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White Plains, New York 10601
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New York Power Authority

John C. Brons
Executive Vice President
Nuclear Generation

Dec. 28, 1990
JPN-90-077

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop P1-137
Washington, D.C. 20555

SUBJECT: James A. FitzPatrick Nuclear Power Plant
Docket No. 50-333
Request for Additional Information Regarding the Reliability of Manual Bus Transfers Between Onsite and Offsite Power Supplies

REFERENCE: 1. NRC letter, D. E. LaBarge to J.C. Brons, dated May 18, 1990, "Reliability of Manual Bus Transfers between Onsite and Offsite Power Supplies – James A. FitzPatrick Nuclear Power Plant."

Dear Sir:

In Reference 1 the NRC staff transmitted questions about the FitzPatrick plant electrical distribution system. These questions address the reliability of manual bus transfers between onsite and offsite power supplies. Attachment 1 to this letter provides the Authority's response.

If you have any questions, please contact Mr. J. A. Gray, Jr.

Very truly yours,

John C. Brons
Executive Vice President
Nuclear Generation

cc: Next page

A001

cc: Regional Administrator
U. S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, Pennsylvania 19400

Office of the Resident Inspector
U. S. Nuclear Regulatory Commission
Post Office Box 136
Lycoming, New York 13093

David E. LaBarge
Project Directorate I-1
Division of Reactor Projects I/II
U. S. Nuclear Regulatory Commission
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Washington, D. C. 20555

ATTACHMENT 1 to JPN-90-077

RESPONSE TO NRC QUESTIONS

New York Power Authority

JAMES A. FITZPATRICK NUCLEAR POWER PLANT
Docket No. 50-333

The questions are numbered as they appear in Reference 1. To clarify the response, however, questions 1 and 2 are separated into component parts.

Question 1.

a. Motors rated at 575 volts are powered from the 600 V buses at the FitzPatrick facility. Motors are usually rated for continuous service over a range of 0.90 pu to 1.10 pu of their rated voltage. When the offsite Preferred Power System (PPS) is at 122 kV, the 600 V buses are at 648 V which is 1.13 pu. Neglecting any tolerance contributions, this exceeds the allowed 1.10 pu. Under some conditions e.g., when the motor load is less than rated, this excess could be acceptable; however the licensee must provide justification to support the adequacy of the FitzPatrick design.

b. In addition, the basis to support that 122 kV is the absolute maximum grid voltage is also required.

c. No mention is made in the FSAR or Technical Specifications (TS) of overvoltage protection.

d. It appears that, in attempting to avoid transient low voltages, NYPA may be continuing the practice of allowing 1.13 pu as a potential steady state motor voltage while attempting to minimize low voltage conditions in parts of the distribution system.

Response to Question 1, Part a.

Stone and Webster calculation 14620-E-77 (Attachment 2) also calculates approximately 648 V at the load center bus assuming no load. The calculation assumes the following conditions:

- o Reserve transformer is on the 116 kV tap (as it is set currently).
- o Load center transformers are on the 4050 V tap (as they are set currently).
- o No-load is defined as 1 megavolt ampere (MVA) on each Reserve Station Service Transformer (RSST) and 1 kilovolt ampere (kVA) load on the load center.

Run 9153 of calculation 14620-E-77 shows the present configuration for the 115 kV to 4 kV transformation. At no load and 122 kV on the 115 kV bus, the 4 kV bus is at 1.09 pu (4360 V) on 4 kV base (See page 6, Figure 3 and data on pages 12 through 15). Run 101 show the 4 kV to 600 V transformation at no load (See page 6, Figure 3 and data on page 16). The theoretical no-load, motor running voltage would be 633.65 V (1.102 pu) on the 575 V base. While the 1.10 pu standard is exceeded, this condition exists only under unrealistically low or no-load conditions. With any loading on the 600 V bus, the motor terminal voltage would drop below the acceptable 1.10 pu upper limit.

The normal shutdown loads (light load condition) are shown on Table 1 indicating 5 to 7 MVA for each of the two RSSTs. The loads include lighting, heating, ventilation, instrumentation, equipment cooling, and other operating equipment. Using these normal shutdown load values, the load center bus voltage is 628 V, which is within the motor design range of 546 to 633 V.

TABLE 1
Normal Shutdown Loads

Transformer	(MW)	(MVAR)*	(MVA)
T-2	3.9	3.4	5.2
T-3	5.6	4.5	7.2

*megavolt-amperes reactive

Response to Question 1, Part b.

The normal maximum voltage of the Offsite Preferred System is 121 kV. This is based on the Niagara Mohawk operating guideline of +5% for the 115 kV lines which is the continuous voltage rating for this equipment. Niagara Mohawk limits voltage under normal conditions to 120 kV (See Attachment 5.)

The Authority used the 122 kV value to envelope the voltage calculation (Attachment 2), not to set the maximum grid voltage limit. The Authority commissioned this study in response to an NRC letter issued August 12, 1976 requesting degraded voltage information. The results of the study were included in an update of the FitzPatrick Final Safety Analysis Report in 1982.

Response to Question 1, Part c.

The Niagara Mohawk Regional Control Center monitors and controls the 115 kV grid. To maintain required 115 kV levels, the Center can adjust load tap changers and/or generation facilities. The FitzPatrick operators routinely monitor the 115 kV grid voltage. In addition, the FitzPatrick plant computer monitors the 115 kV buses and is set to alarm in the control room on high voltage.

Response to Question 1, Part d.

The Part a response shows that the Authority does not operate motors at 1.13 pu. Under no-load conditions with a grid voltage of 122 kV only 1.102 pu (575 volt base) exists. See response to Question 1, Part a.

Question 2.

a. During the past two years the NRC and NYPA have discussed the 25 degree phase shift between the Normal Power Supply (NPS) (i.e., the main generator and T4) and the PPS when the Main Generator is above some power level and near full power. This phase shift was the reason for the request to eliminate the TS requirement to manually transfer one safety division to the PPS when the emergency diesel generator (EDG) associated with that safety division was inoperable.

b. Provide details of all current operating conditions, including testing and emergency conditions, which require manual transfer.

Response to Question 2, Part a.

Niagara Mohawk has permanently installed a power transformer between the 345 kV system and the 115 kV system at the Oswego steam station. By connecting the two systems near the FitzPatrick plant, the phase shift between reserve power supply and normal power supply has been virtually eliminated. Niagara Mohawk has obtained a spare power transformer to be used to back up this transformer as well as other transformers in the system. This ensures that the phase shift can be kept at almost zero.

Response to Question 2, Part b.

A manual transfer is required during planned and controlled shutdowns and start-ups of the plant.

Currently, the Authority also performs a manual transfer during the monthly full load test of the emergency diesel generators. The Authority tests the diesels in parallel with reserve power.

There are no emergency conditions that require manual transfer.

Question 3.

Provide details of any long term corrective action, such as automatic fast transfer, that is being considered to improve the overall system reliability.

Response to Question 3.

The FitzPatrick plant has a good record of system reliability. The plant currently has automatic transfer capability from normal to reserve power. The Authority is not considering an automatic transfer scheme which would be initiated by the operator. Such a design would not improve reliability, because:

a. Niagara Mohawk Power Corporation has made system improvements to the 115 kV system. They have installed a transformer which has reduced the phase angle between 115 kV and the 345 kV system to almost zero. This removes much of the risk of circuit breaker trip as a result of circulating current during a manual transfer.

b. An automatic transfer system affecting four circuit breakers, would be complex and costly. It would not improve reliability. On the contrary, reliability would be reduced, because more devices would be introduced into the fault tree, and additional equipment would need to be maintained and calibrated. The Authority discussed these issues with the NRC at a meeting at NRC headquarters in Rockville, Maryland in March 1988.

Question 4.

Provide details on the coordination of the FitzPatrick reactor operations with the system load dispatchers, during all seasonal conditions, to assure that the PPS is adequate to provide power to the unit's safety-related buses and loads.

Response to Question 4.

The Energy Control Center (ECC) in Marcy, New York is the dispatch and control center for the Authority. As described in the Authority's Operating Policy 1-0 (Attachment 3), the FitzPatrick plant follows the ECC's operating direction and keeps the ECC informed of operations such as:

- o Unscheduled events including changes in plant status, loss of transmission lines, breaker operations, oscillograph operations, loss of any equipment that might affect plant operation, and power deratings.
- o Plant restoration to service or output change.
- o Operation of all transmission line and plant breakers except those out on clearance.
- o Removal of bulk power equipment from service.
- o Any change in the generation schedule.
- o Exceeding maximum normal rating by bulk power equipment.
- o Any condition that could significantly affect the bulk power system or plant operation.

For all seasonal conditions, four groups coordinate reserve power. When a change in reserve power occurs, the identifying or requesting group makes at least two contacts. This ensures coordination and dissemination of information.

The FitzPatrick control room contacts the Nine Mile Point 1 control room and the Authority's Energy Control Center.

The Authority's Energy Control Center contacts the FitzPatrick control room and the Niagara Mohawk Regional Control Center.

The Niagara Mohawk Regional Control Center contacts the Authority's Energy Control Center and the Nine Mile Point 1 control room.

The Nine Mile Point 1 control room contacts the FitzPatrick control room and the Niagara Mohawk Regional Control Center.

As a member of the New York Power Pool, the Authority observes the requirements of the New York Power Pool Operating Committee Manual Operating Policy 1-16 (Attachment 4). This Operating Policy defines the various operating states of the bulk power system and delineates the authority and responsibility of the New York Power Pool members for each of these states. Should the system depart from the normal state because of capacity deficiencies, energy deficiencies, loss of generation or transmission facilities, voltage levels (including overvoltage), fuel emergencies, or air pollution episodes, the objective is to return the system to the normal state as quickly as possible.

This Operating Policy has been in effect since June 26, 1989 and has generally functioned well. However, in the past month, the FitzPatrick plant experienced an incident during which Niagara Mohawk removed a line from service under non-emergency conditions without providing the Authority with prior notification. The Authority plans a meeting with Niagara Mohawk to resolve this problem.

References:

1. NRC letter, D. E. LaBarge to J. C. Brons, dated May 18, 1990, "Reliability of Manual Bus Transfers between Onsite and Offsite Power Supplies - James A. FitzPatrick Nuclear Power Plant."
2. NYPA letter, J. C. Brons to NRC, dated September 4, 1990, "Three-Phase Bolted Fault," (JPN-90-060).
3. Niagara Mohawk memo, C. Nadeau to P. Nelson, dated November 30, 1990, agreed to maintain bus voltage at Nine Mile Point no higher than 120 kV under normal circumstances.

ATTACHMENT 2 to JPN-90-077

VOLTAGE CALCULATION

New York Power Authority

JAMES A. FITZPATRICK NUCLEAR POWER PLANT
Docket No. 50-333

Client PASNY Location FITZPATRICK Ext. No. J.O. No. 11825.10
Subject VOLTAGE PROFILE - EMERGENCY BUSES Date 9-17-76 By W[illegible]
FED FROM RESERVE STATION SERVICE (RSS) TRANSFORMER Checked 10-27-76 By [illegible]
Based on Revised By

PURPOSE: THE PURPOSE OF THIS CALCULATION IS TO ANALYZE VOLTAGE AT EMERGENCY BUSES FOR VARIOUS GRID SYSTEM VOLTAGES - REQUESTED BY PASNY BY LETTER DATED AUG-24-1976 FOR RESPONSE TO NRC REQUEST.

METHOD: USE INPUT DATA OF WANG ADVANCED PROGRAMMING CALCULATOR PROGRAMS VII (3 WINDING TRANSF. VOLTAGE PROFILES) & IV (LOW VOLTAGE SYSTEM PROFILES)

ASSUMPTIONS: THE 115KV BUS IS AN INFINITE BUS BECAUSE LIGHTHOUSE HILL LINE HAS VOLTAGE REGULATION.

CONCLUSIONS: THE VOLTAGE PROFILES FOR THE EMERGENCY BUSES ARE SATISFACTORY FOR TRANSFORMER TAP SETTINGS OF 119 ON RSS & 4050 ON LOAD CENTERS. HOWEVER LOWERING LOAD CENTER TRANSFORMER TAPS TO 3950 AS SHOWN ON FIG. 2 P.5 OF 35 OPTIMIZES THE EMERGENCY BUS VOLTAGE LEVELS FOR NORMAL OPERATING RANGE OF GRID SYSTEM VOLTAGE AS WELL A DEGRADED GRID SYSTEM VOLTAGE OF 115KV.

A 0610.18

STONE & WEBSTER ENGINEERING CORPORATION

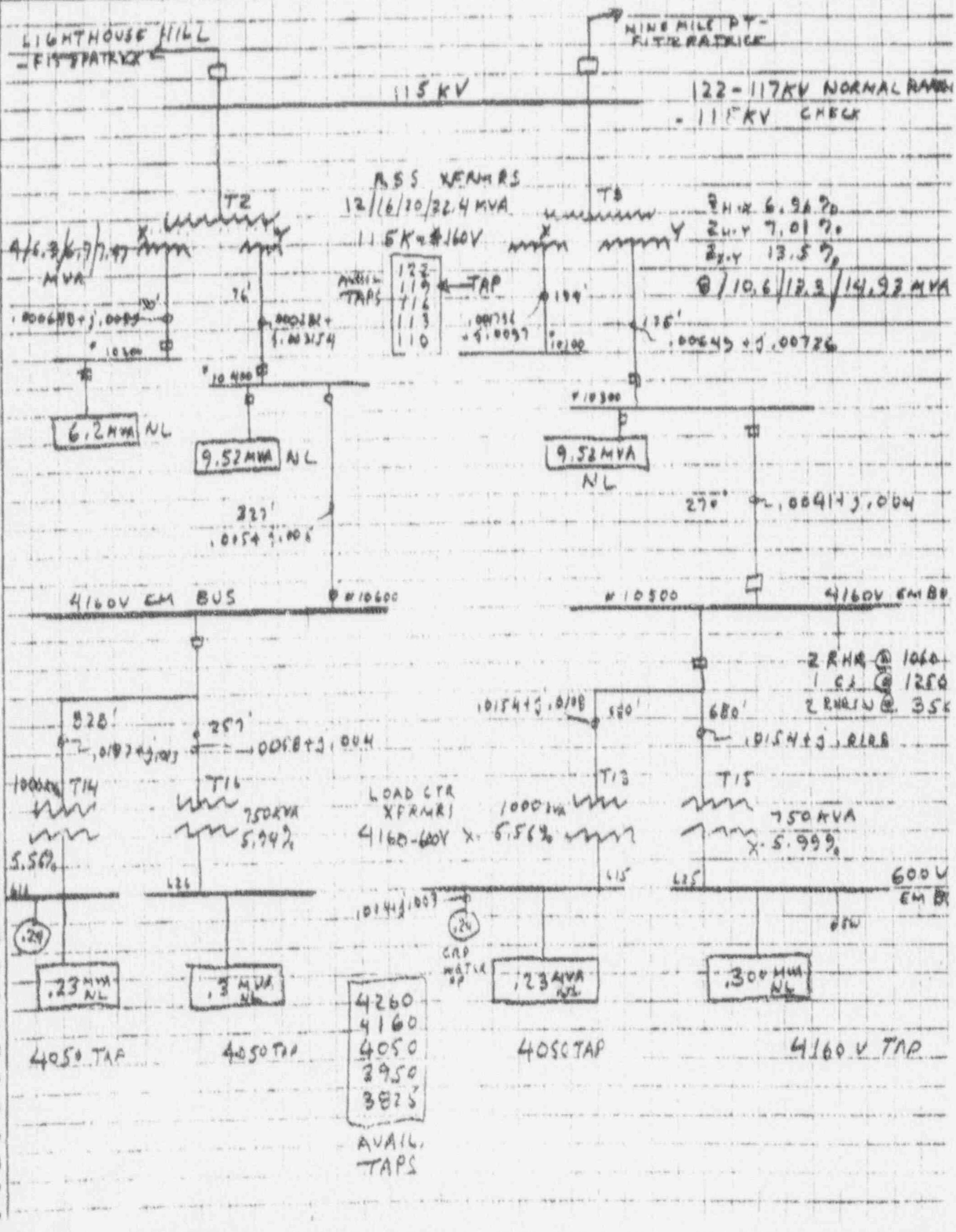
CALCULATION SHEET

Client PASNY | Location FITZPATRICK | Est. No. | J.O. No. 11825.19

Subject VOLTAGE PROFILE - | Date 9-17-76 | By WG

Checked 10-27-76 | By JAW

Based on DATA, DRAWINGS, MFR PRINTS | Revised | By



Client PASNY Location FITZPATRICK J.O. No. 11825
Subject VOLTAGE PROFILE Date 9-17-76 By WG
Checked 10-27-76 By JAW
Revised By
Based on

THE VOLTAGES ON THE EMERGENCY BUSES WERE ANALYZED FOR VARIOUS LOADS & VARIOUS GRID SYSTEM VOLTAGES. THE FOLLOWING CASES WERE RUN:

CASE 1. - FIG 1 (PAGE 4 OF 35 & REFERENCED RUNS)
PRESENT TAP SETTINGS ON THE RESERVE STATION SERVICE TRANSFORMER & LOAD CENTER TRANSFORMERS, 119KV & 4050 RESPECTIVELY

CASE 2. FIG 2 (PAGE 5 OF 35 & REFERENCED RUNS)
LOWERING LOAD CENTER TAPS TO 3950

CASE 3 FIG 3 (PAGE 6 OF 35 & REFERENCED RUNS)
LOWERING RSS TRANSFORMER TAP ONLY TO 116KV

CASE 4 FIG 4 (PAGE 7 OF 35 & REFERENCED RUNS)
LOWERING RSS TRANSF TAP TO 116KV
& " LOAD CENTER TAPS TO 3950.

