

***Generation Interconnection  
Feasibility Study Report***

***For***

***PJM Generation Interconnection Request  
Queue Position Z1-116***

***Metuchen 230 kV***

**March 2014**

## Preface

The intent of the feasibility study is to determine a plan, with ballpark cost and construction time estimates, to connect the subject generation to the PJM network at a location specified by the Interconnection Customer. The Interconnection Customer may request the interconnection of generation as a capacity resource or as an energy-only resource. As a requirement for interconnection, the Interconnection Customer may be responsible for the cost of constructing: (1) Direct Connections, which are new facilities and/or facilities upgrades needed to connect the generator to the PJM network, and (2) Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM system.

In some instances a generator interconnection may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g. another generation interconnection, may also contribute to the need for the same network reinforcement. The possibility of sharing the reinforcement costs with other projects may be identified in the feasibility study, but the actual allocation will be deferred until the impact study is performed.

The Feasibility Study estimates do not include the feasibility, cost, or time required to obtain property rights and permits for construction of the required facilities. The project developer is responsible for the right of way, real estate, and construction permit issues. For properties currently owned by Transmission Owners, the costs may be included in the study.

## General

The Interconnection Customer (IC), has proposed a natural gas generating facility located in Woodbridge, New Jersey. The installed facilities will have a total capability of 785 MW with 725 MW of this output being recognized by PJM as capacity. The proposed in-service date for this project is June 1, 2017. **This study does not imply a PSE&G commitment to this in-service date.**

### Point of Interconnection

Z1-116 will interconnect with the PSE&G transmission system at one of the two following points of interconnection:

Option 1 will connect via a new breaker position at Metuchen substation. **Please note that this option was studied prior to the approval of the conversion of the 138 kV system to 345 kV in the PSE&G zone. As a result, the new topology was not included in the model.** If this option is selected, it will be studied with the new topology in the System Impact Study.

Option 2 will connect via an abandoned Raritan River retail 230 kV feeder that connects to Sewaren substation. **Please note that this option was studied prior to the approval of the conversion of the 138 kV system to 345 kV in the PSE&G zone. As a result, the new topology was not included in the model.** If this option is selected, it will be studied with the new topology in the System Impact Study.

### Cost Summary

The Z1-116 project will be responsible for the following costs:

<b>Description</b>	<b>Total Cost</b>
Attachment Facilities	\$ 0
Direct Connection Network Upgrades	\$ 0
Non Direct Connection Network Upgrades	\$ 4,000,000
<b>Total Costs</b>	<b>\$ 4,000,000</b>

In addition, the Z1-116 project may be responsible for a contribution to the following costs:

<b>Description</b>	<b>Total Cost</b>
New System Upgrades	\$ 1,862,700,000
Previously Identified Upgrades	\$ 0
<b>Total Costs</b>	<b>\$ 1,862,700,000</b>

Cost allocations for these upgrades will be provided in the System Impact Study Report.

## Attachment Facilities

The Interconnection Customer will construct the attachment lines into the proposed Point of Interconnection as depicted in the one-line diagram.

## Non-Direct Connection Cost Estimate

The new interconnection point at the Metuchen station adds a bay of breaker and a half to the existing 230kV yard. This bay would be built with two breakers and the point of interconnection is the bus between the two new breakers. It is the responsibility of the interconnector to install the required equipment to connect to the point of interconnection between the two breakers in a manner acceptable to PSE&G. In order to facilitate the expansion of the station, the existing road adjacent to the station fence will be relocated. It is assumed that the new road location is permitted. Relocation of the solar panels in the area is not included in the estimate. An alternate site for the existing solar panels will need to be developed. This cost is not included in the estimate.

Description	Total Cost
Construct new bay at Metuchen substation and install 2 breakers for a new position to connect the Z1-116 generator.	\$ 4,000,000
<b>Total</b>	<b>\$ 4,000,000</b>

Estimate Assumptions:

- Breaker connects to PSE&G
- This is a planning level estimate with 30% confidence level
- No escalation is included
- Expected cost of the project is stated above
- Property is available

## Revenue Metering and SCADA Requirements

### PJM Requirements

The Interconnection Customer will be required to install equipment necessary to provide Revenue Metering (KWH, KVARH) and real time data (KW, KVAR) for IC's generating Resource. See PJM Manuals M-01 and M-14D, and PJM Tariff Sections 24.1 and 24.2.

### Public Service Electric and Gas Requirements

The Interconnection Customer will be required to comply with all PSE&G Revenue Metering Requirements for Generation Interconnection Customers. The Revenue Metering Requirements may be found within the "Information and Requirements for Electric Service" document located at the following links:

[http://www.pseg.com/business/builders/new\\_service/before/](http://www.pseg.com/business/builders/new_service/before/)

<http://www.pjm.com/planning/design-engineering/to-tech-standards.aspx>

## Option 1 Network Impacts

The Queue Project #Z1-116 was studied as a 785.0 MW (Capacity 725.0 MW) injection at the Metuchen 230 kV substation in the PSEG area. Project #Z1-116 was evaluated for compliance with reliability criteria for summer peak conditions in 2017. Potential network impacts were as follows:

### Contingency Descriptions

The following contingencies resulted in overloads:

Contingency Name	Description
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
H-2286 + G-2207	CONTINGENCY 'H-2286 + G-2207' DISCONNECT BUS 218357 DISCONNECT BUS 218355 MOVE 100 PERCENT LOAD FROM BUS 218381 TO BUS 218380 MOVE 100 PERCENT LOAD FROM BUS 218398 TO BUS 218399 DISCONNECT BRANCH FROM BUS 218320 TO BUS 218524 CKT 2 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 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
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

Contingency Name	Description
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
PS8C_B	CONTINGENCY 'PS8C_B' DISCONNECT BRANCH FROM BUS 916600 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)*

#	Contingency		Affected Area	Facility Description	Bus			Power Flow	Loading %		Rating		MW Contrib.	Ref
	Type	Name			From	To	Circuit		Initial	Final	Type	MVA		
1	N-1	PS51B	PSEG - PSEG	SEWAREN-MINUESTR 230 kV line	218311	218353	1	DC	67.4	103.24	ER	887	317.86	1
2	N-1	PS51B	PSEG - PSEG	ALDENE2-SPRINGRD 230 kV line	218345	216911	1	DC	98.47	107.39	ER	789	156.2	2
3	N-1	PS51B	PSEG - PSEG	MINUESTR-LINDEN 230 kV line	218353	218300	1	DC	76.8	119.76	ER	740	317.86	4
4	N-1	PS8C_B	PSEG - PSEG	FANWOODO- ROSELAND 230 kV line	218320	216950	1	DC	90.31	120.59	ER	870	263.41	5

## Multiple Facility Contingency

*(Double Circuit Tower Line contingencies were studied for the full energy output. The contingencies of Line with Failed Breaker and Bus Fault will be performed for the Impact Study.)*

None.

## Short Circuit

*(Summary of impacted circuit breakers)*

New circuit breakers found to be over-duty:

**Due to the changes to the PSE&G topology regarding the conversion of multiple 138 kV facilities to 345 kV, the short circuit analysis will be run during the System Impact Study.**

Contributions to previously identified circuit breakers found to be over-duty:

**Due to the changes to the PSE&G topology regarding the conversion of multiple 138 kV facilities to 345 kV, the short circuit analysis will be run during the System Impact Study.**

## 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)

#	Contingency		Affected Area	Facility Description	Bus			Power Flow	Loading %		Rating		MW Contrib.	Ref
	Type	Name			From	To	Circuit		Initial	Final	Type	MVA		
5	Non	Non	PSEG - PSEG	SPRINGRD-W.ORANGE 230 kV line	216911	216914	1	DC	100.75	108.18	NR	512	84.44	3
6	Non	Non	PSEG - PSEG	LINDEN-TOSCO 230 kV line	218300	218343	1	DC	108.07	121.63	NR	936	126.9	6
7	Non	Non	PSEG - PSEG	ALDENE2-SPRINGRD 230 kV line	218345	216911	1	DC	114.44	121.87	NR	512	84.44	7
8	Non	Non	PSEG - PSEG	WARINANC-ALDENE1 230 kV line	218316	217122	1	DC	111	128.27	NR	732	126.36	8
9	Non	Non	PSEG - PSEG	TOSCO-Z1-109 TAP 230 kV line	218343	916600	1	DC	115.02	128.52	NR	936	126.36	9
10	DCTL	H-2286 + G-2207	PSEG - PSEG	SPRINGRD-W.ORANGE 230 kV line	216911	216914	1	DC	121.02	131.35	ER	789	180.94	10
11	N-1	PS51B	PSEG - PSEG	LINDEN-TOSCO 230 kV line	218300	218343	1	DC	113.24	132.71	ER	1081	210.41	11
12	N-1	PS51B	PSEG - PSEG	TOSCO-Z1-109 TAP 230 kV line	218343	916600	1	DC	115.61	134.35	ER	1120	209.87	12
13	N-1	PS8C_B	PSEG - PSEG	NEWDOVRO-FANWOODO 230 kV line	218355	218320	1	DC	105.34	136.42	ER	870	270.44	13
14	Non	Non	PSEG - PSEG	Z1-109 TAP-G22_MTX5 230 kV line	916600	218441	1	DC	125.5	139	NR	936	126.36	14
15	N-1	PS51B	PSEG - PSEG	WARINANC-ALDENE1 230 kV line	218316	217122	1	DC	116.53	139.9	ER	887	207.31	15
16	N-1	PS8C_B	PSEG - PSEG	PRSN AVG-NEWDOVRO 230 kV line	218357	218355	1	DC	109.03	140.11	ER	870	270.44	16
17	DCTL	H-2286 + G-2207	PSEG - PSEG	ALDENE2-SPRINGRD 230 kV line	218345	216911	1	DC	129.91	140.24	ER	789	180.94	17
18	N-1	PS51B	PSEG - PSEG	Z1-109 TAP-G22_MTX5 230 kV line	916600	218441	1	DC	125.2	143.94	ER	1120	209.87	18

#	Contingency		Affected Area	Facility Description	Bus			Power Flow	Loading %		Rating		MW Contrib.	Ref
	Type	Name			From	To	Circuit		Initial	Final	Type	MVA		
19	N-1	PS8C_B	PSEG - PSEG	METUCHEN-PRSN AVG 230 kV line	218469	218357	1	DC	113.21	144.3	ER	870	270.45	19
20	Non	Non	PSEG - PSEG	G22_MTX5-WARINANC 230 kV line	218441	218316	1	DC	127.38	146.33	NR	667	126.36	20
21	N-1	PS51B	PSEG - PSEG	G22_MTX5-WARINANC 230 kV line	218441	218316	1	DC	130.42	155.67	ER	821	207.31	21
22	DCTL	H-2286 + G-2207	PSEG - PSEG	WARINANC-ALDENE1 230 kV line	218316	217122	1	DC	166.59	179.46	ER	887	254.84	22
23	DCTL	H-2286 + G-2207	PSEG - PSEG	G22_MTX5-WARINANC 230 kV line	218441	218316	1	DC	185.33	199.24	ER	821	254.84	23

### **Steady-State Voltage Requirements**

*(Summary of the VAR requirements based upon the results of the steady-state voltage studies)*

To be determined.

### **Stability and Reactive Power Requirement for Low Voltage Ride Through**

*(Summary of the VAR requirements based upon the results of the dynamic studies)*

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)*

Violation #	Overloaded Facility	Upgrade Description	Network Upgrade Number	Upgrade Cost
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Violation #	Overloaded Facility	Upgrade Description	Network Upgrade Number	Upgrade Cost
#1, 3	SEWAREN-MINUESTR 230 kV line	<ol style="list-style-type: none"> <li>1. Re-conductor the Warinanco – VFT (U-2273) 230 kV overhead line. Estimated Cost: \$35.9M; Estimated Time: 38 months</li> <li>2. Re-conductor the Aldene – Warinanco (N-2240) 230 kV overhead line. Estimated Cost: \$64.9M; Estimated Time: 42 months</li> <li>3. Re-conductor the Aldene – Springfield Rd 230 kV cable. Estimated Cost: \$214.5M; Estimated Time: 48 months</li> <li>4. Re-conductor the Springfield Rd – W Orange 230 kV cable. Estimated Cost: \$449.5M; Estimated Time: 48 months</li> <li>5. New 230 kV Tosco – Aldene overhead circuit parallel to S-2271, U-2273 and N-2240. Estimated Cost: \$129.6M; Estimated Time: 48 months</li> <li>6. New 230 kV Aldene – Springfield Rd underground cable parallel to G-2285. Estimated Cost: \$237.7M; Estimated Time: 48 months</li> <li>7. New 230 kV Springfield Rd – W Orange underground cable parallel to N-2292. Estimated Cost: \$490.1M; Estimated Time: 48 months</li> <li>8. New Linden – Tosco overhead circuit parallel to B-2254. Estimated Cost: \$17.7M; Estimated Time: 35 months</li> <li>9. Re-conductor the Linden – Minue Str (R-2218) 230 kV overhead line. Estimated Cost: \$51.9M; Estimated Time: 42 months</li> <li>10. Re-conductor the Minue Str – Sewaren (R-2218) 230 kV overhead line. Estimated Cost: \$37M; Estimated Time: 42 months</li> <li>11. Re-conductor the VFT – Z1109 Tap (Half of S-2271) 230 kV overhead line. Estimated Cost: \$3.8M; Estimated Time: 35 months</li> <li>12. Re-conductor the Tosco – Z1109 Tap (Half of S-2271) 230 kV overhead line. Estimated Cost: \$3.8M; Estimated Time: 35 months</li> </ol>	Pending	\$ 1,736,400,000

Violation #	Overloaded Facility	Upgrade Description	Network Upgrade Number	Upgrade Cost
#2	ALDENE2- SPRINGRD 230 kV line	<ol style="list-style-type: none"> <li>1. Re-conductor the Warinanco – VFT (U-2273) 230 kV overhead line. Estimated Cost: \$35.9M; Estimated Time: 38 months (included above)</li> <li>2. Re-conductor the Aldene – Warinanco (N-2240) 230 kV overhead line. Estimated Cost: \$64.9M; Estimated Time: 42 months (included above)</li> <li>3. Re-conductor the Aldene – Springfield Rd 230 kV cable. Estimated Cost: \$214.5M; Estimated Time: 48 months (included above)</li> <li>4. Re-conductor the Springfield Rd – W Orange 230 kV cable. Estimated Cost: \$449.5M; Estimated Time: 48 months (included above)</li> <li>5. New 230 kV Tosco – Aldene overhead circuit parallel to S-2271, U-2273 and N-2240. Estimated Cost: \$129.6M; Estimated Time: 48 months (included above)</li> <li>6. New 230 kV Aldene – Springfield Rd underground cable parallel to G-2285. Estimated Cost: \$237.7M; Estimated Time: 48 months (included above)</li> <li>7. New 230 kV Springfield Rd – W Orange underground cable parallel to N-2292. Estimated Cost: \$490.1M; Estimated Time: 48 months (included above)</li> <li>8. New Linden – Tosco overhead circuit parallel to B-2254. Estimated Cost: \$17.7M; Estimated Time: 35 months (included above)</li> </ol>	Pending	\$ 0

Violation #	Overloaded Facility	Upgrade Description	Network Upgrade Number	Upgrade Cost
#4	FANWOODO-ROSELAND 230 kV line	<ol style="list-style-type: none"> <li>1. Re-conductor the Warinanco – VFT (U-2273) 230 kV overhead line. Estimated Cost: \$35.9M; Estimated Time: 38 months (included above)</li> <li>2. Re-conductor the Aldene – Warinanco (N-2240) 230 kV overhead line. Estimated Cost: \$64.9M; Estimated Time: 42 months (included above)</li> <li>3. Re-conductor the Aldene – Springfield Rd 230 kV cable. Estimated Cost: \$214.5M; Estimated Time: 48 months (included above)</li> <li>4. Re-conductor the Springfield Rd – W Orange 230 kV cable. Estimated Cost: \$449.5M; Estimated Time: 48 months (included above)</li> <li>5. New 230 kV Tosco – Aldene overhead circuit parallel to S-2271, U-2273 and N-2240. Estimated Cost: \$129.6M; Estimated Time: 48 months (included above)</li> <li>6. New 230 kV Aldene – Springfield Rd underground cable parallel to G-2285. Estimated Cost: \$237.7M; Estimated Time: 48 months (included above)</li> <li>7. New 230 kV Springfield Rd – W Orange underground cable parallel to N-2292. Estimated Cost: \$490.1M; Estimated Time: 48 months (included above)</li> <li>8. New Linden – Tosco overhead circuit parallel to B-2254. Estimated Cost: \$17.7M; Estimated Time: 35 months (included above)</li> <li>9. Re-conductor the Metuchen – PRSN AVG 230 kV overhead line. Estimated Cost: \$7.2M; Estimated Time: 35 months</li> <li>10. Re-conductor the PRSN AVG – New Dover 230 kV overhead line. Estimated Cost: \$58.2M; Estimated Time: 42 months</li> <li>11. Re-conductor the New Dover – Fanwood 230 kV overhead line. Estimated Cost: \$60.9M; Estimated Time: 42 months</li> </ol>	Pending	\$ 126,300,000
<b>Total New Network Upgrades</b>				<b>\$ 1,862,700,000</b>

