W2-023 Essex 138kV

Generation Interconnection

Network Impacts

Queue project W2-023 was studied as a(n) 625.0 MW (625.0 MW of which was Capacity) injection into PSEG's system at the SEWAREN 230.0 kV substation. Project W2-023 was evaluated for compliance with reliability criteria for summer peak conditions in 2014.

Generator Deliverability

(Single or N-1 contingencies for the Capacity portion only of the interconnection)

2. (PSEG/PSEG) The Tosco VFT G22-Warinanco 230 kV line (from bus 218441 to bus 218316 ckt 1) loads from 85.93% to 106.94% (DC power flow) of its normal rating (653 MVA) for non contingency condition. This project contributes approximately 137.23 MW to the thermal violation.

3. (PSEG/PSEG) The Deans-Brunswick B 230 kV line (from bus 218306 to bus 218342 ckt 1) loads from 87.65% to 103.47% (DC power flow) of its normal rating (710 MVA) for non contingency condition. This project contributes approximately 112.26 MW to the thermal violation.

Multiple Facility Contingency

(Double Circuit Tower Line, Line with Failed Breaker and Bus Fault contingencies for the full energy output)

7. (PSEG/PSEG) The Deans-Brunswick B 230 kV line (from bus 218306 to bus 218342 ckt 1) loads from 87.31% to 107.26% (DC power flow) of its emergency rating (815 MVA) for the tower contingency '11PS'. This project contributes approximately 162.58 MW to the thermal violation.

Short Circuit

(Summary form of Cost allocation for breakers will be inserted here if any)

Contribution to Previously Identified Overloads

(This project contributes to the following contingency overloads, i.e. "Network Impacts", identified for earlier generation or transmission interconnection projects in the PJM Queue)

8. (PECO/BG&E) The Cooper-Graceton 230 kV line (from bus 214089 to bus 220964 ckt 1) loads from 145.65% to 147.16% (DC power flow) of its emergency rating (485 MVA) for the single contingency 'PJM17'. This project contributes approximately 48.01 MW to the thermal violation.

9. (PL/METED) The Brunner Island Bus-Yorkana 230 kV line (from bus 207922 to bus 204515 ckt 1) loads from 126.12% to 126.91% (DC power flow) of its emergency rating (617 MVA) for the single contingency 'PJM17'. This project contributes approximately 32.08 MW to the thermal violation.

10. (PL/BG&E) The Otter Creek-Conastone 230 kV line (from bus 208048 to bus 220963 ckt 1) loads from 126.36% to 127.59% (DC power flow) of its emergency rating (531 MVA) for the single contingency 'PJM17'. This project contributes approximately 40.40 MW to the thermal violation.

11. (PJM/PJM) The Peach Bottom-Conastone 500 kV line (from bus 200013 to bus 200004 ckt 1) loads from 141.62% to 142.66% (DC power flow) of its emergency rating (2815 MVA) for the single contingency 'PJM67'. This project contributes approximately 188.64 MW to the thermal violation.

12. (PJM/PJM) The Peach Bottom-Conastone 500 kV line (from bus 200013 to bus 200004 ckt 1) loads from 142.21% to 143.45% (DC power flow) of its normal rating (2490 MVA) for non contingency condition. This project contributes approximately 199.27 MW to the thermal violation.

13. (PSEG/PSEG) The Tosco VFT G22-Warinanco 230 kV line (from bus 218441 to bus 218316 ckt 1) loads from 112.76% to 114.02% (DC power flow) of its emergency rating (752 MVA) for the tower contingency '16PS'. This project contributes approximately 58.85 MW to the thermal violation.

14. (PECO/PECO) The Nottingham-Nottingham Reactor 230 kV line (from bus 213844 to bus 213846 ckt 1) loads from 115.05% to 116.21% (DC power flow) of its emergency rating (627 MVA) for the single contingency 'PJM17'. This project contributes approximately 48.01 MW to the thermal violation.

15. (PECO/PECO) The Nottingham Reactor-Peach Bottom Tap 230 kV line (from bus 213846 to bus 213869 ckt 1) loads from 115.03% to 116.19% (DC power flow) of its emergency rating (627 MVA) for the single contingency 'PJM17'. This project contributes approximately 48.01 MW to the thermal violation.

17. (BG&E/BG&E) The Glen Arm 110512-Windy Edge 1 115 kV line (from bus 221090 to bus 221089 ckt 1) loads from 113.20% to 114.02% (DC power flow) of its emergency rating (156 MVA) for the tower contingency 'CNSTN_NWEST'. This project contributes approximately 7.94 MW to the thermal violation.

