

Network Impacts

The Queue Project #Y3-108 was studied as an 110.0MW (Capacity 107.0MW) injection at the Linden Collector Substation. Project #Y3-108 was evaluated for compliance with reliability criteria for summer peak conditions in 2017. Potential network impacts were as follows:

Potential network impacts were as follows:

Table 1 - Y3-108 Contingencies	
Contingency Name	Description
36PS	CONTINGENCY '36PS' /* DEANS-WESTFIELD 230KV & SEWAREN(PIERSON AVE) -ROSELAND 230KV DCTL DISCONNECT BRANCH FROM BUS 218306 TO BUS 218356 CKT 1 DISCONNECT BRANCH FROM BUS 218356 TO BUS 218305 CKT 1 DISCONNECT BRANCH FROM BUS 218357 TO BUS 218355 CKT 1 DISCONNECT BRANCH FROM BUS 218355 TO BUS 218320 CKT 1 DISCONNECT BRANCH FROM BUS 218320 TO BUS 216950 CKT 1 MOVE 49 PERCENT LOAD FROM BUS 218401 TO BUS 218402 /* PRSN AVG T1 T2 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218384 /* PRSN AVG T1 KILMER T2 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218399 /* PRSN AVG T1 NEWDVR T2 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218390 /* PRSN AVG T1 LAFAYET T2 MOVE 100 PERCENT LOAD FROM BUS 218415 TO BUS 218416 /* WESTFIELD T1 T2 MOVE 100 PERCENT LOAD FROM BUS 218380 TO BUS 218381 /* FANWOOD T2 T1 END
ALD_SPRI	CONTINGENCY 'ALD_SPRI' /* ALDENE 230KV-SPRINGFLD RD 138KV TRIP LINE FROM BUS 218345 TO BUS 216911 CKT 1 MOVE 100 PERCENT LOAD FROM BUS 216927 TO BUS 216926 END
PS_GO	CONTINGENCY 'PS_GO' /*DEANS-LINDENG_ WOODBRIDGE TO SEWAREN O DISCONNECT BRANCH FROM BUS 218354 TO BUS 218306 CKT 2 /* PRSN AVG DEANS 230 230 DISCONNECT BRANCH FROM BUS 218354 TO BUS 218300 CKT 1 /* MINUESTG LINDEN 230 230 DISCONNECT BRANCH FROM BUS 218357 TO BUS 218355 CKT 1 /*PRSB AVG NEW DOVER 230 230 DISCONNECT BRANCH FROM BUS 218355 TO BUS 218320 CKT 1 /* NEW DOVER FANWOOD 230 230 DISCONNECT BRANCH FROM BUS 218320 TO BUS 216950 CKT 1 /* FANWOOD ROSELAND 230 230 MOVE 49 PERCENT LOAD FROM BUS 218401 TO BUS 218402 /* PRSN AVG T1 T2 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218384 /* PRSN AVG T1 KILMER T2 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218399 /* PRSN AVG T1 NEWDVR T2 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218390 /* PRSN AVG T1 LAFAYET T2 MOVE 52 PERCENT LOAD FROM BUS 218396 TO BUS 218397 /* MINUESTR T2 T1 MOVE 24 PERCENT LOAD FROM BUS 218396 TO BUS 218410 /* MINUESTR T2 WARINAN T1

Table 1 - Y3-108 Contingencies

Contingency Name	Description
	MOVE 24 PERCENT LOAD FROM BUS 218396 TO BUS 218414 /* MINUESTR T2 WDBRDG T1 END
PS51B	CONTINGENCY 'PS51B' /* METUCHEN - FANWOOD 230 (NEW O-1315) DISCONNECT BRANCH FROM BUS 218469 TO BUS 218357 CKT 1 /* METUCHEN PRSN AVG 230 230 DISCONNECT BRANCH FROM BUS 218357 TO BUS 218355 CKT 1 /* PRSN AVG NEW DOVER 230 230 DISCONNECT BRANCH FROM BUS 218355 TO BUS 218320 CKT 1 /* NEW DOVER FANWOOD 230 230 MOVE 49 PERCENT LOAD FROM BUS 218401 TO BUS 218402 /* PRSN AVG T1 T2 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218384 /* PRSN AVG T1 KILMER T2 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218399 /* PRSN AVG T1 NEWDVR T2 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218390 /* PRSN AVG T1 LAFAYET T2 END
PS61	CONTINGENCY 'PS61' /* WARINANCO BUS BREAKER TO ALDENE DISCONNECT BRANCH FROM BUS 218307 TO BUS 217122 CKT 1 /* ALDENE ALDENE 230 230 DISCONNECT BRANCH FROM BUS 217122 TO BUS 218376 CKT 1 /* ALDENE1 ALDENEAB 230 26 DISCONNECT BRANCH FROM BUS 217122 TO BUS 218316 CKT 1 /* ALDENE1 WARINANC 230 230 DISCONNECT BRANCH FROM BUS 218316 TO BUS 218441 CKT 1 /* WARINANC VFT 230 230 DISCONNECT BRANCH FROM BUS 218316 TO BUS 218410 CKT 1 /* WARINANC T1 DISCONNECT BRANCH FROM BUS 218316 TO BUS 218411 CKT 1 /* WARINANC T2 MOVE 13 MW LOAD FROM BUS 218410 TO BUS 218374 /* WARINANC T1 ALDENE T1 MOVE 5 MW LOAD FROM BUS 218410 TO BUS 218375 /* WARINANC T1 ALDENE T2 MOVE 5 MW LOAD FROM BUS 218410 TO BUS 218413 /* WARINANC T1 WOODBRDG T3 MOVE 8 MW LOAD FROM BUS 218411 TO BUS 216924 /* WARINANC T2 NORTHAV T1 MOVE 5 MW LOAD FROM BUS 218411 TO BUS 216925 /* WARINANC T2 NORTHAV T2 MOVE 8 MW LOAD FROM BUS 218411 TO BUS 218397 /* WARINANC T2 MINUEST T1 END
PS8B	CONTINGENCY 'PS8B' DISCONNECT BRANCH FROM BUS 218441 TO BUS 218316 CKT 1 /* G22 WARINANCO 230 230 MOVE 100 PERCENT LOAD FROM BUS 218410 TO BUS 218411 /* WARINANCO T1 T2 END

Contingency Name		Description
PS8C	CONTINGENCY 'PS8C' DISCONNECT BRANCH FROM BUS 218343 TO BUS 218441 CKT 1 /* TOSCO G22 230 230 END	

Generator Deliverability

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

Table 2 below provides a summary of the impacts caused by Y3-108 on the PSE&G transmission system and other TO areas for generator deliverability:

Table 2 - Y3-108 Generator Deliverability												
#	Contingency		Facility Description	Bus			Loading		Rating		MW Cont.	FG App.
	Type	Name		From	To	Cir.	Initial	Final	Type	MVA		
1	Non	Non	WARINANC-ALDENE1 230 kV line	218316	217122	1	94.04	100.33	NR	732	46.03	1
2	N-1	PS8C	METUCHEN-PRSN AVG 230 kV line	218469	218357	1	98.98	101.95	ER	870	25.86	2
3	N-1	PS51B	WARINANC-ALDENE1 230 kV line	218316	217122	1	98.5	104.21	ER	887	50.65	3
4	Non	Non	ALDENE2-SPRINGRD 230 kV line	218345	216911	1	99.09	104.92	NR	512	29.88	4