### **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)*

<b>Violation #</b>	<b>Overloaded Facility</b>	<b>Upgrade Description</b>	<b>Network Upgrade Number</b>	<b>Upgrade Cost</b>
#5, 7, 9, 10, 14, 15, 17, 18, 20, 21, 22, 23	Multiple Facilities	Same as reinforcement identified above in violation #2	Pending	\$ 0
#6, 13, 16, 19	Multiple Facilities	Same as reinforcement identified above in violation #4	Pending	\$ 0

Violation #	Overloaded Facility	Upgrade Description	Network Upgrade Number	Upgrade Cost
#8	WARINANC-ALDENE1 230 kV line	<ol style="list-style-type: none"> <li>1. Re-conductor the Warinanco – VFT (U-2273) 230 kV overhead line. Estimated Cost: \$35.9M; Estimated Time: 38 months (included above)</li> <li>2. Re-conductor the Aldene – Warinanco (N-2240) 230 kV overhead line. Estimated Cost: \$64.9M; Estimated Time: 42 months (included above)</li> <li>3. Re-conductor the Aldene – Springfield Rd 230 kV cable. Estimated Cost: \$214.5M; Estimated Time: 48 months (included above)</li> <li>4. Re-conductor the Springfield Rd – W Orange 230 kV cable. Estimated Cost: \$449.5M; Estimated Time: 48 months (included above)</li> <li>5. New 230 kV Tosco – Aldene overhead circuit parallel to S-2271, U-2273 and N-2240. Estimated Cost: \$129.6M; Estimated Time: 48 months (included above)</li> <li>6. New 230 kV Aldene – Springfield Rd underground cable parallel to G-2285. Estimated Cost: \$237.7M; Estimated Time: 48 months (included above)</li> <li>7. New 230 kV Springfield Rd – W Orange underground cable parallel to N-2292. Estimated Cost: \$490.1M; Estimated Time: 48 months (included above)</li> <li>8. New Linden – Tosco overhead circuit parallel to B-2254. Estimated Cost: \$17.7M; Estimated Time: 35 months (included above)</li> <li>9. Re-conductor the Metuchen – PRSN AVG 230 kV overhead line. Estimated Cost: \$7.2M; Estimated Time: 35 months (included above)</li> <li>10. Re-conductor the PRSN AVG – New Dover 230 kV overhead line. Estimated Cost: \$58.2M; Estimated Time: 42 months (included above)</li> <li>11. Re-conductor the New Dover – Fanwood 230 kV overhead line. Estimated Cost: \$60.9M; Estimated Time: 42 months (included above)</li> <li>12. Re-conductor the Linden – Minue Str (R-2218) 230 kV overhead line. Estimated Cost: \$51.9M; Estimated Time: 42 months (included above)</li> <li>13. Re-conductor the Minue Str – Sewaren (R-2218) 230 kV overhead line. Estimated Cost: \$37M; Estimated Time: 42 months (included above)</li> <li>14. Re-conductor the VFT – Z1109 Tap (Half of S-2271) 230 kV overhead line. Estimated Cost: \$3.8M; Estimated Time: 35 months (included above)</li> <li>15. Re-conductor the Tosco – Z1109 Tap (Half of S-2271) 230 kV overhead line. Estimated Cost: \$3.8M; Estimated Time: 35 months (included above)</li> </ol>	Pending	\$ 0

Violation #	Overloaded Facility	Upgrade Description	Network Upgrade Number	Upgrade Cost
#11, 12,	Multiple Facilities	Same as reinforcement identified above in violation #1	Pending	\$ 0
			<b>Total New Network Upgrades</b>	<b>\$ 0</b>

### **Potential Congestion due to Local Energy Deliverability**

*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.*

*Note: Only the most severely overloaded conditions are listed below. 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 shall study all overload conditions associated with the overloaded element(s) identified.*

#	Contingency		Affected Area	Facility Description	Bus			Power Flow	Loading %		Rating		MW Contrib.
	Type	Name			From	To	Circuit		Initial	Final	Type	MVA	
24	N-1	ALD_SPRI	PSEG - PSEG	MCARTHUR-W.ORANGE 230 kV line	217170	216914	1	DC	98.37	103.41	ER	550	62.28
25	N-1	ALD_SPRI	PSEG - PSEG	ALDENE-STAN_TER 230 kV line	218307	218430	1	DC	109.22	115.01	ER	558	74.26
26	N-1	ALD_SPRI	PSEG - PSEG	STAN_TER-MCARTHUR 230 kV line	218430	217170	1	DC	110.81	116.68	ER	550	74.26
27	Non	Non	PSEG - PSEG	LINDEN-TOSCO 230 kV line	218300	218343	1	DC	110.08	116.69	NR	936	137.4
28	Non	Non	PSEG - PSEG	TOSCO-Z1-109 TAP 230 kV line	218343	916600	1	DC	117.2	123.7	NR	936	136.82
29	N-1	PS8B	PSEG - PSEG	FANWOODO-ROSELAND 230 kV line	218320	216950	1	DC	96.5	129.34	ER	870	285.78
30	Non	Non	PSEG - PSEG	Z1-109 TAP-G22_MTX5 230 kV line	916600	218441	1	DC	127.63	134.18	NR	936	136.82
31	N-1	PS8B	PSEG - PSEG	NEWDOVRO-FANWOODO 230 kV line	218355	218320	1	DC	111.69	145.41	ER	870	293.39

#	Contingency		Affected Area	Facility Description	Bus			Power Flow	Loading %		Rating		MW Contrib.
	Type	Name			From	To	Circuit		Initial	Final	Type	MVA	
32	N-1	PS8B	PSEG - PSEG	PRSN AVG-NEWDVRO 230 kV line	218357	218355	1	DC	115.38	149.1	ER	870	293.39
33	Non	Non	PSEG - PSEG	SPRINGRD-W.ORANGE 230 kV line	216911	216914	1	DC	141.99	149.72	NR	512	91.43
34	N-1	PS8B	PSEG - PSEG	METUCHEN-PRSN AVG 230 kV line	218469	218357	1	DC	119.37	153.09	ER	870	293.39
35	Non	Non	PSEG - PSEG	WARINANC-ALDENE1 230 kV line	218316	217122	1	DC	155.02	163.38	NR	732	136.82
36	Non	Non	PSEG - PSEG	ALDENE2-SPRINGRD 230 kV line	218345	216911	1	DC	155.68	163.41	NR	512	91.43
37	Non	Non	PSEG - PSEG	G22_MTX5-WARINANC 230 kV line	218441	218316	1	DC	175.68	184.87	NR	667	136.82

## Option 2 Network Impacts

The Queue Project #Z1-116 was studied as a 785.0 MW (Capacity 725.0 MW) injection at Sewaren 230 kV substation in the PSEG area. Project #Z1-116 was evaluated for compliance with reliability criteria for summer peak conditions in 2017. Potential network impacts were as follows:

### Contingency Descriptions

The following contingencies resulted in overloads:

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
H-2286 + G-2207	CONTINGENCY 'H-2286 + G-2207' DISCONNECT BUS 218357 DISCONNECT BUS 218355 MOVE 100 PERCENT LOAD FROM BUS 218381 TO BUS 218380 MOVE 100 PERCENT LOAD FROM BUS 218398 TO BUS 218399 DISCONNECT BRANCH FROM BUS 218320 TO BUS 218524 CKT 2 /* 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 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

Contingency Name	Description
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
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
PS8C_B	CONTINGENCY 'PS8C_B' DISCONNECT BRANCH FROM BUS 916600 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)*

#	Contingency		Affected Area	Facility Description	Bus			Power Flow	Loading %		Rating		MW Contrib.	Ref
	Type	Name			From	To	Circuit		Initial	Final	Type	MVA		
1	N-1	PS51B	PSEG - PSEG	SEWAREN-MINUESTR 230 kV line	218311	218353	1	DC	67.4	108.5	ER	887	364.59	1
2	N-1	PS51B	PSEG - PSEG	SPRINGRD-W.ORANGE 230 kV line	216911	216914	1	DC	89.58	111.49	ER	789	172.83	2
3	N-1	PS8C_B	PSEG - PSEG	FANWOODO-ROSELAND 230 kV line	218320	216950	1	DC	90.31	118.55	ER	870	245.71	4
4	N-1	PS51B	PSEG - PSEG	ALDENE2-SPRINGRD 230 kV line	218345	216911	1	DC	98.47	120.37	ER	789	172.83	5
5	N-1	PS51B	PSEG - PSEG	MINUESTR-LINDEN 230 kV line	218353	218300	1	DC	76.8	126.07	ER	740	364.59	8

## Multiple Facility Contingency

*(Double Circuit Tower Line contingencies were studied for the full energy output. The contingencies of Line with Failed Breaker and Bus Fault will be performed for the Impact Study.)*

#	Contingency		Affected Area	Facility Description	Bus			Power Flow	Loading %		Rating		MW Contrib.	Ref
	Type	Name			From	To	Circuit		Initial	Final	Type	MVA		
6	DCTL	36PS	PSEG - PSEG	SEWAREN-MINUESTR 230 kV line	218311	218353	1	DC	69.4	111.52	ER	887	391.31	3
7	DCTL	36PS	PSEG - PSEG	MINUESTR-LINDEN 230 kV line	218353	218300	1	DC	79.22	129.7	ER	740	391.31	9

## Short Circuit

*(Summary of impacted circuit breakers)*

New circuit breakers found to be over-duty:

Due to the changes to the PSE&G topology regarding the conversion of multiple 138 kV facilities to 345 kV, the short circuit analysis will be run during the System Impact Study.

Contributions to previously identified circuit breakers found to be over-duty:

Due to the changes to the PSE&G topology regarding the conversion of multiple 138 kV facilities to 345 kV, the short circuit analysis will be run during the System Impact Study.

### **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)*

#	Contingency		Affected Area	Facility Description	Bus			Power Flow	Loading %		Rating		MW Contrib.	Ref
	Type	Name			From	To	Circuit		Initial	Final	Type	MVA		
8	Non	Non	PSEG - PSEG	SPRINGRD-W.ORANGE 230 kV line	216911	216914	1	DC	100.75	122.19	NR	512	109.79	6
9	Non	Non	PSEG - PSEG	LINDEN-TOSCO 230 kV line	218300	218343	1	DC	108.08	125.9	NR	936	166.83	7
10	Non	Non	PSEG - PSEG	TOSCO-Z1-109 TAP 230 kV line	218343	916600	1	DC	115.02	132.78	NR	936	166.29	10
11	Non	Non	PSEG - PSEG	WARINANC-ALDENE1 230 kV line	218316	217122	1	DC	111.02	133.74	NR	732	166.29	11
12	N-1	PS8C_B	PSEG - PSEG	NEWDOVRO-FANWOODO 230 kV line	218355	218320	1	DC	105.34	134.35	ER	870	252.38	12
13	N-1	PS51B	PSEG - PSEG	LINDEN-TOSCO 230 kV line	218300	218343	1	DC	113.24	135.46	ER	1081	240.19	13
14	Non	Non	PSEG - PSEG	ALDENE2-SPRINGRD 230 kV line	218345	216911	1	DC	114.44	135.89	NR	512	109.79	14
15	N-1	PS51B	PSEG - PSEG	TOSCO-Z1-109 TAP 230 kV line	218343	916600	1	DC	115.61	137.01	ER	1120	239.64	15
16	N-1	PS8C_B	PSEG - PSEG	PRSN AVG-NEWDOVRO 230 kV line	218357	218355	1	DC	109.03	138.04	ER	870	252.38	16

#	Contingency		Affected Area	Facility Description	Bus			Power Flow	Loading %		Rating		MW Contrib.	Ref
	Type	Name			From	To	Circuit		Initial	Final	Type	MVA		
17	N-1	PS8C_B	PSEG - PSEG	METUCHEN-PRSN AVG 230 kV line	218469	218357	1	DC	113.21	142.22	ER	870	252.38	17
18	Non	Non	PSEG - PSEG	Z1-109 TAP-G22_MTX5 230 kV line	916600	218441	1	DC	125.51	143.27	NR	936	166.29	18
19	N-1	PS51B	PSEG - PSEG	WARINANC-ALDENE1 230 kV line	218316	217122	1	DC	116.54	143.31	ER	887	237.4	19
20	DCTL	36PS	PSEG - PSEG	LINDEN-TOSCO 230 kV line	218300	218343	1	DC	122.9	145.39	ER	1081	253.78	20
21	DCTL	H-2286 + G-2207	PSEG - PSEG	SPRINGRD-W.ORANGE 230 kV line	216911	216914	1	DC	121.02	145.63	ER	789	202.69	21
22	DCTL	36PS	PSEG - PSEG	TOSCO-Z1-109 TAP 230 kV line	218343	916600	1	DC	124.83	146.49	ER	1120	253.2	22
23	N-1	PS51B	PSEG - PSEG	Z1-109 TAP-G22_MTX5 230 kV line	916600	218441	1	DC	125.21	146.61	ER	1120	239.64	23
24	Non	Non	PSEG - PSEG	G22_MTX5-WARINANC 230 kV line	218441	218316	1	DC	127.38	152.32	NR	667	166.29	24
25	DCTL	H-2286 + G-2207	PSEG - PSEG	ALDENE2-SPRINGRD 230 kV line	218345	216911	1	DC	129.91	154.52	ER	789	202.69	25
26	DCTL	H-2286 + G-2207	PSEG - PSEG	Z1-109 TAP-G22_MTX5 230 kV line	916600	218441	1	DC	131.31	156.95	ER	1120	300.63	26
27	N-1	PS51B	PSEG - PSEG	G22_MTX5-WARINANC 230 kV line	218441	218316	1	DC	130.43	159.35	ER	821	237.4	27
28	DCTL	H-2286 + G-2207	PSEG - PSEG	WARINANC-ALDENE1 230 kV line	218316	217122	1	DC	166.62	198.6	ER	887	297.02	28
29	DCTL	H-2286 + G-2207	PSEG - PSEG	G22_MTX5-WARINANC 230 kV line	218441	218316	1	DC	185.37	219.93	ER	821	297.02	29

## **Steady-State Voltage Requirements**

*(Summary of the VAR requirements based upon the results of the steady-state voltage studies)*

To be determined.

## **Stability and Reactive Power Requirement for Low Voltage Ride Through**

*(Summary of the VAR requirements based upon the results of the dynamic studies)*

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)*

Not provided for Option 2 during the Feasibility study.

## **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)*

Not provided for Option 2 during the Feasibility study.