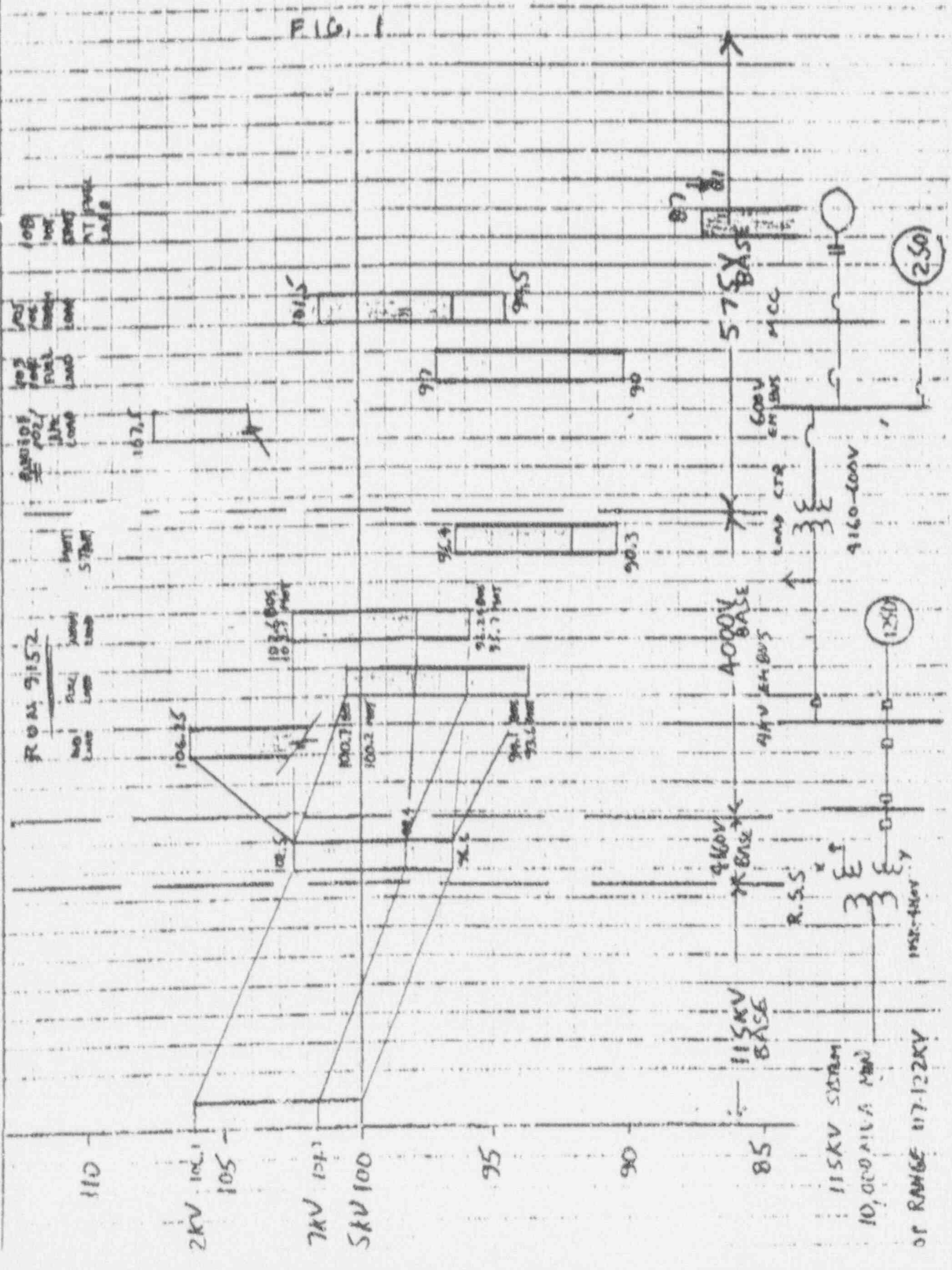
Client PASNY — Location FITZPATRICK — J.O. No. 11825.10

Subject VOLTAGE PROFILE - ESSENTIAL BUSES — Date 9-16-76 — By WG

ON RESERVE STATION SERVICE TRANSFOR & 113KV TAP — Checked 10-22-76

Based on CALC. PROGRAM RUNS — Revised

FIG. 1



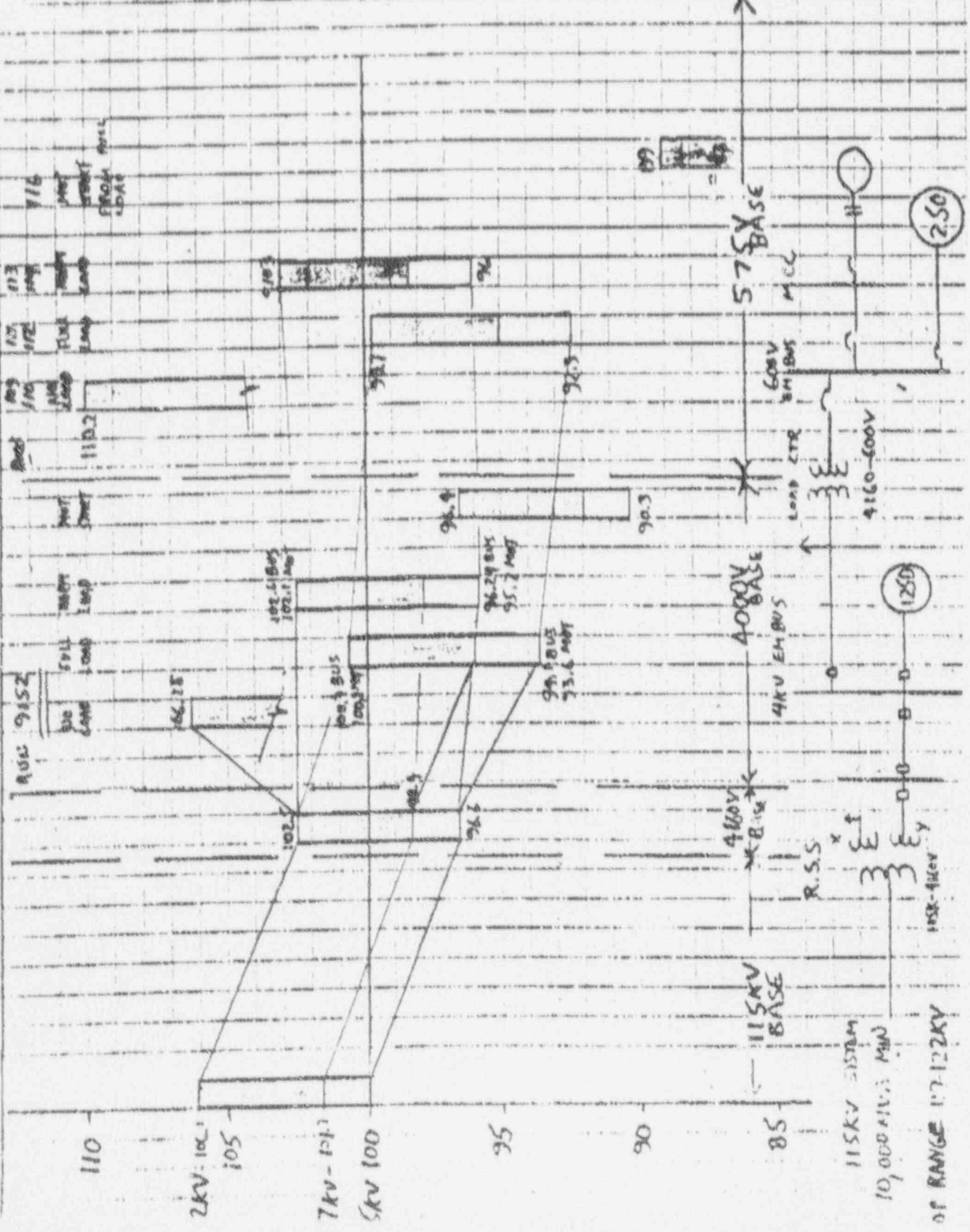
Client PASNY Location FITZPATRICK J.O. No. 11825.10

Subject VOLTAGE PROFILE - ESSENTIAL BUSES Date 9-16-76 By WG

ON RESERVE STATION SERVICE TRANSFORMER 119 KV TAP Checked 10-27-76 By

Based on CALC. PROGRAM RUNS Revised

FIG. 2



CALCULATION SHEET

E-7

Page 6 OF 35

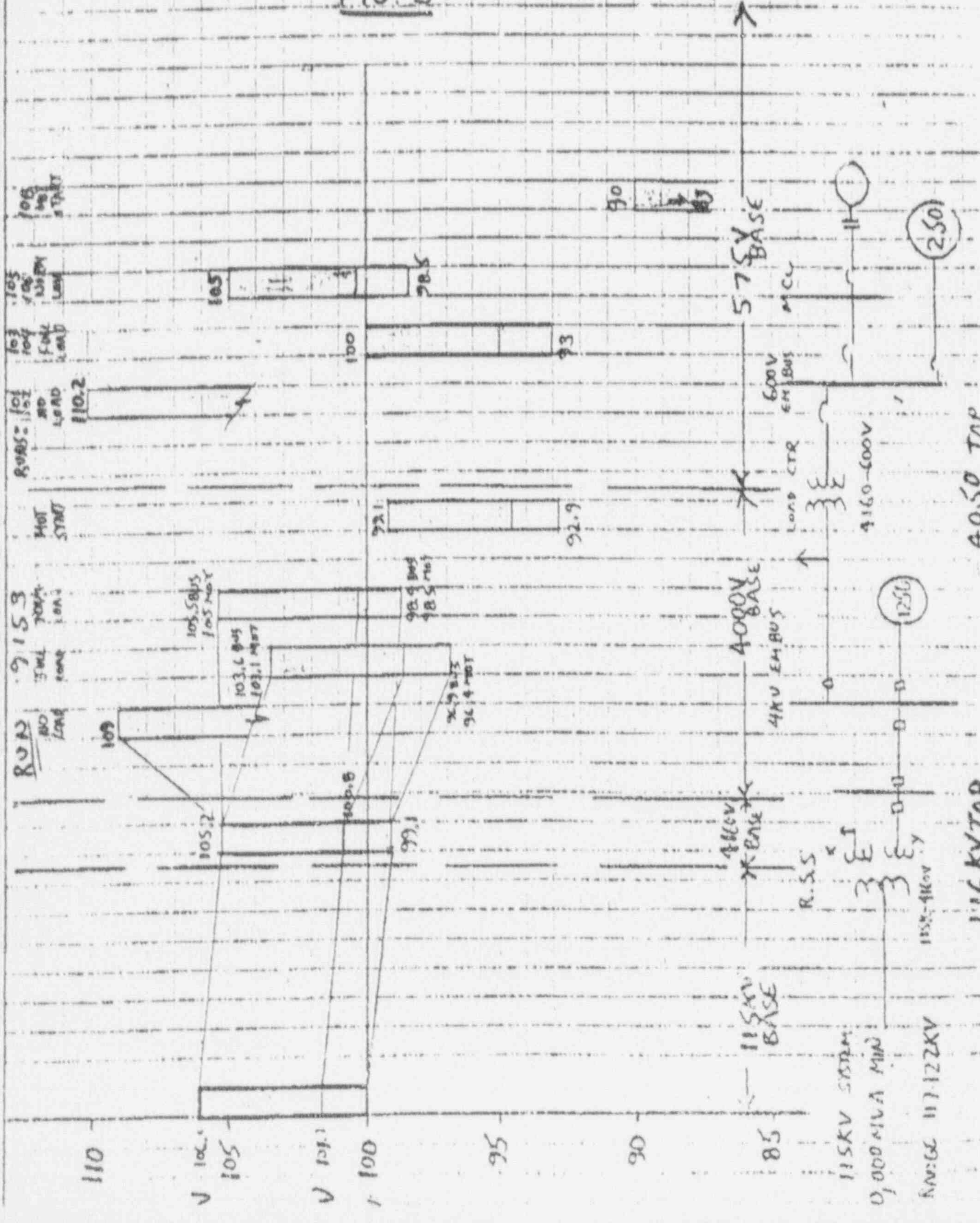
Client: PASNY — Location: FITZPATRICK — J.O. No. 11825.10

Subject: VOLTAGE PROFILE - ESSENTIAL BUSES — Date: 9-16-76 — By: WG

ON RESERVE STATION SERVICE TRANSFORMER 116KV TAP — Checked: 10-27-76 — By: [illegible]

Based on: CALC. PROGRAM RUNS — Revised — By

FIG. 3



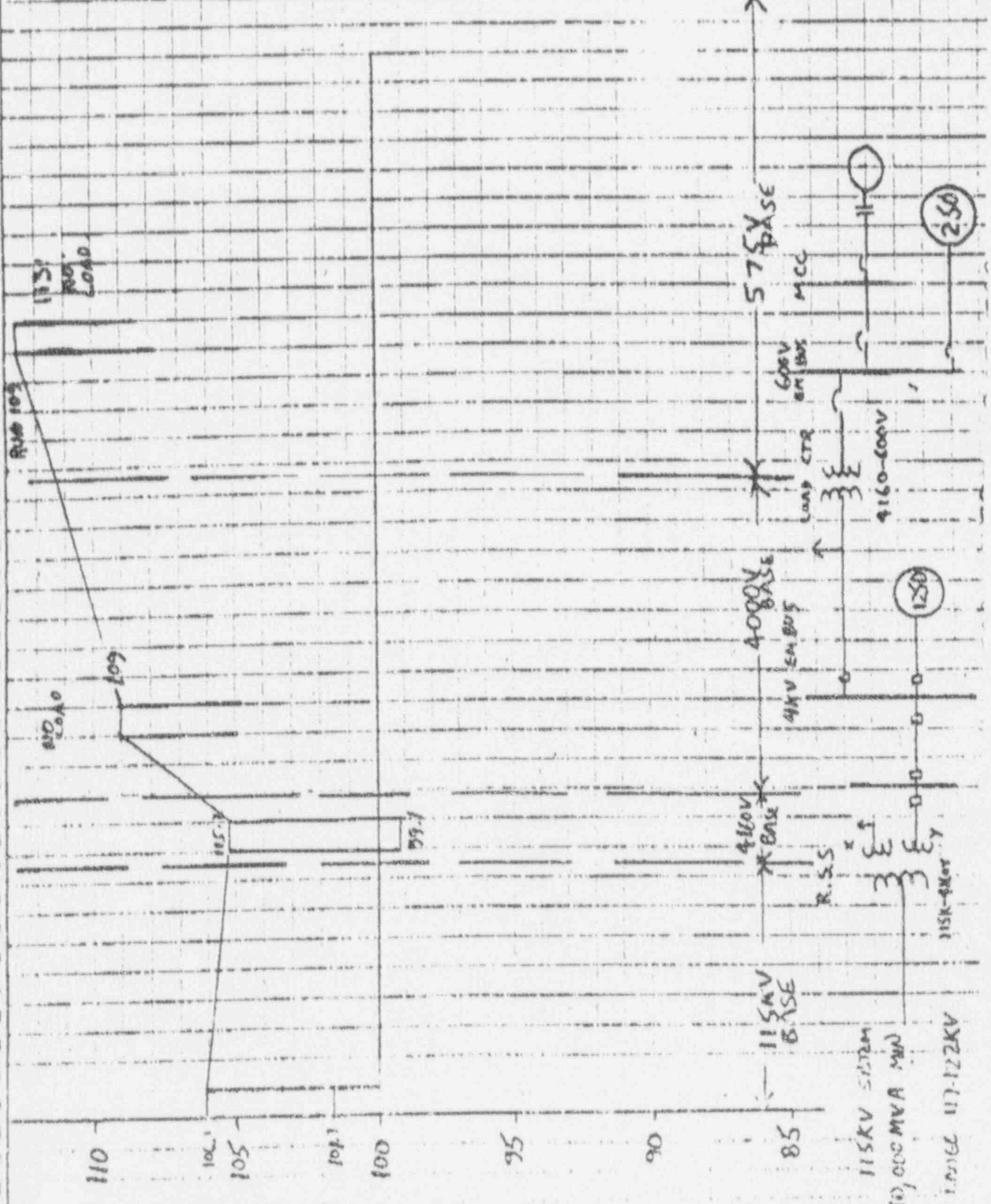
Client PASNY　Location FITZPATRICK　Est. No.　J.O. No. 11825.10

Subject VOLTAGE PROFILE - ESSENTIAL BUSES　Date 9-11-76　By WG

ON RESERVE STATION SERVICE TRANSFORMER 116KV TAP　Checked 10-27-76　By GAW

Based on CALC. PROGRAM RUNS　Revised　By

FIG 4



CHECKED BY [signature]
DATE 10-27-76

THREE-WINDING
STATION SERVICE TRANSFORMER IMPEDANCES

X000000006826ex0 PROGRAM VERIFICATION NO.