19. (PJM/METED) The Three Mile Island-Three Mile Island 500/230 kV transformer (from bus 200016 to bus 204514 ckt 2) loads from 116.72% to 117.61% (DC power flow) of its emergency rating (1072 MVA) for the single contingency 'PJM17'. This project contributes approximately 61.51 MW to the thermal violation.

20. (PECO/PECO) The Peach Bottom Tap-Cooper 230 kV line (from bus 213869 to bus 214089 ckt 1) loads from 148.73% to 150.23% (DC power flow) of its emergency rating (485 MVA) for the single contingency 'PJM17'. This project contributes approximately 48.01 MW to the thermal violation.

New System Reinforcements

(Upgrades required to mitigate reliability criteria violations, i.e. Network Impacts, initially caused by the addition of this project generation)

2,13. Reconductor VFT-Warinanco 230 kV line U-2273. Estimated Cost: $2.5 M, Project Time: 12 months

3, 7. Reconductor Deans-Brunswick 230 kV line D-2204. Estimated Cost: $3.6 M, Project Time: 12 months

5. Reconductor Sewaren-Woodbrideg 230 kV line O-1315-7. Estimated Cost: $3.4M, Project Time

Contribution to Previously Identified System Reinforcements

(Overloads initially caused by prior Queue positions with additional contribution to overloading by this project. This project may have a % allocation cost responsibility which will be calculated and reported for the Impact Study)
(Summary form of Cost allocation for transmission lines and transformers will be inserted here if any)

8. PECO portion: Reconductor Line 220-93 from Cooper Substation to Graceton Substation to get a minimum summer emergency rating of 725 MVA. The line is approximately 4 miles long. This cost is for the PECO portion only. The estimated cost to perform this work is $2.8M, and will require 24 months to complete.

BGE Portion: Rebuild Cooper to Graceton 230 kV line 1.85 miles to PA border. New rating is 648N/802E MVA. The estimated cost to perform this work is $7.5M, and will require 54 months to complete.

9. The proposed upgrade will consist of reconductoring approximately 0.64 miles of 1033 kcmil ACSR, (current ratings 498/617 MVA Summer Normal/Emergency based on conductor temp @ 125 deg C) with new 1590 kcmil ACSR (new ratings 653/793 MVA Summer Normal/Emergency, conductor operating temperature @ 125 deg C). The magnitude cost estimate for this upgrade including substation terminal equipment is $1,700,000. This estimate assumes that temporary facilities will need to be built in order to keep the line in-service.

10. PPL has recently submitted plans to PJM to rebuild the Otter Creek - Conastone 230kV line as part of a modernization project (submitted to PJM as supplemental project S0233). This project is tentatively scheduled to be complete by May 2013 (prior to the IPP's 2014 requested in-service date). The magnitude cost estimate to rebuild PPL's portion of the Otter Creek - Conastone 230kV line is $0. BGE need to rebuild Otter Creek to Conastone 230 kV 4.7 mile line (2302) to Pa Border.

New rating is 648N/802E MVA. The estimated cost to perform this work is $19M, and will require 60 months to complete.

11,12. PECO builds a new 2nd PB-Conastone 500 kV line with a minimum normal and emergency rating of 2,920 / 3,707 MVA, respectively. The line is approximately 6 miles long. Replace the 5012 terminal equipment at PB substation to achieve the conductor normal and emergency rating of 2,920 / 3,707 MVA, respectively. This cost is for the PECO portion only, and does not include right-of-way costs for new line**.** The estimated cost to perform this work is $25M, and will require 60 months to complete. BGE builds a new 500 kV line adjacent to circuit 5012 from Conastone to PA line. The estimated cost to perform this work is $56.7M, and will require 7 years to complete.

14. Replace Line 220-08 reactor and by-pass circuit switcher at Nottingham substation to get a minimum summer emergency rating of 741 MVA. The estimated cost to perform this work is $1.7M, and will require 24 months to complete.

15. Reconductor Line 220-08 from Nottingham Reactor to PB Tap to get a minimum summer emergency rating of 741 MVA. The line is approximately 14 miles long. The estimated cost to perform this work is $10M, and will require 48 months to complete.

17. Upgrade wire drop terminations at Windy Edge. The estimated cost to perform this work is $200,000 and will require 12 months to complete.

19. To mitigate the 3 MILE I-TMI 500/230kV (METED) transformer overload would require the addition of a second 500/230kV transformer at TMI as well as transmission line upgrades between the 230kV and 500kV substations. The estimated cost to perform this work is $15,000,000 and will take 36 months to complete. – This cost estimate is significantly old and could increase during the impact study.

20. Reconductor Line 220-08 from PB Tap to Cooper Substation to get a minimum summer emergency rating of 741 MVA. The line is approximately 1.4 miles long. The estimated cost to perform this work is $1.0M, and will require 24 months to complete.