## **Potential Congestion due to Local Energy Deliverability**

*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.*

*Note: Only the most severely overloaded conditions are listed below. 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 shall study all overload conditions associated with the overloaded element(s) identified.*

#	Contingency		Affected Area	Facility Description	Bus		Circuit	Power Flow	Loading %		Rating		MW Contrib.
	Type	Name			From	To			Initial	Final	Type	MVA	
30	N-1	ALD_SPRI	PSEG - PSEG	MCARTHUR-W.ORANGE 230 kV line	217170	216914	1	DC	98.42	112.41	ER	550	80.97
31	N-1	ALD_SPRI	PSEG - PSEG	ALDENE-STAN_TER 230 kV line	218307	218430	1	DC	109.41	125.61	ER	558	96.56
32	N-1	PS8B	PSEG - PSEG	FANWOODO-ROSELAND 230 kV line	218320	216950	1	DC	96.5	125.87	ER	870	266.8

#	Contingency		Affected Area	Facility Description	Bus			Power Flow	Loading %		Rating		MW Contrib.
	Type	Name			From	To	Circuit		Initial	Final	Type	MVA	
33	N-1	ALD_SPRI	PSEG - PSEG	STAN_TER-MCARTHUR 230 kV line	218430	217170	1	DC	110.98	127.42	ER	550	96.56
34	Non	Non	PSEG - PSEG	LINDEN-TOSCO 230 kV line	218300	218343	1	DC	110.09	128.58	NR	936	180.64
35	Non	Non	PSEG - PSEG	TOSCO-Z1-109 TAP 230 kV line	218343	916600	1	DC	117.22	135.54	NR	936	180.05
36	N-1	PS8B	PSEG - PSEG	NEWDOVRO-FANWOODO 230 kV line	218355	218320	1	DC	111.69	141.86	ER	870	274
37	N-1	PS8B	PSEG - PSEG	PRSN AVG-NEWDOVRO 230 kV line	218357	218355	1	DC	115.38	145.55	ER	870	274
38	Non	Non	PSEG - PSEG	Z1-109 TAP-G22_MTX5 230 kV line	916600	218441	1	DC	127.68	146.03	NR	936	180.05
39	N-1	PS8B	PSEG - PSEG	METUCHEN-PRSN AVG 230 kV line	218469	218357	1	DC	119.38	149.55	ER	870	274
40	Non	Non	PSEG - PSEG	SPRINGRD-W.ORANGE 230 kV line	216911	216914	1	DC	142.24	163.92	NR	512	118.88
41	Non	Non	PSEG - PSEG	ALDENE2-SPRINGRD 230 kV line	218345	216911	1	DC	155.93	177.61	NR	512	118.88
42	Non	Non	PSEG - PSEG	WARINANC-ALDENE1 230 kV line	218316	217122	1	DC	155.07	178.54	NR	732	180.05
43	Non	Non	PSEG - PSEG	G22_MTX5-WARINANC 230 kV line	218441	218316	1	DC	175.73	201.49	NR	667	180.05

# **Attachment 1**

## ***System Configuration***

## **Option 1 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 SEWAREN-MINUESTR 230 kV line (from bus 218311 to bus 218353 ckt 1) loads from 67.4% to 103.24% (**DC power flow**) of its emergency rating (887 MVA) for the single line contingency outage of 'PS51B'. This project contributes approximately 317.86 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	42.14
218327	EDISON 2	42.13
218328	EDISON 3	42.14
218360	SEWAREN1	52.3
218361	SEWAREN2	59.34
218362	SEWAREN3	53.81
218363	SEWAREN4	62.36
218364	SEWAREN6	55.77
219150	TRENTON	0.03
292096	V1-030 C2	0.02
292100	V1-030 C4	< 0.01
292102	V1-030 C5	< 0.01
292106	V1-030 C7	< 0.01
292112	V1-030 CA	< 0.01
292078	V1-034	0.21
297020	V2-009 C1	< 0.01
297022	V2-009 C2	0.01
297024	V2-009 C3	< 0.01
297026	V2-009 C4	< 0.01
293377	V3-024 C	0.01

292680	V3-069 C	0.02
902001	W1-121 C	< 0.01
902251	W2-023	314.3
902651	W2-052 C	< 0.01
905641	W4-080 C	0.12
909451	X2-088 C	< 0.01
915251	Y3-049 1	0.04
915252	Y3-049 2	0.04
915253	Y3-049 3	0.04
916251	Z1-033	29.07
916471	Z1-096 C	0.19
916651	Z1-116 C OP1	317.86

## Appendix 2

(PSEG - PSEG) The ALDENE2-SPRINGRD 230 kV line (from bus 218345 to bus 216911 ckt 1) loads from 98.47% to 107.39% (**DC power flow**) of its emergency rating (789 MVA) for the single line contingency outage of 'PS51B'. This project contributes approximately 156.2 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
218307	ALDENE	0.02
218376	ALDENEAB	12.3
218326	EDISON 1	26.03
218327	EDISON 2	26.03
218328	EDISON 3	26.03
218423	LINDNCT1	1.77
218424	LINDNCT2	1.77
218425	LINDNCT3	1.77
218426	LINDNST1	3.46
290745	S-061	0.25
218360	SEWAREN1	24.79
218361	SEWAREN2	28.13
218362	SEWAREN3	25.51
218363	SEWAREN4	29.56
218364	SEWAREN6	26.44
218344	TOSCONUG	1.47
292094	V1-030 C1	0.01
292078	V1-034	0.45
900801	W1-001	5.16
902251	W2-023	148.99

912221	X4-044 C	4.52
913101	Y1-026	54.01
915271	Y3-051 C	1.91
915272	Y3-051 E1	24.21
916251	Z1-033	60.9
916191	Z1-059 C	5.73
916471	Z1-096 C	0.19
916601	Z1-109	70.9
916651	Z1-116 C OP1	156.2

### Appendix 3

(PSEG - PSEG) The SPRINGRD-W.ORANGE 230 kV line (from bus 216911 to bus 216914 ckt 1) loads from 100.75% to 108.18% (**DC power flow**) of its normal rating (512 MVA) for non-contingency condition. This project contributes approximately 84.44 MW to the thermal violation.

Bus Number	Bus Name	Full Contribution
218307	ALDENE	0.02
218376	ALDENEAB	12.14
218326	EDISON 1	15.72
218327	EDISON 2	15.73
218328	EDISON 3	15.72
218423	LINDNCT1	1.52
218424	LINDNCT2	1.52
218425	LINDNCT3	1.52
218426	LINDNST1	2.97
290745	S-061	0.22
218360	SEWAREN1	15.75
218361	SEWAREN2	17.87
218362	SEWAREN3	16.2
218363	SEWAREN4	18.78
218364	SEWAREN6	16.79
218344	TOSCONUG	1.3
292094	V1-030 C1	< 0.01
292078	V1-034	0.35
900801	W1-001	4.6
902251	W2-023	94.65
912221	X4-044 C	4.46
913101	Y1-026	47.7
915271	Y3-051 C	1.64
915272	Y3-051 E1	20.81
916251	Z1-033	47.32
916191	Z1-059 C	4.93
916601	Z1-109	62.89
916651	Z1-116 C OP1	84.44

## Appendix 4

(PSEG - PSEG) The MINUESTR-LINDEN 230 kV line (from bus 218353 to bus 218300 ckt 1) loads from 76.8% to 119.76% (**DC power flow**) of its emergency rating (740 MVA) for the single line contingency outage of 'PS51B'. This project contributes approximately 317.86 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	42.14
218327	EDISON 2	42.13
218328	EDISON 3	42.14
218360	SEWAREN1	52.3
218361	SEWAREN2	59.34
218362	SEWAREN3	53.81
218363	SEWAREN4	62.36
218364	SEWAREN6	55.77
219150	TRENTON	0.03
292096	V1-030 C2	0.02
292100	V1-030 C4	< 0.01
292102	V1-030 C5	< 0.01
292106	V1-030 C7	< 0.01
292112	V1-030 CA	< 0.01
292078	V1-034	0.21
297020	V2-009 C1	< 0.01
297022	V2-009 C2	0.01
297024	V2-009 C3	< 0.01
297026	V2-009 C4	< 0.01
293377	V3-024 C	0.01

292680	V3-069 C	0.02
902001	W1-121 C	< 0.01
902251	W2-023	314.3
902651	W2-052 C	< 0.01
905641	W4-080 C	0.12
909451	X2-088 C	< 0.01
915251	Y3-049 1	0.04
915252	Y3-049 2	0.04
915253	Y3-049 3	0.04
916251	Z1-033	29.07
916471	Z1-096 C	0.19
916651	Z1-116 C OP1	317.86

## Appendix 5

(PSEG - PSEG) The FANWOODO-ROSELAND 230 kV line (from bus 218320 to bus 216950 ckt 1) loads from 90.31% to 120.59% (**DC power flow**) of its emergency rating (870 MVA) for the single line contingency outage of 'PS8C\_B'. This project contributes approximately 263.41 MW to the thermal violation.

CONTINGENCY 'PS8C\_B'

DISCONNECT BRANCH FROM BUS 916600 TO BUS 218441 CKT 1  
G22 230 230  
END

/\* TOSCO

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	38.35
218327	EDISON 2	38.34
218328	EDISON 3	38.35
218423	LINDNCT1	1.41
218424	LINDNCT2	1.41
218425	LINDNCT3	1.41
218426	LINDNST1	2.75
290745	S-061	0.18
218360	SEWAREN1	35.25
218361	SEWAREN2	39.99
218362	SEWAREN3	36.26
218363	SEWAREN4	42.02
218364	SEWAREN6	37.59
218344	TOSCONUG	1.07
292094	V1-030 C1	< 0.01
292096	V1-030 C2	0.02
292078	V1-034	0.42
292680	V3-069 C	0.01
902251	W2-023	211.82
902651	W2-052 C	< 0.01
905641	W4-080 C	0.1
909461	X2-089 C	0.01
913101	Y1-026	39.54
915251	Y3-049 1	0.03
915253	Y3-049 3	0.03
915271	Y3-051 C	1.52
915272	Y3-051 E1	19.27
916251	Z1-033	56.98
916191	Z1-059 C	4.56
916471	Z1-096 C	0.22
916601	Z1-109	51.17
916651	Z1-116 C OP1	263.41

## Appendix 6

(PSEG - PSEG) The LINDEN-TOSCO 230 kV line (from bus 218300 to bus 218343 ckt 1) loads from 108.07% to 121.63% (**DC power flow**) of its normal rating (936 MVA) for non-contingency condition. This project contributes approximately 126.9 MW to the thermal violation.

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	18.96
218327	EDISON 2	18.96
218328	EDISON 3	18.96
218423	LINDNCT1	2.35
218424	LINDNCT2	2.35
218425	LINDNCT3	2.35
218426	LINDNST1	4.59
218360	SEWAREN1	23.93
218361	SEWAREN2	27.15
218362	SEWAREN3	24.62
218363	SEWAREN4	28.53
218364	SEWAREN6	25.52
292094	V1-030 C1	0.01
292096	V1-030 C2	< 0.01
292078	V1-034	0.23
292680	V3-069 C	< 0.01
902251	W2-023	143.82
902651	W2-052 C	< 0.01
905641	W4-080 C	0.05
909461	X2-089 C	< 0.01
915251	Y3-049 1	0.02
915253	Y3-049 3	0.02
915271	Y3-051 C	2.54
915272	Y3-051 E1	32.13
916251	Z1-033	31.52
916191	Z1-059 C	7.61
916651	Z1-116 C OP1	126.9

## Appendix 7

(PSEG - PSEG) The ALDENE2-SPRINGRD 230 kV line (from bus 218345 to bus 216911 ckt 1) loads from 114.44% to 121.87% (**DC power flow**) of its normal rating (512 MVA) for non-contingency condition. This project contributes approximately 84.44 MW to the thermal violation.

Bus Number	Bus Name	Full Contribution
218307	ALDENE	0.02
218376	ALDENEAB	12.14
218326	EDISON 1	15.72
218327	EDISON 2	15.73
218328	EDISON 3	15.72
218423	LINDNCT1	1.52
218424	LINDNCT2	1.52
218425	LINDNCT3	1.52
218426	LINDNST1	2.97
290745	S-061	0.22
218360	SEWAREN1	15.75
218361	SEWAREN2	17.87
218362	SEWAREN3	16.2
218363	SEWAREN4	18.78
218364	SEWAREN6	16.79
218344	TOSCONUG	1.3
292094	V1-030 C1	< 0.01
292078	V1-034	0.35
900801	W1-001	4.6
902251	W2-023	94.65
912221	X4-044 C	4.46
913101	Y1-026	47.7
915271	Y3-051 C	1.64
915272	Y3-051 E1	20.81
916251	Z1-033	47.32
916191	Z1-059 C	4.93
916601	Z1-109	62.89
916651	Z1-116 C OP1	84.44

## Appendix 8

(PSEG - PSEG) The WARINANC-ALDENE1 230 kV line (from bus 218316 to bus 217122 ckt 1) loads from 111.0% to 128.27% (**DC power flow**) of its normal rating (732 MVA) for non-contingency condition. This project contributes approximately 126.36 MW to the thermal violation.

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	18.84
218327	EDISON 2	18.83
218328	EDISON 3	18.84
218423	LINDNCT1	2.34
218424	LINDNCT2	2.34
218425	LINDNCT3	2.34
218426	LINDNST1	4.58
290745	S-061	0.34
218360	SEWAREN1	23.85
218361	SEWAREN2	27.06
218362	SEWAREN3	24.54
218363	SEWAREN4	28.44
218364	SEWAREN6	25.44
218344	TOSCONUG	2.02
292094	V1-030 C1	0.01
292096	V1-030 C2	< 0.01
292078	V1-034	0.23
292680	V3-069 C	< 0.01
900801	W1-001	7.19
902251	W2-023	143.35
902651	W2-052 C	< 0.01
905641	W4-080 C	0.05
909461	X2-089 C	< 0.01
913101	Y1-026	74.35
915251	Y3-049 1	0.02
915253	Y3-049 3	0.02
915271	Y3-051 C	2.53
915272	Y3-051 E1	32.07
916251	Z1-033	31.82
916191	Z1-059 C	7.6
916601	Z1-109	98.21
916651	Z1-116 C OP1	126.36

## Appendix 9

(PSEG - PSEG) The TOSCO-Z1-109 TAP 230 kV line (from bus 218343 to bus 916600 ckt 1) loads from 115.02% to 128.52% (**DC power flow**) of its normal rating (936 MVA) for non-contingency condition. This project contributes approximately 126.36 MW to the thermal violation.

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	18.84
218327	EDISON 2	18.83
218328	EDISON 3	18.84
218423	LINDNCT1	2.34
218424	LINDNCT2	2.34
218425	LINDNCT3	2.34
218426	LINDNST1	4.58
290745	S-061	0.34
218360	SEWAREN1	23.85
218361	SEWAREN2	27.06
218362	SEWAREN3	24.54
218363	SEWAREN4	28.44
218364	SEWAREN6	25.44
218344	TOSCONUG	2.02
292094	V1-030 C1	0.01
292096	V1-030 C2	< 0.01
292078	V1-034	0.23
292680	V3-069 C	< 0.01
902251	W2-023	143.35
902651	W2-052 C	< 0.01
905641	W4-080 C	0.05
909461	X2-089 C	< 0.01
913101	Y1-026	74.35
915251	Y3-049 1	0.02
915253	Y3-049 3	0.02
915271	Y3-051 C	2.53
915272	Y3-051 E1	32.07
916251	Z1-033	31.82
916191	Z1-059 C	7.6
916651	Z1-116 C OP1	126.36

## Appendix 10

(PSEG - PSEG) The SPRINGRD-W.ORANGE 230 kV line (from bus 216911 to bus 216914 ckt 1) loads from 121.02% to 131.35% (**DC power flow**) of its emergency rating (789 MVA) for the tower line contingency outage of 'H-2286 + G-2207'. This project contributes approximately 180.94 MW to the thermal violation.

CONTINGENCY 'H-2286 + G-2207'

DISCONNECT BUS 218357

DISCONNECT BUS 218355

MOVE 100 PERCENT LOAD FROM BUS 218381 TO BUS 218380

MOVE 100 PERCENT LOAD FROM BUS 218398 TO BUS 218399

DISCONNECT BRANCH FROM BUS 218320 TO BUS 218524 CKT 2

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

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	12.8
218326	EDISON 1	26.88
218327	EDISON 2	26.87
218328	EDISON 3	26.88
218423	LINDNCT1	1.97
218424	LINDNCT2	1.97
218425	LINDNCT3	1.97
218426	LINDNST1	3.86
206679	M&M S721	-0.82
94130	O66_NONFIRM	49.21
206638	PEAPACK	-0.32
290745	S-061	0.27
218360	SEWAREN1	26.85
218361	SEWAREN2	30.47
218362	SEWAREN3	27.63
218363	SEWAREN4	32.02
218364	SEWAREN6	28.63
218344	TOSCONUG	1.62
293093	U2-077	237.68

299906	U3-032 E	-0.87
292094	V1-030 C1	0.01
292095	V1-030 E1	0.51
292185	V1-030 E2	0.61
292101	V1-030 E4	0.06
292103	V1-030 E5	0.14
292107	V1-030 E7	0.09
292111	V1-030 E9	-0.13
292189	V1-030 EA	0.48
292191	V1-030 EC	-0.64
292092	V1-030 ED	-0.37
292078	V1-034	0.42
297021	V2-009 E1	0.18
297023	V2-009 E2	0.36
297025	V2-009 E3	0.3
297027	V2-009 E4	0.24
297069	V2-025 E	-0.34
293378	V3-024 E	0.72
292666	V3-058 E	0.18
292668	V3-059 E	0.18
293444	V3-065 E	-0.05
293440	V3-066 E	-0.04
293434	V3-067 E	-0.07
293429	V3-068 E	-0.04
292681	V3-069 E	0.3
904002	V4-001 E	-0.11
900801	W1-001	5.66
901802	W1-101 E	-0.12
902002	W1-121 E	0.26
901512	W1-122 E	-0.29
902251	W2-023	161.37
902652	W2-052 E	0.11
903042	W2-091 E	-0.56
903502	W3-032 E	-0.27
903952	W3-076 E	-0.65
903962	W3-077 E	-0.52
904142	W3-095 E	-0.52
903672	W3-106 E	-0.56
903682	W3-110 E	-0.42
904452	W3-126 E	-0.94
904582	W3-139 E	-0.56
904592	W3-140 E	-0.45
904642	W3-145 E	-0.94
904652	W3-146 E	-0.48
904732	W3-154 E	-0.06

