



**Northeast
Utilities System**

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Proposed Plan Application

Dooley Substation Addition of 115 kV Circuit Breaker

Middletown Area (Thermal and Voltage Study)

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Northeast Utilities
Transmission Services
8/30/05

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1 Executive Summary

Dooley 30K substation is a substation located in the town of Middletown and feeds 7200 customers in the towns of Durham and Middlefield. Dooley 30K is a 115-13.2kV distribution substation, with two 47 MVA transformers.

Proposed Schedule -Dooley 30K

In-Service Date – June 30, 2006 –Addition of 115kV circuit breaker

The transmission scope includes the installation of the 115kV portion of Dooley substation 30K. This would include an additional 115kV bus tie breaker and associated switches to accommodate a second transformer. In addition, the following scope of work will be included in this project:

- Replacement of CCVT's on both the 1050 and 1766 Transmission lines
- New bus protection, CCVT, and metering associated with the new bus section and new breaker
- New SCADA installation to accommodate Dooley 30K.
- All line relaying, breaker failure relays, reclosing relays, and metering associated with the 1050 line and the new breaker

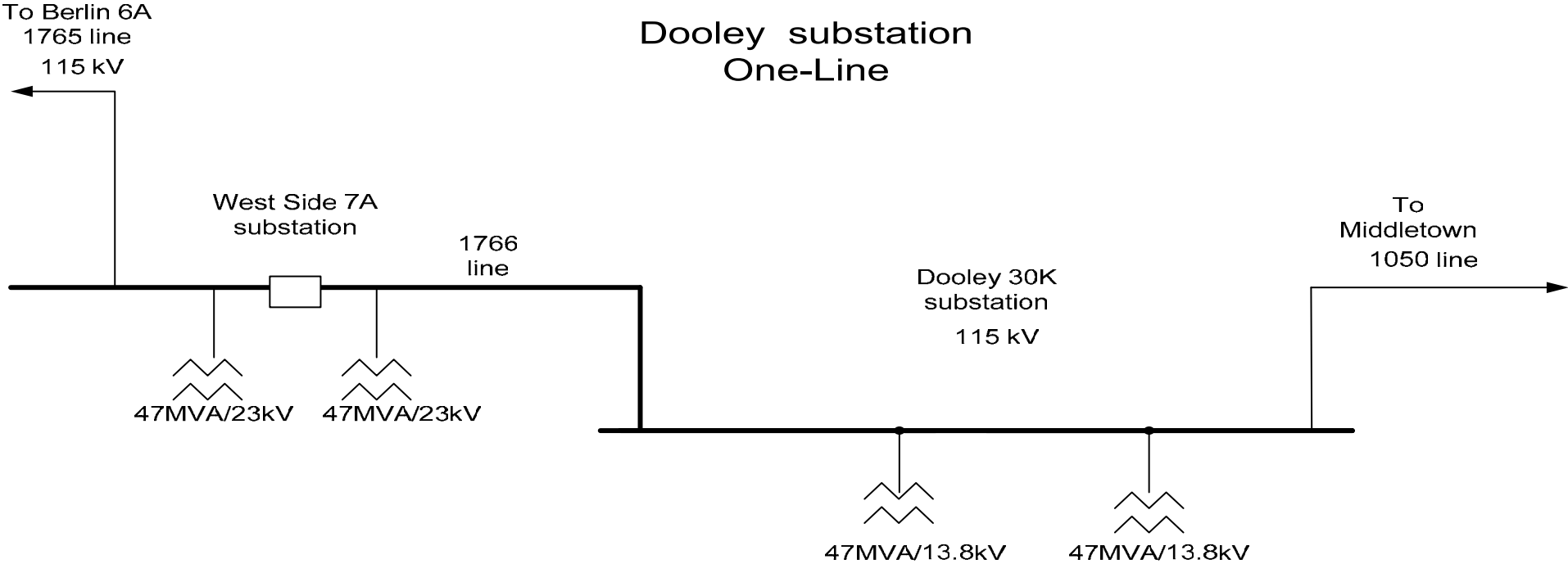
The addition of the 115kV circuit breaker transformer at the Dooley substation, does not adversely impact the bulk power transmission system (NU's or any other participant's system) from a steady-state thermal and voltage perspective. Consequently there was also no significant impact on the NU transmission system when the 115kV units at Middletown were turned off. Overall this project enhances the transmission system performance and reliability for the distribution system.

2 Justification

The installation of the circuit breaker at Dooley 30K and associated tie breaker/bus work is required to meet the increasing demand for electrical capacity in the Durham and Middlefield area, and to relieve projected overloads.

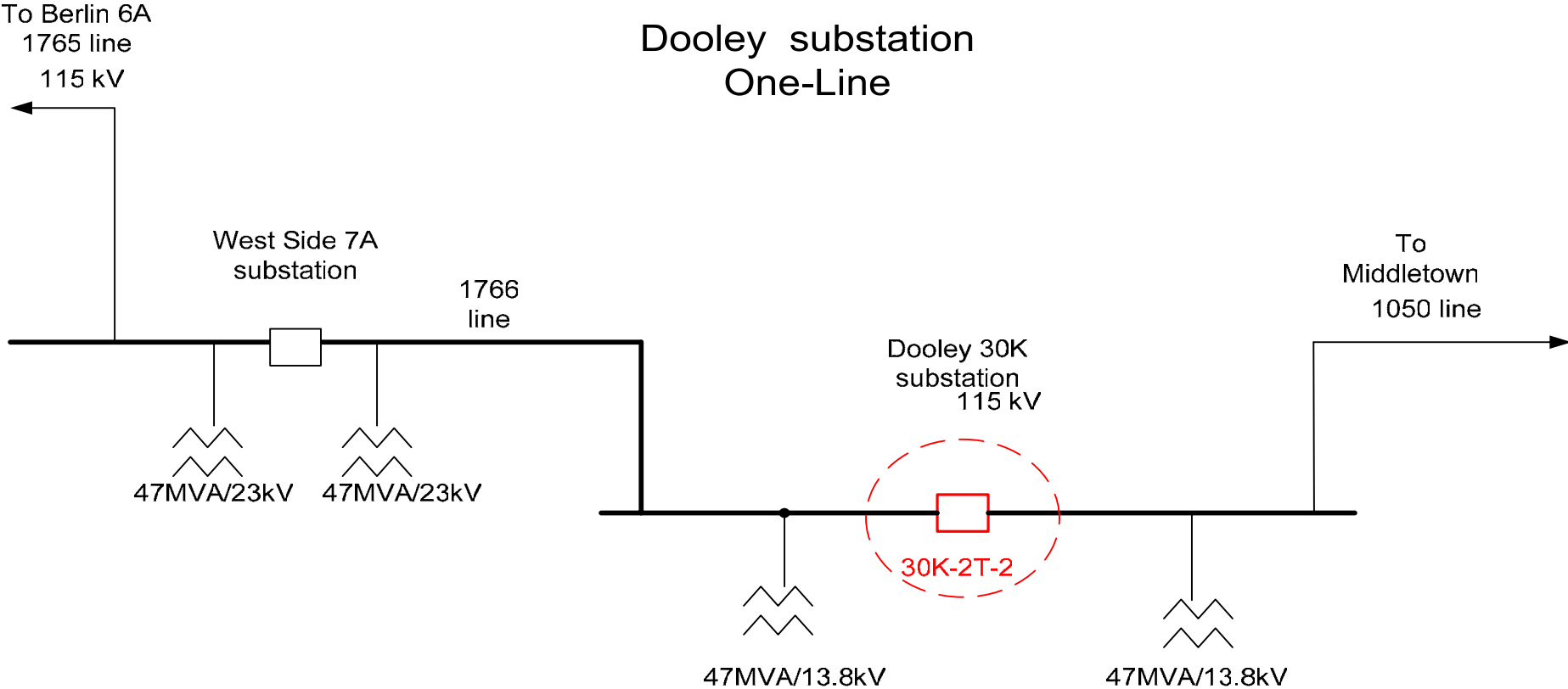
As the station bus work and Protection and Controls will be significantly modified, significant changes will be required for the 115 kV schemes. Additionally, the older relaying at Dooley 30K1 (KD/IRD relays) has a number of maintenance issues that have required replacement of relays (capacitor aging/leaking, PCB contamination, etc.). As such, this project will replace all high side relaying in conjunction with the third transformer replacement. The CCVT's will also be replaced due to age/obsolescence issues and the rewiring required associated with this project.