JOB ORDER NO. 11825.10 CLIENT PASNY PLANT FITZPATRICK

RUN NO. #9152 BY WG DATE 9-17-76

* 1. 22.40 MVA, TOP PRIMARY RATING

* 2. .56 RATING MULTIPLIER [Use 1 for OA or FOA, 0.75 for OA/FA, 0.6 for triple-rated]

* 3. 7.47 MVA, HIGHER VOLTAGE SECONDARY TOP RATING ((X WINDING)

* 4. 16.93 MVA, LOWER VOLTAGE SECONDARY TOP RATING (Y WINDING)

* 5. - PERCENT IMPEDANCE, Z_{H-X}, ON SECONDARY LOWEST MVA BASE

6. - PERCENT IMPEDANCE, Z_{H-Y}, " " " " "

or

7. 6.96 PERCENT IMPEDANCE, Z_{H-X}, ON PRIMARY LOWEST MVA BASE

* 8. 7.01 PERCENT IMPEDANCE, Z_{H-Y}, " " " " "

9. 13.50 PERCENT IMPEDANCE, Z_{X-Y}, " " " " "

10. .24 PERCENT IMPEDANCE, Z_H , " " " " "

11. 6.73 PERCENT IMPEDANCE, Z_X , " " " " "

12. 6.78 PERCENT IMPEDANCE, Z_Y , " " " " "

5. 2.32 PERCENT IMPEDANCE, Z_{H-X}, ON SECONDARY LOWEST MVA BASE

6. 4.67 PERCENT IMPEDANCE, Z_{H-Y}, " " " " "

* 13. 194.00 FT., SECONDARY LEADS, X WINDING

* 14. 175.00 FT., SECONDARY LEADS, Y WINDING

* 15. 4.16 KV, RATING OF X WINDING

* 16. 4.16 KV, RATING OF Y WINDING

** 17. .001796 + j .009700 OHMS PER PHASE, X WINDING SECONDARY LEADS

** 18. .006490 + j .007260 OHMS PER PHASE, Y WINDING SECONDARY LEADS

19. .000186 pu, Z_H — ON 1 MVA BASE

20. .000063 + j .006165 pu, Z_X + SECONDARY LEADS — ON 1 MVA BASE

21. .000755 + j .006066 pu, Z_Y + SECONDARY L[illegible] — ON 1 MVA BASE

* 22. 16.40 MVA, OTHER LOCAL LOAD ON PRIMARY SOURCE

* 23. 100[illegible] MVA, MIN. 15000 MAX. SHORT CIRCUIT FROM PRIMARY SOURCE

* Input by engineer ** Reviewed by engineer

DATA SHEET 18

STATION SERVICE SYSTEM CALCULATIONS
THREE-WINDING TRANSFORMER
PROGRAM VERIFICATION NO.
X.00000000669Oex0

CHECKED BY JAW
DATE 10-27-76

JOB ORDER NO. 11825.10 CLIENT PASNY PLANT FITZPATRICK

RUN NO. 9152 BY WG DATE 9-17-76

1. 143.1 MVA, TRANSFORMER X WINDING MIN. CONTRIBUTION TO BUS FAU...
2. 145.3 MVA " Y WINDING " " " " "

MAXIMUM SUSTAINED LEVEL OF NO-LOAD PRIMARY SOURCE VOLTAGE:

** 3. 106.08 PERCENT OF NOMINAL VALUE

** 4. 95.50 PERCENT, MIN. VALUE COL. 7 TO SATISFY LOAD CENTER SUB. REQ'T

* 5. 115.00 KV, NOM. **[illegible] KV TAP, PRIMARY

STEADY-STATE VOLTAGE PROFILE

(1) NO LOAD SOURCE %	(2) NO LOAD SOURCE KV	(3) TRANSF. PRI. PU	(4) X WINDING BUS, PU	(5) X WINDING MOTOR, %	(6) Y WINDING BUS, PU	(7) Y WINDING MOTOR, %
LIGHT LOAD:						
106.08	121.99	1.0607	1.0624	105.75	1.0625	105.76
103.47	118.99	1.0346	1.0361	103.11	1.0362	103.13
101.75	117.01	1.0174	1.0187	101.38	1.0189	101.39
100.00	115.00	.9999	1.0011	99.61	1.0012	99.63
NEW TAP:	116.00					
106.08	121.99	1.0607	1.0901	108.51	1.0902	108.52
103.47	118.99	1.0346	1.0631	105.81	1.0632	105.82
100.87	116.00	1.0086	1.0362	103.12	1.0363	103.13
100.00	115.00	.9999	1.0272	102.22	1.0273	102.23
FULL LOAD:						
106.08	121.99	1.0589	1.0630	105.81	1.0361	103.11
100.00	115.00	.9980	.9983	99.34	.9691	96.42
95.00	109.25	.9480	.9449	93.99	.9135	90.85
99.17	114.04	.9897	.9895	98.45	.9599	95.50
101.75	117.01	1.0155	1.0170	101.20	.9885	98.35
NEW TAP:	[illegible]					
106.08	121.99	1.0589	1.0347	102.98	1.0068	100.19
100.00	115.00	.9980	.9715	96.66	.9413	93.63
101.75	117.01	1.0156	.9897	98.48	.9602	95.52
103.47	118.99	1.0328	1.0076	100.27	.9788	97.38

"LIGHT LOAD" is 1 MVA per secondary
Columns (1), (2) and (3) are on nominal primary voltage base
Columns (4), (5), (6) and (7) are on motor nameplate voltage base

STATION SERVICE SYSTEM CALCULATIONS
THREE-WINDING TRANSFORMER
AT PARTIAL LOAD

X000000006567gx0 PROGRAM VERIFICATION NO.

CHECKED BY GGW
DATE 10-27-76

JOB ORDER NO. 11825.10 CLIENT PASNY PLANT FITZPATRICK

RUN NO. 9152 BY WG DATE 9-17-76

* 1. 6.20 MVA AT PF = .88 LOAD ON X WINDING CHECKED BY ________

* 2. 10.29 MVA AT PF = .88 LOAD ON Y WINDING DATE ________

* 3. 10.49 MVA AT PF = .88 OTHER LOCAL LOAD ON PRIMARY SOURCE

4. [illegible] KV PRIMARY TAP

STEADY-STATE VOLTAGE PROFILE

(1)	(2)	(3)	(4)	(5)	(6)	(7)
NO LOAD SOURCE			X WINDING		Y WINDING	
%	KV	TRANSF. PRI, PU	BUS, PU	MOTOR, %	BUS, PU	MOTOR, %
AT SPECIFIED LOADS:						
106.08	121.99	1.0592	1.0406	103.56	1.0262	102.13
100.00	115.00	.9984	.9778	97.29	.9624	95.74
95.00	109.25	.9484	.9260	92.11	.9096	90.46
99.76	114.73	.9961	.9754	97.05	.9600	95.50
101.75	117.01	1.0159	.9959	99.10	.9808	97.59
103.47	118.99	1.0331	1.0137	100.87	.9989	99.39

Columns (1), (2) and (3) are on nominal primary voltage base
Columns (4), (5), (6) and (7) are on motor nameplate voltage base

STATION SERVICE SYSTEM CALCULATIONS
THREE-WINDING TRANSFORMER
VOLTAGES DURING MOTOR START

X0000000002521ex0 PROGRAM VERIFICATION NO. CHECKED BY GJW
DATE 10-27-76

JOB ORDER NO. 11825.10 CLIENT PASNY PLANT FITZPATRICK

RUN NO. 9152 BY WG DATE 9-17-76

1. 119700 KV PRIMARY TAP
* 2. 1250 HORSEPOWER MOTOR STARTING ON:
* 3. Y WINDING
** 4. 1028 AMP., LOCKED ROTOR CURRENT
5. 6.20 MVA PRIOR LOAD ON X WINDING
6. 10.29 MVA PRIOR LOAD ON Y WINDING

.500000000000ex 01 VOLTAGES DURING MOTOR START

(1)	(2)	(3)	(4)	(5)	(6)	(7)
NO LOAD		AT INDICATED LOADS				
SOURCE		TRANSF.	X WINDING		Y WINDING	
%	KV	PRI. PU	BUS. PU	MOTOR, %	BUS. PU	MOTOR, %
106.08	121.99	1.0594	1.0412	103.63	.9789	96.40
100.00	115.00	.9986	.9786	97.36	.9179	90.29
95.00	109.25	.9486	.9269	92.19	.8673	85.24
89.85	103.33	.8972	.8735	86.85	.8150	80.00
101.75	117.01	1.0161	.9966	99.17	.9355	92.05
103.47	118.99	1.0333	1.0144	100.94	.9528	93.78

Columns (1), (2) and (3) are on nominal primary voltage base
Columns (4), (5), (6) and (7) are on motor nameplate voltage base

THREE-WINDING
STATION SERVICE TRANSFORMER IMPEDANCES
X000000006826ax0 PROGRAM VERIFICATION NO.

CHECKED BY [signature]
DATE 10-27-76

JOB ORDER NO. 11825.10 CLIENT PASNY PLANT FITZPATRICK

RUN NO. *9153 BY WG DATE 9-17-76

* 1. 22.40 MVA, TOP PRIMARY RATING

* 2. .54 RATING MULTIPLIER [Use 1 for OA or FOA, 0.75 for OA/FA, 0.6 for triple-rated]

* 3. 7.47 MVA, HIGHER VOLTAGE SECONDARY TOP RATING ((X WINDING)

* 4. 14.93 MVA, LOWER VOLTAGE SECONDARY TOP RATING (Y WINDING)

* 5. - PERCENT IMPEDANCE, Z_{H-X}, ON SECONDARY LOWEST MVA BASE

6. - PERCENT IMPEDANCE, Z_{H-Y}, " " " " "

or

* 7. 6.96 PERCENT IMPEDANCE, Z_{H-X}, ON PRIMARY LOWEST MVA BASE

8. 7.01 PERCENT IMPEDANCE, Z_{H-Y}, " " " " "

9. 13.50 PERCENT IMPEDANCE, Z_{X-Y}, " " " " "

10. .24 PERCENT IMPEDANCE, Z_H , " " " " "

11. 6.73 PERCENT IMPEDANCE, Z_X , " " " " "

12. 6.78 PERCENT IMPEDANCE, Z_Y , " " " " "

5. 2.32 PERCENT IMPEDANCE, Z_{H-X}, ON SECONDARY LOWEST MVA BASE

6. 4.67 PERCENT IMPEDANCE, Z_{H-Y}, " " " " "

* 13. 194.00 FT., SECONDARY LEADS, X WINDING

* 14. 175.00 FT., SECONDARY LEADS, Y WINDING

* 15. 4.16 KV, RATING OF X WINDING

* 16. 4.16 KV, RATING OF Y WINDING

** 17. .001796 + j .009700 OHMS PER PHASE, X WINDING SECONDARY LEADS

** 18. .006400 + j .007260 OHMS PER PHASE, Y WINDING SECONDARY LEADS

19. .000196 pu, Z_H — ON 1 MVA BASE

20. .000863 + j .006165 pu, Z_X + SECONDARY LEADS — ON 1 MVA BASE

21. .000755 + j .006066 pu, Z_Y + SECONDARY LEADS — ON 1 MVA BASE

* 22. 16.49 MVA, OTHER LOCAL LOAD ON PRIMARY SOURCE

* 23. 10000 MVA, MIN. 15000 MAX. SHORT CIRCUIT FROM PRIMARY SOURCE

* Input by engineer ** Reviewed by engineer

OCT 10 '90 10:35

CHECKED BY GAW
DATE 10-27-76

STATION SERVICE SYSTEM CALCULATIONS
THREE-WINDING TRANSFORMER
PROGRAM VERIFICATION NO.

X 000000006690ax0

JOB ORDER NO. 11825.10 CLIENT PASNY PLANT FITZPATRICK

RUN NO. 9153 BY WG DATE 9-17-76

1. 143.1 MVA, TRANSFORMER X WINDING MIN. CONTRIBUTION TO BUS FAULT
2. 145.3 MVA " Y WINDING " " " " "

MAXIMUM SUSTAINED LEVEL OF NO-LOAD PRIMARY SOURCE VOLTAGE:

** 3. 106.08 PERCENT OF NOMINAL VALUE

** 4. 95.50 PERCENT, MIN. VALUE COL. 7 TO SATISFY LOAD CENTER SUB. REQ'T

* 5. 115.00 KV, NOM. **[illegible] KV TAP, PRIMARY

STEADY-STATE VOLTAGE PROFILE

(1) NO LOAD SOURCE %	(2) NO LOAD SOURCE KV	(3) TRANSF. PRI. PU	(4) AT INDICATED LOADS X WINDING BUS, PU	(5) X WINDING MOTOR, %	(6) Y WINDING BUS, PU	(7) Y WINDING MOTOR, %
LIGHT LOAD:						
106.08	121.99	1.0607	1.0901	108.51	1.0902	108.52
FULL LOAD:						
106.08	121.99	1.0589	1.0630	105.81	1.0361	103.11
100.00	115.00	.9980	.9983	99.34	.9691	96.42
95.00	109.25	.9480	.9449	93.99	.9135	90.85
99.17	114.04	.9897	.9895	98.45	.9599	95.50

"LIGHT LOAD" is 1 MVA per secondary
Columns (1), (2) and (3) are on nominal primary voltage base
Columns (4), (5), (6) and (7) are on motor nameplate voltage base

STATION SERVICE SYSTEM CALCULATIONS
THREE-WINDING TRANSFORMER
AT PARTIAL LOAD

X00000000G567ex0 PROGRAM VERIFICATION NO.