905142	W4-014 E	-0.57
905442	W4-046 E	-0.38
905492	W4-059 E	-0.07
905542	W4-064 E	-0.17
905552	W4-065 E	-0.35
905582	W4-068 E	-0.31
905642	W4-080 E	2.86
907002	X1-005 E	-0.39
907012	X1-012 E	-0.55
907132	X1-046 E	-0.44
907402	X1-072 E	-0.09
907462	X1-082 E	-0.46
907302	X1-094 E	-0.91
907522	X1-114 E	-0.11
907412	X1-116 E	-0.38
909442	X2-087 E	-0.09
909452	X2-088 E	0.17
910582	X3-011 E	-0.18
910612	X3-029 E	-0.7
910712	X3-052 E	-0.42
910722	X3-054 E	-0.27
910852	X3-083 E	-0.48
912221	X4-044 C	4.7
912222	X4-044 E	3.8
913101	Y1-026	59.44
913322	Y1-072 E	-0.07
914042	Y2-018 E	-0.08
915271	Y3-051 C	2.13
915272	Y3-051 E1	26.99
916251	Z1-033	57.15
916191	Z1-059 C	6.39
916192	Z1-059 E	1.78
916471	Z1-096 C	0.18
916472	Z1-096 E	0.3
916601	Z1-109	77.87
916651	Z1-116 C OP1	167.11
916652	Z1-116 E OP1	13.83

## Appendix 11

(PSEG - PSEG) The LINDEN-TOSCO 230 kV line (from bus 218300 to bus 218343 ckt 1) loads from 113.24% to 132.71% (**DC power flow**) of its emergency rating (1081 MVA) for the single line contingency outage of 'PS51B'. This project contributes approximately 210.41 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	30.96
218327	EDISON 2	30.95
218328	EDISON 3	30.96
218423	LINDNCT1	2.64
218424	LINDNCT2	2.64
218425	LINDNCT3	2.64
218426	LINDNST1	5.16
218360	SEWAREN1	34.45
218361	SEWAREN2	39.09
218362	SEWAREN3	35.45
218363	SEWAREN4	41.08
218364	SEWAREN6	36.74
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	207.06
902651	W2-052 C	< 0.01
905641	W4-080 C	0.08
915251	Y3-049 1	0.03

915253	Y3-049 3	0.03
915271	Y3-051 C	2.85
915272	Y3-051 E1	36.1
916251	Z1-033	47.32
916191	Z1-059 C	8.55
916471	Z1-096 C	0.18
916651	Z1-116 C OP1	210.41

## Appendix 12

(PSEG - PSEG) The TOSCO-Z1-109 TAP 230 kV line (from bus 218343 to bus 916600 ckt 1) loads from 115.61% to 134.35% (**DC power flow**) of its emergency rating (1120 MVA) for the single line contingency outage of 'PS51B'. This project contributes approximately 209.87 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	30.83
218327	EDISON 2	30.82
218328	EDISON 3	30.83
218423	LINDNCT1	2.63
218424	LINDNCT2	2.63
218425	LINDNCT3	2.63
218426	LINDNST1	5.15
290745	S-061	0.37
218360	SEWAREN1	34.38
218361	SEWAREN2	39.
218362	SEWAREN3	35.37
218363	SEWAREN4	40.99
218364	SEWAREN6	36.66
218344	TOSCONUG	2.22
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	206.59
902651	W2-052 C	< 0.01

905641	W4-080 C	0.08
913101	Y1-026	81.7
915251	Y3-049 1	0.03
915253	Y3-049 3	0.03
915271	Y3-051 C	2.85
915272	Y3-051 E1	36.04
916251	Z1-033	47.63
916191	Z1-059 C	8.54
916471	Z1-096 C	0.18
916651	Z1-116 C OP1	209.87

## Appendix 13

(PSEG - PSEG) The NEWDOVRO-FANWOODO 230 kV line (from bus 218355 to bus 218320 ckt 1) loads from 105.34% to 136.42% (**DC power flow**) of its emergency rating (870 MVA) for the single line contingency outage of 'PS8C\_B'. This project contributes approximately 270.44 MW to the thermal violation.

CONTINGENCY 'PS8C\_B'

DISCONNECT BRANCH FROM BUS 916600 TO BUS 218441 CKT 1  
G22 230 230  
END

/\* TOSCO

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	39.03
218327	EDISON 2	39.02
218328	EDISON 3	39.03
218423	LINDNCT1	1.45
218424	LINDNCT2	1.45
218425	LINDNCT3	1.45
218426	LINDNST1	2.83
290745	S-061	0.19
218360	SEWAREN1	36.2
218361	SEWAREN2	41.08
218362	SEWAREN3	37.25
218363	SEWAREN4	43.17
218364	SEWAREN6	38.61
218344	TOSCONUG	1.11
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	217.57
902651	W2-052 C	< 0.01
905641	W4-080 C	0.1
909461	X2-089 C	0.01
913101	Y1-026	40.73
915251	Y3-049 1	0.03
915253	Y3-049 3	0.03
915271	Y3-051 C	1.57
915272	Y3-051 E1	19.83
916251	Z1-033	53.31
916191	Z1-059 C	4.7
916471	Z1-096 C	0.22
916601	Z1-109	52.72
916651	Z1-116 C OP1	270.44

## Appendix 14

(PSEG - PSEG) The Z1-109 TAP-G22\_MTX5 230 kV line (from bus 916600 to bus 218441 ckt 1) loads from 125.5% to 139.0% (**DC power flow**) of its normal rating (936 MVA) for non-contingency condition. This project contributes approximately 126.36 MW to the thermal violation.

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	18.84
218327	EDISON 2	18.83
218328	EDISON 3	18.84
218423	LINDNCT1	2.34
218424	LINDNCT2	2.34
218425	LINDNCT3	2.34
218426	LINDNST1	4.58
290745	S-061	0.34
218360	SEWAREN1	23.85
218361	SEWAREN2	27.06
218362	SEWAREN3	24.54
218363	SEWAREN4	28.44
218364	SEWAREN6	25.44
218344	TOSCONUG	2.02
292094	V1-030 C1	0.01
292096	V1-030 C2	< 0.01
292078	V1-034	0.23
292680	V3-069 C	< 0.01
902251	W2-023	143.35
902651	W2-052 C	< 0.01
905641	W4-080 C	0.05
909461	X2-089 C	< 0.01
913101	Y1-026	74.35
915251	Y3-049 1	0.02
915253	Y3-049 3	0.02
915271	Y3-051 C	2.53
915272	Y3-051 E1	32.07
916251	Z1-033	31.82
916191	Z1-059 C	7.6
916601	Z1-109	98.21
916651	Z1-116 C OP1	126.36

## Appendix 15

(PSEG - PSEG) The WARINANC-ALDENE1 230 kV line (from bus 218316 to bus 217122 ckt 1) loads from 116.53% to 139.9% (**DC power flow**) of its emergency rating (887 MVA) for the single line contingency outage of 'PS51B'. This project contributes approximately 207.31 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	30.47
218327	EDISON 2	30.46
218328	EDISON 3	30.47
218423	LINDNCT1	2.62
218424	LINDNCT2	2.62
218425	LINDNCT3	2.62
218426	LINDNST1	5.13
290745	S-061	0.37
218360	SEWAREN1	34.05
218361	SEWAREN2	38.64
218362	SEWAREN3	35.04
218363	SEWAREN4	40.6
218364	SEWAREN6	36.31
218344	TOSCONUG	2.21
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	7.83
902251	W2-023	204.66

902651	W2-052 C	< 0.01
905641	W4-080 C	0.08
913101	Y1-026	81.47
915251	Y3-049 1	0.03
915253	Y3-049 3	0.03
915271	Y3-051 C	2.84
915272	Y3-051 E1	35.92
916251	Z1-033	47.15
916191	Z1-059 C	8.51
916471	Z1-096 C	0.17
916601	Z1-109	107.24
916651	Z1-116 C OP1	207.31

## Appendix 16

(PSEG - PSEG) The PRSN AVG-NEWDOVRO 230 kV line (from bus 218357 to bus 218355 ckt 1) loads from 109.03% to 140.11% (**DC power flow**) of its emergency rating (870 MVA) for the single line contingency outage of 'PS8C\_B'. This project contributes approximately 270.44 MW to the thermal violation.

CONTINGENCY 'PS8C\_B'

DISCONNECT BRANCH FROM BUS 916600 TO BUS 218441 CKT 1  
G22 230 230  
END

/\* TOSCO

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	39.03
218327	EDISON 2	39.02
218328	EDISON 3	39.03
218423	LINDNCT1	1.45
218424	LINDNCT2	1.45
218425	LINDNCT3	1.45
218426	LINDNST1	2.83
290745	S-061	0.19
218360	SEWAREN1	36.2
218361	SEWAREN2	41.08
218362	SEWAREN3	37.25
218363	SEWAREN4	43.17
218364	SEWAREN6	38.61
218344	TOSCONUG	1.11
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	217.57
902651	W2-052 C	< 0.01
905641	W4-080 C	0.1
909461	X2-089 C	0.01
913101	Y1-026	40.73
915251	Y3-049 1	0.03
915253	Y3-049 3	0.03
915271	Y3-051 C	1.57
915272	Y3-051 E1	19.83
916251	Z1-033	53.31
916191	Z1-059 C	4.7
916471	Z1-096 C	0.22
916601	Z1-109	52.72
916651	Z1-116 C OP1	270.44

## Appendix 17

(PSEG - PSEG) The ALDENE2-SPRINGRD 230 kV line (from bus 218345 to bus 216911 ckt 1) loads from 129.91% to 140.24% (**DC power flow**) of its emergency rating (789 MVA) for the tower line contingency outage of 'H-2286 + G-2207'. This project contributes approximately 180.94 MW to the thermal violation.

CONTINGENCY 'H-2286 + G-2207'

DISCONNECT BUS 218357

DISCONNECT BUS 218355

MOVE 100 PERCENT LOAD FROM BUS 218381 TO BUS 218380

MOVE 100 PERCENT LOAD FROM BUS 218398 TO BUS 218399

DISCONNECT BRANCH FROM BUS 218320 TO BUS 218524 CKT 2

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

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	12.8
218326	EDISON 1	26.88
218327	EDISON 2	26.87
218328	EDISON 3	26.88
218423	LINDNCT1	1.97
218424	LINDNCT2	1.97
218425	LINDNCT3	1.97
218426	LINDNST1	3.86
206679	M&M S721	-0.82
94130	O66_NONFIRM	49.21
206638	PEAPACK	-0.32
290745	S-061	0.27
218360	SEWAREN1	26.85
218361	SEWAREN2	30.47
218362	SEWAREN3	27.63
218363	SEWAREN4	32.02
218364	SEWAREN6	28.63
218344	TOSCONUG	1.62
293093	U2-077	237.68

299906	U3-032 E	-0.87
292094	V1-030 C1	0.01
292095	V1-030 E1	0.51
292185	V1-030 E2	0.61
292101	V1-030 E4	0.06
292103	V1-030 E5	0.14
292107	V1-030 E7	0.09
292111	V1-030 E9	-0.13
292189	V1-030 EA	0.48
292191	V1-030 EC	-0.64
292092	V1-030 ED	-0.37
292078	V1-034	0.42
297021	V2-009 E1	0.18
297023	V2-009 E2	0.36
297025	V2-009 E3	0.3
297027	V2-009 E4	0.24
297069	V2-025 E	-0.34
293378	V3-024 E	0.72
292666	V3-058 E	0.18
292668	V3-059 E	0.18
293444	V3-065 E	-0.05
293440	V3-066 E	-0.04
293434	V3-067 E	-0.07
293429	V3-068 E	-0.04
292681	V3-069 E	0.3
904002	V4-001 E	-0.11
900801	W1-001	5.66
901802	W1-101 E	-0.12
902002	W1-121 E	0.26
901512	W1-122 E	-0.29
902251	W2-023	161.37
902652	W2-052 E	0.11
903042	W2-091 E	-0.56
903502	W3-032 E	-0.27
903952	W3-076 E	-0.65
903962	W3-077 E	-0.52
904142	W3-095 E	-0.52
903672	W3-106 E	-0.56
903682	W3-110 E	-0.42
904452	W3-126 E	-0.94
904582	W3-139 E	-0.56
904592	W3-140 E	-0.45
904642	W3-145 E	-0.94
904652	W3-146 E	-0.48
904732	W3-154 E	-0.06

905142	W4-014 E	-0.57
905442	W4-046 E	-0.38
905492	W4-059 E	-0.07
905542	W4-064 E	-0.17
905552	W4-065 E	-0.35
905582	W4-068 E	-0.31
905642	W4-080 E	2.86
907002	X1-005 E	-0.39
907012	X1-012 E	-0.55
907132	X1-046 E	-0.44
907402	X1-072 E	-0.09
907462	X1-082 E	-0.46
907302	X1-094 E	-0.91
907522	X1-114 E	-0.11
907412	X1-116 E	-0.38
909442	X2-087 E	-0.09
909452	X2-088 E	0.17
910582	X3-011 E	-0.18
910612	X3-029 E	-0.7
910712	X3-052 E	-0.42
910722	X3-054 E	-0.27
910852	X3-083 E	-0.48
912221	X4-044 C	4.7
912222	X4-044 E	3.8
913101	Y1-026	59.44
913322	Y1-072 E	-0.07
914042	Y2-018 E	-0.08
915271	Y3-051 C	2.13
915272	Y3-051 E1	26.99
916251	Z1-033	57.15
916191	Z1-059 C	6.39
916192	Z1-059 E	1.78
916471	Z1-096 C	0.18
916472	Z1-096 E	0.3
916601	Z1-109	77.87
916651	Z1-116 C OP1	167.11
916652	Z1-116 E OP1	13.83

## Appendix 18

(PSEG - PSEG) The Z1-109 TAP-G22\_MTX5 230 kV line (from bus 916600 to bus 218441 ckt 1) loads from 125.2% to 143.94% (**DC power flow**) of its emergency rating (1120 MVA) for the single line contingency outage of 'PS51B'. This project contributes approximately 209.87 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	30.83
218327	EDISON 2	30.82
218328	EDISON 3	30.83
218423	LINDNCT1	2.63
218424	LINDNCT2	2.63
218425	LINDNCT3	2.63
218426	LINDNST1	5.15
290745	S-061	0.37
218360	SEWAREN1	34.38
218361	SEWAREN2	39.
218362	SEWAREN3	35.37
218363	SEWAREN4	40.99
218364	SEWAREN6	36.66
218344	TOSCONUG	2.22
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	206.59
902651	W2-052 C	< 0.01

905641	W4-080 C	0.08
913101	Y1-026	81.7
915251	Y3-049 1	0.03
915253	Y3-049 3	0.03
915271	Y3-051 C	2.85
915272	Y3-051 E1	36.04
916251	Z1-033	47.63
916191	Z1-059 C	8.54
916471	Z1-096 C	0.18
916601	Z1-109	107.53
916651	Z1-116 C OP1	209.87

## Appendix 19

(PSEG - PSEG) The METUCHEN-PRSN AVG 230 kV line (from bus 218469 to bus 218357 ckt 1) loads from 113.21% to 144.3% (**DC power flow**) of its emergency rating (870 MVA) for the single line contingency outage of 'PS8C\_B'. This project contributes approximately 270.45 MW to the thermal violation.

CONTINGENCY 'PS8C\_B'

DISCONNECT BRANCH FROM BUS 916600 TO BUS 218441 CKT 1  
G22 230 230  
END

/\* TOSCO

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	39.03
218327	EDISON 2	39.02
218328	EDISON 3	39.03
218423	LINDNCT1	1.45
218424	LINDNCT2	1.45
218425	LINDNCT3	1.45
218426	LINDNST1	2.83
290745	S-061	0.19
218360	SEWAREN1	36.2
218361	SEWAREN2	41.08
218362	SEWAREN3	37.25
218363	SEWAREN4	43.17
218364	SEWAREN6	38.61
218344	TOSCONUG	1.11
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	217.57
902651	W2-052 C	< 0.01
905641	W4-080 C	0.1
913101	Y1-026	40.73
915251	Y3-049 1	0.03
915253	Y3-049 3	0.03
915271	Y3-051 C	1.57
915272	Y3-051 E1	19.83
916251	Z1-033	53.31
916191	Z1-059 C	4.7
916471	Z1-096 C	0.22
916601	Z1-109	52.72
916651	Z1-116 C OP1	270.45

## Appendix 20

(PSEG - PSEG) The G22\_MTX5-WARINANC 230 kV line (from bus 218441 to bus 218316 ckt 1) loads from 127.38% to 146.33% (**DC power flow**) of its normal rating (667 MVA) for non-contingency condition. This project contributes approximately 126.36 MW to the thermal violation.