Figure 1- Dooley Substation local One-Line-Pre-Project



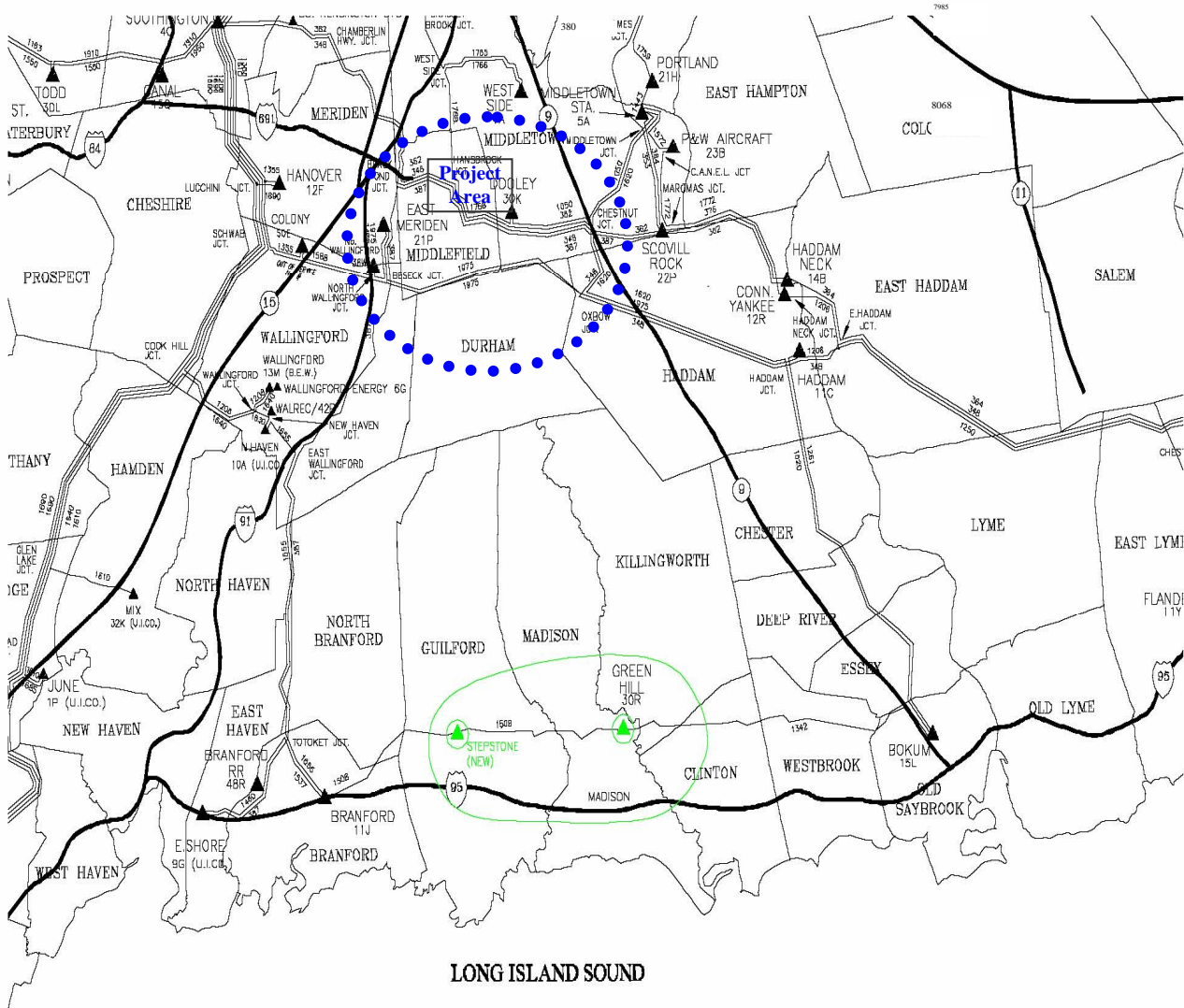
Preliminary one line sketch

Figure 2- Dooley Substation local One-Line- Post Project



Preliminary one line sketch

Figure 3- Geographical Location



Dooley Substation

Figure 4B- Dooley substation configuration
 Dooley 30K-Nomenclature Diagram- Currently needed (L portion)

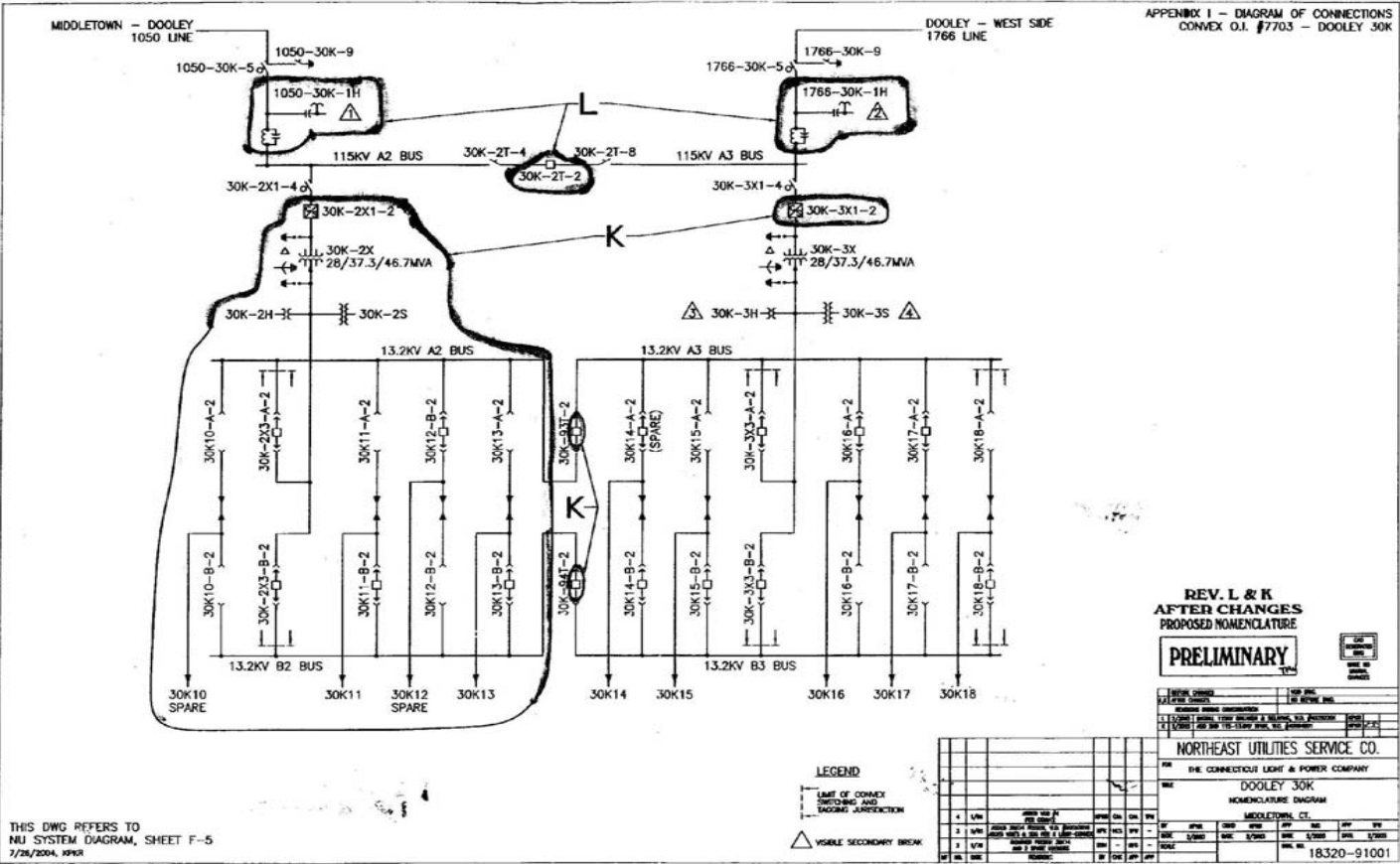
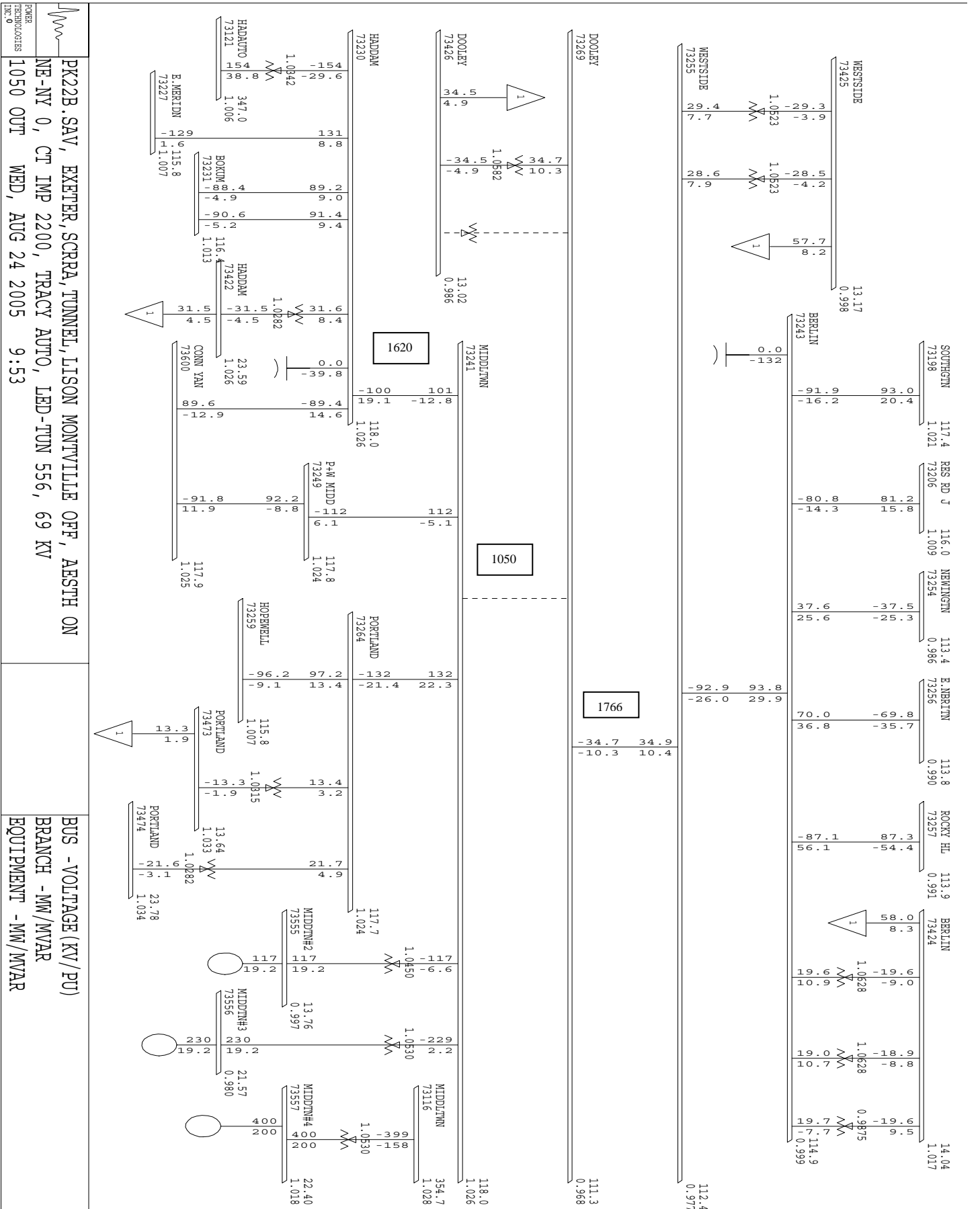