Multiple Facility Contingency

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

None

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)

Table 5 below provides a summary of the impacts caused by Y1-070 on the ATSI transmission system and other TO areas for contribution to previously identified overloads:

Table 3 - Y3-108 Contribution to Previously Identified Overloads												
#	Contingency		Facility Description	Bus			Loading		Rating		MW Cont.	FG App.
	Type	Name		From	To	Cir.	Initial	Final	Type	MVA		
1	Non	Non	LINDEN-TOSCO 230 kV line	218300	218343	1	105.27	110.19	NR	936	46.11	5
2	DCTL	PS_GO	SPRINGRD-W.ORANGE 230 kV line	216911	216914	1	107.35	112.3	ER	789	39	6

Table 3 - Y3-108 Contribution to Previously Identified Overloads

#	Contingency		Facility Description	Bus		Cir.	Loading		Rating		MW Cont.	FG App.
	Type	Name		From	To		Initial	Final	Type	MVA		
3	N-1	PS51B	LINDEN-TOSCO 230 kV line	218300	218343	1	108.36	113.06	ER	1081	50.88	7
4	LFFB	PS61	LINDEN-MINUESTR 230 kV line	218300	218353	1	106.42	114.06	ER	740	56.49	8
5	N-1	PS51B	TOSCO-G22_MTX5 230 kV line	218343	218441	1	110.83	115.36	ER	1120	50.8	9
6	Non	Non	G22_MTX5-WARINANC 230 kV line	218441	218316	1	108.78	115.68	NR	667	46.03	10
7	N-1	PS51B	G22_MTX5-WARINANC 230 kV line	218441	218316	1	110.94	117.12	ER	821	50.65	11
8	Non	Non	TOSCO-G22_MTX5 230 kV line	218343	218441	1	112.23	117.15	NR	936	46.03	12
9	DCTL	PS_GO	ALDENE2-SPRINGRD 230 kV line	218345	216911	1	116.25	121.19	ER	789	39	13
10	DCTL	36PS	LINDEN-TOSCO 230 kV line	218300	218343	1	121.03	125.56	ER	1081	48.96	14
11	DCTL	36PS	TOSCO-G22_MTX5 230 kV line	218343	218441	1	122.51	126.88	ER	1120	48.87	15
12	DCTL	36PS	WARINANC-ALDENE1 230 kV line	218316	217122	1	147.59	153.08	ER	887	48.7	16
13	DCTL	36PS	G22_MTX5-WARINANC 230 kV line	218441	218316	1	163.99	169.92	ER	821	48.7	17

Energy Portion of Interconnection Request

PJM also studied the delivery of the energy portion of the surrounding generation. Any potential 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 Transmission Interconnection request.

Note: 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 analyzes all overload conditions associated with the overloaded element(s) identified. As a result of the aggregate energy resources in the area, the following violations were identified.

Short Circuit

(Summary of impacted circuit breakers)

Not required

New System Reinforcements

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

Table 2b - Y3-108 Generator Deliverability						
#	Contingency		Facility Description	Description	Schedule	Cost
	Type	Name				
1	Non	Non	WARINANC-ALDENE1 230 kV line	This overload can be alleviated by reconductoring the Aldene – Warinanco (N-2240) 230 kV line.	Estimated time: 48 months	\$22 M
2	N-1	PS8C	METUCHEN-PRSN AVG 230 kV line	This overload can be alleviated by reconductoring the Metuchen – Pierson Ave (S2219-1) 230 kV line.;	Estimated time: 48 months	\$3 M
3	N-1	PS51B	WARINANC-ALDENE1 230 kV line	Same as #1		
4	Non	Non	ALDENE2-SPRINGRD 230 kV line	Build new Aldene – Springfield Rd 230 kV cable.	Estimated time: 48 months.	\$75 M
				Build new Springfield Rd – West Orange 230 kV cable.	Estimated time: 48 months	\$135 M

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)

Table 3b - Y3-108 Contribution to Previously Identified Overloads						
#	Contingency		Facility Description	Description	Schedule	Cost
	Type	Name				
1	Non	Non	LINDEN-TOSCO 230 kV line	This overload can be alleviated by reconductoring the Tosco – Linden (B-2254) 230 kV line	Estimated time: 48 months	\$6 M;
2	DCTL	PS_GO	SPRINGRD-W.ORANGE 230 kV line	Build new Aldene – Springfield Rd 230 kV cable. Estimated cost: \$75 M; Estimated time: \$48 months. Build new Springfield Rd – West Orange 230 kV cable.	Estimated time: \$48 months.	\$135 M
3	N-1	PS51B	LINDEN-TOSCO 230 kV line	Same as #1		
4	LFFB	PS61	LINDEN-MINUESTR 230 kV line	This overload can be alleviated by reconductoring the Linden – Minue St (R2218-1) 230 kV line. Estimated cost.;	Estimated time: 48 months	\$22 M
5	N-1	PS51B	TOSCO-G22_MTX5 230 kV line	This overload can be alleviated by reconductoring the VFT – Tosco (S-2271) 230 kV line. Estimated cost:	Estimated time: 48 months	\$2 M;
6	Non	Non	G22_MTX5-WARINANC 230 kV line	This overload can be alleviated by reconductoring the Aldene – Warinanco (N-2240) 230 kV line. Estimated cost: \$22 M; Estimated time: 48 months This overload can be alleviated by reconductoring the Warinanco - VFT (U-2273) 230 kV line.	Estimated time: 48 months	\$14 M
7	N-1	PS51B	G22_MTX5-WARINANC 230 kV line	This overload can be alleviated by reconductoring the Warinanco - VFT (U-2273) 230 kV line.	Estimated time: 48 months	\$14 M;
8	Non	Non	TOSCO-G22_MTX5 230 kV line	Same as #5		
9	DCTL	PS_GO	ALDENE2-SPRINGRD 230 kV line	Build new Aldene – Springfield Rd 230 kV cable.	Estimated time: 48 months.	\$75 M

Table 3b - Y3-108 Contribution to Previously Identified Overloads

Contingency		Facility Description	Description	Schedule	Cost
#	Type Name				
			Build new Springfield Rd – West Orange 230 kV cable.	Estimated time: 48 months	\$135 M
10	DCTL 36PS	LINDEN-TOSCO 230 kV line	Same as #1		
11	DCTL 36PS	TOSCO-G22_MTX5 230 kV line	Same as #5		
12	DCTL 36PS	WARINANC-ALDENE1 230 kV line	This overload can be alleviated by reconductoring the Aldene – Warinanco (N-2240) 230 kV line.	Estimated time: 48 months	\$22 M;
13	DCTL 36PS	G22_MTX5-WARINANC 230 kV line	Same as #7		

Energy Portion of Interconnection Request

PJM also studied the delivery of the energy portion of the surrounding generation. Any potential 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 Transmission Interconnection request.

Note: 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 analyzes all overload conditions associated with the overloaded element(s) identified. As a result of the aggregate energy resources in the area, the following violations were identified.