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	18.84
218327	EDISON 2	18.83
218328	EDISON 3	18.84
218423	LINDNCT1	2.34
218424	LINDNCT2	2.34
218425	LINDNCT3	2.34
218426	LINDNST1	4.58
290745	S-061	0.34
218360	SEWAREN1	23.85
218361	SEWAREN2	27.06
218362	SEWAREN3	24.54
218363	SEWAREN4	28.44
218364	SEWAREN6	25.44
218344	TOSCONUG	2.02
292094	V1-030 C1	0.01
292096	V1-030 C2	< 0.01
292078	V1-034	0.23
292680	V3-069 C	< 0.01
900801	W1-001	7.19
902251	W2-023	143.35
902651	W2-052 C	< 0.01
905641	W4-080 C	0.05
909461	X2-089 C	< 0.01
913101	Y1-026	74.35
915251	Y3-049 1	0.02
915253	Y3-049 3	0.02
915271	Y3-051 C	2.53
915272	Y3-051 E1	32.07
916251	Z1-033	31.82
916191	Z1-059 C	7.6
916601	Z1-109	98.21
916651	Z1-116 C OP1	126.36

## Appendix 21

(PSEG - PSEG) The G22\_MTX5-WARINANC 230 kV line (from bus 218441 to bus 218316 ckt 1) loads from 130.42% to 155.67% (**DC power flow**) of its emergency rating (821 MVA) for the single line contingency outage of 'PS51B'. This project contributes approximately 207.31 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	30.47
218327	EDISON 2	30.46
218328	EDISON 3	30.47
218423	LINDNCT1	2.62
218424	LINDNCT2	2.62
218425	LINDNCT3	2.62
218426	LINDNST1	5.13
290745	S-061	0.37
218360	SEWAREN1	34.05
218361	SEWAREN2	38.64
218362	SEWAREN3	35.04
218363	SEWAREN4	40.6
218364	SEWAREN6	36.31
218344	TOSCONUG	2.21
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	7.83
902251	W2-023	204.66

902651	W2-052 C	< 0.01
905641	W4-080 C	0.08
913101	Y1-026	81.47
915251	Y3-049 1	0.03
915253	Y3-049 3	0.03
915271	Y3-051 C	2.84
915272	Y3-051 E1	35.92
916251	Z1-033	47.15
916191	Z1-059 C	8.51
916471	Z1-096 C	0.17
916601	Z1-109	107.24
916651	Z1-116 C OP1	207.31

## Appendix 22

(PSEG - PSEG) The WARINANC-ALDENE1 230 kV line (from bus 218316 to bus 217122 ckt 1) loads from 166.59% to 179.46% (**DC power flow**) of its emergency rating (887 MVA) for the tower line contingency outage of 'H-2286 + G-2207'. This project contributes approximately 254.84 MW to the thermal violation.

CONTINGENCY 'H-2286 + G-2207'

DISCONNECT BUS 218357

DISCONNECT BUS 218355

MOVE 100 PERCENT LOAD FROM BUS 218381 TO BUS 218380

MOVE 100 PERCENT LOAD FROM BUS 218398 TO BUS 218399

DISCONNECT BRANCH FROM BUS 218320 TO BUS 218524 CKT 2

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

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
218326	EDISON 1	32.63
218327	EDISON 2	32.62
218328	EDISON 3	32.63
218423	LINDNCT1	3.14
218424	LINDNCT2	3.14
218425	LINDNCT3	3.14
218426	LINDNST1	6.15
206679	M&M S721	-0.55
94130	O66_NONFIRM	32.22
206638	PEAPACK	-0.21
290745	S-061	0.44
218360	SEWAREN1	39.35
218361	SEWAREN2	44.65
218362	SEWAREN3	40.49
218363	SEWAREN4	46.92
218364	SEWAREN6	41.96
218344	TOSCONUG	2.59
293093	U2-077	382.44
292094	V1-030 C1	0.02
292095	V1-030 E1	0.81

292185	V1-030 E2	0.75
292101	V1-030 E4	0.05
292107	V1-030 E7	0.1
292111	V1-030 E9	-0.08
292189	V1-030 EA	0.31
292191	V1-030 EC	-0.42
292092	V1-030 ED	-0.24
292078	V1-034	0.27
297021	V2-009 E1	0.2
297023	V2-009 E2	0.4
297025	V2-009 E3	0.23
297069	V2-025 E	-0.22
293378	V3-024 E	0.82
292666	V3-058 E	0.12
292668	V3-059 E	0.12
293444	V3-065 E	-0.03
293440	V3-066 E	-0.02
293434	V3-067 E	-0.04
293429	V3-068 E	-0.02
292681	V3-069 E	0.43
900801	W1-001	9.11
901802	W1-101 E	-0.08
901512	W1-122 E	-0.19
902251	W2-023	236.48
902652	W2-052 E	0.15
903672	W3-106 E	-0.37
903682	W3-110 E	-0.28
904452	W3-126 E	-0.62
904592	W3-140 E	-0.3
904642	W3-145 E	-0.62
904652	W3-146 E	-0.32
905492	W4-059 E	-0.05
905542	W4-064 E	-0.11
905552	W4-065 E	-0.23
905642	W4-080 E	4.03
907012	X1-012 E	-0.37
907132	X1-046 E	-0.29
907402	X1-072 E	-0.06
907302	X1-094 E	-0.6
907522	X1-114 E	-0.07
907412	X1-116 E	-0.25
909442	X2-087 E	-0.06
909452	X2-088 E	0.19
910712	X3-052 E	-0.27
910722	X3-054 E	-0.18

910852	X3-083 E	-0.32
913101	Y1-026	95.44
915271	Y3-051 C	3.4
915272	Y3-051 E1	43.04
916251	Z1-033	37.42
916191	Z1-059 C	10.19
916192	Z1-059 E	2.83
916471	Z1-096 C	0.16
916472	Z1-096 E	0.26
916601	Z1-109	125.17
916651	Z1-116 C OP1	235.36
916652	Z1-116 E OP1	19.48

## Appendix 23

(PSEG - PSEG) The G22\_MTX5-WARINANC 230 kV line (from bus 218441 to bus 218316 ckt 1) loads from 185.33% to 199.24% (**DC power flow**) of its emergency rating (821 MVA) for the tower line contingency outage of 'H-2286 + G-2207'. This project contributes approximately 254.84 MW to the thermal violation.

CONTINGENCY 'H-2286 + G-2207'

DISCONNECT BUS 218357

DISCONNECT BUS 218355

MOVE 100 PERCENT LOAD FROM BUS 218381 TO BUS 218380

MOVE 100 PERCENT LOAD FROM BUS 218398 TO BUS 218399

DISCONNECT BRANCH FROM BUS 218320 TO BUS 218524 CKT 2

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

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
218326	EDISON 1	32.63
218327	EDISON 2	32.62
218328	EDISON 3	32.63
218423	LINDNCT1	3.14
218424	LINDNCT2	3.14
218425	LINDNCT3	3.14
218426	LINDNST1	6.15
206679	M&M S721	-0.55
94130	O66_NONFIRM	32.22
206638	PEAPACK	-0.21
290745	S-061	0.44
218360	SEWAREN1	39.35
218361	SEWAREN2	44.65
218362	SEWAREN3	40.49
218363	SEWAREN4	46.92
218364	SEWAREN6	41.96
218344	TOSCONUG	2.59
293093	U2-077	382.44
292094	V1-030 C1	0.02
292095	V1-030 E1	0.81

292185	V1-030 E2	0.75
292101	V1-030 E4	0.05
292107	V1-030 E7	0.1
292111	V1-030 E9	-0.08
292189	V1-030 EA	0.31
292191	V1-030 EC	-0.42
292092	V1-030 ED	-0.24
292078	V1-034	0.27
297021	V2-009 E1	0.2
297023	V2-009 E2	0.4
297025	V2-009 E3	0.23
297069	V2-025 E	-0.22
293378	V3-024 E	0.82
292666	V3-058 E	0.12
292668	V3-059 E	0.12
293444	V3-065 E	-0.03
293440	V3-066 E	-0.02
293434	V3-067 E	-0.04
293429	V3-068 E	-0.02
292681	V3-069 E	0.43
900801	W1-001	9.11
901802	W1-101 E	-0.08
901512	W1-122 E	-0.19
902251	W2-023	236.48
902652	W2-052 E	0.15
903672	W3-106 E	-0.37
903682	W3-110 E	-0.28
904452	W3-126 E	-0.62
904592	W3-140 E	-0.3
904642	W3-145 E	-0.62
904652	W3-146 E	-0.32
905492	W4-059 E	-0.05
905542	W4-064 E	-0.11
905552	W4-065 E	-0.23
905642	W4-080 E	4.03
907012	X1-012 E	-0.37
907132	X1-046 E	-0.29
907402	X1-072 E	-0.06
907302	X1-094 E	-0.6
907522	X1-114 E	-0.07
907412	X1-116 E	-0.25
909442	X2-087 E	-0.06
909452	X2-088 E	0.19
910712	X3-052 E	-0.27
910722	X3-054 E	-0.18

910852	X3-083 E	-0.32
913101	Y1-026	95.44
915271	Y3-051 C	3.4
915272	Y3-051 E1	43.04
916251	Z1-033	37.42
916191	Z1-059 C	10.19
916192	Z1-059 E	2.83
916471	Z1-096 C	0.16
916472	Z1-096 E	0.26
916601	Z1-109	125.17
916651	Z1-116 C OP1	235.36
916652	Z1-116 E OP1	19.48

## **Option 2 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 SEWAREN-MINUESTR 230 kV line (from bus 218311 to bus 218353 ckt 1) loads from 67.4% to 108.5% (**DC power flow**) of its emergency rating (887 MVA) for the single line contingency outage of 'PS51B'. This project contributes approximately 364.59 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	42.14
218327	EDISON 2	42.13
218328	EDISON 3	42.14
218360	SEWAREN1	52.3
218361	SEWAREN2	59.34
218362	SEWAREN3	53.81
218363	SEWAREN4	62.36
218364	SEWAREN6	55.77
219150	TRENTON	0.03
292096	V1-030 C2	0.02
292100	V1-030 C4	< 0.01
292102	V1-030 C5	< 0.01
292106	V1-030 C7	< 0.01
292112	V1-030 CA	< 0.01
292078	V1-034	0.21
297020	V2-009 C1	< 0.01
297022	V2-009 C2	0.01
297024	V2-009 C3	< 0.01
297026	V2-009 C4	< 0.01
293377	V3-024 C	0.01

292680	V3-069 C	0.02
902001	W1-121 C	< 0.01
902251	W2-023	314.3
902651	W2-052 C	< 0.01
905641	W4-080 C	0.12
909451	X2-088 C	< 0.01
915251	Y3-049 1	0.04
915252	Y3-049 2	0.04
915253	Y3-049 3	0.04
916251	Z1-033	29.07
916471	Z1-096 C	0.19
916651	Z1-116 C OP2	364.59

## Appendix 2

(PSEG - PSEG) The SPRINGRD-W.ORANGE 230 kV line (from bus 216911 to bus 216914 ckt 1) loads from 89.58% to 111.49% (**DC power flow**) of its emergency rating (789 MVA) for the single line contingency outage of 'PS51B'. This project contributes approximately 172.83 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
218307	ALDENE	0.02
218376	ALDENEAB	12.3
218326	EDISON 1	26.03
218327	EDISON 2	26.03
218328	EDISON 3	26.03
218423	LINDNCT1	1.77
218424	LINDNCT2	1.77
218425	LINDNCT3	1.77
218426	LINDNST1	3.46
290745	S-061	0.25
218360	SEWAREN1	24.79
218361	SEWAREN2	28.13
218362	SEWAREN3	25.51
218363	SEWAREN4	29.56
218364	SEWAREN6	26.44
218344	TOSCONUG	1.47
292094	V1-030 C1	0.01
292078	V1-034	0.45
900801	W1-001	5.16
902251	W2-023	148.99

912221	X4-044 C	4.52
913101	Y1-026	54.01
915271	Y3-051 C	1.91
915272	Y3-051 E1	24.21
916251	Z1-033	60.9
916191	Z1-059 C	5.73
916471	Z1-096 C	0.19
916601	Z1-109	70.9
916651	Z1-116 C OP2	172.83

### Appendix 3

(PSEG - PSEG) The SEWAREN-MINUESTR 230 kV line (from bus 218311 to bus 218353 ckt 1) loads from 69.4% to 111.52% (**DC power flow**) of its emergency rating (887 MVA) for the tower line contingency outage of '36PS'. This project contributes approximately 391.31 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	43.02
218327	EDISON 2	43.
218328	EDISON 3	43.02
206679	M&M S721	-0.53
94130	O66_NONFIRM	32.05
206638	PEAPACK	-0.21
218360	SEWAREN1	51.84
218361	SEWAREN2	58.82
218362	SEWAREN3	53.34
218363	SEWAREN4	61.81
218364	SEWAREN6	55.28
292095	V1-030 E1	-0.41
292185	V1-030 E2	0.98
292101	V1-030 E4	0.06
292103	V1-030 E5	0.15
292107	V1-030 E7	0.13
292111	V1-030 E9	-0.08

292189	V1-030 EA	0.35
292191	V1-030 EC	-0.42
292092	V1-030 ED	-0.24
292078	V1-034	0.27
297021	V2-009 E1	0.27
297023	V2-009 E2	0.53
297025	V2-009 E3	0.27
297027	V2-009 E4	0.35
297069	V2-025 E	-0.22
293378	V3-024 E	1.07
292666	V3-058 E	0.14
292668	V3-059 E	0.14
293444	V3-065 E	-0.03
293440	V3-066 E	-0.02
293434	V3-067 E	-0.04
293429	V3-068 E	-0.02
292681	V3-069 E	0.57
901802	W1-101 E	-0.08
902002	W1-121 E	0.28
901512	W1-122 E	-0.19
902251	W2-023	311.56
902652	W2-052 E	0.21
903672	W3-106 E	-0.36
903682	W3-110 E	-0.27
904452	W3-126 E	-0.6
904592	W3-140 E	-0.29
904642	W3-145 E	-0.6
905492	W4-059 E	-0.05
905542	W4-064 E	-0.11
905552	W4-065 E	-0.23
905642	W4-080 E	5.42
907012	X1-012 E	-0.36
907132	X1-046 E	-0.28
907402	X1-072 E	-0.06
907302	X1-094 E	-0.58
907522	X1-114 E	-0.07
907412	X1-116 E	-0.25
909442	X2-087 E	-0.06
909452	X2-088 E	0.25
909462	X2-089 E	0.76
910712	X3-052 E	-0.27
910722	X3-054 E	-0.17
916251	Z1-033	37.22
916471	Z1-096 C	0.21
916472	Z1-096 E	0.34

916651	Z1-116 C OP2	361.41
916652	Z1-116 E OP2	29.91

## Appendix 4

(PSEG - PSEG) The FANWOODO-ROSELAND 230 kV line (from bus 218320 to bus 216950 ckt 1) loads from 90.31% to 118.55% (**DC power flow**) of its emergency rating (870 MVA) for the single line contingency outage of 'PS8C\_B'. This project contributes approximately 245.71 MW to the thermal violation.

CONTINGENCY 'PS8C\_B'

DISCONNECT BRANCH FROM BUS 916600 TO BUS 218441 CKT 1  
G22 230 230  
END

/\* TOSCO

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	38.35
218327	EDISON 2	38.34
218328	EDISON 3	38.35
218423	LINDNCT1	1.41
218424	LINDNCT2	1.41
218425	LINDNCT3	1.41
218426	LINDNST1	2.75
290745	S-061	0.18
218360	SEWAREN1	35.25
218361	SEWAREN2	39.99
218362	SEWAREN3	36.26
218363	SEWAREN4	42.02
218364	SEWAREN6	37.59
218344	TOSCONUG	1.07
292094	V1-030 C1	< 0.01
292096	V1-030 C2	0.02
292078	V1-034	0.42
292680	V3-069 C	0.01
902251	W2-023	211.82
902651	W2-052 C	< 0.01
905641	W4-080 C	0.1
909461	X2-089 C	0.01
913101	Y1-026	39.54
915251	Y3-049 1	0.03
915253	Y3-049 3	0.03
915271	Y3-051 C	1.52
915272	Y3-051 E1	19.27
916251	Z1-033	56.98
916191	Z1-059 C	4.56
916471	Z1-096 C	0.22
916601	Z1-109	51.17
916651	Z1-116 C OP2	245.71

## Appendix 5

(PSEG - PSEG) The ALDENE2-SPRINGRD 230 kV line (from bus 218345 to bus 216911 ckt 1) loads from 98.47% to 120.37% (**DC power flow**) of its emergency rating (789 MVA) for the single line contingency outage of 'PS51B'. This project contributes approximately 172.83 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
218307	ALDENE	0.02
218376	ALDENEAB	12.3
218326	EDISON 1	26.03
218327	EDISON 2	26.03
218328	EDISON 3	26.03
218423	LINDNCT1	1.77
218424	LINDNCT2	1.77
218425	LINDNCT3	1.77
218426	LINDNST1	3.46
290745	S-061	0.25
218360	SEWAREN1	24.79
218361	SEWAREN2	28.13
218362	SEWAREN3	25.51
218363	SEWAREN4	29.56
218364	SEWAREN6	26.44
218344	TOSCONUG	1.47
292094	V1-030 C1	0.01
292078	V1-034	0.45
900801	W1-001	5.16
902251	W2-023	148.99

912221	X4-044 C	4.52
913101	Y1-026	54.01
915271	Y3-051 C	1.91
915272	Y3-051 E1	24.21
916251	Z1-033	60.9
916191	Z1-059 C	5.73
916471	Z1-096 C	0.19
916601	Z1-109	70.9
916651	Z1-116 C OP2	172.83

## Appendix 6

(PSEG - PSEG) The SPRINGRD-W.ORANGE 230 kV line (from bus 216911 to bus 216914 ckt 1) loads from 100.75% to 122.19% (**DC power flow**) of its normal rating (512 MVA) for non-contingency condition. This project contributes approximately 109.79 MW to the thermal violation.