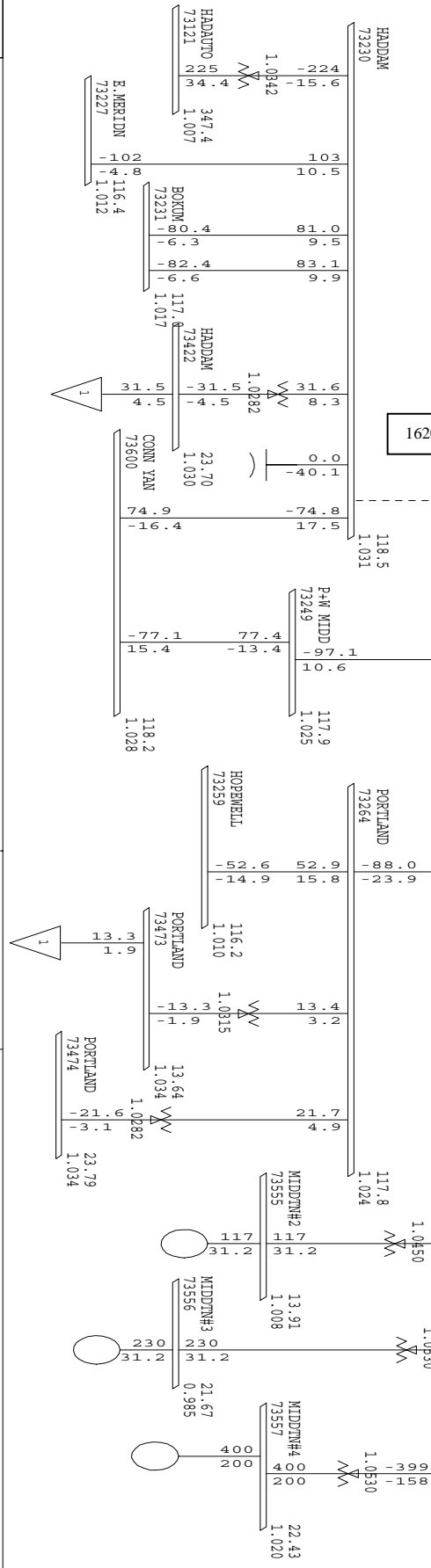
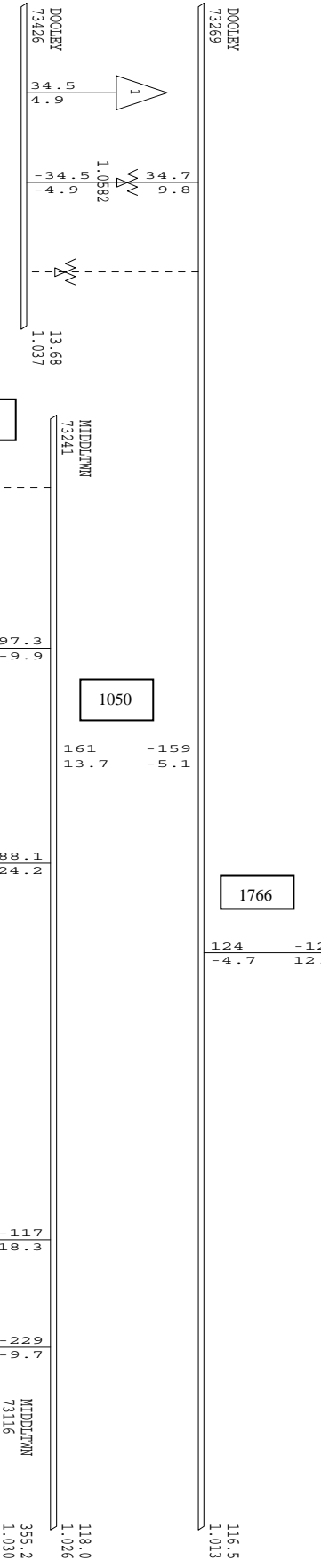
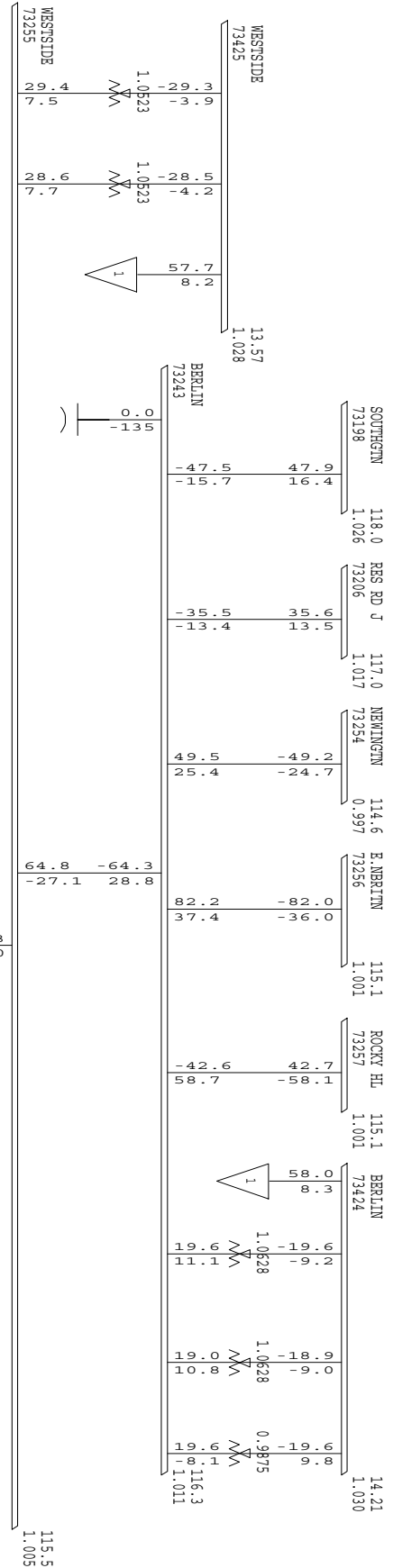
Figure- 5 1050 out of service-Middletown units 2, 3, 4 on