Table 4 - Y3-108 Delivery of Energy Portion of Interconnection Request												
#	Contingency		Facility Description	Bus			Loading		Rating		MW Cont.	FG App.
	Type	Name		From	To	Cir.	Initial	Final	Type	MVA		
1	N-1	PS8B	NEWDOVRO-FANWOODO 230 kV line	218355	218320	1	101.59	102.09	ER	870	26.77	
2	N-1	ALD_SPRI	ALDENE-STAN_TER 230 kV line	218307	218430	1	99.04	103.52	ER	558	25	
3	N-1	ALD_SPRI	STAN_TER-MCARTHUR 230 kV line	218430	217170	1	100.48	105.03	ER	550	25	
4	N-1	PS8B	PRSN AVG-NEWDOVRO 230 kV line	218357	218355	1	105.28	105.78	ER	870	26.77	
5	N-1	PS8B	METUCHEN-PRSN AVG 230 kV line	218469	218357	1	109.39	109.88	ER	870	26.77	
6	Non	Non	LINDEN-TOSCO 230 kV line	218300	218343	1	108.1	113.16	NR	936	47.4	
7	Non	Non	TOSCO-G22_MTX5 230 kV line	218343	218441	1	115.04	120.1	NR	936	47.32	
8	Non	Non	SPRINGRD-W.ORANGE 230 kV line	216911	216914	1	128.06	134.06	NR	512	30.71	
9	Non	Non	WARINANC-ALDENE1 230 kV line	218316	217122	1	139.51	145.97	NR	732	47.32	
10	Non	Non	ALDENE2-SPRINGRD 230 kV line	218345	216911	1	141.77	147.77	NR	512	30.71	
11	Non	Non	G22_MTX5-WARINANC 230 kV line	218441	218316	1	158.68	165.78	NR	667	47.32	

Short Circuit – Breaker Costs

Not required

Steady-State Voltage Requirements

(Results of the steady-state voltage studies should be inserted here)

To be determined

Light Load Reliability Analysis

*(Summary of any reinforcements required to mitigate system reliability issues during light load periods. This light load study was evaluated for compliance with reliability criteria for **Light Load conditions** in 2014.)*

Not required.

Stability and Reactive Power Requirement

(Results of the dynamic studies should be inserted here)

The analysis will be done in the Impact Study

Appendices

The following appendices contain additional information about each flowgate presented in the body of the report. For each appendix, a description of the flowgate and its contingency was included for convenience. However, the intent of the appendix section is to provide more information on which projects/generators have contributions to the flowgate in question. Although this information is not used "as is" for cost allocation purposes, it can be used to gage other generators impact.

It should be noted the generator contributions presented in the appendices sections are full contributions, whereas in the body of the report, those contributions take into consideration the commercial probability of each project.

Appendix 1

(PSEG - PSEG) The WARINANC-ALDENE1 230 kV line (from bus 218316 to bus 217122 ckt 1) loads from 94.04% to 100.33% (**DC power flow**) of its normal rating (732 MVA) for non-contingency condition. This project contributes approximately 46.03 MW to the thermal violation.

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	20.79
218327	EDISON 2	20.78
218328	EDISON 3	20.79
218423	LINDNCT1	2.89
218424	LINDNCT2	2.89
218425	LINDNCT3	2.89
218426	LINDNST1	5.66
290745	S-061	0.42
218360	SEWAREN1	24.18
218361	SEWAREN2	25.37
218362	SEWAREN3	23.01
218363	SEWAREN4	24.82
218364	SEWAREN6	22.2
218344	TOSCONUG	2.49
292094	V1-030 C1	0.02
292096	V1-030 C2	0.01
292078	V1-034	0.24
292680	V3-069 C	< 0.01
900801	W1-001	7.3
902251	W2-023	154.12
902651	W2-052C	< 0.01
905641	W4-080 C	0.05
909461	X2-089 C	< 0.01
913101	Y1-026	75.51
915251	Y3-049 1	0.49
915252	Y3-049 2	0.49
915253	Y3-049 3	0.49
915681	Y3-108 C	46.03

Appendix 2

(PSEG - PSEG) The METUCHEN-PRSN AVG 230 kV line (from bus 218469 to bus 218357 ckt 1) loads from 98.98% to 101.95% (**DC power flow**) of its emergency rating (870 MVA) for the single line contingency outage of 'PS8C'. This project contributes approximately 25.86 MW to the thermal violation.

CONTINGENCY 'PS8C'

DISCONNECT BRANCH FROM BUS 218343 TO BUS 218441 CKT 1
G22 230 230

/* TOSCO

END

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	38.65
218327	EDISON 2	38.63
218328	EDISON 3	38.65
218423	LINDNCT1	1.63
218424	LINDNCT2	1.63
218425	LINDNCT3	1.63
218426	LINDNST1	3.18
290745	S-061	0.21
218360	SEWAREN1	33.21
218361	SEWAREN2	37.11
218362	SEWAREN3	33.65
218363	SEWAREN4	38.5
218364	SEWAREN6	34.43
218344	TOSCONUG	1.24
292094	V1-030 C1	< 0.01
292096	V1-030 C2	0.02
292078	V1-034	0.39
292680	V3-069 C	0.01
902251	W2-023	201.98
902651	W2-052C	< 0.01
903961	W3-077C	-0.19
905641	W4-080 C	0.13
913101	Y1-026	37.66
915251	Y3-049 1	0.92
915252	Y3-049 2	0.92
915253	Y3-049 3	0.92
915681	Y3-108 C	25.86

Appendix 3

(PSEG - PSEG) The WARINANC-ALDENE1 230 kV line (from bus 218316 to bus 217122 ckt 1) loads from 98.5% to 104.21% (**DC power flow**) of its emergency rating (887 MVA) for the single line contingency outage of 'PS51B'. This project contributes approximately 50.65 MW to the thermal violation.

CONTINGENCY 'PS51B' /* METUCHEN - FANWOOD 230
 (NEW O-1315)
 DISCONNECT BRANCH FROM BUS 218469 TO BUS 218357 CKT 1 /*
 METUCHEN PRSN AVG 230 230
 DISCONNECT BRANCH FROM BUS 218357 TO BUS 218355 CKT 1 /* PRSN AVG
 NEW DOVER 230 230
 DISCONNECT BRANCH FROM BUS 218355 TO BUS 218320 CKT 1 /* NEW
 DOVER FANWOOD 230 230
 MOVE 49 PERCENT LOAD FROM BUS 218401 TO BUS 218402 /* PRSN AVG
 T1 T2
 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218384 /* PRSN AVG
 T1 KILMER T2
 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218399 /* PRSN AVG
 T1 NEWDVR T2
 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218390 /* PRSN AVG
 T1 LAFAYET T2
 END

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	31.62
218327	EDISON 2	31.61
218328	EDISON 3	31.62
218423	LINDNCT1	3.19
218424	LINDNCT2	3.19
218425	LINDNCT3	3.19
218426	LINDNST1	6.23
290745	S-061	0.45
218360	SEWAREN1	32.97
218361	SEWAREN2	35.32
218362	SEWAREN3	32.04
218363	SEWAREN4	35.28
218364	SEWAREN6	31.55
218344	TOSCONUG	2.69
292094	V1-030 C1	0.02
292096	V1-030 C2	0.02
292078	V1-034	0.35
292680	V3-069 C	0.01
900801	W1-001	7.84
902251	W2-023	207.01
902651	W2-052C	< 0.01

905641	W4-080 C	0.09
913101	Y1-026	81.56
915251	Y3-049 1	0.75
915252	Y3-049 2	0.75
915253	Y3-049 3	0.75
915681	Y3-108 C	50.65

Appendix 4

(PSEG - PSEG) The ALDENE2-SPRINGRD 230 kV line (from bus 218345 to bus 216911 ckt 1) loads from 99.09% to 104.92% (**DC power flow**) of its normal rating (512 MVA) for non-contingency condition. This project contributes approximately 29.88 MW to the thermal violation.