CHECKED BY GAW
DATE 10-27-76

JOB ORDER NO. 11825.10 CLIENT PASNY PLANT FITZPATRICK

RUN NO. 9153 BY WG DATE 9-17-76

* 1. 6.20 MVA AT PF = .88 LOAD ON X WINDING CHECKED BY ________

* 2. 10.29 MVA AT PF = .88 LOAD ON Y WINDING DATE ________

* 3. 16.49 MVA AT PF = .88 OTHER LOCAL LOAD ON PRIMARY SOURCE

4. ~~[illegible]~~ KV PRIMARY TAP

STEADY-STATE VOLTAGE PROFILE

(1)	(2)	(3)	(4)	(5)	(6)	(7)
NO LOAD SOURCE		TRANSF.	X WINDING		Y WINDING	
%	KV	PRI. PU	BUS, PU	MOTOR, %	BUS, PU	MOTOR, %
AT SPECIFIED LOADS:						
106.08	121.99	1.0592	1.0687	106.38	1.0548	104.99
100.00	115.00	.9984	1.0045	99.95	.9805	98.46
95.00	109.25	.9483	.9514	94.65	.9355	93.05
97.26	111.85	.9710	.9754	97.05	.9600	95.50
101.74	117.00	1.0158	1.0229	101.79	1.0082	100.33

Columns (1), (2) and (3) are on nominal primary voltage base
Columns (4), (5), (6) and (7) are on motor nameplate voltage base

STATION SERVICE SYSTEM CALCULATIONS
THREE-WINDING TRANSFORMER
VOLTAGES DURING MOTOR START
X 00000000252lex0 PROGRAM VERIFICATION NO.

CHECKED BY GJW
DATE 10-22-76

JOB ORDER NO. 11825.10 CLIENT PASNY PLANT FITZPATRICK

RUN NO. 9153 BY WG DATE 9-17-76

1. [illegible] KV PRIMARY TAP

* 2. 1250 HORSEPOWER MOTOR STARTING ON:

* 3. Y WINDING

** 4. 1028 AMP., LOCKED ROTOR CURRENT

5. 6.20 MVA PRIOR LOAD ON X WINDING

6. 10.29 MVA PRIOR LOAD ON Y WINDING

.500000000000ex 01 VOLTAGES DURING MOTOR START

(1)	(2)	(3)	(4)	(5)	(6)	(7)
NO LOAD SOURCE		AT INDICATED LOADS				
			X WINDING		Y WINDING	
%	KV	TRANSF. PRI. PU	BUS. PU	MOTOR, %	BUS. PU	MOTOR, %
106.08	121.99	1.0594	1.0694	106.44	1.0063	99.13
100.00	115.00	.9986	1.0052	100.02	.9438	92.89
95.00	109.25	.9486	.9522	94.73	.8921	87.72
87.60	100.74	.8746	.8735	86.85	.8149	80.00
101.74	117.00	1.0160	1.0236	101.86	.9617	94.68

Columns (1), (2) and (3) are on nominal primary voltage base
Columns (4), (5), (6) and (7) are on motor nameplate voltage base

=5

STATION SERVICE SYSTEM CALCULATIONS
LOW VOLTAGE STEADY STATE VOLTAGE PROFILE - NO LOAD
~~Starting Voltage - Low Voltage Motors~~

X JOB ORDER NO. 11825.10 CLIENT PASNY PLANT FITZPATRICK

RUN NO. 101 BY WG DATE 9.17.76

.000000007001ex0 PROGRAM VERIFICATION NO. REVIEWED BY JGW

* 1 HP MOTOR BEING STARTED DATE 10-27-76

* 575 V. MOTOR NAMEPLATE

MOTOR LEADS

** 1 AMP. LOCKED ROTOR CURRENT R = * X = * OHMS/PHASE

** .25 PF OF LOCKED ROTOR CURRENT

* 1000 KVA TRANSFORMER, STEP-DOWN TO MOTOR VOLTAGE

* 5.56 PER CENT IMPEDANCE VOLTS, STEP-DOWN TRANSFORMER

* 1 KVA PRIOR LOAD ON TRANSFORMER SECONDARY

** .88 PF, PRIOR LOAD

* 100 MVA MIN. SHORT CIRCUIT AVAILABLE AT TRANSF. PRI. TERMINALS

NOM. PRI. VOLTAGE:* 4000 V; PRI. TAP:** RECOM.* ~~1050~~ CHOSEN

(7) PRI. VOLTAGE LOADED, %	(8) SEC. VOLTAGE LOADED, PU	(9) MOTOR STARTING VOLTAGE, %	(10) MOTOR RUNNING VOLTAGE, %
110.00	1.1335		111.27
108			*110.00
108.00	1.1129		109.21
106.25	1.0950		≈107.5
106.00	1.0923		107.13
104.00	1.0717		105.08
100.00	1.0304		100.96
90.00	.9274		90.66

(7) NOM. PRI. VOLTAGE BASE

(8) (9) (10) MOTOR NAMEPLATE VOLTAGE BASE

STATION SERVICE SYSTEM CALCULATIONS

LOW VOLTAGE STEADY STATE VOLTAGE PROFILE - NO LOAD

~~Starting Voltage - Low Voltage Motors~~

X JOB ORDER NO. 11825.10 CLIENT PASNY PLANT FITZPATRICK

RUN NO. 102 BY WG DATE 9-17-76

.000000000000ex 00 PROGRAM VERIFICATION NO. REVIEWED BY JAW

* 1 HP MOTOR BEING STARTED DATE 10-22-76

* 575 V. MOTOR NAMEPLATE

** 1 AMP. LOCKED ROTOR CURRENT R = * MOTOR LEADS X = * OHMS/PHASE

** .25 PF OF LOCKED ROTOR CURRENT

* 750 KVA TRANSFORMER, STEP-DOWN TO MOTOR VOLTAGE

* 5.99 PER CENT IMPEDANCE VOLTS, STEP-DOWN TRANSFORMER

* 1 KVA PRIOR LOAD ON TRANSFORMER SECONDARY

** .88 PF, PRIOR LOAD

* 100 MVA MIN. SHORT CIRCUIT AVAILABLE AT TRANSF. PRI. TERMINALS

NOM. PRI. VOLTAGE:* 4000 V; PRI. TAP:** RECOM.* ~~4050~~ CHOSEN

(7) PRI. VOLTAGE LOADED, %	(8) SEC. VOLTAGE LOADED, PU	(9) MOTOR STARTING VOLTAGE, %	(10) MOTOR RUNNING VOLTAGE, %
110.00	1.1335		111.26
109			110.21
108.00	1.1128		109.20
106.00	1.0922		107.14
104.00	1.0716		105.08
100.00	1.0304		100.96

(7) NOM. PRI. VOLTAGE BASE

(8) (9) (10) MOTOR NAMEPLATE VOLTAGE BASE

P.18

OCT 10 '90 10:37

STATION SERVICE SYSTEM CALCULATIONS
LOW VOLTAGE STEADY STATE VOLTAGE PROFILE - FULL LOAD
~~Starting Voltage - Low Voltage Motors~~

X JOB ORDER NO. 11825.10 CLIENT PASNY PLANT FITZPATRICK

RUN NO. 103 BY WG DATE 9-17-76

.000000007001ex0 PROGRAM VERIFICATION NO. REVIEWED BY JOW

DATE 10-27-76

* 1 HP MOTOR BEING STARTED

* 575 V. MOTOR NAMEPLATE

MOTOR LEADS

** 1 AMP. LOCKED ROTOR CURRENT R = * X = * OHMS/PHASE

** .25 PF OF LOCKED ROTOR CURRENT

* 1000 KVA TRANSFORMER, STEP-DOWN TO MOTOR VOLTAGE

* 5.56 PER CENT IMPEDANCE VOLTS, STEP-DOWN TRANSFORMER

* 995 KVA PRIOR LOAD ON TRANSFORMER SECONDARY

** .85 PF, PRIOR LOAD

* 100 MVA MIN. SHORT CIRCUIT AVAILABLE AT TRANSF. PRI. TERMINALS

NOM. PRI. VOLTAGE:* 4000 V; PRI. TAP:** RECOM.* 4050 CHOSEN

(7) PRI. VOLTAGE LOADED, %	(8) SEC. VOLTAGE LOADED, PU	(9) MOTOR STARTING VOLTAGE, %	(10) MOTOR RUNNING VOLTAGE, %
110.00	1.0980		107.72
100.00	.9909		97.01
95.00	.9370		91.61
93.50	.9208		90.00

(7) NOM. PRI. VOLTAGE BASE

(8) (9) (10) MOTOR NAMEPLATE VOLTAGE BASE

OCT 10 '90 10:38

STATION SERVICE SYSTEM CALCULATIONS
LOW VOLTAGE STEADY STATE VOLTAGE PROFILE - FULL LOAD
~~Starting Voltage - Low Voltage Motors~~

X JOB ORDER NO. 11825.10 CLIENT PASNY PLANT FITZPATRICK

.000000007001 BY WG DATE 9-17-76

.000000007001ax0 PROGRAM VERIFICATION NO. REVIEWED BY JW

DATE 10-27-76

* 1 HP MOTOR BEING STARTED

* 575 V. MOTOR NAMEPLATE

** 1 AMP. LOCKED ROTOR CURRENT R = * MOTOR LEADS X = * OHMS/PHASE

** .25 PF OF LOCKED ROTOR CURRENT

* 750 KVA TRANSFORMER, STEP-DOWN TO MOTOR VOLTAGE

* 5.99 PER CENT IMPEDANCE VOLTS, STEP-DOWN TRANSFORMER

* 745 KVA PRIOR LOAD ON TRANSFORMER SECONDARY

** .88 PF, PRIOR LOAD

* 100 MVA MIN. SHORT CIRCUIT AVAILABLE AT TRANSF. PRI. TERMINALS

NOM. PRI. VOLTAGE:* 4000 V; PRI. TAP:** RECOM.* ~~4050~~ CHOSEN

(7) PRI. VOLTAGE LOADED, %	(8) SEC. VOLTAGE LOADED, PU	(9) MOTOR STARTING VOLTAGE, %	(10) MOTOR RUNNING VOLTAGE, %
110.00	1.0980		107.71
100.7	1.000		
100.00	.9908		97.00
95.00	.9368		91.60
94.1	.925		
93.52	.9208		90.00
97.00	.9585		93.76
96.00	.95		

(7) NOM. PRI. VOLTAGE BASE

(8) (9) (10) MOTOR NAMEPLATE VOLTAGE BASE

STATION SERVICE SYSTEM CALCULATIONS
LOW VOLTAGE STEADY STATE VOLTAGE PROFILE - NORMAL LOAD
~~Starting Voltage - Low Voltage Motors~~

X JOB ORDER NO. 11825.10 CLIENT PASNY PLANT FITZPATRICK

RUN NO. 105 BY WG DATE 9-17-76

.000000007001e+0 PROGRAM VERIFICATION NO. REVIEWED BY JAW

DATE 10-27-76

* 1 HP MOTOR BEING STARTED

* 575 V. MOTOR NAMEPLATE

** 1 AMP. LOCKED ROTOR CURRENT R = * MOTOR LEADS X = * OHMS/PHASE

** .25 PF OF LOCKED ROTOR CURRENT

* 1000 KVA TRANSFORMER, STEP-DOWN TO MOTOR VOLTAGE

* 5.56 PER CENT IMPEDANCE VOLTS, STEP-DOWN TRANSFORMER

* 500 KVA PRIOR LOAD ON TRANSFORMER SECONDARY

** .88 PF. PRIOR LOAD

* 100 MVA MIN. SHORT CIRCUIT AVAILABLE AT TRANSF. PRI. TERMINALS

NOM. PRI. VOLTAGE:* 4000 V; PRI. TAP:** RECOM.* 4050 CHOSEN

(7) PRI. VOLTAGE LOADED, %	(8) SEC. VOLTAGE LOADED, PU	(9) MOTOR STARTING VOLTAGE, %	(10) MOTOR RUNNING VOLTAGE, %
110.00	1.1175		109.67
102	1.035		101.5
100.00	1.0127		99.19
95.00	.9602		93.94
91.26	.9208		90.00
106.00	1.0756		105.48
98	99		
97.00	.9812		96.04
96.00	.9707		94.99
95.7	96.7		94.5
94.00	.9497		92.88

(7) NOM. PRI. VOLTAGE BASE

(8) (9) (10) MOTOR NAMEPLATE VOLTAGE BASE

OCT 18 '90 10:39

STATION SERVICE SYSTEM CALCULATIONS

LOW VOLTAGE STEADY STATE VOLTAGE PROFILE - NORMAL LOAD

~~Starting Voltage - Low Voltage Motors~~

X JOB ORDER NO. 11825.10 CLIENT PASNY PLANT FITZPATRICK

RUN NO. 106 BY WG DATE 9-17-76

.00000000070010x0 PROGRAM VERIFICATION NO. REVIEWED BY JAW

* 1 HP MOTOR BEING STARTED DATE 10-27-76

* 575 V. MOTOR NAMEPLATE

** 1 AMP. LOCKED ROTOR CURRENT R = * MOTOR LEADS X = * OHMS/PHASE

** .25 PF OF LOCKED ROTOR CURRENT

* 750 KVA TRANSFORMER, STEP-DOWN TO MOTOR VOLTAGE

* 5.99 PER CENT IMPEDANCE VOLTS, STEP-DOWN TRANSFORMER

* 300 KVA PRIOR LOAD ON TRANSFORMER SECONDARY

** .88 PF, PRIOR LOAD

* 100 MVA MIN. SHORT CIRCUIT AVAILABLE AT TRANSF. PRI. TERMINALS

NOM. PRI. VOLTAGE:* 4000 V; PRI. TAP:** RECOM.*4050 CHOSEN

(7) PRI. VOLTAGE LOADED, %	(8) SEC. VOLTAGE LOADED, PU	(9) MOTOR STARTING VOLTAGE, %	(10) MOTOR RUNNING VOLTAGE, %
110.00	1.1197		109.89
100.00	1.0152		99.64
95.00	.9628		94.20
90.00	.9103		88.95
91.00	.9208		90.00

(7) NOM. PRI. VOLTAGE BASE

(8) (9) (10) MOTOR NAMEPLATE VOLTAGE BASE

STATION SERVICE SYSTEM CALCULATIONS

Starting Voltage - Low Voltage Motors

X JOB ORDER NO. 11825.10 CLIENT PASNY PLANT FITZPATRICK

RUN No. 107 BY WG DATE 9-17-76

.000000007001ex0 PROGRAM VERIFICATION NO. REVIEWED BY JAW

DATE 10-27-76

* 250 HP MOTOR BEING STARTED

* 575 V. MOTOR NAMEPLATE

MOTOR LEADS

** 1460 AMP. LOCKED ROTOR CURRENT R = *.0040 X = *.0030 OHMS/PHASE

** .25 PF OF LOCKED ROTOR CURRENT

* 1000 KVA TRANSFORMER, STEP-DOWN TO MOTOR VOLTAGE

* 5.56 PER CENT IMPEDANCE VOLTS, STEP-DOWN TRANSFORMER

* 230 KVA PRIOR LOAD ON TRANSFORMER SECONDARY

** .88 PF, PRIOR LOAD

* 100 MVA MIN. SHORT CIRCUIT AVAILABLE AT TRANSF. PRI. TERMINALS

NOM. PRI. VOLTAGE:* 4000 V; PRI. TAP:** RECOM.*4050 CHOSEN

(7) PRI. VOLTAGE LOADED, %	(8) SEC. VOLTAGE LOADED, PU	(9) MOTOR STARTING VOLTAGE, %	(10) MOTOR RUNNING VOLTAGE, %
110.00	1.0182	100.10	
100.00	.9231	90.75	
95.00	.8755	86.07	
88.52	.8138	80.00	
99.40	.9174	90.19	
99.30	.9164	90.09	
99.20	.9155	90.00	