POWER TECHNOLOGIES INC. ©
 PK22B.SAV, EXETER, SCRRA, TUNNEL, LISON MONTVILLE OFF, AESTH ON
 NE-NY 0, CT IMP 2200, TRACY AUTO, LED-TUN 556, 69 KV
 1050 OUT WED, AUG 24 2005 9:53

BUS - VOLTAGE (KV/PU)
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR

Figure- 6 1620 out of service-Middletown units 2, 3, 4 on



POWER TECHNOLOGISTS INC. ©

PK22B.SAV, EXETER, SCRRA, TUNNEL, LISON MONTVILLE OFF, AESTH ON
 NE-NY 0, CT IMP 2200, TRACY AUTO, LED-TUN 556, 69 KV
 1620 OUT WED, AUG 24 2005 9:57

BUS - VOLTAGE (KV/PU)
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR

Figure- 7 Dooley Bus fault-Middletown units 2, 3, 4 on

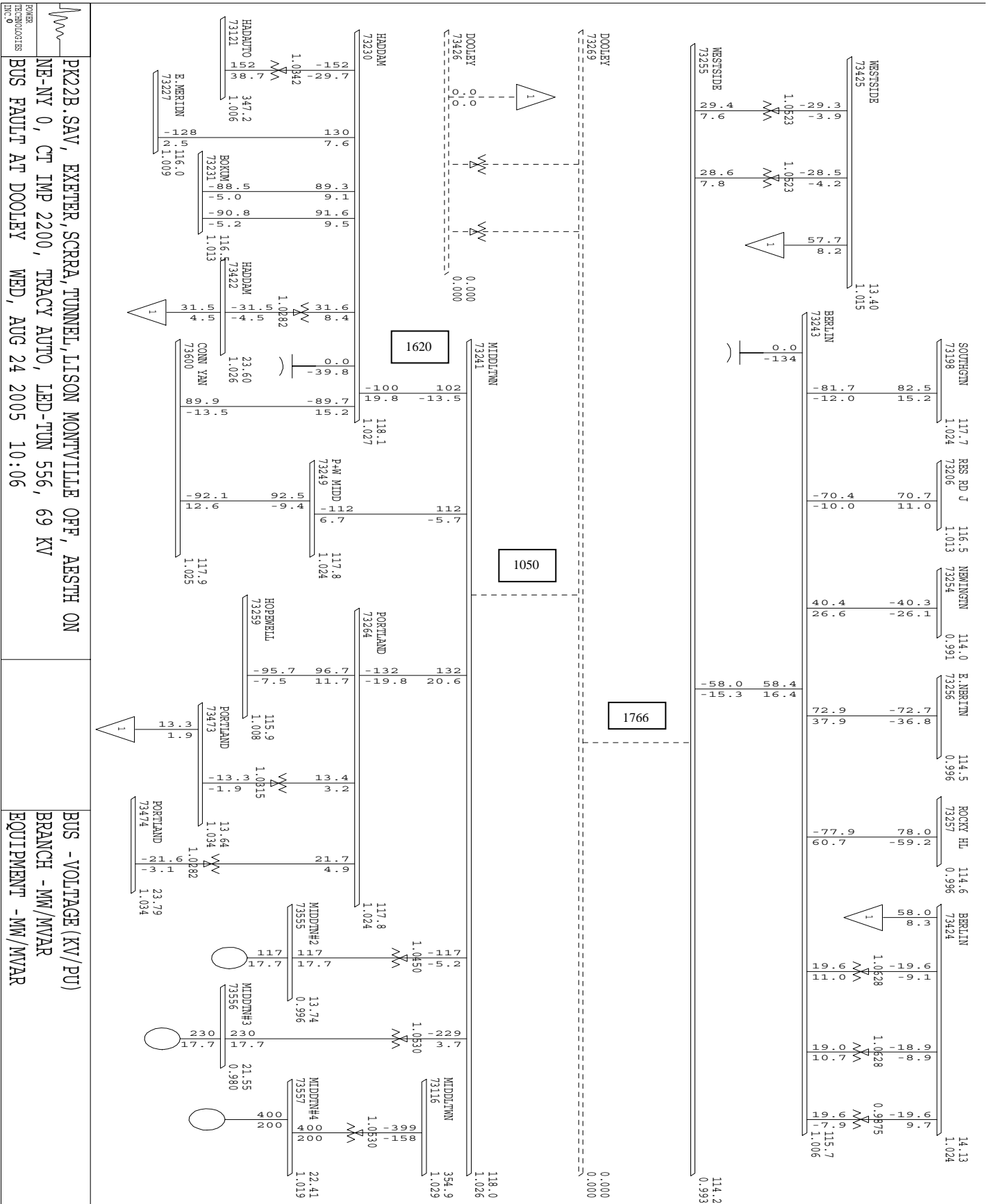
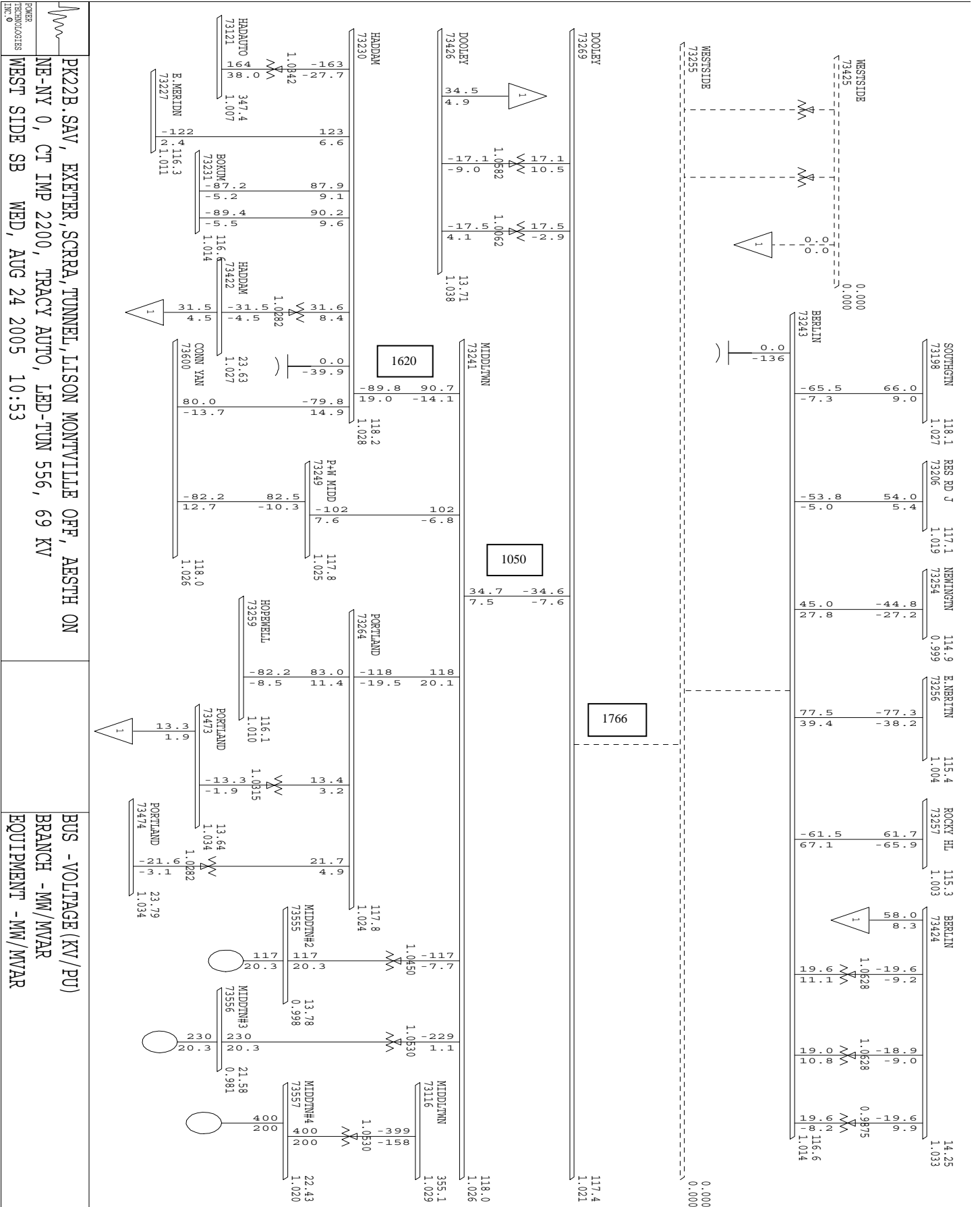


