#O63 – Linden 230kV

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

The **#O63 project was studied as an injection of 525 MW into the Linden 230 kV substation**. Project #O63 was evaluated for compliance with reliability criteria for summer peak conditions in 2009. Potential network impacts were as follows:

Generator Deliverability

1. The Linden to Tosco 230 kV circuit is loaded to 113% of its emergency rating (873 MVA) for the outage of the Sewaren to Roseland 138 kV circuit. The #O63 project contributes approximately 165 MW to the contingency overloaded facility.

2. The Aldene 230/138 kV transformer is loaded to 107% of its emergency rating (314 MVA) for the outage of the West Orange to Roseland 138 kV circuit. The #O63 project contributes approximately 35 MW to the contingency overloaded facility.

3. The Aldene to Spring Rd. 138 kV circuit is loaded to 103% of its emergency rating (315 MVA) for the outage of the Sewaren to Roseland 138 kV circuit. The #O63 project contributes approximately 45 MW to the contingency overloaded facility.

Multiple Facility Contingency – Tower Line Outages

4. The Sewaren to Woodbridge 138 kV circuit is loaded to 107% of its emergency rating (308 MVA) for the Sewaren to Woodbridge tower line outage. The #O63 project contributes approximately 57 MW to the contingency overloaded facility.

5. The Warinanco-G22 230kV circuit is overloaded to 123.7% of its emergency rating (725 MVA) for the outage of the Linden-Sewaren/Linden-Deans 230kV tower line. The #O63 project contributes 384 MW to the flow of which 178MW is above the rating.

6. The Warinanco-Aldene 230kV circuit is overloaded to 100.3% of its emergency rating (865 MVA) for the outage of the Linden-Sewaren/Linden-Deans 230kV tower line. The O63 project contributes 364 MW to the flow of which 3 MW are above the rating.

7. The Tosco-G22 230kV circuit is overloaded to 112.3% of its emergency rating (873MVA) for the outage of the Linden-Sewaren/Linden-Deans 230kV tower line. The O63 project contributes 367 MW to the flow of which 108 MW are above the rating.

Short Circuit

No problems identified

Note #1:
There are ongoing studies to identify system reinforcements to accommodate the generator retirements in Eastern PJM. All of the system upgrades have not been identified at the time the Feasibility Study was completed for generation project O63. The network impacts for this project will be re-evaluated at the Impact Study when a more complete set of system reinforcements for Eastern MAAC will be available.

Note#2:
The network impacts for the O13 Merchant Transmission project were not factored into the analysis for the O63 project. Those network impacts will be evaluated in the Impact Study, if the O63 project chooses to move forward to that evaluation.

New System Reinforcements

1. The Linden to Tosco 230 kV overload can be resolved by reconductoring the circuit with 1590 ACSS. The estimated cost to reconductor the circuit is **$1.33 million** with an estimated completion time of 2 years. Upgrade # 364

2. & 3. The Aldene 230/138 kV transformer overload and the Aldene to Spring Rd. 138 kV overload can be resolved by moving the Aldene transformer to West Orange substation, raising the Aldene - Springfield Rd - West Orange (circuits L-1312 & Y-1351) voltage to 230kV, & reconnecting the transformer from the new 230kV from Springfield Rd to the West Orange 138kV bus. The estimated cost for this is **$32 million** with an estimated completion time of 3 years.

4. The Sewaren to Woodbridge 138 kV overload can be resolved by reconductoring the circuit with 1033 ACSS. The estimated cost to reconductor the circuit is **$4 million** with an estimated completion time of 2 years, provided there are no issues with the railroad that the circuit parallels.

5. The O63 project is the initial project to require the G22 substation-Warinanco 230kV line reconductoring described as network upgrade #5 above. The O63 project cost allocation is 100% of **$5.82 million** with an estimated completion time of 2 years. Upgrade # 361.

6. The O63 project is the initial project to require the Warinanco-Aldene 230kV line reconductoring described as network upgrade #6 above. The O63 project cost allocation is 100% of **$8.45 million** with an estimated completion time of 2 years. Upgrade # 362.

7. The O63 project is the initial project to require the Tosco-G22 230kV line reconductoring described as network upgrade #7 above. The O63 project cost allocation is 100% of **$0.310 million** with an estimated completion time of 2 years. Upgrade #365.

Contribution to Previously Identified System Reinforcements

Since the reinforcements required for the generator retirements have not been completely identified and the specific network reinforcements have not been identified for the Merchant Transmission projects in the O Queue, when those reinforcements are finalized the O63 project could have some cost allocation to existing network upgrades due to changes in flow caused by the baseline reinforcements and/or to those reinforcements mandated by the interconnection of the O13 project.