(7) NOM. PRI. VOLTAGE BASE

(8) (9) (10) MOTOR NAMEPLATE VOLTAGE BASE

STATION SERVICE SYSTEM CALCULATIONS

Starting Voltage - Low Voltage Motors

X JOB ORDER NO. 11825.10 CLIENT PASNY PLANT FITZPATRICK

RUN NO. 108 BY WG DATE 9-17-76

.00000000700lex0 PROGRAM VERIFICATION NO. REVIEWED BY JAW

* 250 HP MOTOR BEING STARTED DATE 10-27-76

* 575 V. MOTOR NAMEPLATE

MOTOR LEADS

** 1460 AMP. LOCKED ROTOR CURRENT R = *.0040 X = *.0030 OHMS/PHASE

** .25 PF OF LOCKED ROTOR CURRENT

* 750 KVA TRANSFORMER, STEP-DOWN TO MOTOR VOLTAGE

* 5.99 PER CENT IMPEDANCE VOLTS, STEP-DOWN TRANSFORMER

* 300 KVA PRIOR LOAD ON TRANSFORMER SECONDARY

** .80 PF, PRIOR LOAD

* 100 MVA MIN. SHORT CIRCUIT AVAILABLE AT TRANSF. PRI. TERMINALS

NOM. PRI. VOLTAGE:* 4000 V; PRI. TAP:** RECOM.* 4050 CHOSEN

(7) PRI. VOLTAGE LOADED, %	(8) SEC. VOLTAGE LOADED, PU	(9) MOTOR STARTING VOLTAGE, %	(10) MOTOR RUNNING VOLTAGE, %
110.00	.9751	95.86	
100.00	.8826	86.76	
95.00	.8362	82.20	
92.58	.8138	80.00	
105.00	.9289	91.32	
104.00	.9196	90.41	
103.80	.9178	90.22	
103.00	.9104	89.50	
103.50	.9150	89.95	

(7) NOM. PRI. VOLTAGE BASE

(8) (9) (10) MOTOR NAMEPLATE VOLTAGE BASE

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STATION SERVICE SYSTEM CALCULATIONS
LOW VOLTAGE ~~STEADY STATE~~ VOLTAGE PROFILE. NO LOAD
~~Starting Voltage - Low Voltage Motors~~

X JOB ORDER NO. 11825.10 CLIENT PASNY PLANT FITZPATRICK

RUN NO. 109 BY WG DATE 9-17-76

.000000007001ex0 PROGRAM VERIFICATION NO. REVIEWED BY JAW

* 1 HP MOTOR BEING STARTED DATE 10-27-76

* 575 V. MOTOR NAMEPLATE

** 1 AMP. LOCKED ROTOR CURRENT R = * MOTOR LEADS X = * OHMS/PHASE

** .25 PF OF LOCKED ROTOR CURRENT

* 1000 KVA TRANSFORMER, STEP-DOWN TO MOTOR VOLTAGE

* 5.56 PER CENT IMPEDANCE VOLTS, STEP-DOWN TRANSFORMER

* 1 KVA PRIOR LOAD ON TRANSFORMER SECONDARY

** .88 PF, PRIOR LOAD

* 100 MVA MIN. SHORT CIRCUIT AVAILABLE AT TRANSF. PRI. TERMINALS

NOM. PRI. VOLTAGE:* 4000 V; PRI. TAP:** RECOM.* 3950 CHOSEN

(7) PRI. VOLTAGE LOADED, %	(8) SEC. VOLTAGE LOADED, PU	(9) MOTOR STARTING VOLTAGE, %	(10) MOTOR RUNNING VOLTAGE, %
110.00	1.1622		114.16
108.00	1.1411		112.02
106.00	1.1199		109.91
104.00	1.0988		107.80
100.00	1.0565		103.57

(7) NOM. PRI. VOLTAGE BASE

(8) (9) (10) MOTOR NAMEPLATE VOLTAGE BASE

STATION SERVICE SYSTEM CALCULATIONS
LOW VOLTAGE STEADY STATE VOLTAGE PROFILE - NO LOAD
~~Starting Voltage - Low Voltage Motors~~

X JOB ORDER NO. 11825.10 CLIENT PASNY PLANT FITZPATRICK

RUN NO. 110 BY WG DATE 9-17-76

.000000000000ex 00 PROGRAM VERIFICATION NO. REVIEWED BY [signature]

* 1 HP MOTOR BEING STARTED DATE 10-27-76

* 575 V. MOTOR NAMEPLATE

MOTOR LEADS

** 1 AMP. LOCKED ROTOR CURRENT R = X = * OHMS/PHASE

** .25 PF OF LOCKED ROTOR CURRENT

* 750 KVA TRANSFORMER, STEP-DOWN TO MOTOR VOLTAGE

* 5.99 PER CENT IMPEDANCE VOLTS, STEP-DOWN TRANSFORMER

* 1 KVA PRIOR LOAD ON TRANSFORMER SECONDARY

** .88 PF, PRIOR LOAD

* 100 MVA MIN. SHORT CIRCUIT AVAILABLE AT TRANSF. PRI. TERMINALS

NOM. PRI. VOLTAGE:* 4000 V; PRI. TAP:** RECOM.* ~~3930~~ CHOSEN

(7) PRI. VOLTAGE LOADED, %	(8) SEC. VOLTAGE LOADED, PU	(9) MOTOR STARTING VOLTAGE, %	(10) MOTOR RUNNING VOLTAGE, %
110.00	1.1622		114.13
108.00	1.1410		112.02
106.25	1.1226		
106.00	1.1199		109.91
104.00	1.0988		107.79
100.00	1.0565		103.57

(7) NOM. PRI. VOLTAGE BASE

(8) (9) (10) MOTOR NAMEPLATE VOLTAGE BASE

STATION SERVICE SYSTEM CALCULATIONS

LOW VOLTAGE STEADY STATE VOLTAGE PROFILE - FULL LOAD

~~Starting Voltage - Low Voltage Motors~~

X JOB ORDER NO. 11825.10 CLIENT PASNY PLANT FITZPATRICK

RUN NO. 111 BY WG DATE 9-17-76

.000000007001ex0 PROGRAM VERIFICATION NO. REVIEWED BY [signature]

* 1 HP MOTOR BEING STARTED DATE 10-27-76

* 575 V. MOTOR NAMEPLATE

** 1 AMP. LOCKED ROTOR CURRENT MOTOR LEADS R = * X = * OHMS/PHASE

** .25 PF OF LOCKED ROTOR CURRENT

* 1000 KVA TRANSFORMER, STEP-DOWN TO MOTOR VOLTAGE

* 5.56 PER CENT IMPEDANCE VOLTS, STEP-DOWN TRANSFORMER

* 995 KVA PRIOR LOAD ON TRANSFORMER SECONDARY

** .85 PF, PRIOR LOAD

* 100 MVA MIN. SHORT CIRCUIT AVAILABLE AT TRANSF. PRI. TERMINALS

NOM. PRI. VOLTAGE:* 4000 V; PRI. TAP:** RECOM.* 3950 CHOSEN

(7) PRI. VOLTAGE LOADED, %	(8) SEC. VOLTAGE LOADED, PU	(9) MOTOR STARTING VOLTAGE, %	(10) MOTOR RUNNING VOLTAGE, %
110.00	1.1277		110.68
100.00	1.0181		99.73
95.00	.9629		94.21
91.20	.9208		90.00

(7) NOM. PRI. VOLTAGE BASE

(8) (9) (10) MOTOR NAMEPLATE VOLTAGE BASE

STATION SERVICE SYSTEM CALCULATIONS
LOW VOLTAGE STEADY STATE VOLTAGE PROFILE – FULL LOAD
~~Starting Voltage – Low Voltage Motors~~

X JOB ORDER NO. 11825.10 CLIENT PASNY PLANT FITZPATRICK

RUN NO. 112 BY WG DATE 9-17-76

.000000007001ex0 PROGRAM VERIFICATION NO. REVIEWED BY JAW

DATE 10-27-76

* 1 HP MOTOR BEING STARTED

* 575 V. MOTOR NAMEPLATE

** 1 AMP. LOCKED ROTOR CURRENT R = * X = * OHMS/PHASE (MOTOR LEADS)

** .25 PF OF LOCKED ROTOR CURRENT

* 750 KVA TRANSFORMER, STEP-DOWN TO MOTOR VOLTAGE

* 5.99 PER CENT IMPEDANCE VOLTS, STEP-DOWN TRANSFORMER

* 745 KVA PRIOR LOAD ON TRANSFORMER SECONDARY

** .88 PF, PRIOR LOAD

* 134 MVA MIN. SHORT CIRCUIT AVAILABLE AT TRANSF. PRI. TERMINALS

NOM. PRI. VOLTAGE:* 4000 V; PRI. TAP:** RECOM.* ~~8250~~ CHOSEN

(7) PRI. VOLTAGE LOADED, %	(8) SEC. VOLTAGE LOADED, PU	(9) MOTOR STARTING VOLTAGE, %	(10) MOTOR RUNNING VOLTAGE, %
110.00	1.1276		110.68
100.00 (100.2)	1.0180 (1.02)		99.72
95.00	.9628		94.20
91.21	.9208		90.00
93.00	.9407		91.98
97.00	.9849		96.41
99.00	1.0070		98.62
93.6			≈ 92.3

(7) NOM. PRI. VOLTAGE BASE

(8) (9) (10) MOTOR NAMEPLATE VOLTAGE BASE

STATION SERVICE SYSTEM CALCULATIONS
LOW VOLTAGE STEADY STATE VOLTAGE PROFILE - NORMAL LOAD
~~Starting Voltage - Low Voltage Motors~~

X JOB ORDER NO. 11825.10 CLIENT PASNY PLANT FITZPATRICK

RUN NO. 113 BY WG DATE 9-17-76

.00000000700lex0 PROGRAM VERIFICATION NO. REVIEWED BY JEW

* 1 HP MOTOR BEING STARTED DATE 10-27-76

* 575 V. MOTOR NAMEPLATE

** 1 AMP. LOCKED ROTOR CURRENT R = * MOTOR LEADS X = * OHMS/PHASE

** .25 PF OF LOCKED ROTOR CURRENT

* 1000 KVA TRANSFORMER, STEP-DOWN TO MOTOR VOLTAGE

* 5.56 PER CENT IMPEDANCE VOLTS, STEP-DOWN TRANSFORMER

* 500 KVA PRIOR LOAD ON TRANSFORMER SECONDARY

** .88 PF, PRIOR LOAD

* 100 MVA MIN. SHORT CIRCUIT AVAILABLE AT TRANSF. PRI. TERMINALS

NOM. PRI. VOLTAGE:* 4000 V; PRI. TAP:** RECOM.* 3950 CHOSEN

(7) PRI. VOLTAGE LOADED, %	(8) SEC. VOLTAGE LOADED, PU	(9) MOTOR STARTING VOLTAGE, %	(10) MOTOR RUNNING VOLTAGE, %
110.00	1.1466		112.58
100.00	1.0393		101.84
95.00	.9855		96.46
89.00	.9208		90.00
90.00	.9315		91.07
91.00	.9423		92.15
93.00	.9639		94.31
97.00	1.0070		98.62

(7) NOM. PRI. VOLTAGE BASE

(8) (9) (10) MOTOR NAMEPLATE VOLTAGE BASE

STATION SERVICE SYSTEM CALCULATIONS
LOW VOLTAGE STEADY STATE VOLTAGE PROFILE - NORMAL LOAD
~~Starting Voltage - Low Voltage Motors~~

X JOB ORDER NO. 11825.10 CLIENT PASNY PLANT FITZPATRICK

RUN NO. 114 BY WG DATE 9-17-76

.000000007001ex0 PROGRAM VERIFICATION NO. REVIEWED BY 10-27-76

* 1 HP MOTOR BEING STARTED DATE [signature]

* 575 V. MOTOR NAMEPLATE

** 1 AMP. LOCKED ROTOR CURRENT R = * MOTOR LEADS X = * OHMS/PHASE

** .25 PF OF LOCKED ROTOR CURRENT

* 750 KVA TRANSFORMER, STEP-DOWN TO MOTOR VOLTAGE

* 5.99 PER CENT IMPEDANCE VOLTS, STEP-DOWN TRANSFORMER

* 500 KVA PRIOR LOAD ON TRANSFORMER SECONDARY

** .88 PF, PRIOR LOAD

* 100 MVA MIN. SHORT CIRCUIT AVAILABLE AT TRANSF. PRI. TERMINALS

NOM. PRI. VOLTAGE:* 4000 V; PRI. TAP:** RECOM.* 3950 CHOSEN

(7) PRI. VOLTAGE LOADED, %	(8) SEC. VOLTAGE LOADED, PU	(9) MOTOR STARTING VOLTAGE, %	(10) MOTOR RUNNING VOLTAGE, %
110.00	1.1395		111.86
102	1.05		
100.00	1.0313		101.05
95	1.008		
95.00	.9770		95.62
89.84	.9208		90.00
93.00	.9552		93.44
94.00	.9661		94.53
95.7	.983		
96.00	.9879		96.71

(7) NOM. PRI. VOLTAGE BASE

(8) (9) (10) MOTOR NAMEPLATE VOLTAGE BASE

STATION SERVICE SYSTEM CALCULATIONS

~~Starting Voltage – Low Voltage Motors~~

X JOB ORDER NO. 11825.16 CLIENT PASNY PLANT FITZPATRICK

RUN NO. 115 BY WG DATE 9-17-76

.000000007001ex0 PROGRAM VERIFICATION NO. REVIEWED BY JAW

* 250 HP MOTOR BEING STARTED DATE 10-27-76

* 575 V. MOTOR NAMEPLATE

MOTOR LEADS

** 1460 AMP. LOCKED ROTOR CURRENT R = *.0040 X = *.0030 OHMS/PHASE

** .25 PF OF LOCKED ROTOR CURRENT

* 1000 KVA TRANSFORMER, STEP-DOWN TO MOTOR VOLTAGE

* 5.56 PER CENT IMPEDANCE VOLTS, STEP-DOWN TRANSFORMER

* 230 KVA PRIOR LOAD ON TRANSFORMER SECONDARY

** .88 PF, PRIOR LOAD

* 100 MVA MIN. SHORT CIRCUIT AVAILABLE AT TRANSF. PRI. TERMINALS

NOM. PRI. VOLTAGE:* 4000 V; PRI. TAP:** RECOM.*3950 CHOSEN

(7) PRI. VOLTAGE LOADED, %	(8) SEC. VOLTAGE LOADED, PU	(9) MOTOR STARTING VOLTAGE, %	(10) MOTOR RUNNING VOLTAGE, %
110.00	1.0441	102.64	
100.00	.9466	93.06	
95.00	.8978	88.26	
86.40	.8138	80.00	
96.90	.9163	90.08	

(7) NOM. PRI. VOLTAGE BASE

(8) (9) (10) MOTOR NAMEPLATE VOLTAGE BASE

E-77

DATA SHEET 11

STATION SERVICE SYSTEM CALCULATIONS

~~Starting Voltage - Low Voltage Motors~~

X JOB ORDER NO. 11825.10 CLIENT PASNY PLANT FITZPATRICK

RUN NO. 116 BY WG DATE 9-17-76

.00000000700lex0 PROGRAM VERIFICATION NO. REVIEWED BY JEW

* 250 HP MOTOR BEING STARTED DATE 10-27-76

* 575 V. MOTOR NAMEPLATE

MOTOR LEADS

** 1460 AMP. LOCKED ROTOR CURRENT R = * .0040 X = * .0030 OHMS/PHASE

** .25 PF OF LOCKED ROTOR CURRENT

* 750 KVA TRANSFORMER, STEP-DOWN TO MOTOR VOLTAGE

* 5.99 PER CENT IMPEDANCE VOLTS, STEP-DOWN TRANSFORMER

* 300 KVA PRIOR LOAD ON TRANSFORMER SECONDARY

** .88 PF, PRIOR LOAD

* 100 MVA MIN. SHORT CIRCUIT AVAILABLE AT TRANSF. PRI. TERMINALS

NOM. PRI. VOLTAGE:* 4000 V; PRI. TAP:** RECOM.* 3950 CHOSEN

(7) PRI. VOLTAGE LOADED, %	(8) SEC. VOLTAGE LOADED, PU	(9) MOTOR STARTING VOLTAGE, %	(10) MOTOR RUNNING VOLTAGE, %
110.00	.9999	98.30	
100.00	.9051	88.98	
95.00	.8576	84.31	
90.39	.8130	80.00	
88.00	.7909	77.75	
86.00	.7718	75.87	
84.00	.7526	73.99	
82.00	.7335	72.11	