Figure- 8 West Side Bus fault-SB-Middletown units 2, 3, 4 on



POWER TECHNOLOGIES INC. ©

PK22B, SAV, EXETER, SCRRA, TUNNEL, LISON MONTVILLE OFF, AESTH ON
 NE-NY 0, CT IMP 2200, TRACY AUTO, LED-TUN 556, 69 KV
 WEST SIDE SB WED, AUG 24 2005 10:53

BUS - VOLTAGE (KV/PV)
 BRANCH - MW/MVAR
 EQUIPMENT - MW/MVAR

Figure- 9 Middletown units off (2, 3, 4)

3 Study Approach

This study was prepared in accordance with the NEPOOL Planning Procedure PP5-3: Guidelines for Conducting and Evaluating Proposed Plan Application Analyses.

3.1 Study Criteria

The transmission system simulation performance(s) are monitored to ensure conformance to the NEPOOL Reliability Standards.

The NU transmission system planning minimum design criteria for voltage performance is utilized and summarized below (Ref. Transmission Reliability Standards for Northeast Utilities, dated Jan 2004).

Table 2- Steady State Voltage Criteria (per unit)

Nominal kV	Normal		Emergency	
	Minimum	Maximum	Minimum	Maximum
345,115 & 69	0.95	1.05	0.95	1.05

NU Thermal Criteria:

- Pre-contingency, all lines in- normal rating.
- Post-contingency, line out- LTE rating

Thermal overloads will be flagged if the post-contingency load flow MVA is $\geq 95\%$ of an element LTE rating.

Case and Contingency Descriptions

3.2 Contingency Description

A contingency analysis was run, using ACCC, against the before and after project power flows. The contingencies listed in section 5 were studied and analyzed for the proposed changes, showing no relevant problems to the system.

-Addition of 115kV circuit breaker

3.3 Base Case

The primary power flow case used is from the 2003 FERC 715 library. The NEPOOL load and losses is scaled to model a 2006 extreme summer peak load level (90/10) of approximately 28,660 MW, based on the 2005 CELT Report.

4 Performance Evaluation

4.1 Steady State Analysis

The results of the ACCC runs showed no thermal or voltage violations due to the addition of this project. No adverse impact on short circuit analyses.

4.2 Stability Report

The stability analysis portion of this project will be addressed in a separate study

BUS VOLTAGES

				BUS VOLTAGES							
				~~~~~							
		V	LMT			V	LMT			V	LMT
72692	NWGTN345	345	357.	72694	SEBRK345	345	357.	71789	TEWKS	345	357.
70759	MYSTIC	345	360.	71797	MILLBURY	345	356.	72925	LUDLOW	345	351.
72926	NRTHFLD	345	359.	73106	SOUTHGTN	345	344.	73108	CARD	345	354.
73109	MONTVILLE	345	355.	73110	MILLSTNE	345	357.	73116	MIDDLTWN	345	355.
71801	BRAYTN P	345	358.	71811	KENT CO.	345	352.	71326	BRIDGWTR	345	354.
71336	SHERMAN	345	356.	71338	OS POWER	345	356.	71337	WFARNUM	345	354.
70772	W MEDWAY	345	355.	70780	WWALP345	345	354.	70783	PILGRIM	345	358.
70773	NEA 336	345	358.	71193	CANAL	345	358.	71133	CARVER	345	355.
70795	FRMNGHAM	230	230.	70793	MDFRM230	230	236.	70794	MDWLT230	230	238.
70818	MYSTC MA	115	113.	71891	SALEM HR	115	119.	73195	DEVON	115	117.
73709	OLD TOWN	115	116.	73710	HAWTHORN	115	115.	73158	WESTON	115	116.
73198	SOUTHGTN	115	118.	73182	HANOVERB	115	117.	73634	COLONY	115	116.
73633	NO. WALLF	115	116.	73227	E. MERIDN	115	116.	73230	HADDAM	115	118.
73231	BOKUM	115	117.	73265	GREEN HL	115	116.	73153	BRANFORD	115	118.
73703	ASHCREEK	115	118.	73700	PEQUONIC	115	118.	73174	PEACEABL	115	115.
71403	WFARNUM	115	116.	72539	WOLFHILL	115	117.	72581	WOOD RIV	115	114.

AREA / ZONE TOTALS

				~~~~~							
NEPOOL_GEN		25985		NEPOOL_LOAD		27887		NEPOOL_LOSS		715	
NEPOOL_INT		-2635									

Base case summary

PK22B.SAV, NE-NY 0, CT IMP 2275, Middletown unit 4 off.

GENERATION														
#	V	MW	MX	#	V	MW	MX	#	V	MW	MX			
73538	AESTH PF	1.025	180	80*	73549	SMD1112J	0.000	0	0	73550	SMD1314J	0.000	0	0
73551	NORHAR#1	1.006	159	41	73552	NORHAR#2	1.005	168	41	73553	DEVON#7	1.006	106	27
73554	DEVON#8	1.004	106	27	73555	MIDDTN#2	1.004	117	27	73556	MIDDTN#3	0.983	230	27
73557	MIDDTN#4	0.000	0	0	73558	MONTV#5	0.000	0	0	73559	MONTV#6	0.000	0	0
73562	MILL#2	1.012	940	318	73563	MILL#3	1.004	1260	318	73565	LAKERD#1	1.023	280	96
73566	LAKERD#2	1.023	280	96	73567	LAKERD#3	1.023	280	96	73574	MILFD#1	1.017	280	2
73575	MILFD#2	0.000	0	0	73588	MERIDEN1	0.000	0	0	73589	MERIDEN2	0.000	0	0
73590	MERIDEN3	0.000	0	0	73594	WALL LV1	0.000	0	0	73595	WALL LV2	0.000	0	0
73596	WALL LV3	0.000	0	0	73646	BPTHBR#1	0.000	0	0	73647	BPTHBR#2	0.993	170	87
73648	BPTHBR#3	0.984	375	87	73649	BPTHBR#4	0.000	0	0	73651	NH HARBR	0.989	370	137
73652	BE 11	0.978	170	11	73653	BE 12	0.978	170	11	73654	BE 10 ST	0.974	180	11
73085	MT.TOM	0.000	0	0	70365	WF WY #1	1.015	50	9	70366	WF WY #2	1.015	50	9
70367	WF WY #3	1.015	100	17	70368	WF WY #4	1.055	523	198	70386	WBK G1	0.000	0	0
70387	WBK G2	0.000	0	0	70388	WBK G3	0.000	0	0	70705	VTYAK G	0.995	502	150*
71060	MYST G4	0.000	0	0	71061	MYST 5G	0.000	0	0	71062	MYST G6	1.018	136	104*
71063	MYST G7	1.047	565	335*	71064	MYST J1	0.000	0	0	71065	CABOTCMB	0.000	0	0
71094	PLGRM G1	1.049	702	240	71073	N.BOST 1	0.000	0	0	71074	N.BOST 2	0.000	0	0
71084	NEA GTPF	1.051	85	40*	71085	NEA GTPF	1.051	85	40*	71086	NEA STPF	1.066	80	55*
71095	ANPBLCK1	1.090	290	132	71096	ANPBLCK2	1.090	290	132	71251	CANAL G1	1.039	566	239*
71252	CANAL G2	1.017	577	120*	72372	BP #1 GN	1.033	238	119*	72375	BP #2 GN	1.032	241	117*
72370	BP #3 GN	1.019	536	42	72371	BP #4 GN	1.017	421	32	72661	MANCH09A	1.013	99	33
72662	MANCH10A	1.013	99	33	72663	MANCH11A	1.013	99	33	72666	FRSQ SC1	0.996	43	-5
72667	FRSQ SC2	0.995	43	-5	72668	FRSQ SC3	0.993	42	-5	71522	SOM G6	1.003	70	70
71531	OSP1 PF	1.003	77	0	71532	OSP2 PF	1.003	77	0	71533	OSP3 PF	1.002	108	0
71534	OSP4 PF	1.003	77	0	71535	OSP5 PF	1.003	77	0	71536	OSP6 PF	1.002	108	0
71946	SALEM G1	1.032	79	19	71947	SALEM G2	1.032	78	19	71948	SALEM G3	1.029	143	39
71949	SALEM G4	1.030	400	116	72869	SBRK G1	1.012	1150	325	72868	NWNGT G1	0.988	406	31
72870	SCHILLER	1.011	48	25*	72871	SCHILLER	1.011	50	25*	72872	SCHILLER	1.011	48	25*
72866	MERMK G1	1.044	113	38	72867	MERMK G2	1.044	320	109	72702	CONEDG1	0.997	168	31
72703	CONEDG2	0.997	168	31	72704	CONEDG3	0.996	195	31	72243	MILLENCT	1.018	273	68
72244	MILLENST	1.014	117	30	72378	BELL #2	1.095	270	150*	72512	BRSWP G1	0.987	280	57
72513	BRSWP G2	0.987	280	57	72986	BERKPWR	1.036	280	46	73072	ALT12 PF	1.029	65	18*
71739	TAUNTON	0.000	0	0	73073	ALT34 PF	1.027	80	18	73069	MAPR1 PF	1.045	56	47*
73080	WSPFLD 3	1.010	107	19	73083	NRTHFD12	1.027	540	156*	73084	NRTHFD34	1.026	540	156*
72930	STNYBK1A	1.043	65	12	71581	STNY_BRK	0.000	0	0	72669	TIVER G1	1.053	189	61
72670	TIVER G2	1.049	92	32	72377	BELL #1	1.095	270	150*	72378	BELL #2	1.095	270	150*