Bus Number	Bus Name	Full Contribution
218307	ALDENE	0.02
218376	ALDENEAB	12.17
218326	EDISON 1	16.45
218327	EDISON 2	16.45
218328	EDISON 3	16.45
218423	LINDNCT1	1.88
218424	LINDNCT2	1.88
218425	LINDNCT3	1.88
218426	LINDNST1	3.68
290745	S-061	0.27
218360	SEWAREN1	16.11
218361	SEWAREN2	17.09
218362	SEWAREN3	15.51
218363	SEWAREN4	16.92
218364	SEWAREN6	15.13
218344	TOSCONUG	1.6
292094	V1-030 C1	0.01
292078	V1-034	0.35
900801	W1-001	4.67
902251	W2-023	101.84
912221	X4-044 C	4.47
913101	Y1-026	48.48
915251	Y3-049 1	0.39
915252	Y3-049 2	0.39
915253	Y3-049 3	0.39
915681	Y3-108 C	29.88

Appendix 5

(PSEG - PSEG) The LINDEN-TOSCO 230 kV line (from bus 218300 to bus 218343 ckt 1) loads from 105.27% to 110.19% (**DC power flow**) of its normal rating (936 MVA) for non-contingency condition. This project contributes approximately 46.11 MW to the thermal violation.

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	20.92
218327	EDISON 2	20.91
218328	EDISON 3	20.92
218423	LINDNCT1	2.9
218424	LINDNCT2	2.9
218425	LINDNCT3	2.9
218426	LINDNST1	5.67
218360	SEWAREN1	24.26
218361	SEWAREN2	25.45
218362	SEWAREN3	23.09
218363	SEWAREN4	24.92
218364	SEWAREN6	22.28
292094	V1-030 C1	0.02
292096	V1-030 C2	0.01
292078	V1-034	0.24
292680	V3-069 C	< 0.01
902251	W2-023	154.59
902651	W2-052C	< 0.01
905641	W4-080 C	0.05
909461	X2-089 C	< 0.01
915251	Y3-049 1	0.5
915252	Y3-049 2	0.5
915253	Y3-049 3	0.5
915681	Y3-108 C	46.11

Appendix 6

(PSEG - PSEG) The SPRINGRD-W.ORANGE 230 kV line (from bus 216911 to bus 216914 ckt 1) loads from 107.35% to 112.3% (**DC power flow**) of its emergency rating (789 MVA) for the tower line contingency outage of 'PS_GO'. This project contributes approximately 39.0 MW to the thermal violation.