(7) NOM. PRI. VOLTAGE BASE

(8) (9) (10) MOTOR NAMEPLATE VOLTAGE BASE

STATION SERVICE SYSTEM CALCULATIONS

LOW VOLTAGE STEADY STATE VOLTAGE PROFILE - FULL LOAD

~~Starting Voltage Low Voltage Motors~~

X JOB ORDER NO. 11825,10 CLIENT PASNY PLANT FITZPATRICK

RUN NO. 117 BY WG DATE 9-17-76

.000000007001ex0 PROGRAM VERIFICATION NO. REVIEWED BY JAW

DATE 10-27-76

* 1 HP MOTOR BEING STARTED

* 575 V. MOTOR NAMEPLATE

** 1 AMP. LOCKED ROTOR CURRENT R = * MOTOR LEADS X = * OHMS/PHASE

** .25 PF OF LOCKED ROTOR CURRENT

* 750 KVA TRANSFORMER, STEP-DOWN TO MOTOR VOLTAGE

* 5.99 PER CENT IMPEDANCE VOLTS, STEP-DOWN TRANSFORMER

* 745 KVA PRIOR LOAD ON TRANSFORMER SECONDARY

** .85 PF, PRIOR LOAD

* 100 MVA MIN. SHORT CIRCUIT AVAILABLE AT TRANSF. PRI. TERMINALS

NOM. PRI. VOLTAGE:* 4000 V; PRI. TAP:** RECOM.* 4160 CHOSEN

(7) PRI. VOLTAGE LOADED, %	(8) SEC. VOLTAGE LOADED, PU	(9) MOTOR STARTING VOLTAGE, %	(10) MOTOR RUNNING VOLTAGE, %
110.00	1.0640		104.31
100.00	.9590		93.82
95.00	.9061		88.53
96.38	.9208		90.00

(7) NOM. PRI. VOLTAGE BASE

(8) (9) (10) MOTOR NAMEPLATE VOLTAGE BASE

STATION SERVICE SYSTEM CALCULATIONS

LOW VOLTAGE STEADY STATE VOLTAGE PROFILE. NORMAL LOAD

~~Starting Voltage - Low Voltage Motors~~

X JOB ORDER NO. 11825.10 CLIENT PASNY PLANT FITZPATRICK

RUN NO. 118 BY WG DATE 9-17-76

.000000007001ex0 PROGRAM VERIFICATION NO. REVIEWED BY 10-27-76

* 1 HP MOTOR BEING STARTED DATE JW

* 575 V. MOTOR NAMEPLATE

MOTOR LEADS

** 1 AMP. LOCKED ROTOR CURRENT R = * X = * OHMS/PHASE

** .25 PF OF LOCKED ROTOR CURRENT

* 750 KVA TRANSFORMER, STEP-DOWN TO MOTOR VOLTAGE

* 5.99 PER CENT IMPEDANCE VOLTS, STEP-DOWN TRANSFORMER

* 300 KVA PRIOR LOAD ON TRANSFORMER SECONDARY

** .88 PF, PRIOR LOAD

* 100 MVA MIN. SHORT CIRCUIT AVAILABLE AT TRANSF. PRI. TERMINALS

NOM. PRI. VOLTAGE:* 4000 V; PRI. TAP:** RECOM.* 4160 CHOSEN

(7) PRI. VOLTAGE LOADED, %	(8) SEC. VOLTAGE LOADED, PU	(9) MOTOR STARTING VOLTAGE, %	(10) MOTOR RUNNING VOLTAGE, %
110.00	1.0893		106.85
100.00	.9875		96.67
95.00	.9365		91.57
93.80	.9242		90.34
93.50	.9211		90.03

(7) NOM. PRI. VOLTAGE BASE

(8) (9) (10) MOTOR NAMEPLATE VOLTAGE BASE

STATION SERVICE SYSTEM CALCULATIONS

Starting Voltage - Low Voltage Motors

X JOB ORDER NO. 11825.10 CLIENT PASNY PLANT FITZPATRICK

RUN NO. 119 BY WG DATE 9-17-76

.00000000700lax0 PROGRAM VERIFICATION NO. REVIEWED BY JAW

* 250 HP MOTOR BEING STARTED DATE 10-27-76

* 575 V. MOTOR NAMEPLATE

MOTOR LEADS

** 1460 AMP. LOCKED ROTOR CURRENT R = *.0040 X = *.0030 OHMS/PHASE

** .25 PF OF LOCKED ROTOR CURRENT

* 750 KVA TRANSFORMER, STEP-DOWN TO MOTOR VOLTAGE

* 5.99 PER CENT IMPEDANCE VOLTS, STEP-DOWN TRANSFORMER

* 300 KVA PRIOR LOAD ON TRANSFORMER SECONDARY

** .88 PF, PRIOR LOAD

* 100 MVA MIN. SHORT CIRCUIT AVAILABLE AT TRANSF. PRI. TERMINALS

NOM. PRI. VOLTAGE:* 4000 V; PRI. TAP:** RECOM.*4160 CHOSEN

(7) PRI. VOLTAGE LOADED, %	(8) SEC. VOLTAGE LOADED, PU	(9) MOTOR STARTING VOLTAGE, %	(10) MOTOR RUNNING VOLTAGE, %
110.00	.9482	93.22	
100.00	.8581	84.35	
95.00	.8128	79.91	
95.10	.8138	80.00	
106.00	.9122	89.68	
106.20	.9140	89.85	
106.35	.9154	89.99	

(7) NOM. PRI. VOLTAGE BASE

(8) (9) (10) MOTOR NAMEPLATE VOLTAGE BASE

ATTACHMENT 3 to JPN-90-077

OPERATING POLICY 1-0

New York Power Authority

JAMES A. FITZPATRICK NUCLEAR POWER PLANT
Docket No. 50-333

NEW YORK POWER AUTHORITY

OPERATING POLICY 1-0

SUBJECT: ECC System Operations

EFFECTIVE DATE: March 1, 1984

SUPERSEDES: None

REFERENCES: None

I. INTRODUCTION

The Authority plants operate inside other utility control areas, and these facilities are part of the interconnected bulk power system. Consequently, facilities or generation cannot be removed from service or restored to service without coordination with the parts of the system.

II. ECC SYSTEM OPERATIONS RESPONSIBILITIES

The Energy Control Center (ECC) in Marcy has been established as the Dispatch and Control Center for the Authority. As a control center, the System Shift Supervisors (SSS) at the ECC operate the Authority's facilities in the most economical manner permitted by system constraints and coordinate the Authority's system with the actions of other utilities and Power Pools.

The areas of ECC operational responsibilities are:

1. Preschedule project generation.
2. Determine hourly project schedules and direct the implementation of the schedules by the generating projects.
3. Coordinate the Authority's system with other utilities and Power Pools.
4. Approve removal of bulk power equipment from service or restrictions on its use.
5. Receive notification of the removal from service of any equipment that might affect plant operation.
6. Monitor and take appropriate action to prevent damage or loss of life to Authority bulk power facilities.

I. PROJECT SYSTEM OPERATIONAL RESPONSIBILITIES

The projects are required to follow the ECC's operating direction and keep the ECC informed of the following project operations:

1. Unscheduled Events requiring immediate notification:

    a. changes in unit status
    b. loss of transmission lines
    c. breaker operations
    d. oscillograph operations
    e. loss of any equipment that might affect plant operation
    f. unit deratings

    The SSS shall be promptly informed of the reasons for any unscheduled event as soon as they are known.

2. Unit Restoration - After restoration to service, units must not be loaded or outputs changed, except for emergency reasons, without notification and approval by the ECC.

3. Breaker Status - The ECC must be promptly notified of the operation of all transmission line and unit breakers except those out on clearance.

4. Removal of Equipment from Service - The SSS must approve, except in emergency conditions, the removal from service of any piece of bulk power equipment or the reduction of protection on bulk power equipment for in-service work. This includes Hot Line Work Orders. The SSS may disapprove or request restoration of equipment that has previously been removed from service.

5. Schedule - The generating projects shall follow the generation schedule given them by the SSS as closely as practical and notify the SSS immediately if this is not possible.

6. Ratings - The SSS shall be notified when bulk power equipment is exceeding its maximum normal rating.

7. Miscellaneous Events - The SSS shall be informed of any condition that could significantly affect the bulk power system or plant operation.

8. The ECC SSS shall not direct that equipment be operated in excess of its normal thermal rating unless a major pool emergency has been declared. In this event, the SSS shall explicitly state to the project that this is the case.

9. The Project Operator shall have the responsibility of determining the Unit commitment where applicable and the line up of the station service supply.

NYPA OPERATING POLICY 1-0

Recommended by:

Charles Poletti ____	Indian Point ____
Blenheim-Gilboa ____	Niagara ____
J. A. FitzPatrick ____	St. Lawrence-FDR ____
ECC ____	NYO Oper. Engineering ____

Approved by:

Sr. V.P. System Operations ____ Date 2/17/84

ATTACHMENT 4 to JPN-90-077

OPERATING POLICY 1-16

New York Power Authority

JAMES A. FITZPATRICK NUCLEAR POWER PLANT
Docket No. 50-333

NEW YORK POWER POOL

Operating Policy 1-16

Subject: Operation of the Bulk Power System

Approved By: Operating Committee on June 22, 1989
Effective June 26, 1989

Appendices: A, B, C, D and E

References: OP 2, OP 3, OP 5, OP 9, OP 13, MP 20
NPCC Procedures for Emergency Operation

I. INTRODUCTION

This Operating Policy defines the various states of the Bulk Power System and also delineates authority a' responsibility of the New York Power Pool (NYPP) Senior Pool Dispatcher (SPD) and Member System Dispatchers for each of these States. It is the objective of the NYPP Member Systems to operate the Bulk Power System within the Normal State as defined herein. It is recognized, however, that conditions may cause the System to depart from this State. Such conditions include, but are not limited to, capacity deficiencies, energy deficiencies, loss of generation or transmission facilities, voltage levels, fuel emergencies or air pollution episodes When the System enters a condition other than the Normal State, the primary objective shall be to return the System to the Normal State as quickly as possible. When all of the criteria for the Normal State cannot be achieved, the objective shall be to satisfy as many of the Normal State criteria as possible, and also, to minimize the consequences of any single contingency. Should a disturbance occur, its extent and duration are to be minimized.

The specific methods to be used in implementing this Operating Policy in each Member System will not necessarily be identical, but it will be the responsibility of the SPD to coordinate such methods in order to achieve uniform results.

In the event that a Member loses communications with the NYPP Power Control Center (PCC), the Member System Dispatcher must operate his system in accordance with the procedures set forth in this Policy.

II. OPERATING OBJECTIVES

The five States defined in this Policy are:

State	Section
Normal	IV
Warning	V
Alert	VI
Major Emergency	VII
Restoration	VIII

A summary of system conditions for each State is given in Appendix D, and corrective procedures are given in Appendix C.

The State of the System will be transmitted to the Member Systems via computer to computer data links. The SPD shall be aware of the State of the System at all times. When the State of the System is other than Normal or Warning, the SPD shall immediately notify the Member Systems via the Emergency Alarm System (Hot Line) and keep the Member Systems informed of any subsequent change in the State of the System and the reasons for such changes.

When multiple violations occur in the same State, the objective shall be to correct actual violations before predicted violations. Where multiple violations of differing State criteria occur, the most serious violation will be solved first.

The NYPP Schedule Coordinator and/or SPD shall forecast the likelihood of occurrence of States other than the Normal State as far in advance as possible. If it is predicted that load relief, either by Voltage Reduction or Load Shedding, may be necessary during a future period, all Member Systems shall be notified and preparatory arrangements shall be made for corrective measures requiring substantial lead time including:

- Curtailment of interruptible load
- Manual (local) Voltage Reduction
- Curtailment of non-essential company use
- Voluntary curtailment of large customers
- Public appeals

III. DEFINITIONS APPLICABLE TO THIS OPERATING POLICY

Area	As the situation requires, Area may mean a portion of a Member System or all or portions of more than one Member System of NYPP. In a pre-disturbance context, Areas may be used to help describe a transmission interface between portions of NYPP. An Area may also be used to describe a post-disturbance portion of NYPP that is not defined until it becomes isolated or separated.
Bulk Power System	The Bulk Power System consists principally of relatively large generating units and the high voltage transmission system which connects NYPP Member Systems to each other and neighboring pools. These will usually be generating units of 300 MW or larger and transmission facilities of 230 kV or above. Smaller generating units and lower voltage transmission may also be a part of the Bulk Power System where the loss of such facilities may result in a Major Emergency.
Emergency Transfer Criteria	Emergency Transfer Criteria requires: a. Adequate facilities are available to supply firm load, b. Pre-Contingency voltage, line and equipment loadings are within applicable limits. (See Note 1,3) c. Post-Contingency voltage, line and equipment loadings will be within applicable emergency limits. (See Note 1,2,3)
Load Relief	Load Reduction accomplished by Voltage Reduction or Load Shedding or both. (Voltage Reduction and Load Shedding are measures which shall be ordered by the SPD as specified in this Policy (OP-1), or OP-2 or OP-3.

Load Shedding	Interruption of customer load by manual or automatic means. (Voltage Reduction and Load Shedding are measures which shall be ordered by the SPD as specified in this Policy (OP-1), or OP-2 or OP-3.
Long Time Emergency (LTE) Rating	Maximum loading, which may be carried for up to four hours during any twenty-four hour period, or such longer period as may be established by the Rating Authority.
Major Emergency	A situation usually accompanied by abnormal frequency, abnormal voltage and/or equipment overloads which might seriously affect the reliability of the Bulk Power System.
Normal Rating	Maximum loading which may be carried continuously.
Normal Transfer Criteria	Normal Transfer Criteria requires: a. Adequate facilities are available to supply firm load, b. Pre-Contingency voltage, line and equipment loadings are within normal limits. (See Note 1,3) c. Post-Contingency voltage, line and equipment loadings will be within applicable emergency limits. (See Note 1, 2,3)
Order	After declaration of a Major Emergency, any request made by the SPD to a Member System Dispatcher for remedial action including, but not limited to, Load Shedding, shall be considered an Order to effect such remedial action.
Rating Authority	The Rating Authority is the member who has the authority and responsibility for maintaining the correct dynamic rating for Bulk Power System facilities in the NYPP PCC computer.
Reserve Conditions	Refer to OP 2, Appendix C.
Short Time Emergency (STE) Rating	Maximum loading, which may be carried for up to fifteen minutes, following a contingency.

Voltage Reduction	A means of achieving load reduction by reducing customer supply voltage, usually by 3, 5, or 8 percent.

Note 1

Under Normal Transfer Conditions:

Pre-contingency loading must not exceed the Normal rating.

Post-contingency loading must not exceed the LTE rating except as noted in Appendix E.

Under Emergency Transfer Conditions:

Pre-contingency loading must not exceed the Normal rating.

Post-contingency loading must not exceed the STE rating.

Under extreme conditions, such as may exist under transmission outage conditions where the alternative is Load Relief, facilities may be operated up to the LTE rating upon notification to the SPD and after making any necessary adjustments to the STE rating to reflect the higher pre-loading.

Note 2

It is recognized that the ability to accurately predict post-contingency voltages on all busses in the Bulk Power System does not presently exist. On busses where post-contingency voltages are calculated this information should be used in implementing this policy. On buses where post-contingency voltages are not calculated the policy should be implemented using pre-contingency voltages only.

Note 3

When actual or predicted post-contingency loadings on non-Bulk Power System (BPS) facilities monitored by NYPP exceed STE ratings and when the loss of such facilities would cause other monitored non-BPS facilities to exceed their STE ratings or cause BPS facilities to exceed their LTE ratings (except where noted) then the monitored non-BPS facility shall be considered a part of the BPS and action in accordance with this procedure shall be implemented.

IV. NORMAL STATE

A. Definition

The following is the list of specific criteria, all of which must be met for the Bulk Power System to be operating in the Normal State:

1. The actual loading of all Bulk Power System transmission facilities does not exceed the associated Normal ratings.

2. The loss of any single generator, single circuit, or adjacent circuits on the same structure, together with other facilities which will trip at the same time due to pre set automatic devices, will not cause any Bulk Power System facility to exceed its LTE rating. The following are exceptions to the criteria:

   a. The Post-Contingency loading of any underground cable may exceed its LTE rating, but not its STE rating, provided 10 minute reserve or phase angle control is available to return its post-contingency loading to its LTE rating within 15 minutes without causing another facility to be loaded beyond its LTE rating. (See Appendix E)

   b. With prior approval of the Operating Committee, the post- contingency loading of any transmission facility may exceed its LTE rating, provided sufficient control is available to return the loading on the facility to its LTE rating within 15 minutes without causing another facility to exceed its LTE rating. (See Appendix E)

   c. Multiple circuit towers used only for station entrance and exit purposes, which do not exceed five towers at each station, are not considered adjacent circuits on the same structure.