	MW	MX		MW	MX		MW	MX
MILLSTONE	2200	637	MIDDLETOWN	347	54	MONTVILLE	0	0
NORWALK	327	83	BRIDGEPORT	1065	208	NHHARBOUR	370	137
DEVON	212	54	BRAYTONPT	1971	352	MANCHSTRST	425	84
SOMERSET	70	70	OSP	523	0	NEA	249	135
PAWTKTPWR	64	-12	ENRON	124	80	CANAL	1143	359
PILGRIM	702	240	MYSTIC	701	439	NEWBOSTON	0	0
SALEMHBR	700	193	SEABROOK	1150	325	NEWINGTON	937	125
SCHILLER	145	75	MERRIMACK	433	148	STONYBROOK	0	0
WYMAN	723	233	VTYANKEE	502	150	BEARSWAMP	560	114
NORTHFIELD	1080	312	MASSPWR	56	47	GLENBROOK	0	0

INTERFACE FLOWS

NB-NE	712	-45	MEYANKEE-SOUTH	110	-106	MAINE-NH	187	-30
NNE-SCOBIE+394	1789	67	SEABROOK-SOUTH	1421	123	NORTH-SOUTH	1879	86
CMFD/MOORE-SO	171	-7	SNDYPOND-SOUTH	2139	196	CONN EXPORT	-2340	90
CONN-MASS	-966	147	CONN-RI	-337	84	SW CONN IMPORT	1649	249
NORWLK-STAMFORD	1027	-15	BOSTON IMPORT	3573	455	NEMA/BOS IMPORT	4296	451
SEMA/RI EXPORT	2248	299	CONVEX-REMVEC	-690	77	EAST-WEST	892	-97
NY-NE	-8	-71	PV20	142	-11	CT-LI-1385	-5	-61

HVDC TRANSFERS FROM H-Q

CHAT-1	=	0	CHAT-2	=	0	HIGHGATE	=	215
MADAWASK	=	-151	PHII-P1	=	1000	PHII-P2	=	1000
EEL	=	74						

BUS VOLTAGES

				~~~~~							
		V	LMT			V	LMT			V	LMT
72692	NWGTN345	345	357.	72694	SEBRK345	345	357.	71789	TEWKS	345	357.
70759	MYSTIC	345	359.	71797	MILLBURY	345	356.	72925	LUDLOW	345	350.
72926	NRTHFLD	345	359.	73106	SOUTHGTN	345	344.	73108	CARD	345	354.
73109	MONTVILLE	345	355.	73110	MILLSTNE	345	357.	73116	MIDDLTWN	345	351.
71801	BRAYTN P	345	358.	71811	KENT CO.	345	351.	71326	BRIDGWTR	345	354.
71336	SHERMAN	345	356.	71338	OS POWER	345	356.	71337	WFARNUM	345	354.
70772	W MEDWAY	345	355.	70780	WWALP345	345	354.	70783	PILGRIM	345	358.
70773	NEA 336	345	358.	71193	CANAL	345	358.	71133	CARVER	345	355.
70795	FRMNGHAM	230	230.	70793	MDFRM230	230	236.	70794	MDWLT230	230	238.
70818	MYSTC MA	115	113.	71891	SALEM HR	115	119.	73195	DEVON	115	118.
73709	OLD TOWN	115	116.	73710	HAWTHORN	115	116.	73158	WESTON	115	116.
73198	SOUTHGTN	115	118.	73182	HANOVERB	115	117.	73634	COLONY	115	116.
73633	NO. WALLF	115	116.	73227	E. MERIDN	115	116.	73230	HADDAM	115	118.
73231	BOKUM	115	117.	73265	GREEN HL	115	116.	73153	BRANFORD	115	118.
73703	ASHCREEK	115	118.	73700	PEQUONIC	115	118.	73174	PEACEABL	115	115.
71403	WFARNUM	115	116.	72539	WOLFHILL	115	117.	72581	WOOD RIV	115	114.

AREA/ZONE TOTALS

NEPOOL_GEN	25984	NEPOOL_LOAD	27887	NEPOOL_LOSS	713
NEPOOL_INT	-2634				

**Base case summary**

**PK22B.SAV, NE-NY 0, CT IMP 2275, Middletown unit 2,3,4 off.**

GENERATION														
#	V	MW	MX	#	V	MW	MX	#	V	MW	MX			
73538	AESTH PF	1.026	180	80*	73549	SMD1112J	0.000	0	0	73550	SMD1314J	0.000	0	0
73551	NORHAR#1	1.010	159	50	73552	NORHAR#2	1.010	168	50	73553	DEVON#7	1.027	106	47
73554	DEVON#8	1.023	106	47	73555	MIDDTN#2	0.000	0	0	73556	MIDDTN#3	0.000	0	0
73557	MIDDTN#4	0.000	0	0	73558	MONTV#5	0.000	0	0	73559	MONTV#6	0.000	0	0
73562	MILL#2	1.010	940	296	73563	MILL#3	1.002	1260	296	73565	LAKERD#1	1.024	280	97
73566	LAKERD#2	1.024	280	97	73567	LAKERD#3	1.024	280	97	73574	MILFD#1	1.017	280	11
73575	MILFD#2	1.022	280	23	73588	MERIDEN1	1.043	167	104*	73589	MERIDEN2	1.043	167	104*
73590	MERIDEN3	0.000	0	0	73594	WALL LV1	0.000	0	0	73595	WALL LV2	0.000	0	0
73596	WALL LV3	0.000	0	0	73646	BPTHBR#1	0.000	0	0	73647	BPTHBR#2	0.000	0	0
73648	BPTHBR#3	1.003	375	166	73649	BPTHBR#4	0.000	0	0	73651	NH HARBR	0.986	370	118
73652	BE 11	0.988	170	22	73653	BE 12	0.988	170	22	73654	BE 10 ST	0.985	180	22
73085	MT.TOM	0.000	0	0	70365	WF WY #1	1.016	50	9	70366	WF WY #2	1.016	50	9
70367	WF WY #3	1.015	100	18	70368	WF WY #4	1.057	584	213	70386	WBK G1	0.000	0	0
70387	WBK G2	0.000	0	0	70388	WBK G3	0.000	0	0	70705	VTYAK G	0.995	502	150*
71060	MYST G4	0.000	0	0	71061	MYST 5G	0.000	0	0	71062	MYST G6	1.018	136	104*
71063	MYST G7	1.046	565	335*	71064	MYST J1	0.000	0	0	71065	CABOTCMB	0.000	0	0
71094	PLGRM G1	1.049	702	240	71073	N.BOST 1	0.000	0	0	71074	N.BOST 2	0.000	0	0
71084	NEA GTPF	1.051	85	40*	71085	NEA GTPF	1.051	85	40*	71086	NEA STPF	1.066	80	55*
71095	ANPBLCK1	1.090	290	132	71096	ANPBLCK2	1.090	290	132	71251	CANAL G1	1.039	566	239*
71252	CANAL G2	1.017	577	120*	72372	BP #1 GN	1.032	238	118*	72375	BP #2 GN	1.032	241	117*
72370	BP #3 GN	1.019	536	42	72371	BP #4 GN	1.017	421	32	72661	MANCH09A	1.013	99	33
72662	MANCH10A	1.013	99	33	72663	MANCH11A	1.013	99	33	72666	FRSQ SC1	0.996	43	-5
72667	FRSQ SC2	0.995	43	-5	72668	FRSQ SC3	0.993	42	-5	71522	SOM G6	1.003	70	70
71531	OSP1 PF	1.003	77	0	71532	OSP2 PF	1.003	77	0	71533	OSP3 PF	1.002	108	0
71534	OSP4 PF	1.003	77	0	71535	OSP5 PF	1.003	77	0	71536	OSP6 PF	1.002	108	0
71946	SALEM G1	1.032	79	19	71947	SALEM G2	1.032	78	19	71948	SALEM G3	1.029	143	39
71949	SALEM G4	1.030	400	117	72869	SBRK G1	1.013	1150	332	72868	NWNGT G1	0.988	406	32
72870	SCHILLER	1.011	48	25*	72871	SCHILLER	1.011	50	25*	72872	SCHILLER	1.011	48	25*
72866	MERMK G1	1.045	113	39	72867	MERMK G2	1.045	320	111	72702	CONEDG1	0.998	168	32
72703	CONEDG2	0.998	168	32	72704	CONEDG3	0.996	195	32	72243	MILLENCT	1.018	273	68
72244	MILLENST	1.014	117	31	72378	BELL #2	1.095	270	150*	72512	BRSWP G1	0.987	280	57
72513	BRSWP G2	0.987	280	57	72986	BERKPWR	1.037	280	47	73072	ALT12 PF	1.029	65	18*
71739	TAUNTON	0.000	0	0	73073	ALT34 PF	1.028	80	18	73069	MAPR1 PF	1.045	56	47*
73080	WSPFLD 3	1.011	107	19	73083	NRTHFD12	1.027	540	159*	73084	NRTHFD34	1.027	540	159*
72930	STNYBK1A	1.043	65	12	71581	STNY_BRK	0.000	0	0	72669	TIVER G1	1.053	189	61
72670	TIVER G2	1.049	92	32	72377	BELL #1	1.095	270	150*	72378	BELL #2	1.095	270	150*

