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 - 550 MW Injection

Network impacts for the injection of 550 MW into the Grays Ferry – Island Rd. (220-75) 230kV Line were evaluated. The following network impacts were identified:

Normal System

1) The D28 contributes 181 MW to the overload on the Parrish - Master 230kV circuit.
2) The D28 project contributes 169 MW to the overload on the Master – North Philadelphia 230kV circuits.
3) The D28 project contributes 67 MW to the overload on the North Philadelphia - Waneeta 230kV circuit.

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

- No violations

Generator Deliverability

4) D28 causes an overload on the A27-Graysferry 230 kV line at 107.3 % of the emergency rating (617 MVA) due to an outage involving the A19-Morton Tap 230kV circuit. D28 contributes 332 MW to the facility loading.
5) D28 causes an overload on the Morton Tap-Morton 230 kV line at 107.8 % of the emergency rating (613 MVA) due to an outage of the A27-Graysferry 230 kV line Project. D28 contributes 157 MW to the facility loading.
6) D28 causes an overload on the A19-Morton Tap 230 kV line at 105.4 % of the emergency rating (1436 MVA) due to an outage of the A27-Graysferry 230 kV line. D28 project contributes 253 MW to the facility loading.
7) D28 causes an overload on the Morton-Middletown 230 kV line at 102.7 % of the emergency rating (613 MVA) due to an outage of Graysferry – Parirsh 230 kV line. D28 contributes 157 MW to the facility loading.
8) D28 causes overloads on the North Philadelphia-Delaware 69kV (underground), Island Road-Packer 69kV (underground), Master-University 69kV (underground), and University-Schuylkill 69kV (underground) lines.
9) D28 contributes 364 MW to the overload of the Graysferry – Parrish 230kV circuit for the contingency involving the loss of the Concord – Lenape 230kV circuit.

Short Circuit Analysis

- Please note that all but one of these circuit breakers were previously overdutied. The D28 project contributed to the violations and overdutied one additional breaker at the Island Road 230 kV substation (# 235).

BREAKER	SUBSTATION
235	ISLAND RD
115	GRAYSFRY 230
775	GRAYSFRY 230
985	GRAYSFRY 230
815,825	GRAYSFRY 230
375	GRAYSFRY 230
25	GRAYSFRY 230
705	PARRISH 230
305,405	EDDYSTN 230
365	EDDYSTN 230
35	EDDYSTN 230
45	EDDYSTN 230
345	EDDYSTN 230
235	EDDYSTN 230
445	EDDYSTN 230

System Reinforcements

- The plan to relieve the violation # 1 is to reconductor the path with bundled 1590 kcmil conductor at an estimated cost of $7,700,000.

- The plan to relieve the violation # 2 is to reconductor the path with bundled 1590 kcmil conductor at an estimated cost of $16,700,000.

- The plan to relieve the violation # 3 is to reconductor the path with 1590 kcmil conductor at an estimated cost of $8,400,000.

- The plans to remove the violations 4 through 9 are to construct of a new 230kV line from A27 to Parrish. The cost of this new line, not including the cost of new right of way, which may be difficult or impossible to acquire, is approximately $65,000,000. The line will take two years to construct.

- $3.175 million will be needed to replace all the 17 Circuit breakers.