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CONTINGENCY 'PS_GO'                                /*DEANS-LINDENG_
WOODBIDGE TO SEWAREN O
  DISCONNECT BRANCH FROM BUS 218354 TO BUS 218306 CKT 2    /* PRSN AVG
DEANS 230 230
  DISCONNECT BRANCH FROM BUS 218354 TO BUS 218300 CKT 1    /*
MINUESTG LINDEN 230 230
  DISCONNECT BRANCH FROM BUS 218357 TO BUS 218355 CKT 1    /*PRSB AVG
NEW DOVER 230 230
  DISCONNECT BRANCH FROM BUS 218355 TO BUS 218320 CKT 1    /* NEW
DOVER FANWOOD 230 230
  DISCONNECT BRANCH FROM BUS 218320 TO BUS 216950 CKT 1    /* FANWOOD
ROSELAND 230 230
  MOVE 49 PERCENT LOAD FROM BUS 218401 TO BUS 218402        /* PRSN AVG
T1 T2
  MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218384        /* PRSN AVG
T1 KILMER T2
  MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218399        /* PRSN AVG
T1 NEWDVR T2
  MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218390        /* PRSN AVG
T1 LAFAYET T2
  MOVE 52 PERCENT LOAD FROM BUS 218396 TO BUS 218397        /* MINUESTR
T2 T1
  MOVE 24 PERCENT LOAD FROM BUS 218396 TO BUS 218410        /* MINUESTR
T2 WARINAN T1
  MOVE 24 PERCENT LOAD FROM BUS 218396 TO BUS 218414        /* MINUESTR
T2 WDBRDG T1
END
  
```

Bus Number	Bus Name	Full Contribution
218307	ALDENE	0.02
218376	ALDENEAB	12.74
218326	EDISON 1	27.35
218327	EDISON 2	27.35
218328	EDISON 3	27.35
218423	LINDNCT1	2.39
218424	LINDNCT2	2.39
218425	LINDNCT3	2.39
218426	LINDNST1	4.67
206679	M&M S721	-0.85
94130	O66_NONFIRM	50.33
206638	PEAPACK	-0.33

290745	S-061	0.33
218360	SEWAREN1	26.04
218361	SEWAREN2	28.14
218362	SEWAREN3	25.52
218363	SEWAREN4	28.32
218364	SEWAREN6	25.33
218344	TOSCONUG	1.95
293093	U2-077	237.18
292094	V1-030 C1	0.01
292095	V1-030 E1	0.51
292185	V1-030 E2	0.63
292101	V1-030 E4	0.06
292103	V1-030 E5	0.15
292107	V1-030 E7	0.09
292189	V1-030 EA	0.48
292078	V1-034	0.43
297021	V2-009 E1	0.19
297023	V2-009 E2	0.37
297025	V2-009 E3	0.39
297027	V2-009 E4	0.26
293378	V3-024 E	0.75
292666	V3-058 E	0.26
292668	V3-059 E	0.26
292681	V3-069 E	0.26
900801	W1-001	5.65
902002	W1-121 E	0.29
902251	W2-023	162.48
902652	W2-052E	0.1
903961	W3-077C	-0.33
905642	W4-080 E	2.68
909452	X2-088 E	0.18
909462	X2-089 E	0.37
910612	X3-029 E	-0.72
910712	X3-052 E	-0.43
912221	X4-044 C	4.68
912222	X4-044 E	3.78
913101	Y1-026	59.33
915251	Y3-049 1	0.65
915252	Y3-049 2	0.65
915253	Y3-049 3	0.65
915652	Y3-105 E	1.51
915681	Y3-108 C	37.94
915682	Y3-108 E	1.06

Appendix 7

(PSEG - PSEG) The LINDEN-TOSCO 230 kV line (from bus 218300 to bus 218343 ckt 1) loads from 108.36% to 113.06% (**DC power flow**) of its emergency rating (1081 MVA) for the single line contingency outage of 'PS51B'. This project contributes approximately 50.88 MW to the thermal violation.

CONTINGENCY 'PS51B' /* METUCHEN - FANWOOD 230
 (NEW O-1315)
 DISCONNECT BRANCH FROM BUS 218469 TO BUS 218357 CKT 1 /*
 METUCHEN PRSN AVG 230 230
 DISCONNECT BRANCH FROM BUS 218357 TO BUS 218355 CKT 1 /* PRSN AVG
 NEW DOVER 230 230
 DISCONNECT BRANCH FROM BUS 218355 TO BUS 218320 CKT 1 /* NEW
 DOVER FANWOOD 230 230
 MOVE 49 PERCENT LOAD FROM BUS 218401 TO BUS 218402 /* PRSN AVG
 T1 T2
 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218384 /* PRSN AVG
 T1 KILMER T2
 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218399 /* PRSN AVG
 T1 NEWDVR T2
 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218390 /* PRSN AVG
 T1 LAFAYET T2
 END

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	32.09
218327	EDISON 2	32.07
218328	EDISON 3	32.09
218423	LINDNCT1	3.2
218424	LINDNCT2	3.2
218425	LINDNCT3	3.2
218426	LINDNST1	6.26
218360	SEWAREN1	33.33
218361	SEWAREN2	35.72
218362	SEWAREN3	32.4
218363	SEWAREN4	35.69
218364	SEWAREN6	31.92
292094	V1-030 C1	0.02
292096	V1-030 C2	0.02
292078	V1-034	0.35
292680	V3-069 C	0.01
902251	W2-023	209.13
902651	W2-052C	< 0.01
905641	W4-080 C	0.09
915251	Y3-049 1	0.76
915252	Y3-049 2	0.76

915253	Y3-049 3	0.76
915681	Y3-108 C	50.88

Appendix 8

(PSEG - PSEG) The LINDEN-MINUESTR 230 kV line (from bus 218300 to bus 218353 ckt 1) loads from 106.42% to 114.06% (**DC power flow**) of its emergency rating (740 MVA) for the line fault with failed breaker contingency outage of 'PS61'. This project contributes approximately 56.49 MW to the thermal violation.

CONTINGENCY 'PS61' /* WARINANCO BUS BREAKER TO
ALDENE
DISCONNECT BRANCH FROM BUS 218307 TO BUS 217122 CKT 1 /* ALDENE
ALDENE 230 230
DISCONNECT BRANCH FROM BUS 217122 TO BUS 218376 CKT 1 /* ALDENE1
ALDENEAB 230 26
DISCONNECT BRANCH FROM BUS 217122 TO BUS 218316 CKT 1 /* ALDENE1
WARINANC 230 230
DISCONNECT BRANCH FROM BUS 218316 TO BUS 218441 CKT 1 /*
WARINANC VFT 230 230
DISCONNECT BRANCH FROM BUS 218316 TO BUS 218410 CKT 1 /*
WARINANC T1
DISCONNECT BRANCH FROM BUS 218316 TO BUS 218411 CKT 1 /*
WARINANC T2
MOVE 13 MW LOAD FROM BUS 218410 TO BUS 218374 /* WARINANC T1
ALDENE T1
MOVE 5 MW LOAD FROM BUS 218410 TO BUS 218375 /* WARINANC T1
ALDENE T2
MOVE 5 MW LOAD FROM BUS 218410 TO BUS 218413 /* WARINANC T1
WOODBRDG T3
MOVE 8 MW LOAD FROM BUS 218411 TO BUS 216924 /* WARINANC T2
NORTHAV T1
MOVE 5 MW LOAD FROM BUS 218411 TO BUS 216925 /* WARINANC T2
NORTHAV T2
MOVE 8 MW LOAD FROM BUS 218411 TO BUS 218397 /* WARINANC T2
MINUESTR T1
END

Bus Number	Bus Name	Full Contribution
218423	LINDNCT1	3.46
218424	LINDNCT2	3.46
218425	LINDNCT3	3.46
218426	LINDNST1	6.76
290745	S-061	0.45
218344	TOSCONUG	2.66
293093	U2-077	315.73
292094	V1-030 C1	0.02
292095	V1-030 E1	0.73