	MW	MX		MW	MX		MW	MX
MILLSTONE	2200	591	MIDDLETOWN	0	0	MONTVILLE	0	0
NORWALK	327	99	BRIDGEPORT	895	230	NHHARBOUR	370	118
DEVON	212	94	BRAYTONPT	1971	351	MANCHSTRST	425	84
SOMERSET	70	70	OSP	523	0	NEA	249	135
PAWTKTPWR	64	-12	ENRON	124	80	CANAL	1143	359
PILGRIM	702	240	MYSTIC	701	439	NEWBOSTON	0	0
SALEMHBR	700	194	SEABROOK	1150	332	NEWINGTON	937	127
SCHILLER	145	75	MERRIMACK	433	149	STONYBROOK	0	0
WYMAN	784	248	VTYANKEE	502	150	BEARSWAMP	560	115
NORTHFIELD	1080	318	MASSPWR	56	47	GLENBROOK	0	0

INTERFACE FLOWS					
NB-NE	712	-44	MEYANKEE-SOUTH	110	-106
NNE-SCOBIE+394	1842	69	SEABROOK-SOUTH	1432	128
CMFD/MOORE-SO	171	-6	SNDYPOND-SOUTH	2162	194
CONN-MASS	-1005	160	CONN-RI	-360	88
NORWLK-STAMFORD	1027	-32	BOSTON IMPORT	3573	455
SEMA/RI EXPORT	2252	299	CONVEX-REMVEC	-749	84
NY-NE	-5	-104	PV20	141	-11
			MAINE-NH	247	-36
			NORTH-SOUTH	1934	85
			CONN EXPORT	-2400	139
			SW CONN IMPORT	1698	252
			NEMA/BOS IMPORT	4296	451
			EAST-WEST	950	-100
			CT-LI-1385	1	-47

HVDC TRANSFERS FROM H-Q					
CHAT-1	=	0	CHAT-2	=	0
MADAWASK	=	-151	PHII-P1	=	1000
EEL	=	74	HIGHGATE	=	215
			PHII-P2	=	1000

BUS VOLTAGES

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V LMT
72692 NWGTN345 345 357.
70759 MYSTIC 345 359.
72926 NRTHFLD 345 359.
73109 MONTVILE 345 355.
71801 BRAYTN P 345 358.
71336 SHERMAN 345 356.
70772 W MEDWAY 345 355.
70773 NEA 336 345 358.
70795 FRMNGHAM 230 230.
70818 MYSTC MA 115 113. L
73709 OLD TOWN 115 116.
73198 SOUTHGTN 115 118.
73633 NO.WALLF 115 117.
73231 BOKUM 115 117.
73703 ASHCREEK 115 118.
71403 WFARNUM 115 116.
    
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V LMT
72694 SEBRK345 345 357.
71797 MILLBURY 345 356.
73106 SOUTHGTN 345 347.
73110 MILLSTNE 345 357.
71811 KENT CO. 345 351.
71338 OS POWER 345 356.
70780 WWALP345 345 354.
71193 CANAL 345 358.
70793 MDFRM230 230 236.
71891 SALEM HR 115 119.
73710 HAWTHORN 115 115.
73182 HANOVERB 115 117.
73227 E.MERIDN 115 117.
73265 GREEN HL 115 117.
73700 PEQUONIC 115 118.
72539 WOLFHILL 115 117.
    
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V LMT
71789 TEWKS 345 357.
72925 LUDLOW 345 350.
73108 CARD 345 354.
73116 MIDDLETWN 345 352.
71326 BRIDGWTR 345 354.
71337 WFARNUM 345 354.
70783 PILGRIM 345 358.
71133 CARVER 345 355.
70794 MDWLT230 230 238.
73195 DEVON 115 118.
73158 WESTON 115 116.
73634 COLONY 115 117.
73230 HADDAM 115 119.
73153 BRANFORD 115 118.
73174 PEACEABL 115 115.
72581 WOOD RIV 115 114.
    
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AREA/ZONE TOTALS

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NEPOOL_GEN 25982
NEPOOL_INT -2637
    
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NEPOOL_LOAD 27887
    
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NEPOOL_LOSS 714
    
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## 5 Contingency List

### /* 115-kV Normal Contingencies *

No.	Contingency	Description
	CONTINGENCY '1A:1050' /*	L/O MIDLTWN-DOOLEY
	CONTINGENCY '1B:1766' /*	L/O -DOOLEY-WEST SIDE
	CONTINGENCY '2:1206&1975' /*	L/O CT YANKEE-HADDAM LINE 1206 ALSO OPENS 1975
	CONTINGENCY '3:L/O 1206' /*	L/O CT YANKEE-HADDAM 1206 LINE
	CONTINGENCY '4:L/O 1261' /*	L/O BOKUM-HADDAM 1261 LINE
	CONTINGENCY '5:L/O 1342' /*	L/O BOKUM-GREEN HILL 1342 LINE
	CONTINGENCY '6:L/O 1355' /*	L/O COLONY-SOUTHINGTON-HANOVER 1355 Line
	CONTINGENCY '7:1443&1759' /	L/O MIDD-PORTLAND-HOPEWELL 1759 Line
	CONTINGENCY '8:L/O 1460' /*	L/O BRANFORD RR-E.SHORE LINE
	CONTINGENCY '9:L/O 1466' /*	L/O EAST MERIDEN-N. WALLINGFORD 1466 LINE
	CONTINGENCY '10:L/O 1508' /*	L/O GREEN HILL-BRANFORD 1508 LINE -STEPSTONE- GREEN HILL 1508 LINE
	CONTINGENCY '11:L/O 1537' /*	L/O BRANFORD RR-BRANFORD LINE
	CONTINGENCY '13:L/O 1588' /*	L/O N. WALLINGFORD-COLONY 1588 LINE
	CONTINGENCY '14:L/O 1610' /*	L/O GLENJ-MIX-SOUTH LINES
	CONTINGENCY '15:L/O 1620' /*	L/O MIDDLETOWN-BOKUM 1620 LINE
	CONTINGENCY '16:L/O 1620N' /*	L/O MIDDLETOWN-HADDAM 1620N LINE
	CONTINGENCY '17:L/O 1620S' /*	L/O HADDAM-BOKUM 1620S LINE
	CONTINGENCY '18:L/O 1630' /*	L/O SOUTH-WALLPF LINE
	CONTINGENCY '19:L/O 1640' /*	L/O DEVON-WALLPF LINE
	CONTINGENCY '20:L/O 1655' /*	L/O BRANFORD-NORTH HAVEN 1655 LINE
	CONTINGENCY '21:L/O 1670' /*	L/O BERLIN-SOUTHINGTON-BLACK ROCK 1670 LINE
	CONTINGENCY '22:L/O 1685' /*	L/O DEVON JUNE ST LINE
	CONTINGENCY '23:L/O 1690' /*	L/O DEVON-SOUTHINGTON-HANOVER 1690 Line
	CONTINGENCY '24:L/O 1765' /*	L/O WEST SIDE-BERLIN 1765 Line
	CONTINGENCY '25:L/O 1767' /*	L/O HOPEWELL-MANCHESTER 1767 Line
	CONTINGENCY '26:L/O 1771' /*	L/O SOUTHINGTON-BERLIN LINE
	CONTINGENCY '27:L/O 1975' /*	L/O HADDAM-EAST MERIDEN 1975 line
	CONTINGENCY '28:L/O 8100' /*	L/O 8100 LINE ENG-ENGLISH
	CONTINGENCY '29:L/O 8200' /*	L/O E.SHORE-GRANDAVE LINE
	CONTINGENCY '30:L/O 8300' /*	L/O QUINNIPIAC-MILL RIVER 8300 line

