891 MVA) for the outage of the Cox's corner –Lumberton 230 kV line. The project contributes 265 MW to the flows on the facility loading.
- Holmesburg 230/138 kV circuit was overloaded at 115 % of the emergency rating (451 MVA) for the outage of the Richmond- Waneeta 230kV, and Richmond bank # 6. The project contributes 90 MW to the flows on the facility loading.
- Emilie 230/138 kV transformer was overloaded at 106% of the emergency rating (451 MVA) for the outage of the Eddington- Croydon 230kV, Eddington- Eddington Tap 230 kV, Eddington- Emilie 230 kV and Emilie 230/35 kV transformer. The project contributes 100 MW to the flows on the facility loading.
- Emilie-Neshaminy 138 kV circuit was overloaded at 118% of the emergency rating (755 MVA) for the outage of the Eddington- Croydon 230kV, Eddington- Eddington Tap 230 kV, Eddington- Emilie 230 kV and Emilie 230/35 kV transformer. The project contributes 160 MW to the flows on the facility loading.
- Richmond –E21 230 kV circuit was overloaded at 111 % of the emergency rating (892 MVA) for the outage of the Eddington- Croydon 230kV, Eddington- Eddington Tap 230 kV, Eddington- Emilie 230 kV and Emilie 230/35 kV transformer. The project contributes 145 MW to the flows on the facility loading.
- Blue Grass-Holmesburg 138 kV circuit was overloaded at 113 % of the emergency rating (323 MVA) for the outage of the Richmond –Waneeta 230 kV, Richmond bank # 6. The project contributes 75 MW to the flows on the facility loading.
- Mount Laurel- G12 230 kV circuit was overloaded at 135 % of the emergency rating (844 MVA) for the outage of the Eddington- Croydon 230kV, Eddington- Eddington Tap 230 kV, Eddington-

Emilie 230 kV and Emilie 230/35 kV transformer. The project contributes 375 MW to the flows on the facility loading.

- Cox's Corner-Mount Laurel 230 kV circuit was overloaded at 125 % of the emergency rating (873 MVA) for the outage of the Eddington- Croydon 230kV, Eddington- Eddington Tap 230 kV, Eddington- Emilie 230 kV and Emilie 230/35 kV transformer. The project contributes 385 MW to the flows on the facility loading.
- Eddington – Eddington Tap 230 kV circuit was overloaded at 124 % of the emergency rating (856 MVA) for the outage G12-Mount Laurel 230 kV and Mount Laurel – Cox's corner 230 kV. The project contributes 375 MW to the flows on the facility loading.
- Groydon-Burlington 230 kV circuit was normally overloaded at 137 % of the emergency rating (558 MVA).

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

- Eddington – Eddington Tap 230 kV circuit was overloaded at 112 % of the emergency rating (856 MVA) for the outage of the Cox's Corner-Camden 230 kV and Burlington-Camden 138 kV tower line. The project contributes 270 MW to the flows on the facility loading.

Short Circuit

- Short circuit analysis was not performed due to the magnitude of reinforcements required eliminating overloads. Any identified breaker replacements are not expected to materially alter the total network reinforcement cost.

New System Reinforcements

- Construct approximately 6 miles of a new 230 kV circuit from the Burlington 230 kV substation to the Salem - East Windsor 500 kV circuit. Install a new 500/230 kV transformer and terminate by expanding the 500 kV substation along the Salem - East Windsor 500 kV circuit that was required for a previous queued project (D27). It is expected that a portion of the new 6 mile 230 kV circuit will be underground. The total estimate for these reinforcements is \$ 35 M with 4-5 year lead-time to complete the work.
- To reduce the flows on the New Freedom to Silver Lake lines, both phase angle regulators at New Freedom were reset to 350 and this alleviated overloads on the Richmond-Waneeta 230 kV line and Richmond-E21 230 kV line.

Contribution to Previously Identified System Reinforcements

The G12 project will be allocated a percentage of the costs for the following previously identified network reinforcements:

- Add a second Emilie 230/138 kV transformer at an estimated cost of \$1.8 M. The G12 project contributes approximately 100 MW toward the need for this reinforcement.

- Rebuild the Emilie – Neshaminy 138 kV circuit with bundled 795-kcmil conductor at an estimated cost of \$6.3 M. The G12 project contributes approximately 160 MW toward the need for this reinforcement.

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, and G Impact Study evaluations.