PJM Generation Interconnection Request
Queue Y3-120
Conowingo 230kV
Feasibility Study

Network Impacts

The Queue Project #Y3-120 was studied as a 45.0MW (Capacity45.0MW) injection at the Conowingo 13.8 kV substation in the PECO area. Project #Y3-120 was evaluated for compliance with reliability criteria for summer peak conditions in 2017. Potential network impacts were as follows:

Generator Deliverability

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

1. (PECO - DP&L) The CONOWG01-COLOR_PE 230 kV line (from bus 213519 to bus 231006 ckt 1) loads from 97.43% to 105.27% (**DC power flow**) of its emergency rating (572 MVA) for the single line contingency outage of '220-03/* $ CHESCO $ 220-03 $ L'. This project contributes approximately 44.86 MW to the thermal violation.

```
CONTINGENCY '220-03/* $ CHESCO $ 220-03 $ L'
 TRIP BRANCH FROM BUS 213520 TO BUS 213844 CKT 1          /* CONOWG03 230.00 NOTTNGHM 230.00 $ CHESCO $ 220-03 $ L
 END/*       $ CHESCO $ 220-03 $ L
```

2. (PECO - PECO) The CONOWG03-NOTTNGHM 230 kV line (from bus 213520 to bus 213844 ckt 1) loads from 97.77% to 105.64% (**DC power flow**) of its emergency rating (570 MVA) for the single line contingency outage of '220-88/* $ CHESCO $ 220-88 $ L'. This project contributes approximately 44.86 MW to the thermal violation.

```
CONTINGENCY '220-88/* $ CHESCO $ 220-88 $ L'
 TRIP BRANCH FROM BUS 213519 TO BUS 231006 CKT 1          /* CONOWG01 230.00 COLOR_PE 230.00 $ CHESCO $ 220-88 $ L
 END/*       $ CHESCO $ 220-88 $ L
```

Light Load Analysis

Not applicable.

Multiple Facility Contingency

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

None

Short Circuit

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

To be determined

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)

1. (PECO - PECO) The BRADFRD2-PLANBRK1 230 kV line (from bus 213440 to bus 213894 ckt 1) loads from 102.62% to 104.2% (**DC power flow**) of its emergency rating (617 MVA) for the single line contingency outage of 'BRAD290/* $ CHESCO $ BRAD290 $ K'. This project contributes approximately 9.8 MW to the thermal violation.

```
CONTINGENCY 'BRAD290/* $ CHESCO $ BRAD290 $ K'
 TRIP BRANCH FROM BUS 213436 TO BUS 213438 CKT Z              /* BRADFR12 230.00 BRADFRD1 230.00 $ CHESCO $ BRAD290 $ K
 END/*    $ CHESCO $ BRAD290 $ K
```

2. (PECO - PECO) The DALEVLLE-BRADFRD1 230 kV line (from bus 213553 to bus 213438 ckt 1) loads from 102.37% to 107.61% (**DC power flow**) of its emergency rating (519 MVA) for the single line contingency outage of '220-88/* $ CHESCO $ 220-88 $ L'. This project contributes approximately 27.19 MW to the thermal violation.

```
CONTINGENCY '220-88/* $ CHESCO $ 220-88 $ L'
 TRIP BRANCH FROM BUS 213519 TO BUS 231006 CKT 1              /* CONOWG01 230.00 COLOR_PE 230.00 $ CHESCO $ 220-88 $ L
 END/*       $ CHESCO $ 220-88 $ L
```

3. (PECO - PECO) The NOTTNGHM-DALEVLLE 230 kV line (from bus 213844 to bus 213553 ckt 1) loads from 110.15% to 115.39% (**DC power flow**) of its emergency rating (519 MVA) for the single line contingency outage of '220-88/* $ CHESCO $ 220-88 $ L'. This project contributes approximately 27.2 MW to the thermal violation.

```
CONTINGENCY '220-88/* $ CHESCO $ 220-88 $ L'
 TRIP BRANCH FROM BUS 213519 TO BUS 231006 CKT 1              /* CONOWG01 230.00 COLOR_PE 230.00 $ CHESCO $ 220-88 $ L
 END/*       $ CHESCO $ 220-88 $ L
```

Please refer to Appendix 5 for a table containing the generators having contribution to this flowgate.

Steady-State Voltage Requirements
(Results of the steady-state voltage studies should be inserted here)

To be determined

Stability and Reactive Power Requirement
(Results of the dynamic studies should be inserted here)

To be determined

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

1. (PECO - DP&L) The CONOWG01-COLOR_PE 230 kV line:
DPL:
Reconductor line 22088, Conowingo – Colora 230 kV (no pole replacement). Estimated Cost: $7.5M; Estimated Time: 24 – 36 months
PECO:
Replace 2 sections of station cable, 2 disconnect switches, 3 meters and reconductor 3.3 miles crossing the Susquehanna River south of the dam. Estimated Cost: $15.5M (including $2M extra for river crossing logistics); Estimated Time: 4 years

2. (PECO - PECO) The CONOWG03-NOTTNGHM 230 kV line:
Replace 6 sections of station cable, 2 disconnect switches, 4 meters, 2 line traps and reconductor 10.5 miles including crossing the Susquehanna River south of the dam. Estimated Cost: $44.5M (including $2M extra for river crossing logistics); Estimated Time: 4 years

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)

1. (PECO - PECO) The BRADFRD2-PLANBRK1 230 kV line:
Replace 10 sections of station cable, 5 meters, 2 line traps and 2 CCVTs. Estimated Cost: $700K; Estimated Time: $2 years

2, 3. (PECO - PECO) The DALEVLLE-BRADFRD1 230 kV line:
Replace 5 sections of station cable, 4 meters, 2 line traps and reconductor 24.5 miles. Estimated Cost: $98.5M; Estimated Time: 4 years

Delivery of Energy Portion of Interconnection Request
PJM also studied the delivery of the energy portion of this interconnection request. Any problems identified below are likely to result in operational restrictions to the project under study. The developer can proceed with network upgrades to eliminate the operational restriction at their discretion by submitting a Merchant Transmission Interconnection request.
Only the most severely overloaded conditions are listed. There is no guarantee of full delivery of energy for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed, which will study all overload conditions associated with the overloaded element(s) identified.

Not Applicable