CONTINGENCY '31:L/O 8301' /* L/O MILL RIVER-GRAND AVE 8301 line  
 CONTINGENCY '32:L/O 8600' /* L/O NORTH HAVEN-QUINNIPIAC 8600 line  
 CONTINGENCY '33:L/O 1752' /* L/O BERLIN- Rocky Hill 1752 Line  
 CONTINGENCY '34:L/O 1773' /* L/O Rocky Hill- South Meadow 1773 Line  
 CONTINGENCY '35:L/O 1572 & 1772' /* L/O Middletown-P&W-CT Yankee 1572 &1772 Line

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 /*  
 / * 115-kV Double Circuit Towers (-) *  
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No.	Contingency	Description
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CONTINGENCY '33:1261-1620' /* L/O BOKUM-HADDAM-BOKUM-MIDD LINES  
 CONTINGENCY '34:1620S1261' /* L/O HADDAM-BOKUM - HADDAM-Bokum LINES  
 CONTINGENCY '35:1620-1975' /* L/O MIDD-BOKUM-E.MERIDEN-HADDAM LINES  
 CONTINGENCY '36:1620N1975' /* L/O HADD-MIDDLETOWN-E.MERIDEN-HADDAM LINES  
 CONTINGENCY '37:1630-1640' /* L/O SOUHINGTON-WALL-DEVON LINES  
 CONTINGENCY '38:1640-1690' /* L/O DEVON- LINES

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 / * *  
 / * 115-kV Breaker Failures (/) *  
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CONTINGENCY '39:1460/1537' /* BRANFORD RR STK BKR L/O 1460&1537  
 CONTINGENCY '40:1508/1537' /* BRANFORD 4T STK BKR L/O 1508&1537  
 CONTINGENCY '41:1537/1655' /* BRANFORD 2T STK BKR L/O 1508&1655  
 CONTINGENCY '42:1640/1685' /* DEVON STK BKR  
 CONTINGENCY '43:161084004' /* MIX STK BKR  
 CONTINGENCY '44:1620N1206' /* HADDAM STK BKR L/O 1620N&1206  
 CONTINGENCY '45:1620S1975' /* HADDAM STK BKR L/O 1620S&1975  
 CONTINGENCY '46:1261/1620' /* BOKUM STK BKR  
 CONTINGENCY '47:1355/1588' /* COLONY STK BKR L/O 1355&1588  
 CONTINGENCY '48:1466/1588' /* NORTH WALLINGFORD STK BKR  
 CONTINGENCY '49:1466/1975' /* EAST MERIDEN STK BKR1466/1975  
 CONTINGENCY '50:1765/1050' /* WESTSIDE STK BKRL/O 1765/1050&  
 CONTINGENCY '51:1767/1443' /* HOPEWELL STK BKRL/O 1767/1443&1759  
 CONTINGENCY '52:1670/1771' /* SOUTHINGTON STK BKR  
 CONTINGENCY '53:1355/1610' /* SOUTHINGTON E.STK BKR  
 CONTINGENCY '54:1610/1630' /* SOUTHINGTON W.STK BKR

CONTINGENCY '55:1752/1765' /* BERLIN STK BKR

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 / *  
 / * **345-kV Normal Contingencies** *  
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CONTINGENCY '55:L/O 310' /* L/O MILLSTONE-MANCHESTER 310 LINE  
 CONTINGENCY '56:L/O 318' /* L/O SOUTHINGTON-MERIDEN POWER 318 LINE

No.	Contingency	Description
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CONTINGENCY '57:330wAUTO' /* L/O CARD-LAKE ROAD 330wAuto line  
 CONTINGENCY '58:330-LKRD' /* L/O CARD-LAKE ROAD 330wAuto line  
 CONTINGENCY '59:L/O 347' /* L/O Lake Road-Sherman 347 line  
 CONTINGENCY '60:347-LKRD' /* L/O Lake Road-Sherman 347 line  
 CONTINGENCY '61:348wAUTO' /* L/O MILL-SOUTH-SOUTHB-Auto  
 CONTINGENCY '62:L/O 348W' /* L/O HADDAM-SOUTH-SOUTHB-Auto  
 CONTINGENCY '63:348WwAUTO' /* L/O HADDAM-Auto-SOUTH-SOUTHB-Auto + HADDAM-MP  
 CONTINGENCY '64:L/O 348E' /* L/O MILLSTONE-HADDAM  
 CONTINGENCY '65:L/O 353' /* L/O SCOVIL ROCK-MANCHESTER 353 LINE  
 CONTINGENCY '66:L/O 362' /* L/O HADDAM NK-MERIDEN LINE  
 CONTINGENCY '67:364wAUTO' /* L/O Haddam Neck-Montville 364wAuto  
 CONTINGENCY '68:L/O 368' /* L/O CARD-MANCHESTER LINE  
 CONTINGENCY '69:371wAUTO' /* L/O Millstone-Montville 371wAuto  
 CONTINGENCY '70:L/O 376' /* L/O SCOVIL ROCK-HADDAM NECK 376 LINE  
 CONTINGENCY '71:L/O 383' /* L/O MILLSTONE-CARD 383 LINE  
 CONTINGENCY '72:387wAUTOS' /* L/O SCOVIL ROCK-E.SHORE & AUTOS & CSC  
 CONTINGENCY '73:L/O 384' /* L/O SCOVIL ROCK-MIDDLETOWN 384 LINE

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 / *  
 / * **345-kV Double Circuit Towers (-)** *  
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CONTINGENCY '74:310-348' /* L/O MILLSTONE-MANCHESTER & MILLSTONE-SOUTHINGTON LINES  
 CONTINGENCY '75:310-348E' /* L/O MILLSTONE-MANCHESTER & MILLSTONE-HADDAM LINES  
 CONTINGENCY '76:310-368' /* L/O MILL-MANCH-CARD-MANCH LINES  
 CONTINGENCY '77:348-387' /* L/O SOUTHINGTON-MP SCOVIL-E.Shore & CSC  
 CONTINGENCY '78:348W-387' /* L/O SOUTHINGTON&Auto-HADDAM&Auto & SCOVIL-E.Shore-CSC & HAD-MP  
 CONTINGENCY '78A:348W-387' /* L/O SOUTHINGTON&Auto-HADDAM & SCOVIL-E.Shore & CSC

CONTINGENCY '79:353-1767' /* L/O MANCH-HOPE-PORTJ-SCOVIL LINE

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/ *  
/ * 345-kV Breaker Failures (/) *  
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CONTINGENCY '80:310/395' /* MANCHESTER STBKR L/O 310 & 395 LINES

CONTINGENCY '81:330/368' /* CARD STKBKR L/O 330 & 368 & 383 LINES

CONTINGENCY '82:330/368LR' /* CARD STKBKR L/O 330,368, 383, & LAKE ROAD UNITS

CONTINGENCY '83:348W/348E' /* HADDAM 11C STK BKR L/O HADMwAuto-SGTONwAuto & MP-HADM

CONTINGENCY '84:L/O 384' /* SCOVILL ROCK - MIDDLETOWN