900801	W1-001	7.52
913101	Y1-026	80.7
915681	Y3-108 C	54.94

915682	Y3-108 E	1.54
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Appendix 9

(PSEG - PSEG) The TOSCO-G22_MTX5 230 kV line (from bus 218343 to bus 218441 ckt 1) loads from 110.83% to 115.36% (**DC power flow**) of its emergency rating (1120 MVA) for the single line contingency outage of 'PS51B'. This project contributes approximately 50.8 MW to the thermal violation.

CONTINGENCY 'PS51B' /* METUCHEN - FANWOOD 230
 (NEW O-1315)
 DISCONNECT BRANCH FROM BUS 218469 TO BUS 218357 CKT 1 /*
 METUCHEN PRSN AVG 230 230
 DISCONNECT BRANCH FROM BUS 218357 TO BUS 218355 CKT 1 /* PRSN AVG
 NEW DOVER 230 230
 DISCONNECT BRANCH FROM BUS 218355 TO BUS 218320 CKT 1 /* NEW
 DOVER FANWOOD 230 230
 MOVE 49 PERCENT LOAD FROM BUS 218401 TO BUS 218402 /* PRSN AVG
 T1 T2
 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218384 /* PRSN AVG
 T1 KILMER T2
 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218399 /* PRSN AVG
 T1 NEWDVR T2
 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218390 /* PRSN AVG
 T1 LAFAYET T2
 END

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	31.96
218327	EDISON 2	31.95
218328	EDISON 3	31.96
218423	LINDNCT1	3.19
218424	LINDNCT2	3.19
218425	LINDNCT3	3.19
218426	LINDNST1	6.25
290745	S-061	0.45
218360	SEWAREN1	33.25
218361	SEWAREN2	35.64
218362	SEWAREN3	32.32
218363	SEWAREN4	35.6
218364	SEWAREN6	31.84
218344	TOSCONUG	2.69
292094	V1-030 C1	0.02
292096	V1-030 C2	0.02
292078	V1-034	0.35
292680	V3-069 C	0.01
902251	W2-023	208.66
902651	W2-052C	< 0.01
905641	W4-080 C	0.09

913101	Y1-026	81.74
915251	Y3-049 1	0.76
915252	Y3-049 2	0.76
915253	Y3-049 3	0.76
915681	Y3-108 C	50.8

Appendix 10

(PSEG - PSEG) The G22_MTX5-WARINANC 230 kV line (from bus 218441 to bus 218316 ckt 1) loads from 108.78% to 115.68% (**DC power flow**) of its normal rating (667 MVA) for non-contingency condition. This project contributes approximately 46.03 MW to the thermal violation.

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	20.79
218327	EDISON 2	20.78
218328	EDISON 3	20.79
218423	LINDNCT1	2.89
218424	LINDNCT2	2.89
218425	LINDNCT3	2.89
218426	LINDNST1	5.66
290745	S-061	0.42
218360	SEWAREN1	24.18
218361	SEWAREN2	25.37
218362	SEWAREN3	23.01
218363	SEWAREN4	24.82
218364	SEWAREN6	22.2
218344	TOSCONUG	2.49
292094	V1-030 C1	0.02
292096	V1-030 C2	0.01
292078	V1-034	0.24
292680	V3-069 C	< 0.01
900801	W1-001	7.3
902251	W2-023	154.12
902651	W2-052C	< 0.01
905641	W4-080 C	0.05
909461	X2-089 C	< 0.01
913101	Y1-026	75.51
915251	Y3-049 1	0.49
915252	Y3-049 2	0.49
915253	Y3-049 3	0.49
915681	Y3-108 C	46.03

Appendix 11

(PSEG - PSEG) The G22_MTX5-WARINANC 230 kV line (from bus 218441 to bus 218316 ckt 1) loads from 110.94% to 117.12% (**DC power flow**) of its emergency rating (821 MVA) for the single line contingency outage of 'PS51B'. This project contributes approximately 50.65 MW to the thermal violation.

CONTINGENCY 'PS51B' /* METUCHEN - FANWOOD 230
 (NEW O-1315)
 DISCONNECT BRANCH FROM BUS 218469 TO BUS 218357 CKT 1 /*
 METUCHEN PRSN AVG 230 230
 DISCONNECT BRANCH FROM BUS 218357 TO BUS 218355 CKT 1 /* PRSN AVG
 NEW DOVER 230 230
 DISCONNECT BRANCH FROM BUS 218355 TO BUS 218320 CKT 1 /* NEW
 DOVER FANWOOD 230 230
 MOVE 49 PERCENT LOAD FROM BUS 218401 TO BUS 218402 /* PRSN AVG
 T1 T2
 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218384 /* PRSN AVG
 T1 KILMER T2
 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218399 /* PRSN AVG
 T1 NEWDVR T2
 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218390 /* PRSN AVG
 T1 LAFAYET T2
 END

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	31.62
218327	EDISON 2	31.61
218328	EDISON 3	31.62
218423	LINDNCT1	3.19
218424	LINDNCT2	3.19
218425	LINDNCT3	3.19
218426	LINDNST1	6.23
290745	S-061	0.45
218360	SEWAREN1	32.97
218361	SEWAREN2	35.32
218362	SEWAREN3	32.04
218363	SEWAREN4	35.28
218364	SEWAREN6	31.55
218344	TOSCONUG	2.69
292094	V1-030 C1	0.02
292096	V1-030 C2	0.02
292078	V1-034	0.35
292680	V3-069 C	0.01
900801	W1-001	7.84
902251	W2-023	207.01
902651	W2-052C	< 0.01

905641	W4-080 C	0.09
913101	Y1-026	81.56
915251	Y3-049 1	0.75
915252	Y3-049 2	0.75
915253	Y3-049 3	0.75
915681	Y3-108 C	50.65

Appendix 12

(PSEG - PSEG) The TOSCO-G22_MTX5 230 kV line (from bus 218343 to bus 218441 ckt 1) loads from 112.23% to 117.15% (**DC power flow**) of its normal rating (936 MVA) for non-contingency condition. This project contributes approximately 46.03 MW to the thermal violation.

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	20.79
218327	EDISON 2	20.78
218328	EDISON 3	20.79
218423	LINDNCT1	2.89
218424	LINDNCT2	2.89
218425	LINDNCT3	2.89
218426	LINDNST1	5.66
290745	S-061	0.42
218360	SEWAREN1	24.18
218361	SEWAREN2	25.37
218362	SEWAREN3	23.01
218363	SEWAREN4	24.82
218364	SEWAREN6	22.2
218344	TOSCONUG	2.49
292094	V1-030 C1	0.02
292096	V1-030 C2	0.01
292078	V1-034	0.24
292680	V3-069 C	< 0.01
902251	W2-023	154.12
902651	W2-052C	< 0.01
905641	W4-080 C	0.05
909461	X2-089 C	< 0.01
913101	Y1-026	75.51
915251	Y3-049 1	0.49
915252	Y3-049 2	0.49
915253	Y3-049 3	0.49
915681	Y3-108 C	46.03

Appendix 13

(PSEG - PSEG) The ALDENE2-SPRINGRD 230 kV line (from bus 218345 to bus 216911 ckt 1) loads from 116.25% to 121.19% (**DC power flow**) of its emergency rating (789 MVA) for the tower line contingency outage of 'PS_GO'. This project contributes approximately 39.0 MW to the thermal violation.