Bus Number	Bus Name	Full Contribution
218307	ALDENE	0.02
218376	ALDENEAB	12.14
218326	EDISON 1	15.72
218327	EDISON 2	15.73
218328	EDISON 3	15.72
218423	LINDNCT1	1.52
218424	LINDNCT2	1.52
218425	LINDNCT3	1.52
218426	LINDNST1	2.97
290745	S-061	0.22
218360	SEWAREN1	15.75
218361	SEWAREN2	17.87
218362	SEWAREN3	16.2
218363	SEWAREN4	18.78
218364	SEWAREN6	16.79
218344	TOSCONUG	1.3
292094	V1-030 C1	< 0.01
292078	V1-034	0.35
900801	W1-001	4.6
902251	W2-023	94.65
912221	X4-044 C	4.46
913101	Y1-026	47.7
915271	Y3-051 C	1.64
915272	Y3-051 E1	20.81
916251	Z1-033	47.32
916191	Z1-059 C	4.93
916601	Z1-109	62.89
916651	Z1-116 C OP2	109.79

## Appendix 7

(PSEG - PSEG) The LINDEN-TOSCO 230 kV line (from bus 218300 to bus 218343 ckt 1) loads from 108.08% to 125.9% (**DC power flow**) of its normal rating (936 MVA) for non-contingency condition. This project contributes approximately 166.83 MW to the thermal violation.

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	18.96
218327	EDISON 2	18.96
218328	EDISON 3	18.96
218423	LINDNCT1	2.35
218424	LINDNCT2	2.35
218425	LINDNCT3	2.35
218426	LINDNST1	4.59
218360	SEWAREN1	23.93
218361	SEWAREN2	27.15
218362	SEWAREN3	24.62
218363	SEWAREN4	28.53
218364	SEWAREN6	25.52
292094	V1-030 C1	0.01
292096	V1-030 C2	< 0.01
292078	V1-034	0.23
292680	V3-069 C	< 0.01
902251	W2-023	143.82
902651	W2-052 C	< 0.01
905641	W4-080 C	0.05
909461	X2-089 C	< 0.01
915251	Y3-049 1	0.02
915253	Y3-049 3	0.02
915271	Y3-051 C	2.54
915272	Y3-051 E1	32.13
916251	Z1-033	31.52
916191	Z1-059 C	7.61
916651	Z1-116 C OP2	166.83

## Appendix 8

(PSEG - PSEG) The MINUESTR-LINDEN 230 kV line (from bus 218353 to bus 218300 ckt 1) loads from 76.8% to 126.07% (**DC power flow**) of its emergency rating (740 MVA) for the single line contingency outage of 'PS51B'. This project contributes approximately 364.59 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	42.14
218327	EDISON 2	42.13
218328	EDISON 3	42.14
218360	SEWAREN1	52.3
218361	SEWAREN2	59.34
218362	SEWAREN3	53.81
218363	SEWAREN4	62.36
218364	SEWAREN6	55.77
219150	TRENTON	0.03
292096	V1-030 C2	0.02
292100	V1-030 C4	< 0.01
292102	V1-030 C5	< 0.01
292106	V1-030 C7	< 0.01
292112	V1-030 CA	< 0.01
292078	V1-034	0.21
297020	V2-009 C1	< 0.01
297022	V2-009 C2	0.01
297024	V2-009 C3	< 0.01
297026	V2-009 C4	< 0.01
293377	V3-024 C	0.01

292680	V3-069 C	0.02
902001	W1-121 C	< 0.01
902251	W2-023	314.3
902651	W2-052 C	< 0.01
905641	W4-080 C	0.12
909451	X2-088 C	< 0.01
915251	Y3-049 1	0.04
915252	Y3-049 2	0.04
915253	Y3-049 3	0.04
916251	Z1-033	29.07
916471	Z1-096 C	0.19
916651	Z1-116 C OP2	364.59

## Appendix 9

(PSEG - PSEG) The MINUESTR-LINDEN 230 kV line (from bus 218353 to bus 218300 ckt 1) loads from 79.22% to 129.7% (**DC power flow**) of its emergency rating (740 MVA) for the tower line contingency outage of '36PS'. This project contributes approximately 391.31 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	43.02
218327	EDISON 2	43.
218328	EDISON 3	43.02
206679	M&M S721	-0.53
94130	O66_NONFIRM	32.05
206638	PEAPACK	-0.21
218360	SEWAREN1	51.84
218361	SEWAREN2	58.82
218362	SEWAREN3	53.34
218363	SEWAREN4	61.81
218364	SEWAREN6	55.28
292095	V1-030 E1	-0.41
292185	V1-030 E2	0.98
292101	V1-030 E4	0.06
292103	V1-030 E5	0.15
292107	V1-030 E7	0.13
292111	V1-030 E9	-0.08

292189	V1-030 EA	0.35
292191	V1-030 EC	-0.42
292092	V1-030 ED	-0.24
292078	V1-034	0.27
297021	V2-009 E1	0.27
297023	V2-009 E2	0.53
297025	V2-009 E3	0.27
297027	V2-009 E4	0.35
297069	V2-025 E	-0.22
293378	V3-024 E	1.07
292666	V3-058 E	0.14
292668	V3-059 E	0.14
293444	V3-065 E	-0.03
293440	V3-066 E	-0.02
293434	V3-067 E	-0.04
293429	V3-068 E	-0.02
292681	V3-069 E	0.57
901802	W1-101 E	-0.08
902002	W1-121 E	0.28
901512	W1-122 E	-0.19
902251	W2-023	311.56
902652	W2-052 E	0.21
903672	W3-106 E	-0.36
903682	W3-110 E	-0.27
904452	W3-126 E	-0.6
904592	W3-140 E	-0.29
904642	W3-145 E	-0.6
905492	W4-059 E	-0.05
905542	W4-064 E	-0.11
905552	W4-065 E	-0.23
905642	W4-080 E	5.42
907012	X1-012 E	-0.36
907132	X1-046 E	-0.28
907402	X1-072 E	-0.06
907302	X1-094 E	-0.58
907522	X1-114 E	-0.07
907412	X1-116 E	-0.25
909442	X2-087 E	-0.06
909452	X2-088 E	0.25
909462	X2-089 E	0.76
910712	X3-052 E	-0.27
910722	X3-054 E	-0.17
916251	Z1-033	37.22
916471	Z1-096 C	0.21
916472	Z1-096 E	0.34

916651	Z1-116 C OP2	361.41
916652	Z1-116 E OP2	29.91

## Appendix 10

(PSEG - PSEG) The TOSCO-Z1-109 TAP 230 kV line (from bus 218343 to bus 916600 ckt 1) loads from 115.02% to 132.78% (**DC power flow**) of its normal rating (936 MVA) for non-contingency condition. This project contributes approximately 166.29 MW to the thermal violation.

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	18.84
218327	EDISON 2	18.83
218328	EDISON 3	18.84
218423	LINDNCT1	2.34
218424	LINDNCT2	2.34
218425	LINDNCT3	2.34
218426	LINDNST1	4.58
290745	S-061	0.34
218360	SEWAREN1	23.85
218361	SEWAREN2	27.06
218362	SEWAREN3	24.54
218363	SEWAREN4	28.44
218364	SEWAREN6	25.44
218344	TOSCONUG	2.02
292094	V1-030 C1	0.01
292096	V1-030 C2	< 0.01
292078	V1-034	0.23
292680	V3-069 C	< 0.01
902251	W2-023	143.35
902651	W2-052 C	< 0.01
905641	W4-080 C	0.05
909461	X2-089 C	< 0.01
913101	Y1-026	74.35
915251	Y3-049 1	0.02
915253	Y3-049 3	0.02
915271	Y3-051 C	2.53
915272	Y3-051 E1	32.07
916251	Z1-033	31.82
916191	Z1-059 C	7.6
916651	Z1-116 C OP2	166.29

## Appendix 11

(PSEG - PSEG) The WARINANC-ALDENE1 230 kV line (from bus 218316 to bus 217122 ckt 1) loads from 111.02% to 133.74% (**DC power flow**) of its normal rating (732 MVA) for non-contingency condition. This project contributes approximately 166.29 MW to the thermal violation.

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	18.84
218327	EDISON 2	18.83
218328	EDISON 3	18.84
218423	LINDNCT1	2.34
218424	LINDNCT2	2.34
218425	LINDNCT3	2.34
218426	LINDNST1	4.58
290745	S-061	0.34
218360	SEWAREN1	23.85
218361	SEWAREN2	27.06
218362	SEWAREN3	24.54
218363	SEWAREN4	28.44
218364	SEWAREN6	25.44
218344	TOSCONUG	2.02
292094	V1-030 C1	0.01
292096	V1-030 C2	< 0.01
292078	V1-034	0.23
292680	V3-069 C	< 0.01
900801	W1-001	7.19
902251	W2-023	143.35
902651	W2-052 C	< 0.01
905641	W4-080 C	0.05
909461	X2-089 C	< 0.01
913101	Y1-026	74.35
915251	Y3-049 1	0.02
915253	Y3-049 3	0.02
915271	Y3-051 C	2.53
915272	Y3-051 E1	32.07
916251	Z1-033	31.82
916191	Z1-059 C	7.6
916601	Z1-109	98.21
916651	Z1-116 C OP2	166.29

## Appendix 12

(PSEG - PSEG) The NEWDOVRO-FANWOODO 230 kV line (from bus 218355 to bus 218320 ckt 1) loads from 105.34% to 134.35% (**DC power flow**) of its emergency rating (870 MVA) for the single line contingency outage of 'PS8C\_B'. This project contributes approximately 252.38 MW to the thermal violation.

CONTINGENCY 'PS8C\_B'

DISCONNECT BRANCH FROM BUS 916600 TO BUS 218441 CKT 1  
G22 230 230  
END

/\* TOSCO

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	39.03
218327	EDISON 2	39.02
218328	EDISON 3	39.03
218423	LINDNCT1	1.45
218424	LINDNCT2	1.45
218425	LINDNCT3	1.45
218426	LINDNST1	2.83
290745	S-061	0.19
218360	SEWAREN1	36.2
218361	SEWAREN2	41.08
218362	SEWAREN3	37.25
218363	SEWAREN4	43.17
218364	SEWAREN6	38.61
218344	TOSCONUG	1.11
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	217.57
902651	W2-052 C	< 0.01
905641	W4-080 C	0.1
909461	X2-089 C	0.01
913101	Y1-026	40.73
915251	Y3-049 1	0.03
915253	Y3-049 3	0.03
915271	Y3-051 C	1.57
915272	Y3-051 E1	19.83
916251	Z1-033	53.31
916191	Z1-059 C	4.7
916471	Z1-096 C	0.22
916601	Z1-109	52.72
916651	Z1-116 C OP2	252.38

## Appendix 13

(PSEG - PSEG) The LINDEN-TOSCO 230 kV line (from bus 218300 to bus 218343 ckt 1) loads from 113.24% to 135.46% (**DC power flow**) of its emergency rating (1081 MVA) for the single line contingency outage of 'PS51B'. This project contributes approximately 240.19 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	30.96
218327	EDISON 2	30.95
218328	EDISON 3	30.96
218423	LINDNCT1	2.64
218424	LINDNCT2	2.64
218425	LINDNCT3	2.64
218426	LINDNST1	5.16
218360	SEWAREN1	34.45
218361	SEWAREN2	39.09
218362	SEWAREN3	35.45
218363	SEWAREN4	41.08
218364	SEWAREN6	36.74
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	207.06
902651	W2-052 C	< 0.01
905641	W4-080 C	0.08
915251	Y3-049 1	0.03

915253	Y3-049 3	0.03
915271	Y3-051 C	2.85
915272	Y3-051 E1	36.1
916251	Z1-033	47.32
916191	Z1-059 C	8.55
916471	Z1-096 C	0.18
916651	Z1-116 C OP2	240.19

## Appendix 14

(PSEG - PSEG) The ALDENE2-SPRINGRD 230 kV line (from bus 218345 to bus 216911 ckt 1) loads from 114.44% to 135.89% (**DC power flow**) of its normal rating (512 MVA) for non-contingency condition. This project contributes approximately 109.79 MW to the thermal violation.

Bus Number	Bus Name	Full Contribution
218307	ALDENE	0.02
218376	ALDENEAB	12.14
218326	EDISON 1	15.72
218327	EDISON 2	15.73
218328	EDISON 3	15.72
218423	LINDNCT1	1.52
218424	LINDNCT2	1.52
218425	LINDNCT3	1.52
218426	LINDNST1	2.97
290745	S-061	0.22
218360	SEWAREN1	15.75
218361	SEWAREN2	17.87
218362	SEWAREN3	16.2
218363	SEWAREN4	18.78
218364	SEWAREN6	16.79
218344	TOSCONUG	1.3
292094	V1-030 C1	< 0.01
292078	V1-034	0.35
900801	W1-001	4.6
902251	W2-023	94.65
912221	X4-044 C	4.46
913101	Y1-026	47.7
915271	Y3-051 C	1.64
915272	Y3-051 E1	20.81
916251	Z1-033	47.32
916191	Z1-059 C	4.93
916601	Z1-109	62.89
916651	Z1-116 C OP2	109.79

## Appendix 15

(PSEG - PSEG) The TOSCO-Z1-109 TAP 230 kV line (from bus 218343 to bus 916600 ckt 1) loads from 115.61% to 137.01% (**DC power flow**) of its emergency rating (1120 MVA) for the single line contingency outage of 'PS51B'. This project contributes approximately 239.64 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	30.83
218327	EDISON 2	30.82
218328	EDISON 3	30.83
218423	LINDNCT1	2.63
218424	LINDNCT2	2.63
218425	LINDNCT3	2.63
218426	LINDNST1	5.15
290745	S-061	0.37
218360	SEWAREN1	34.38
218361	SEWAREN2	39.
218362	SEWAREN3	35.37
218363	SEWAREN4	40.99
218364	SEWAREN6	36.66
218344	TOSCONUG	2.22
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	206.59
902651	W2-052 C	< 0.01

905641	W4-080 C	0.08
913101	Y1-026	81.7
915251	Y3-049 1	0.03
915253	Y3-049 3	0.03
915271	Y3-051 C	2.85
915272	Y3-051 E1	36.04
916251	Z1-033	47.63
916191	Z1-059 C	8.54
916471	Z1-096 C	0.18
916651	Z1-116 C OP2	239.64

## Appendix 16

(PSEG - PSEG) The PRSN AVG-NEWDOVRO 230 kV line (from bus 218357 to bus 218355 ckt 1) loads from 109.03% to 138.04% (**DC power flow**) of its emergency rating (870 MVA) for the single line contingency outage of 'PS8C\_B'. This project contributes approximately 252.38 MW to the thermal violation.

CONTINGENCY 'PS8C\_B'

DISCONNECT BRANCH FROM BUS 916600 TO BUS 218441 CKT 1  
G22 230 230  
END

/\* TOSCO

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	39.03
218327	EDISON 2	39.02
218328	EDISON 3	39.03
218423	LINDNCT1	1.45
218424	LINDNCT2	1.45
218425	LINDNCT3	1.45
218426	LINDNST1	2.83
290745	S-061	0.19
218360	SEWAREN1	36.2
218361	SEWAREN2	41.08
218362	SEWAREN3	37.25
218363	SEWAREN4	43.17
218364	SEWAREN6	38.61
218344	TOSCONUG	1.11
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	217.57
902651	W2-052 C	< 0.01
905641	W4-080 C	0.1
909461	X2-089 C	0.01
913101	Y1-026	40.73
915251	Y3-049 1	0.03
915253	Y3-049 3	0.03
915271	Y3-051 C	1.57
915272	Y3-051 E1	19.83
916251	Z1-033	53.31
916191	Z1-059 C	4.7
916471	Z1-096 C	0.22
916601	Z1-109	52.72
916651	Z1-116 C OP2	252.38

## Appendix 17

(PSEG - PSEG) The METUCHEN-PRSN AVG 230 kV line (from bus 218469 to bus 218357 ckt 1) loads from 113.21% to 142.22% (**DC power flow**) of its emergency rating (870 MVA) for the single line contingency outage of 'PS8C\_B'. This project contributes approximately 252.38 MW to the thermal violation.