3. The actual voltage on all busses listed in Appendix B is within pre-contingency limits. The predicted post-contingency voltage on all applicable busses is within specified post-contingency limits.

4. Sufficient Operating Reserve exists to meet the requirements specified in OP-2.

5. Bulk Power System stability limits are not exceeded.

6. The Pool Control Error is not greater than ±100 MW, or is more than ±100 MW but not more than ±500 MW for less than 10 minutes.

7. The System Frequency is not less than 59.95 or greater than 60.05 Hz.

8. All communication facilities, computers, control and indication equipment necessary to monitor these criteria are available.

9. All neighboring Systems or Pools are operating under Normal conditions.

B. Responsibilities - NYPP SPD

The SPD shall monitor system conditions at all times and determine the action necessary to remain in the Normal State.

1. Coordinate actions with member and neighboring Systems.

2. Limit his actions to remain in the Normal State to:

   a. Modification of energy transactions.

   b. Phase angle regulator adjustments.

   c. Generation shift.

   d. Reserve activation.

   e. Adjustment of reactive sources and transformer taps.

   f. Prepare to implement Manual Voltage Reduction.

3. If the NYPP Control Error exceeds 100 MW, the SPD has the authority to call for a Reserve Pickup to return to schedule.

4. The SPD shall take action to maintain Operating Reserve in accordance with OP 2 and OP 3.

C. Responsibilities - Member System Dispatchers

Member System Dispatchers will coordinate and implement corrective actions as requested by the SPD.

Member System Dispatchers shall monitor conditions with respect to their own Systems.

Whenever the NYPP is operating in the Normal State and Normal State Criteria are not met the Member System Dispatchers shall:

1. Notify the NYPP SPD.
2. Request assistance via the NYPP SPD as required.
3. Initiate unilateral corrective action if the violation is severe enough to require immediate action.

D. Other Considerations

1. All schedule changes should be analyzed in advance of implementation in an effort to avoid violation of these criteria.

2. The Bulk Power System shall be dispatched such that the removal of any facility for scheduled work will not result in the violation of these criteria. Member System Dispatchers are responsible for giving appropriate advance notice of such switching.

3. During periods when severe weather, such as tornadoes or hurricanes, exists or is forecast to occur within the service area of the NYPP Member Systems, it may be necessary to take steps in addition to those procedures normally followed to maintain system security.

   It is the responsibility of the NYPP Senior Pool Dispatcher (SPD) to monitor weather conditions and forecasts issued by the National Weather Bureau on the teletype at the Power Control Center. Should local severe weather conditions occur or they are predicted to occur by regional forecasts, it is the responsibility of the Member System Dispatcher to inform the SPD. If a situation involving impending severe weather exists, the SPD shall notify all Member Systems and consider declaration of the Alert State.

4. The actual voltage on all busses listed in Appendix B shall be monitored by the Senior Pool Dispatcher (SPD) and Member System Dispatchers. It shall be the Member Systems responsibility to maintain voltage levels within limits specified in Appendix B and to coordinate actions which would affect voltage levels on buses of other Member or Neighboring Systems. If the SPD anticipates conditions which would cause the voltage at any bus listed in Appendix B to violate Normal State Criteria, the SPD shall notify the Member System and together they shall formulate a corrective strategy. If, implementation of the corrective strategy does not produce the desired result and the SPD determines further corrective action is necessary to remain in the normal state, the SPD shall request such actions in accordance with Section IV-B. Member System Dispatchers must coordinate and implement corrective actions as requested by the SPD.

V. WARNING STATE

A. Definition

The Warning State exists when any of the following conditions occur:

1. Emergency Transfer Criteria have not been invoked and the actual loading on any Bulk Power System facility exceeds its associated Normal Rating but is less than the LTE for not more than 30 minutes.

2. A condition exists for not more than 30 minutes in which Emergency Transfer Criteria have not been invoked and the predicted post-contingency loading of a bulk power transmission facility will exceed its associated LTE rating but not its STE rating.

3. Emergency Transfer Criteria have been invoked and:

   a. The actual loading of any Bulk Power System transmission facility does not exceed its associated Normal rating.

   b. The loss of any single generator or circuit, together with other facilities which will trip at the same time due to pre-set automatic devices, will not cause any Bulk Power System facility to exceed its STE rating.

4. The actual voltage on any bus listed in Appendix B is above its pre-contingency high limit or below its pre-contingency low limit but within post-contingency limits for less than 5 minutes.

5. The post-contingency voltage on any bus listed in Appendix B is predicted to be below its post-contingency low limit or above its post-contingency high limit following a contingency, is indicative of a system problem, and the condition has existed for less than 5 minutes.

6. Sufficient Operating Reserve exists to meet requirements as specified in OP-2, but only using Emergency Transfer Criteria.

7. The Pool Control Error is greater than ±100 MW but not more than ±500 MW for more than 10 minutes.

8. A neighboring System or Pool is not operating under Normal conditions, but has not implemented voltage or load reduction.

9. An Operating Reserve deficiency is predicted, and a Reserve Condition "1", as defined in Appendix C, OP 2, is in effect.

B. Responsibilities - NYPP SPD

The SPD shall monitor system conditions at all times. Whenever system conditions exist which are within the criteria defined above as the Warning State, the SPD shall:

1. Determine the actions necessary to return to the Normal State through coordination with Member and neighboring Systems.

2. Actions to be taken in the Warning State shall be limited to:

   a. Modification of energy transactions

   b. Phase angle regulator adjustments

   c. Generation shift

   d. Reserve activation

   e. Adjustment of reactive sources and transformer taps

   f. Curtailment of non-essential company load

   g. Manual Voltage Reduction

   Generation may be ordered to full operating capability, and transmission facilities out of service for maintenance may be ordered restored to service.

3. After the above measures have been implemented and are insufficient to comply with Normal Transfer Criteria within 30 minutes or Operating Reserve cannot be delivered due to transmission limitations for 30 minutes, the SPD shall take the following actions:

   a. Notify all Member Systems via the Emergency Alarm System (Hot Line) that Emergency Transfer Criteria are in effect, for the facility(ies) involved;

   b. Take action as required to stay within Emergency Transfer Criteria;

   c. If useful, order Member-Directed Dispatch;

   d. The SPD shall confer with Member Systems that will have Post-Contingency loading or voltage conditions which exceed allowable limits and they shall jointly develop strategies to be followed in the event a contingency occurs. Strategies may include preparation for rapid Voltage Reduction and/or Load Shedding.

4. If all the actions above have been implemented and all the criteria for the Normal State cannot be achieved, the objective shall be to satisfy as many of the Normal State criteria as possible and to return the system to the Normal State as quickly as possible.

C. <u>Responsibilities - Member System Dispatchers</u>

Member System Dispatchers will coordinate and implement corrective actions as requested by the SPD.

Member System Dispatchers shall monitor conditions with respect to their own systems. Whenever the NYPP is operating in the Warning State and Warning State Criteria are not met the Member System Dispatchers shall:

1. Notify the NYPP SPD,

2. Request assistance via the NYPP SPD as required;

3. Initiate unilateral corrective action if the violation is severe enough to require immediate action.

D. Other Considerations

1. For all contingencies which would result in a violation of Warning State criteria, corrective action which would be necessary if the contingency occurs shall be determined through coordination between the SPD and the affected Member Systems.

2. If the SPD foresees an extended period of operation in the Warning State, a canvass of the Member Systems shall be made to determine if assistance can be provided through unit start-up or other appropriate means.

3. If a situation involving impending severe weather or severe Solar Magnetic Disturbances exists, the SPD shall notify all Member Systems and consider declaration of the Alert State.

VI. ALERT STATE

A. Definition

The Alert State exists when any of the following conditions occur:

1. Emergency Transfer Criteria have been invoked and:

   a. A Bulk Power System transmission facility remains loaded above its Normal rating but below its LTE rating for up to 4 continuous hours (or such longer period as may be established by the Rating Authority);

   b. A condition exists for less than 30 minutes in which the loss of any single generator or circuit, together with other facilities which will trip at the same time due to preset automatic devices, may cause a Bulk Power System facility to exceed its STE rating, except as noted in Appendix E.

2. The actual voltage on any bus listed in Appendix B is below its pre-contingency low limit or above its pre-contingency high limit for 5 minutes but less than 10 minutes or is above its post-contingency high limit for less than 5 minutes and is indicative of a system problem.

3. The post-contingency voltage on any bus listed in Appendix B is predicted to be below its post-contingency low limit or above its post-contingency high limit following a contingency, is indicative of a system problem, and the condition has existed for 5 minutes but less than 10 minutes.

4. Sufficient 10 Minute Reserve exists to meet the requirements as specified in OP-2 but only if quick response Voltage Reduction is counted.

5. A Bulk Power System stability limit is exceeded for less than 15 minutes and less than 5%.

6. The Pool Control Error is greater than ±500 MW for less than 10 minutes.

7. The System Frequency is between 59.90 and 59.95 or between 60.05 and 60.10.

8. A neighboring System or Pool is in voltage or load reduction but has not requested NYPP to go into voltage reduction.

9. A situation involving impending severe weather or severe Solar Magnetic Disturbances exists.

10. An Operating Reserve deficiency is predicted, and a Reserve Condition "2" is in effect.

B. Responsibilities - SPD

1. The SPD shall monitor weather conditions and forecasts issued by the National Weather Bureau on the teletype at the Power Control Center.

2. The SPD shall monitor system conditions at all times. Whenever system conditions exist which are within the criteria defined above as the Alert State the SPD shall:

   a. Immediately upon entering the Alert State, notify Member Dispatchers, via the Hot Line, stating the reasons for the change of State.

   b. Determine remedial measures necessary to return to the Warning State and, if possible, to the Normal State through coordination with the affected Member Systems.

3. Actions to be taken in the Alert State shall be limited to those actions permissable in the Warning State, and with the addition of:

   a. Requests to large industrial and commercial customers for voluntary curtailment of load;

   b. General radio and television appeals to the public to restrict unnecessary use;

   c. Curtailment of interruptible load.

4. When a situation exists in which the effects of impending severe weather or severe Solar Magnetic Disturbances could severely jeopardize the security of the Bulk Power System the SPD shall:

   a. Notify all Member Systems of the impending conditions;

   b. Determine, through coordination with Member Systems, corrective actions which would be necessary to protect for one transmission contingency greater than the normal criteria within the affected area. Such actions may include:

      1. Modification of energy transactions.
      2. Phase angle regulator adjustments.
      3. Generation shifts.
      4. Reserve activation.
      5. Adjustment of reactive sources and transformer taps.

      Generation may be ordered to full operating capability, and transmission facilities out of service for maintenance may be ordered restored to service;

   c. Subject to the limitations of b. above, the SPD shall order actions necessary to protect the security of the Bulk Power System;

d. Notify all Member Systems of the conditions and actions being taken;

e. The SPD shall notify all Member Systems after the danger of severe weather has passed or of any significant change in conditions. The Member System Dispatcher shall keep the SPD informed on any changes in local weather conditions.

C. <u>Responsibilities - Member System Dispatchers</u>

Member System Dispatchers will coordinate and implement corrective actions as required by the SPD.

Member System Dispatchers shall monitor local weather conditions. Should local severe weather conditions occur or they are predicted to occur by regional forecasts, the Member System Dispatcher shall inform the SPD.

Member System Dispatchers shall monitor conditions with respect to their own Systems. Whenever the NYPP is operating in the Alert State and Alert State Criteria are not met the Member System Dispatchers shall:

1. Notify the NYPP SPD that a local emergency exists.

2. Request assistance via the NYPP SPD as required.

3. Initiate unilateral corrective action if the violation is severe enough to require immediate action.

D. <u>Other Considerations</u>

1. For all contingencies which would result in a violation of Alert State criteria, corrective action, which would be necessary if the contingency occurs shall be determined through coordination between the SPD and the affected Member Systems.

2. If the SPD foresees an extended period of operation in the Alert State, a canvass of the Member Systems shall be made to determine if assistance can be provided through unit start-up or other appropriate means.

VII. MAJOR EMERGENCY STATE

A. Definition

The Major Emergency State exists when any of the following conditions occur:

1. A transmission facility, which constitutes part of the Bulk Power System, becomes loaded above its LTE rating;

2. Emergency Transfer Criteria have been invoked and a transmission facility which constitutes a part of the Bulk Power System:

   a. remains loaded above its Normal rating, but equal to or less than its LTE rating for four continuous hours or such longer period as may be established by the Rating Authority;

   b. remains for 30 minutes at a loading level which would cause its STE rating to be exceeded following a contingency, or

   c. becomes loaded to a level which would cause its STE rating to be violated and corrective action could not be taken rapidly enough to meet the requirements of this Operating Policy once the contingency occurs.

3. The voltage on any bus listed in Appendix B is:

   a. below its pre-contingency low limit or above its pre-contingency high limit for 10 minutes and is indicative of a system problem;

   b. below its pre-contingency low limit, is indicative of a system problem and appropriate voltage control measures have already been utilized;

   c. below its post-contingency low limit and is indicative of a system problem;

   d. above its post-contingency high limit for 5 minutes;

   e. predicted to be below its post-contingency low limit or above its post-contingency high limit following a contingency, is indicative of a system problem, and the condition has existed for 10 minutes.

If the actual voltage at any bus listed in Appendix B declines below the post-contingency low limit and is indicative of a system voltage collapse, the Senior Pool Dispatcher shall immediately order Load Shedding in the amount and at the locations deemed necessary to maintain a minimum voltage equal to the post-contingency low limit.

4. There is a 10 Minute Reserve or an Operating Reserve deficiency, and the actions described in the Operating Reserve Policy (OP-2) up to and including purchase of Operating Capability from other systems are not sufficient to re-establish the required reserve.

5. The power flow on an internal NYPP interface or towards NYPP on an interpool interface exceeds its stability limit by 5% or more or its stability limit is exceeded by less than 5% and corrective measures are not effective within 15 minutes.

6. The Pool Control Error is greater than 500 MW and normal corrective procedures are not effective within 10 minutes.

7. System Frequency declines to 59.9 Hz or increases to 60.1 Hz and is sustained at that level or continues to decline below 59.9 Hz or increase above 60.1 Hz.

8. Communications, computer, control and indication facilities necessary to monitor these criteria are not available and, in the judgement of the SPD, the system is in jeopardy.

9. A neighboring System or Pool already in Voltage Reduction, has requested assistance that can only be achieved through Voltage Reduction within the NYPP.

10. Portions of the NYPP system are separated.

B. <u>Responsibilities - Major Emergency Declared By NYPP</u>

1. <u>Senior Pool Dispatcher</u>

The SPD shall monitor system conditions at all times. Whenever a Major Emergency State exists as defined above, the SPD has the authority and responsibility to:

a. Determine and declare that a Major Emergency exists;

b. Communicate as soon as possible with all Member Systems via the Emergency Alarm System, and notify them that a Major Emergency has been declared. At this time, all prescheduled generation changes should be held in abeyance until the SPD determines that they will not aggravate system conditions;

c. Verify the status of the Bulk Power System with all Systems whose facilities are involved in the Major Emergency;

d. Determine those remedial measures set forth or referenced in this Policy which must be taken by a Member or Members to alleviate the emergency and Order that such measures be implemented. Actions to be taken during a Major Emergency may include Voltage Reduction and Load Shedding. If an Order includes Load Shedding, such Order shall be followed immediately by a visual signal to the Member or Members involved via the Load Shed Alarm System. The SPD shall initiate or Order the required remedial action;

e. Arrance to notify and keep informed all Members and neighboring Pools, on a timely basis, of the current status of the Bulk Power System;

f. Coordinate the restoration of the Bulk Power System and the termination of Load Relief measures as conditions permit;

g. Communicate as soon as possible with all Member Systems, via the Hot Line, when the Major Emergency is terminated.