```

CONTINGENCY 'PS_GO'                                /*DEANS-LINDENG_
WOODBIDGE TO SEWAREN O
  DISCONNECT BRANCH FROM BUS 218354 TO BUS 218306 CKT 2    /* PRSN AVG
DEANS 230 230
  DISCONNECT BRANCH FROM BUS 218354 TO BUS 218300 CKT 1    /*
MINUESTG LINDEN 230 230
  DISCONNECT BRANCH FROM BUS 218357 TO BUS 218355 CKT 1    /*PRSB AVG
NEW DOVER 230 230
  DISCONNECT BRANCH FROM BUS 218355 TO BUS 218320 CKT 1    /* NEW
DOVER FANWOOD 230 230
  DISCONNECT BRANCH FROM BUS 218320 TO BUS 216950 CKT 1    /* FANWOOD
ROSELAND 230 230
  MOVE 49 PERCENT LOAD FROM BUS 218401 TO BUS 218402        /* PRSN AVG
T1 T2
  MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218384        /* PRSN AVG
T1 KILMER T2
  MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218399        /* PRSN AVG
T1 NEWDVR T2
  MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218390        /* PRSN AVG
T1 LAFAYET T2
  MOVE 52 PERCENT LOAD FROM BUS 218396 TO BUS 218397        /* MINUESTR
T2 T1
  MOVE 24 PERCENT LOAD FROM BUS 218396 TO BUS 218410        /* MINUESTR
T2 WARINAN T1
  MOVE 24 PERCENT LOAD FROM BUS 218396 TO BUS 218414        /* MINUESTR
T2 WDBRDG T1
END
  
```

Bus Number	Bus Name	Full Contribution
218307	ALDENE	0.02
218376	ALDENEAB	12.74
218326	EDISON 1	27.35
218327	EDISON 2	27.35
218328	EDISON 3	27.35
218423	LINDNCT1	2.39
218424	LINDNCT2	2.39
218425	LINDNCT3	2.39
218426	LINDNST1	4.67
206679	M&M S721	-0.85
94130	O66_NONFIRM	50.33
206638	PEAPACK	-0.33

290745	S-061	0.33
218360	SEWAREN1	26.04
218361	SEWAREN2	28.14
218362	SEWAREN3	25.52
218363	SEWAREN4	28.32
218364	SEWAREN6	25.33
218344	TOSCONUG	1.95
293093	U2-077	237.18
292094	V1-030 C1	0.01
292095	V1-030 E1	0.51
292185	V1-030 E2	0.63
292101	V1-030 E4	0.06
292103	V1-030 E5	0.15
292107	V1-030 E7	0.09
292189	V1-030 EA	0.48
292078	V1-034	0.43
297021	V2-009 E1	0.19
297023	V2-009 E2	0.37
297025	V2-009 E3	0.39
297027	V2-009 E4	0.26
293378	V3-024 E	0.75
292666	V3-058 E	0.26
292668	V3-059 E	0.26
292681	V3-069 E	0.26
900801	W1-001	5.65
902002	W1-121 E	0.29
902251	W2-023	162.48
902652	W2-052E	0.1
903961	W3-077C	-0.33
905642	W4-080 E	2.68
909452	X2-088 E	0.18
909462	X2-089 E	0.37
910612	X3-029 E	-0.72
910712	X3-052 E	-0.43
912221	X4-044 C	4.68
912222	X4-044 E	3.78
913101	Y1-026	59.33
915251	Y3-049 1	0.65
915252	Y3-049 2	0.65
915253	Y3-049 3	0.65
915652	Y3-105 E	1.51
915681	Y3-108 C	37.94
915682	Y3-108 E	1.06

Appendix 14

(PSEG - PSEG) The LINDEN-TOSCO 230 kV line (from bus 218300 to bus 218343 ckt 1) loads from 121.03% to 125.56% (**DC power flow**) of its emergency rating (1081 MVA) for the tower line contingency outage of '36PS'. This project contributes approximately 48.96 MW to the thermal violation.

CONTINGENCY '36PS' /* DEANS-WESTFIELD 230KV &
 SEWAREN(PIERSON AVE) -ROSELAND 230KV DCTL
 DISCONNECT BRANCH FROM BUS 218306 TO BUS 218356 CKT 1
 DISCONNECT BRANCH FROM BUS 218356 TO BUS 218305 CKT 1
 DISCONNECT BRANCH FROM BUS 218357 TO BUS 218355 CKT 1
 DISCONNECT BRANCH FROM BUS 218355 TO BUS 218320 CKT 1
 DISCONNECT BRANCH FROM BUS 218320 TO BUS 216950 CKT 1
 MOVE 49 PERCENT LOAD FROM BUS 218401 TO BUS 218402 /* PRSN AVG
 T1 T2
 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218384 /* PRSN AVG
 T1 KILMER T2
 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218399 /* PRSN AVG
 T1 NEWDVR T2
 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218390 /* PRSN AVG
 T1 LAFAYET T2
 MOVE 100 PERCENT LOAD FROM BUS 218415 TO BUS 218416 /* WESTFIELD
 T1 T2
 MOVE 100 PERCENT LOAD FROM BUS 218380 TO BUS 218381 /* FANWOOD
 T2 T1
 END

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	33.25
218327	EDISON 2	33.24
218328	EDISON 3	33.25
206617	EXXON	-0.37
218423	LINDNCT1	2.99
218424	LINDNCT2	2.99
218425	LINDNCT3	2.99
218426	LINDNST1	5.86
206679	M&M S721	-0.91
94130	O66_NONFIRM	54.11
206638	PEAPACK	-0.36
218360	SEWAREN1	32.53
218361	SEWAREN2	35.08
218362	SEWAREN3	31.81
218363	SEWAREN4	35.25
218364	SEWAREN6	31.52
292094	V1-030 C1	0.02
292095	V1-030 E1	0.63

292185	V1-030 E2	0.76
292101	V1-030 E4	0.08
292103	V1-030 E5	0.18
292107	V1-030 E7	0.11
292189	V1-030 EA	0.52
292078	V1-034	0.46
297021	V2-009 E1	0.22
297023	V2-009 E2	0.45
297025	V2-009 E3	0.46
297027	V2-009 E4	0.31
293378	V3-024 E	0.9
292666	V3-058 E	0.31
292668	V3-059 E	0.31
292681	V3-069 E	0.33
902002	W1-121 E	0.34
902251	W2-023	203.22
902652	W2-052E	0.13
903961	W3-077C	-0.35
905642	W4-080 E	3.34
909452	X2-088 E	0.21
909462	X2-089 E	0.46
910562	X3-007 E	0.11
910612	X3-029 E	-0.77
910712	X3-052 E	-0.46
915251	Y3-049 1	0.79
915252	Y3-049 2	0.79
915253	Y3-049 3	0.79
915652	Y3-105 E	1.62
915681	Y3-108 C	47.62
915682	Y3-108 E	1.34

Appendix 15

(PSEG - PSEG) The TOSCO-G22_MTX5 230 kV line (from bus 218343 to bus 218441 ckt 1) loads from 122.51% to 126.88% (**DC power flow**) of its emergency rating (1120 MVA) for the tower line contingency outage of '36PS'. This project contributes approximately 48.87 MW to the thermal violation.

CONTINGENCY '36PS' /* DEANS-WESTFIELD 230KV &
 SEWAREN(PIERSON AVE) -ROSELAND 230KV DCTL
 DISCONNECT BRANCH FROM BUS 218306 TO BUS 218356 CKT 1
 DISCONNECT BRANCH FROM BUS 218356 TO BUS 218305 CKT 1
 DISCONNECT BRANCH FROM BUS 218357 TO BUS 218355 CKT 1
 DISCONNECT BRANCH FROM BUS 218355 TO BUS 218320 CKT 1
 DISCONNECT BRANCH FROM BUS 218320 TO BUS 216950 CKT 1
 MOVE 49 PERCENT LOAD FROM BUS 218401 TO BUS 218402 /* PRSN AVG
 T1 T2
 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218384 /* PRSN AVG
 T1 KILMER T2
 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218399 /* PRSN AVG
 T1 NEWDVR T2
 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218390 /* PRSN AVG
 T1 LAFAYET T2
 MOVE 100 PERCENT LOAD FROM BUS 218415 TO BUS 218416 /* WESTFIELD
 T1 T2
 MOVE 100 PERCENT LOAD FROM BUS 218380 TO BUS 218381 /* FANWOOD
 T2 T1
 END