CONTINGENCY 'PS8C\_B'

DISCONNECT BRANCH FROM BUS 916600 TO BUS 218441 CKT 1  
G22 230 230  
END

/\* TOSCO

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	39.03
218327	EDISON 2	39.02
218328	EDISON 3	39.03
218423	LINDNCT1	1.45
218424	LINDNCT2	1.45
218425	LINDNCT3	1.45
218426	LINDNST1	2.83
290745	S-061	0.19
218360	SEWAREN1	36.2
218361	SEWAREN2	41.08
218362	SEWAREN3	37.25
218363	SEWAREN4	43.17
218364	SEWAREN6	38.61
218344	TOSCONUG	1.11
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	217.57
902651	W2-052 C	< 0.01
905641	W4-080 C	0.1
913101	Y1-026	40.73
915251	Y3-049 1	0.03
915253	Y3-049 3	0.03
915271	Y3-051 C	1.57
915272	Y3-051 E1	19.83
916251	Z1-033	53.31
916191	Z1-059 C	4.7
916471	Z1-096 C	0.22
916601	Z1-109	52.72
916651	Z1-116 C OP2	252.38

## Appendix 18

(PSEG - PSEG) The Z1-109 TAP-G22\_MTX5 230 kV line (from bus 916600 to bus 218441 ckt 1) loads from 125.51% to 143.27% (**DC power flow**) of its normal rating (936 MVA) for non-contingency condition. This project contributes approximately 166.29 MW to the thermal violation.

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	18.84
218327	EDISON 2	18.83
218328	EDISON 3	18.84
218423	LINDNCT1	2.34
218424	LINDNCT2	2.34
218425	LINDNCT3	2.34
218426	LINDNST1	4.58
290745	S-061	0.34
218360	SEWAREN1	23.85
218361	SEWAREN2	27.06
218362	SEWAREN3	24.54
218363	SEWAREN4	28.44
218364	SEWAREN6	25.44
218344	TOSCONUG	2.02
292094	V1-030 C1	0.01
292096	V1-030 C2	< 0.01
292078	V1-034	0.23
292680	V3-069 C	< 0.01
902251	W2-023	143.35
902651	W2-052 C	< 0.01
905641	W4-080 C	0.05
909461	X2-089 C	< 0.01
913101	Y1-026	74.35
915251	Y3-049 1	0.02
915253	Y3-049 3	0.02
915271	Y3-051 C	2.53
915272	Y3-051 E1	32.07
916251	Z1-033	31.82
916191	Z1-059 C	7.6
916601	Z1-109	98.21
916651	Z1-116 C OP2	166.29

## Appendix 19

(PSEG - PSEG) The WARINANC-ALDENE1 230 kV line (from bus 218316 to bus 217122 ckt 1) loads from 116.54% to 143.31% (**DC power flow**) of its emergency rating (887 MVA) for the single line contingency outage of 'PS51B'. This project contributes approximately 237.4 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	30.47
218327	EDISON 2	30.46
218328	EDISON 3	30.47
218423	LINDNCT1	2.62
218424	LINDNCT2	2.62
218425	LINDNCT3	2.62
218426	LINDNST1	5.13
290745	S-061	0.37
218360	SEWAREN1	34.05
218361	SEWAREN2	38.64
218362	SEWAREN3	35.04
218363	SEWAREN4	40.6
218364	SEWAREN6	36.31
218344	TOSCONUG	2.21
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	7.83
902251	W2-023	204.66

902651	W2-052 C	< 0.01
905641	W4-080 C	0.08
913101	Y1-026	81.47
915251	Y3-049 1	0.03
915253	Y3-049 3	0.03
915271	Y3-051 C	2.84
915272	Y3-051 E1	35.92
916251	Z1-033	47.15
916191	Z1-059 C	8.51
916471	Z1-096 C	0.17
916601	Z1-109	107.24
916651	Z1-116 C OP2	237.4

## Appendix 20

(PSEG - PSEG) The LINDEN-TOSCO 230 kV line (from bus 218300 to bus 218343 ckt 1) loads from 122.9% to 145.39% (**DC power flow**) of its emergency rating (1081 MVA) for the tower line contingency outage of '36PS'. This project contributes approximately 253.78 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	32.57
218327	EDISON 2	32.56
218328	EDISON 3	32.57
218423	LINDNCT1	2.47
218424	LINDNCT2	2.47
218425	LINDNCT3	2.47
218426	LINDNST1	4.83
206679	M&M S721	-0.89
94130	O66_NONFIRM	53.5
206638	PEAPACK	-0.35
218360	SEWAREN1	33.62
218361	SEWAREN2	38.15
218362	SEWAREN3	34.59
218363	SEWAREN4	40.09
218364	SEWAREN6	35.85
299906	U3-032 E	-0.94
292094	V1-030 C1	0.01

292095	V1-030 E1	0.63
292185	V1-030 E2	0.75
292101	V1-030 E4	0.07
292103	V1-030 E5	0.16
292107	V1-030 E7	0.1
292111	V1-030 E9	-0.14
292189	V1-030 EA	0.53
292191	V1-030 EC	-0.7
292092	V1-030 ED	-0.4
292078	V1-034	0.45
297021	V2-009 E1	0.21
297023	V2-009 E2	0.43
297025	V2-009 E3	0.33
297027	V2-009 E4	0.29
297069	V2-025 E	-0.37
293378	V3-024 E	0.86
292666	V3-058 E	0.2
292668	V3-059 E	0.2
293444	V3-065 E	-0.05
293440	V3-066 E	-0.04
293434	V3-067 E	-0.07
293429	V3-068 E	-0.04
292681	V3-069 E	0.37
904002	V4-001 E	-0.12
901612	W1-082 E	-0.63
901802	W1-101 E	-0.13
902002	W1-121 E	0.3
901512	W1-122 E	-0.31
902251	W2-023	202.06
902652	W2-052 E	0.14
903042	W2-091 E	-0.6
903502	W3-032 E	-0.29
903952	W3-076 E	-0.7
903962	W3-077 E	-0.56
904142	W3-095 E	-0.56
903672	W3-106 E	-0.61
903682	W3-110 E	-0.46
904452	W3-126 E	-1.02
904582	W3-139 E	-0.6
904592	W3-140 E	-0.48
904642	W3-145 E	-1.02
904652	W3-146 E	-0.52
904732	W3-154 E	-0.06
905142	W4-014 E	-0.62
905442	W4-046 E	-0.41

905492	W4-059 E	-0.08
905542	W4-064 E	-0.18
905552	W4-065 E	-0.38
905582	W4-068 E	-0.33
905602	W4-073 E	-0.56
905642	W4-080 E	3.58
907002	X1-005 E	-0.42
907012	X1-012 E	-0.6
907132	X1-046 E	-0.48
907402	X1-072 E	-0.1
907462	X1-082 E	-0.5
907302	X1-094 E	-0.98
907522	X1-114 E	-0.12
907412	X1-116 E	-0.42
909442	X2-087 E	-0.1
909452	X2-088 E	0.2
909462	X2-089 E	0.5
910562	X3-007 E	0.1
910582	X3-011 E	-0.2
910612	X3-029 E	-0.76
910712	X3-052 E	-0.45
910722	X3-054 E	-0.29
910842	X3-082 E	-0.33
910852	X3-083 E	-0.52
913322	Y1-072 E	-0.07
914042	Y2-018 E	-0.08
915271	Y3-051 C	2.67
915272	Y3-051 E1	33.84
916251	Z1-033	62.14
916191	Z1-059 C	8.01
916192	Z1-059 E	2.23
916471	Z1-096 C	0.21
916472	Z1-096 E	0.34
916651	Z1-116 C OP2	234.39
916652	Z1-116 E OP2	19.4

## Appendix 21

(PSEG - PSEG) The SPRINGRD-W.ORANGE 230 kV line (from bus 216911 to bus 216914 ckt 1) loads from 121.02% to 145.63% (**DC power flow**) of its emergency rating (789 MVA) for the tower line contingency outage of 'H-2286 + G-2207'. This project contributes approximately 202.69 MW to the thermal violation.

CONTINGENCY 'H-2286 + G-2207'

DISCONNECT BUS 218357

DISCONNECT BUS 218355

MOVE 100 PERCENT LOAD FROM BUS 218381 TO BUS 218380

MOVE 100 PERCENT LOAD FROM BUS 218398 TO BUS 218399

DISCONNECT BRANCH FROM BUS 218320 TO BUS 218524 CKT 2

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

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	12.8
218326	EDISON 1	26.88
218327	EDISON 2	26.87
218328	EDISON 3	26.88
218423	LINDNCT1	1.97
218424	LINDNCT2	1.97
218425	LINDNCT3	1.97
218426	LINDNST1	3.86
206679	M&M S721	-0.82
94130	O66_NONFIRM	49.21
206638	PEAPACK	-0.32
290745	S-061	0.27
218360	SEWAREN1	26.85
218361	SEWAREN2	30.47
218362	SEWAREN3	27.63
218363	SEWAREN4	32.02
218364	SEWAREN6	28.63
218344	TOSCONUG	1.62
293093	U2-077	237.68

299906	U3-032 E	-0.87
292094	V1-030 C1	0.01
292095	V1-030 E1	0.51
292185	V1-030 E2	0.61
292101	V1-030 E4	0.06
292103	V1-030 E5	0.14
292107	V1-030 E7	0.09
292111	V1-030 E9	-0.13
292189	V1-030 EA	0.48
292191	V1-030 EC	-0.64
292092	V1-030 ED	-0.37
292078	V1-034	0.42
297021	V2-009 E1	0.18
297023	V2-009 E2	0.36
297025	V2-009 E3	0.3
297027	V2-009 E4	0.24
297069	V2-025 E	-0.34
293378	V3-024 E	0.72
292666	V3-058 E	0.18
292668	V3-059 E	0.18
293444	V3-065 E	-0.05
293440	V3-066 E	-0.04
293434	V3-067 E	-0.07
293429	V3-068 E	-0.04
292681	V3-069 E	0.3
904002	V4-001 E	-0.11
900801	W1-001	5.66
901802	W1-101 E	-0.12
902002	W1-121 E	0.26
901512	W1-122 E	-0.29
902251	W2-023	161.37
902652	W2-052 E	0.11
903042	W2-091 E	-0.56
903502	W3-032 E	-0.27
903952	W3-076 E	-0.65
903962	W3-077 E	-0.52
904142	W3-095 E	-0.52
903672	W3-106 E	-0.56
903682	W3-110 E	-0.42
904452	W3-126 E	-0.94
904582	W3-139 E	-0.56
904592	W3-140 E	-0.45
904642	W3-145 E	-0.94
904652	W3-146 E	-0.48
904732	W3-154 E	-0.06

905142	W4-014 E	-0.57
905442	W4-046 E	-0.38
905492	W4-059 E	-0.07
905542	W4-064 E	-0.17
905552	W4-065 E	-0.35
905582	W4-068 E	-0.31
905642	W4-080 E	2.86
907002	X1-005 E	-0.39
907012	X1-012 E	-0.55
907132	X1-046 E	-0.44
907402	X1-072 E	-0.09
907462	X1-082 E	-0.46
907302	X1-094 E	-0.91
907522	X1-114 E	-0.11
907412	X1-116 E	-0.38
909442	X2-087 E	-0.09
909452	X2-088 E	0.17
910582	X3-011 E	-0.18
910612	X3-029 E	-0.7
910712	X3-052 E	-0.42
910722	X3-054 E	-0.27
910852	X3-083 E	-0.48
912221	X4-044 C	4.7
912222	X4-044 E	3.8
913101	Y1-026	59.44
913322	Y1-072 E	-0.07
914042	Y2-018 E	-0.08
915271	Y3-051 C	2.13
915272	Y3-051 E1	26.99
916251	Z1-033	57.15
916191	Z1-059 C	6.39
916192	Z1-059 E	1.78
916471	Z1-096 C	0.18
916472	Z1-096 E	0.3
916601	Z1-109	77.87
916651	Z1-116 C OP2	187.2
916652	Z1-116 E OP2	15.49

## Appendix 22

(PSEG - PSEG) The TOSCO-Z1-109 TAP 230 kV line (from bus 218343 to bus 916600 ckt 1) loads from 124.83% to 146.49% (**DC power flow**) of its emergency rating (1120 MVA) for the tower line contingency outage of '36PS'. This project contributes approximately 253.2 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	32.44
218327	EDISON 2	32.44
218328	EDISON 3	32.44
218423	LINDNCT1	2.47
218424	LINDNCT2	2.47
218425	LINDNCT3	2.47
218426	LINDNST1	4.83
206679	M&M S721	-0.9
94130	O66_NONFIRM	53.76
206638	PEAPACK	-0.35
290745	S-061	0.35
218360	SEWAREN1	33.55
218361	SEWAREN2	38.06
218362	SEWAREN3	34.51
218363	SEWAREN4	40.
218364	SEWAREN6	35.77
218344	TOSCONUG	2.06

299906	U3-032 E	-0.95
292094	V1-030 C1	0.01
292095	V1-030 E1	0.63
292185	V1-030 E2	0.74
292101	V1-030 E4	0.06
292103	V1-030 E5	0.16
292107	V1-030 E7	0.1
292111	V1-030 E9	-0.14
292189	V1-030 EA	0.52
292191	V1-030 EC	-0.7
292092	V1-030 ED	-0.41
292078	V1-034	0.46
297021	V2-009 E1	0.21
297023	V2-009 E2	0.42
297025	V2-009 E3	0.33
297027	V2-009 E4	0.29
297069	V2-025 E	-0.37
293378	V3-024 E	0.85
292666	V3-058 E	0.2
292668	V3-059 E	0.2
293444	V3-065 E	-0.05
293440	V3-066 E	-0.04
293434	V3-067 E	-0.07
293429	V3-068 E	-0.04
292681	V3-069 E	0.37
904002	V4-001 E	-0.12
901612	W1-082 E	-0.64
901802	W1-101 E	-0.13
902002	W1-121 E	0.29
901512	W1-122 E	-0.32
902251	W2-023	201.59
902652	W2-052 E	0.14
903042	W2-091 E	-0.61
903502	W3-032 E	-0.3
903952	W3-076 E	-0.71
903962	W3-077 E	-0.57
904142	W3-095 E	-0.57
903672	W3-106 E	-0.61
903682	W3-110 E	-0.46
904452	W3-126 E	-1.03
904582	W3-139 E	-0.61
904592	W3-140 E	-0.49
904642	W3-145 E	-1.03
904652	W3-146 E	-0.52
904732	W3-154 E	-0.06

905142	W4-014 E	-0.63
905442	W4-046 E	-0.41
905492	W4-059 E	-0.08
905542	W4-064 E	-0.18
905552	W4-065 E	-0.38
905582	W4-068 E	-0.34
905602	W4-073 E	-0.57
905642	W4-080 E	3.57
907002	X1-005 E	-0.43
907012	X1-012 E	-0.61
907132	X1-046 E	-0.48
907402	X1-072 E	-0.1
907462	X1-082 E	-0.51
907302	X1-094 E	-0.99
907522	X1-114 E	-0.12
907412	X1-116 E	-0.42
909442	X2-087 E	-0.1
909452	X2-088 E	0.2
909462	X2-089 E	0.5
910582	X3-011 E	-0.2
910612	X3-029 E	-0.77
910712	X3-052 E	-0.46
910722	X3-054 E	-0.3
910842	X3-082 E	-0.34
910852	X3-083 E	-0.52
913101	Y1-026	75.98
913322	Y1-072 E	-0.07
914042	Y2-018 E	-0.08
915271	Y3-051 C	2.67
915272	Y3-051 E1	33.78
916251	Z1-033	62.44
916191	Z1-059 C	8.
916192	Z1-059 E	2.22
916471	Z1-096 C	0.21
916472	Z1-096 E	0.34
916651	Z1-116 C OP2	233.85
916652	Z1-116 E OP2	19.35

## Appendix 23

(PSEG - PSEG) The Z1-109 TAP-G22\_MTX5 230 kV line (from bus 916600 to bus 218441 ckt 1) loads from 125.21% to 146.61% (**DC power flow**) of its emergency rating (1120 MVA) for the single line contingency outage of 'PS51B'. This project contributes approximately 239.64 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	30.83
218327	EDISON 2	30.82
218328	EDISON 3	30.83
218423	LINDNCT1	2.63
218424	LINDNCT2	2.63
218425	LINDNCT3	2.63
218426	LINDNST1	5.15
290745	S-061	0.37
218360	SEWAREN1	34.38
218361	SEWAREN2	39.
218362	SEWAREN3	35.37
218363	SEWAREN4	40.99
218364	SEWAREN6	36.66
218344	TOSCONUG	2.22
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	206.59
902651	W2-052 C	< 0.01

905641	W4-080 C	0.08
913101	Y1-026	81.7
915251	Y3-049 1	0.03
915253	Y3-049 3	0.03
915271	Y3-051 C	2.85
915272	Y3-051 E1	36.04
916251	Z1-033	47.63
916191	Z1-059 C	8.54
916471	Z1-096 C	0.18
916601	Z1-109	107.53
916651	Z1-116 C OP2	239.64

## Appendix 24

(PSEG - PSEG) The G22\_MTX5-WARINANC 230 kV line (from bus 218441 to bus 218316 ckt 1) loads from 127.38% to 152.32% (**DC power flow**) of its normal rating (667 MVA) for non-contingency condition. This project contributes approximately 166.29 MW to the thermal violation.