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	33.13
218327	EDISON 2	33.12
218328	EDISON 3	33.13
206617	EXXON	-0.37
218423	LINDNCT1	2.99
218424	LINDNCT2	2.99
218425	LINDNCT3	2.99
218426	LINDNST1	5.85
206679	M&M S721	-0.92
94130	O66_NONFIRM	54.37
206638	PEAPACK	-0.36
290745	S-061	0.42
218360	SEWAREN1	32.45
218361	SEWAREN2	34.99
218362	SEWAREN3	31.73
218363	SEWAREN4	35.15
218364	SEWAREN6	31.44
218344	TOSCONUG	2.5

292094	V1-030 C1	0.02
292095	V1-030 E1	0.63
292185	V1-030 E2	0.76
292101	V1-030 E4	0.07
292103	V1-030 E5	0.18
292107	V1-030 E7	0.11
292189	V1-030 EA	0.51
292078	V1-034	0.46
297021	V2-009 E1	0.22
297023	V2-009 E2	0.45
297025	V2-009 E3	0.46
297027	V2-009 E4	0.31
293378	V3-024 E	0.9
292666	V3-058 E	0.3
292668	V3-059 E	0.3
292681	V3-069 E	0.33
902002	W1-121 E	0.34
902251	W2-023	202.76
902652	W2-052E	0.13
903961	W3-077C	-0.36
905642	W4-080 E	3.33
909452	X2-088 E	0.21
909462	X2-089 E	0.46
910562	X3-007 E	0.11
910612	X3-029 E	-0.78
910712	X3-052 E	-0.46
913101	Y1-026	75.93
915251	Y3-049 1	0.79
915252	Y3-049 2	0.79
915253	Y3-049 3	0.79
915652	Y3-105 E	1.63
915681	Y3-108 C	47.54
915682	Y3-108 E	1.33

Appendix 16

(PSEG - PSEG) The WARINANC-ALDENE1 230 kV line (from bus 218316 to bus 217122 ckt 1) loads from 147.59% to 153.08% (**DC power flow**) of its emergency rating (887 MVA) for the tower line contingency outage of '36PS'. This project contributes approximately 48.7 MW to the thermal violation.

CONTINGENCY '36PS' /* DEANS-WESTFIELD 230KV &
 SEWAREN(PIERSON AVE) -ROSELAND 230KV DCTL
 DISCONNECT BRANCH FROM BUS 218306 TO BUS 218356 CKT 1
 DISCONNECT BRANCH FROM BUS 218356 TO BUS 218305 CKT 1
 DISCONNECT BRANCH FROM BUS 218357 TO BUS 218355 CKT 1
 DISCONNECT BRANCH FROM BUS 218355 TO BUS 218320 CKT 1
 DISCONNECT BRANCH FROM BUS 218320 TO BUS 216950 CKT 1
 MOVE 49 PERCENT LOAD FROM BUS 218401 TO BUS 218402 /* PRSN AVG
 T1 T2
 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218384 /* PRSN AVG
 T1 KILMER T2
 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218399 /* PRSN AVG
 T1 NEWDVR T2
 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218390 /* PRSN AVG
 T1 LAFAYET T2
 MOVE 100 PERCENT LOAD FROM BUS 218415 TO BUS 218416 /* WESTFIELD
 T1 T2
 MOVE 100 PERCENT LOAD FROM BUS 218380 TO BUS 218381 /* FANWOOD
 T2 T1
 END

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	32.8
218327	EDISON 2	32.79
218328	EDISON 3	32.8
206617	EXXON	-0.37
218423	LINDNCT1	2.98
218424	LINDNCT2	2.98
218425	LINDNCT3	2.98
218426	LINDNST1	5.83
206679	M&M S721	-0.91
94130	O66_NONFIRM	54.06
206638	PEAPACK	-0.36
290745	S-061	0.42
218360	SEWAREN1	32.17
218361	SEWAREN2	34.67
218362	SEWAREN3	31.45
218363	SEWAREN4	34.83
218364	SEWAREN6	31.15
218344	TOSCONUG	2.49

293093	U2-077	304.78
292094	V1-030 C1	0.02
292095	V1-030 E1	0.63
292185	V1-030 E2	0.75
292101	V1-030 E4	0.07
292103	V1-030 E5	0.18
292107	V1-030 E7	0.11
292189	V1-030 EA	0.51
292078	V1-034	0.46
297021	V2-009 E1	0.22
297023	V2-009 E2	0.44
297025	V2-009 E3	0.46
297027	V2-009 E4	0.3
293378	V3-024 E	0.89
292666	V3-058 E	0.3
292668	V3-059 E	0.3
292681	V3-069 E	0.32
900801	W1-001	7.26
902002	W1-121 E	0.33
902251	W2-023	201.06
902652	W2-052E	0.13
903961	W3-077C	-0.35
905642	W4-080 E	3.29
909452	X2-088 E	0.21
909462	X2-089 E	0.46
910562	X3-007 E	0.11
910612	X3-029 E	-0.78
910712	X3-052 E	-0.46
913101	Y1-026	75.7
915251	Y3-049 1	0.78
915252	Y3-049 2	0.78
915253	Y3-049 3	0.78
915652	Y3-105 E	1.62
915681	Y3-108 C	47.37
915682	Y3-108 E	1.33

Appendix 17

(PSEG - PSEG) The G22_MTX5-WARINANC 230 kV line (from bus 218441 to bus 218316 ckt 1) loads from 163.99% to 169.92% (**DC power flow**) of its emergency rating (821 MVA) for the tower line contingency outage of '36PS'. This project contributes approximately 48.7 MW to the thermal violation.

CONTINGENCY '36PS' /* DEANS-WESTFIELD 230KV &
 SEWAREN(PIERSON AVE) -ROSELAND 230KV DCTL
 DISCONNECT BRANCH FROM BUS 218306 TO BUS 218356 CKT 1
 DISCONNECT BRANCH FROM BUS 218356 TO BUS 218305 CKT 1
 DISCONNECT BRANCH FROM BUS 218357 TO BUS 218355 CKT 1
 DISCONNECT BRANCH FROM BUS 218355 TO BUS 218320 CKT 1
 DISCONNECT BRANCH FROM BUS 218320 TO BUS 216950 CKT 1
 MOVE 49 PERCENT LOAD FROM BUS 218401 TO BUS 218402 /* PRSN AVG
 T1 T2
 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218384 /* PRSN AVG
 T1 KILMER T2
 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218399 /* PRSN AVG
 T1 NEWDVR T2
 MOVE 17 PERCENT LOAD FROM BUS 218401 TO BUS 218390 /* PRSN AVG
 T1 LAFAYET T2
 MOVE 100 PERCENT LOAD FROM BUS 218415 TO BUS 218416 /* WESTFIELD
 T1 T2
 MOVE 100 PERCENT LOAD FROM BUS 218380 TO BUS 218381 /* FANWOOD
 T2 T1
 END

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	32.8
218327	EDISON 2	32.79
218328	EDISON 3	32.8
206617	EXXON	-0.37
218423	LINDNCT1	2.98
218424	LINDNCT2	2.98
218425	LINDNCT3	2.98
218426	LINDNST1	5.83
206679	M&M S721	-0.91
94130	O66_NONFIRM	54.06
206638	PEAPACK	-0.36
290745	S-061	0.42
218360	SEWAREN1	32.17
218361	SEWAREN2	34.67
218362	SEWAREN3	31.45
218363	SEWAREN4	34.83
218364	SEWAREN6	31.15
218344	TOSCONUG	2.49

293093	U2-077	304.78
292094	V1-030 C1	0.02
292095	V1-030 E1	0.63
292185	V1-030 E2	0.75
292101	V1-030 E4	0.07
292103	V1-030 E5	0.18
292107	V1-030 E7	0.11
292189	V1-030 EA	0.51
292078	V1-034	0.46
297021	V2-009 E1	0.22
297023	V2-009 E2	0.44
297025	V2-009 E3	0.46
297027	V2-009 E4	0.3
293378	V3-024 E	0.89
292666	V3-058 E	0.3
292668	V3-059 E	0.3
292681	V3-069 E	0.32
900801	W1-001	7.26
902002	W1-121 E	0.33
902251	W2-023	201.06
902652	W2-052E	0.13
903961	W3-077C	-0.35
905642	W4-080 E	3.29
909452	X2-088 E	0.21
909462	X2-089 E	0.46
910562	X3-007 E	0.11
910612	X3-029 E	-0.78
910712	X3-052 E	-0.46
913101	Y1-026	75.7
915251	Y3-049 1	0.78
915252	Y3-049 2	0.78
915253	Y3-049 3	0.78
915652	Y3-105 E	1.62
915681	Y3-108 C	47.37
915682	Y3-108 E	1.33