Bus Number	Bus Name	Full Contribution
218326	EDISON 1	18.84
218327	EDISON 2	18.83
218328	EDISON 3	18.84
218423	LINDNCT1	2.34
218424	LINDNCT2	2.34
218425	LINDNCT3	2.34
218426	LINDNST1	4.58
290745	S-061	0.34
218360	SEWAREN1	23.85
218361	SEWAREN2	27.06
218362	SEWAREN3	24.54
218363	SEWAREN4	28.44
218364	SEWAREN6	25.44
218344	TOSCONUG	2.02
292094	V1-030 C1	0.01
292096	V1-030 C2	< 0.01
292078	V1-034	0.23
292680	V3-069 C	< 0.01
900801	W1-001	7.19
902251	W2-023	143.35
902651	W2-052 C	< 0.01
905641	W4-080 C	0.05
909461	X2-089 C	< 0.01
913101	Y1-026	74.35
915251	Y3-049 1	0.02
915253	Y3-049 3	0.02
915271	Y3-051 C	2.53
915272	Y3-051 E1	32.07
916251	Z1-033	31.82
916191	Z1-059 C	7.6
916601	Z1-109	98.21
916651	Z1-116 C OP2	166.29

## Appendix 25

(PSEG - PSEG) The ALDENE2-SPRINGRD 230 kV line (from bus 218345 to bus 216911 ckt 1) loads from 129.91% to 154.52% (**DC power flow**) of its emergency rating (789 MVA) for the tower line contingency outage of 'H-2286 + G-2207'. This project contributes approximately 202.69 MW to the thermal violation.

CONTINGENCY 'H-2286 + G-2207'

DISCONNECT BUS 218357

DISCONNECT BUS 218355

MOVE 100 PERCENT LOAD FROM BUS 218381 TO BUS 218380

MOVE 100 PERCENT LOAD FROM BUS 218398 TO BUS 218399

DISCONNECT BRANCH FROM BUS 218320 TO BUS 218524 CKT 2

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

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	12.8
218326	EDISON 1	26.88
218327	EDISON 2	26.87
218328	EDISON 3	26.88
218423	LINDNCT1	1.97
218424	LINDNCT2	1.97
218425	LINDNCT3	1.97
218426	LINDNST1	3.86
206679	M&M S721	-0.82
94130	O66_NONFIRM	49.21
206638	PEAPACK	-0.32
290745	S-061	0.27
218360	SEWAREN1	26.85
218361	SEWAREN2	30.47
218362	SEWAREN3	27.63
218363	SEWAREN4	32.02
218364	SEWAREN6	28.63
218344	TOSCONUG	1.62
293093	U2-077	237.68

299906	U3-032 E	-0.87
292094	V1-030 C1	0.01
292095	V1-030 E1	0.51
292185	V1-030 E2	0.61
292101	V1-030 E4	0.06
292103	V1-030 E5	0.14
292107	V1-030 E7	0.09
292111	V1-030 E9	-0.13
292189	V1-030 EA	0.48
292191	V1-030 EC	-0.64
292092	V1-030 ED	-0.37
292078	V1-034	0.42
297021	V2-009 E1	0.18
297023	V2-009 E2	0.36
297025	V2-009 E3	0.3
297027	V2-009 E4	0.24
297069	V2-025 E	-0.34
293378	V3-024 E	0.72
292666	V3-058 E	0.18
292668	V3-059 E	0.18
293444	V3-065 E	-0.05
293440	V3-066 E	-0.04
293434	V3-067 E	-0.07
293429	V3-068 E	-0.04
292681	V3-069 E	0.3
904002	V4-001 E	-0.11
900801	W1-001	5.66
901802	W1-101 E	-0.12
902002	W1-121 E	0.26
901512	W1-122 E	-0.29
902251	W2-023	161.37
902652	W2-052 E	0.11
903042	W2-091 E	-0.56
903502	W3-032 E	-0.27
903952	W3-076 E	-0.65
903962	W3-077 E	-0.52
904142	W3-095 E	-0.52
903672	W3-106 E	-0.56
903682	W3-110 E	-0.42
904452	W3-126 E	-0.94
904582	W3-139 E	-0.56
904592	W3-140 E	-0.45
904642	W3-145 E	-0.94
904652	W3-146 E	-0.48
904732	W3-154 E	-0.06

905142	W4-014 E	-0.57
905442	W4-046 E	-0.38
905492	W4-059 E	-0.07
905542	W4-064 E	-0.17
905552	W4-065 E	-0.35
905582	W4-068 E	-0.31
905642	W4-080 E	2.86
907002	X1-005 E	-0.39
907012	X1-012 E	-0.55
907132	X1-046 E	-0.44
907402	X1-072 E	-0.09
907462	X1-082 E	-0.46
907302	X1-094 E	-0.91
907522	X1-114 E	-0.11
907412	X1-116 E	-0.38
909442	X2-087 E	-0.09
909452	X2-088 E	0.17
910582	X3-011 E	-0.18
910612	X3-029 E	-0.7
910712	X3-052 E	-0.42
910722	X3-054 E	-0.27
910852	X3-083 E	-0.48
912221	X4-044 C	4.7
912222	X4-044 E	3.8
913101	Y1-026	59.44
913322	Y1-072 E	-0.07
914042	Y2-018 E	-0.08
915271	Y3-051 C	2.13
915272	Y3-051 E1	26.99
916251	Z1-033	57.15
916191	Z1-059 C	6.39
916192	Z1-059 E	1.78
916471	Z1-096 C	0.18
916472	Z1-096 E	0.3
916601	Z1-109	77.87
916651	Z1-116 C OP2	187.2
916652	Z1-116 E OP2	15.49

## Appendix 26

(PSEG - PSEG) The Z1-109 TAP-G22\_MTX5 230 kV line (from bus 916600 to bus 218441 ckt 1) loads from 131.31% to 156.95% (**DC power flow**) of its emergency rating (1120 MVA) for the tower line contingency outage of 'H-2286 + G-2207'. This project contributes approximately 300.63 MW to the thermal violation.

CONTINGENCY 'H-2286 + G-2207'

DISCONNECT BUS 218357

DISCONNECT BUS 218355

MOVE 100 PERCENT LOAD FROM BUS 218381 TO BUS 218380

MOVE 100 PERCENT LOAD FROM BUS 218398 TO BUS 218399

DISCONNECT BRANCH FROM BUS 218320 TO BUS 218524 CKT 2

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

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
218326	EDISON 1	33.06
218327	EDISON 2	33.05
218328	EDISON 3	33.06
218423	LINDNCT1	3.17
218424	LINDNCT2	3.17
218425	LINDNCT3	3.17
218426	LINDNST1	6.2
206679	M&M S721	-0.55
94130	O66_NONFIRM	32.39
206638	PEAPACK	-0.22
290745	S-061	0.44
218360	SEWAREN1	39.83
218361	SEWAREN2	45.19
218362	SEWAREN3	40.98
218363	SEWAREN4	47.49
218364	SEWAREN6	42.47
218344	TOSCONUG	2.61
292094	V1-030 C1	0.02
292095	V1-030 E1	0.81
292185	V1-030 E2	0.76

292101	V1-030 E4	0.05
292107	V1-030 E7	0.1
292111	V1-030 E9	-0.09
292189	V1-030 EA	0.31
292191	V1-030 EC	-0.42
292092	V1-030 ED	-0.24
292078	V1-034	0.28
297021	V2-009 E1	0.21
297023	V2-009 E2	0.41
297025	V2-009 E3	0.23
297069	V2-025 E	-0.22
293378	V3-024 E	0.83
292666	V3-058 E	0.12
292668	V3-059 E	0.12
293444	V3-065 E	-0.03
293440	V3-066 E	-0.02
293434	V3-067 E	-0.04
293429	V3-068 E	-0.02
292681	V3-069 E	0.44
901802	W1-101 E	-0.08
901512	W1-122 E	-0.19
902251	W2-023	239.36
902652	W2-052 E	0.16
903672	W3-106 E	-0.37
903682	W3-110 E	-0.28
904452	W3-126 E	-0.62
904592	W3-140 E	-0.3
904642	W3-145 E	-0.62
904652	W3-146 E	-0.32
905492	W4-059 E	-0.05
905542	W4-064 E	-0.11
905552	W4-065 E	-0.23
905642	W4-080 E	4.08
907012	X1-012 E	-0.37
907132	X1-046 E	-0.29
907402	X1-072 E	-0.06
907302	X1-094 E	-0.6
907522	X1-114 E	-0.07
907412	X1-116 E	-0.26
909442	X2-087 E	-0.06
909452	X2-088 E	0.19
910712	X3-052 E	-0.28
910722	X3-054 E	-0.18
910852	X3-083 E	-0.32
913101	Y1-026	96.08

915271	Y3-051 C	3.42
915272	Y3-051 E1	43.37
916251	Z1-033	37.62
916191	Z1-059 C	10.27
916192	Z1-059 E	2.85
916471	Z1-096 C	0.16
916472	Z1-096 E	0.27
916601	Z1-109	125.98
916651	Z1-116 C OP2	277.65
916652	Z1-116 E OP2	22.98

## Appendix 27

(PSEG - PSEG) The G22\_MTX5-WARINANC 230 kV line (from bus 218441 to bus 218316 ckt 1) loads from 130.43% to 159.35% (**DC power flow**) of its emergency rating (821 MVA) for the single line contingency outage of 'PS51B'. This project contributes approximately 237.4 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	30.47
218327	EDISON 2	30.46
218328	EDISON 3	30.47
218423	LINDNCT1	2.62
218424	LINDNCT2	2.62
218425	LINDNCT3	2.62
218426	LINDNST1	5.13
290745	S-061	0.37
218360	SEWAREN1	34.05
218361	SEWAREN2	38.64
218362	SEWAREN3	35.04
218363	SEWAREN4	40.6
218364	SEWAREN6	36.31
218344	TOSCONUG	2.21
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	7.83
902251	W2-023	204.66

902651	W2-052 C	< 0.01
905641	W4-080 C	0.08
913101	Y1-026	81.47
915251	Y3-049 1	0.03
915253	Y3-049 3	0.03
915271	Y3-051 C	2.84
915272	Y3-051 E1	35.92
916251	Z1-033	47.15
916191	Z1-059 C	8.51
916471	Z1-096 C	0.17
916601	Z1-109	107.24
916651	Z1-116 C OP2	237.4

## Appendix 28

(PSEG - PSEG) The WARINANC-ALDENE1 230 kV line (from bus 218316 to bus 217122 ckt 1) loads from 166.62% to 198.6% (**DC power flow**) of its emergency rating (887 MVA) for the tower line contingency outage of 'H-2286 + G-2207'. This project contributes approximately 297.02 MW to the thermal violation.

CONTINGENCY 'H-2286 + G-2207'

DISCONNECT BUS 218357

DISCONNECT BUS 218355

MOVE 100 PERCENT LOAD FROM BUS 218381 TO BUS 218380

MOVE 100 PERCENT LOAD FROM BUS 218398 TO BUS 218399

DISCONNECT BRANCH FROM BUS 218320 TO BUS 218524 CKT 2

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

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
218326	EDISON 1	32.63
218327	EDISON 2	32.62
218328	EDISON 3	32.63
218423	LINDNCT1	3.14
218424	LINDNCT2	3.14
218425	LINDNCT3	3.14
218426	LINDNST1	6.15
206679	M&M S721	-0.55
94130	O66_NONFIRM	32.22
206638	PEAPACK	-0.21
290745	S-061	0.44
218360	SEWAREN1	39.35
218361	SEWAREN2	44.65
218362	SEWAREN3	40.49
218363	SEWAREN4	46.92
218364	SEWAREN6	41.96
218344	TOSCONUG	2.59
293093	U2-077	382.44
292094	V1-030 C1	0.02
292095	V1-030 E1	0.81

292185	V1-030 E2	0.75
292101	V1-030 E4	0.05
292107	V1-030 E7	0.1
292111	V1-030 E9	-0.08
292189	V1-030 EA	0.31
292191	V1-030 EC	-0.42
292092	V1-030 ED	-0.24
292078	V1-034	0.27
297021	V2-009 E1	0.2
297023	V2-009 E2	0.4
297025	V2-009 E3	0.23
297069	V2-025 E	-0.22
293378	V3-024 E	0.82
292666	V3-058 E	0.12
292668	V3-059 E	0.12
293444	V3-065 E	-0.03
293440	V3-066 E	-0.02
293434	V3-067 E	-0.04
293429	V3-068 E	-0.02
292681	V3-069 E	0.43
900801	W1-001	9.11
901802	W1-101 E	-0.08
901512	W1-122 E	-0.19
902251	W2-023	236.48
902652	W2-052 E	0.15
903672	W3-106 E	-0.37
903682	W3-110 E	-0.28
904452	W3-126 E	-0.62
904592	W3-140 E	-0.3
904642	W3-145 E	-0.62
904652	W3-146 E	-0.32
905492	W4-059 E	-0.05
905542	W4-064 E	-0.11
905552	W4-065 E	-0.23
905642	W4-080 E	4.03
907012	X1-012 E	-0.37
907132	X1-046 E	-0.29
907402	X1-072 E	-0.06
907302	X1-094 E	-0.6
907522	X1-114 E	-0.07
907412	X1-116 E	-0.25
909442	X2-087 E	-0.06
909452	X2-088 E	0.19
910712	X3-052 E	-0.27
910722	X3-054 E	-0.18

910852	X3-083 E	-0.32
913101	Y1-026	95.44
915271	Y3-051 C	3.4
915272	Y3-051 E1	43.04
916251	Z1-033	37.42
916191	Z1-059 C	10.19
916192	Z1-059 E	2.83
916471	Z1-096 C	0.16
916472	Z1-096 E	0.26
916601	Z1-109	125.17
916651	Z1-116 C OP2	274.32
916652	Z1-116 E OP2	22.7

## Appendix 29

(PSEG - PSEG) The G22\_MTX5-WARINANC 230 kV line (from bus 218441 to bus 218316 ckt 1) loads from 185.37% to 219.93% (**DC power flow**) of its emergency rating (821 MVA) for the tower line contingency outage of 'H-2286 + G-2207'. This project contributes approximately 297.02 MW to the thermal violation.

CONTINGENCY 'H-2286 + G-2207'

DISCONNECT BUS 218357

DISCONNECT BUS 218355

MOVE 100 PERCENT LOAD FROM BUS 218381 TO BUS 218380

MOVE 100 PERCENT LOAD FROM BUS 218398 TO BUS 218399

DISCONNECT BRANCH FROM BUS 218320 TO BUS 218524 CKT 2

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

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
218326	EDISON 1	32.63
218327	EDISON 2	32.62
218328	EDISON 3	32.63
218423	LINDNCT1	3.14
218424	LINDNCT2	3.14
218425	LINDNCT3	3.14
218426	LINDNST1	6.15
206679	M&M S721	-0.55
94130	O66_NONFIRM	32.22
206638	PEAPACK	-0.21
290745	S-061	0.44
218360	SEWAREN1	39.35
218361	SEWAREN2	44.65
218362	SEWAREN3	40.49
218363	SEWAREN4	46.92
218364	SEWAREN6	41.96
218344	TOSCONUG	2.59
293093	U2-077	382.44
292094	V1-030 C1	0.02
292095	V1-030 E1	0.81

292185	V1-030 E2	0.75
292101	V1-030 E4	0.05
292107	V1-030 E7	0.1
292111	V1-030 E9	-0.08
292189	V1-030 EA	0.31
292191	V1-030 EC	-0.42
292092	V1-030 ED	-0.24
292078	V1-034	0.27
297021	V2-009 E1	0.2
297023	V2-009 E2	0.4
297025	V2-009 E3	0.23
297069	V2-025 E	-0.22
293378	V3-024 E	0.82
292666	V3-058 E	0.12
292668	V3-059 E	0.12
293444	V3-065 E	-0.03
293440	V3-066 E	-0.02
293434	V3-067 E	-0.04
293429	V3-068 E	-0.02
292681	V3-069 E	0.43
900801	W1-001	9.11
901802	W1-101 E	-0.08
901512	W1-122 E	-0.19
902251	W2-023	236.48
902652	W2-052 E	0.15
903672	W3-106 E	-0.37
903682	W3-110 E	-0.28
904452	W3-126 E	-0.62
904592	W3-140 E	-0.3
904642	W3-145 E	-0.62
904652	W3-146 E	-0.32
905492	W4-059 E	-0.05
905542	W4-064 E	-0.11
905552	W4-065 E	-0.23
905642	W4-080 E	4.03
907012	X1-012 E	-0.37
907132	X1-046 E	-0.29
907402	X1-072 E	-0.06
907302	X1-094 E	-0.6
907522	X1-114 E	-0.07
907412	X1-116 E	-0.25
909442	X2-087 E	-0.06
909452	X2-088 E	0.19
910712	X3-052 E	-0.27
910722	X3-054 E	-0.18

910852	X3-083 E	-0.32
913101	Y1-026	95.44
915271	Y3-051 C	3.4
915272	Y3-051 E1	43.04
916251	Z1-033	37.42
916191	Z1-059 C	10.19
916192	Z1-059 E	2.83
916471	Z1-096 C	0.16
916472	Z1-096 E	0.26
916601	Z1-109	125.17
916651	Z1-116 C OP2	274.32
916652	Z1-116 E OP2	22.7