2. Member System Dispatchers

Each Member System Dispatcher has the responsibility to:

a. Execute orders received from the SPD in accordance with this Policy;

b. Notify the SPD immediately upon completion of the Orders received from the SPD;

c. Inform the NYPP Pool Dispatcher of changes in system status;

d. Coordinate corrective action with the NYPP SPD;

e. Initiate unilateral corrective action if the violation is severe enough to require immediate action.

C. Responsibilities - Emergency Declared by Member System

1. Member System Dispatcher

Member System Dispatchers shall monitor conditions with respect to their own Systems. Whenever conditions exist which are within the criteria defined above as a Major Emergency, the Member System Dispatchers shall:

a. Determine that an Emergency exists and immediately notify the SPD. They shall also keep the SPD fully informed of local conditions and system status;

b. Direct the operation of their generating and transmission facilities to effect prompt remedial action during Emergencies on their system. They shall also direct immediate corrective action to prevent equipment damage from cascading events;

c. Request assistance from the SPD if needed.

2. Senior Pool Dispatcher

The SPD has the authority and responsibility to:

a. Identify problems on the System requesting assistance and determine whether a Major Emergency should be declared. If the SPD declares a Major Emergency, actions under paragraph V. B., above, should be implemented;

b. If a Major Emergency is not declared, the SPD will:

1. Notify all Member Systems, via the Hot Line, that a Major Emergency does not exist, but should it become necessary, they should be prepared to provide assistance;

2. Coordinate any assistance requested by the Member who has declared that an Emergency exists.

D. Major Emergenc - Transmission Thermal Overloads

1. Transmission Overloads - Time Duration Criteria

If a transmission facility, which constitutes a part of the Bulk Power System, becomes overloaded, relief measures shall be applied immediately to bring the loading within established ratings.

a. When a facility becomes loaded above its LTE rating but below its STE rating corrective action, which may include Voltage Reduction and/or Load Shedding must be taken to return the loading on the facility to its LTE rating within 15 minutes.

b. When a facility becomes loaded at or above its STE rating, immediate corrective action, which may include Voltage Reduction and/or Load Shedding must be initiated to reduce the loading on the facility to below its STE rating within 5 minutes and furthermore, to continue to reduce the loading on the facility to its LTE rating within 10 minutes from the initial overload. If the loading is substantially above the STE rating, Load Relief should be considered as the initial action to be taken.

c. After the loading on a facility has been reduced below its LTE rating additional corrective action, excluding further Voltage Reduction and/or Load Shedding, should be taken to reduce the loading on the facility to below its Normal rating within 30 minutes of the initial overload. In the event this cannot be accomplished, the SPD shall invoke Emergency Transfer Criteria.

d. When a facility has been loaded for 4 continuous hours (or such longer period as may be established by the Rating Authority) above its Normal rating, but at or below its LTE rating, corrective action, which may include Voltage Reduction and/or Load Shedding, must be taken to return the facility to its Normal rating within 30 minutes.

2. Transmission Overloads Caused by Internal Events

If the overload on the Bulk Power System is caused by events within NYPP, the SPD shall Order such of the following actions as he may deem necessary, in whatever order he may deem appropriate. These possible actions are listed in the order of increasing severity.

a. If the overload involves the loss of transmission facilities, attempt to have the facilities restored.

b. Initiate generation shifts, phase shifter adjustments, and/or modify interchange transactions.

c. If the overload involves the loss of generation, institute the appropriate procedures as set forth in OP-2.

d. Order quick response Voltage Reduction in those Areas where such action will reduce the overload. This step should be taken immediately if the need for Load Shedding appears likely.

e. Determine the amount and location of Load Shedding required to relieve the overload and Order such Load Shedding.

A Member System may open transmission facilities, if necessary, to prevent damage to equipment. The SPD shall be notified of the intended action and he shall notify all other parties involved prior to opening the transmission facilities if time and loading conditions permit.

3. Transmission Overloads Caused By External Events

If the overload on the Bulk Power System is caused by events on Systems not within NYPP, the following actions shall be taken by the SPD.

a. Communicate with the System producing the overload and request immediate relief.

b. Request assistance from neighboring Systems.

A Member System may open transmission facilities, if necessary, to prevent damage to equipment. The SPD shall be notified of the intended action and he shall notify all other parties involved prior to opening the transmission facilities if time and loading conditions permit.

E. Major Emergency - Post-Contingency STE Rating Violations

If a transmission facility which constitutes a part of the Bulk Power System is being operated under Emergency Transfer Criteria and becomes loaded to a level which would cause its Post-Contingency loading to exceed its STE rating and corrective action could not be taken rapidly enough to meet the requirements of this policy once the contingency occurs, immediate corrective action, which may include Voltage Reduction and Load Shedding must be taken to reduce the loading such that sufficient time will be available to apply corrective action following the contingency.

F. Major Emergency - High or Low Voltage

Voltage control of the Bulk Power System is coordinated by the SPD to provide adequate voltage at all times to maintain power transfer capability. The procedures for coordinating voltage control of the Bulk Power System are detailed in OP-9.

The SPD shall declare a Major Emergency, notify all members of the condition and direct the necessary corrective action short of Load Shedding if the voltage at any bus listed in Appendix B is:

1. below its pre-contingency low limit or above its pre-contingency high limit for 10 minutes and is indicative of a system problem;

2. below its pre-contingency low limit, is indicative of a system problem and appropriate voltage control measures have already been utilized;

3. below its post-contingency low limit and is indicative of a system problem;

4. above its post-contingency high limit for 5 minutes;

5. predicted to be below its post-contingency low limit or above its post-contingency high limit following a contingency, is indicative of a system problem, and the condition has existed for 10 minutes.

If the actual voltage at any bus listed in Appendix B declines below the post-contingency low limit and is indicative of a system voltage collapse, the SPD shall immediately order Load Shedding in the amount and at the locations deemed necessary to maintain a minimum voltage equal to the post-contingency low limit.

G. Major Emergency - Operating Reserve Deficiency

Emergency Transfer Criteria shall be invoked if necessary to provide transmission capability to deliver Operating Reserve to an Area deficient in Operating Reserve. The SPD shall notify all Members that Emergency Transfer Criteria have been invoked and Members in the deficient Area should be prepared to return facilities to appropriate ratings within the prescribed time should such ratings be exceeded. When a shortage of Operating Reserve is predicted and adequate time is available to complete load curtailment and manual voltage reduction procedures, such procedures shall be accomplished prior to implementing quick response voltage reduction.

If, after the above action, a shortage of 10 Minute Reserve or Operating Reserve still exists, the Senior Pool Dispatcher shall declare a Major Emergency and shall direct that Load Relief procedures be implemented in accordance with OP-3.

H. Major Emergency-Stability Limit Violation

1. Less than 5%

If the loading of an internal NYPP transfer interface or the power flow towards NYPP on an inter-pool interface exceeds the NYPP system stability limit by less than 5%, measures shall be applied immediately to bring the loading to established limits within 15 minutes. If, after taking corrective action, loadings are not below the stability limit within 15 minutes, a Major Emergency shall be declared and corrective measures, which may include Load Relief, shall be initiated to bring the loading to established limits within 15 minutes. If loadings are not below the stability limit within 30 minutes from the initial overload, Load Relief measures must be instituted.

2. More than 5%

If the loading of an internal NYPP transfer interface or the power flow towards NYPP on an inter-pool interface exceeds the NYPP system stability limit by 5% or more, a Major Emergency shall be declared immediately and corrective measures, which may include Load Relief, shall be initiated to bring the loading to established limits. If loadings are not below 105% of the stability limit within 15 minutes from the initial overload, or below the stability limit within 30 minutes from the initial overload, Load Relief measures must be instituted.

I. Major Emergency - Low Frequency

A sustained low frequency of 59.9 Hz is an indication of major load-generation imbalance in which case the SPD shall declare a Major Emergency. It is important for the Area causing the imbalance to provide load-generation balance at once to restore frequency.

During a Major Emergency resulting from a low frequency condition caused by load-generation imbalance within NYPP, if a Member System loses generation such Member shall immediately Shed Load in accordance with a schedule previously determined by the SPD.

1. <u>Deficient Area Identifiable and Within NYPP</u>

When the generation-deficient Area is clearly identifiable and within NYPP, when the frequency decline is slow enough to permit communication among the SPD and Member System Dispatchers, and when adequate consideration can be given to the amount of assistance which can be delivered to the deficient Area by all power systems, the SPD shall Order such assistance and, to the extent required, he shall Order the deficient system to initiate immediate Action to correct load-generation imbalance.

2. <u>Deficient Area Not Clearly Identifiable</u>

When the generation-deficient Area is not clearly identifiable, and/or when the frequency decline is so rapid as to preclude analysis and communication among various dispatchers, the following procedures will apply up to permissible LTE ratings:

a. 59.5 to 59.0 Hz	All Systems should have achieved a 10% Load Shedding if the transmission system loadings permit.
b. 59.0 to 58.5 Hz	All Systems should have achieved an additional 15% Load Shedding if the transmission system loadings permit.
c. 58.5 Hz	If frequency is still declining, all Systems shall take such steps as are necessary, including separating units to preserve generation, minimize damage and service interruption.

In the event that the frequency decline is so rapid as to prevent operator action, automatic facilities exist to achieve the Load Shedding in Steps (1) and (2) above without regard for transmission loadings.

J. <u>Major Emergency - Load Shedding Allocation</u>

It is the responsibility of all Member Systems to shed load as ordered by the SPD to assist other Member Systems. However, should the duration of the period during which load is shed be sufficient to warrant such action, and should transmission loading permit, the SPD shall re-allocate Load Shedding such that at all times the deficient Member or Members shall have shed 6% more of their respective loads than the sufficient members.

The amount of load to be shed by each Member System, within the geographic Area of its franchise Area where Load Shedding can contribute effective relief, shall be in ratio that its estimated peak load for the current Capability Period in such Area bears to the sum of the estimated peak loads for the current Capability Period for all Member Systems in such Area, as set forth in Appendix A.

Each Area must be capable of carrying out the following:

1. Automatic Load Shedding of ten percent of its load at a nominal trip point of 59.3 hertz;

2. Automatic Load Shedding of an additional 15 percent of its load at a nominal trip point of 58.8 hertz.

Each Area must be capable of shedding at least 50 percent of its load in ten minutes or less. Insofar as practical, the first half of the load shed manually should not include that load which is part of any Automatic Load Shedding plan.

K. Responsibility of New York Power Authority

The Power Authority loads are largely wholesale deliveries to other Pool Members, and reduction of such load would not be appropriate. Other Power Authority loads are supplied by wheeling power over the transmission facilities of other Pool Members. The Authority has agreed that such wheeled loads may be included in the reduction provision of the wheeling utility on the same basis as the utility applies to its own loads. The Power Authority has ad hoc arrangements with its directly served principal industrial customers to reduce load under certain conditions. Such reduction, to the extent that it would alleviate the Emergency condition, will probably have been implemented before widespread reduction of other loads.

VIII. RESTORATION STATE

A. Definition

The Restoration State exists when an Area within the NYPP becomes islanded and/or customer load becomes interrupted, following a System disturbance affecting the Bulk Power System.

B. Responsibilities

1. Senior Pool Dispatcher

The SPD has the authority and responsibility to:

a. Permit the restoration of load previously shed when it is ascertained that there is adequate generation and transmission capacity available;

b. Coordinate the closing of inter-company transmission tie lines;

c. Monitor power flow, frequency and voltage conditions. Order appropriate actions to operate within Criteria prescribed by Operating Policies;

d. Expedite and coordinate the synchronization of the separated Areas to adjacent systems within the Pool and with neighboring Pools;

e. Obtain all energy necessary to facilitate restoration;

f. Maintain continuous communication with systems impacted by restorative actions;

g. Communicate periodically with Member Systems via the Hot Line to provide status reports regarding restoration action.

2. Member System Dispatchers

Each Member System Dispatcher has the responsibility and authority to:

a. Execute the Orders received from the SPD to restore the Bulk Power Systems;

b Notify SPD as soon as possible and periodically thereafter of their system status including generation, transmission, loading and any other appropriate information;

c. Implement Member System restoration procedures;

d. Notify the SPD of internal system conditions such as voltage problems, transmission overloads or mismatch of load and generation, which must be corrected prior to completing his Orders;

e. Coordinate any restorative actions with the SPD that will impact other systems.

Other Considerations

The highest restoration priority must be assigned to the Bulk Power System of the New York Power Pool. The next priority will be restoration of load. If there is limited energy available within the NYPP, priority will be given to generating station start-up. In the Restoration State, each Member shall be responsible for the dispatch of its own generation. Each Member System is required to have a restoration procedure specifically designed for its system. If all communication is lost between the NYPP and Member Systems, restoration efforts should proceed using inter-company communication facilities.

OPERATING COMMITTEE

Central Hudson Gas and Electric Corporation	William D. Ness
Consolidated Edison Company of New York, Inc.	[illegible]
Long Island Lighting Company	[illegible]
New York Power Authority	[illegible]
New York State Electric & Gas Corporation	William G. M[illegible]
Niagara Mohawk Power Corporation	[illegible]
Orange and Rockland Utilities, Inc.	Donald V. Engelhart
Rochester Gas and Electric Corporation	[illegible]
New York Power Pool Operating Manager	Richard E. Phillips

NEW YORK POWER POOL

1990 SUMMER CAPABILITY PERIOD

LOAD REDUCTION BY ENTIRE POOL
(IN MEGAWATTS)

REDUCTION REQUIRED	CH	CE	LILCO	NYSEG	NMP	O&R	RGE	NYPP TOTAL
100	4	38	16	9	23	4	5	100
200	8	76	33	18	46	8	11	200
300	11	115	49	27	70	12	16	300
400	15	153	66	36	93	16	22	400
500	19	191	82	45	116	20	27	500
600	23	229	98	54	139	24	33	600
700	27	267	115	63	162	28	38	700
800	30	305	131	72	185	32	44	800
900	34	344	147	81	209	37	49	900
1000	38	382	164	90	232	41	54	1000

NEW YORK POWER POOL

1990 SUMMER CAPABILITY PERIOD

ALLOCATION OF LOAD REDUCTION AMONG ALL MEMBERS IN A GEOGRAPHIC AREA
(IN MEGAWATTS)

LOAD REDUCTION TO RELIEVE WEST-CENTRAL TRANSMISSION

REDUCTION REQUIRED	CH	CE	LILCO	O&RU	NMP(C+E)	NYS(C+E)	TOTAL
100	4	45	19	5	18	9	100
200	9	90	39	10	35	17	200
300	13	136	58	14	53	26	300
400	18	181	78	19	70	34	400
500	22	226	97	24	88	43	500
600	27	271	116	29	105	52	600
700	31	316	136	34	123	60	700
800	36	361	155	38	140	69	800
900	40	407	174	43	158	77	900
1000	45	452	194	48	175	86	1000

LOAD REDUCTION TO RELIEVE CENTRAL-EAST TRANSMISSION

REDUCTION REQUIRED	CH	CE	LILCO	O & R	NMP(E)	NYSEG(E)	TOTAL
100	5	54	23	6	10	1	100
200	11	109	47	12	20	2	200
300	16	163	70	17	30	3	300
400	22	218	94	23	40	4	400
500	27	272	117	29	50	5	500
600	33	327	140	35	60	6	600
700	38	381	164	41	69	7	700
800	43	436	187	46	79	8	800
900	49	490	210	52	89	9	900
1000	54	545	234	58	99	10	1000

LOAD REDUCTION TO RELIEVE UPNY-SENY TRANSMISSION

REDUCTION REQUIRED	CE	LILCO	O & R	NYSEG(E)	TOTAL
100	64	28	7	1	100
200	129	55	14	2	200
300	193	83	21	3	300
400	257	110	27	5	400
500	322	138	34	6	500
600	386	166	41	7	600
700	451	193	48	8	700
800	515	221	55	9	800
900	579	249	62	10	900
1000	644	276	68	12	1000

NEW YORK POWER POOL

1990 SUMMER CAPABILITY PERIOD
LOAD DISCONNECTION QUALIFICATION
BASED ON 6% OF LOAD IN GEOGRAPHIC AREA
(IN MEGAWATTS)

)TAL)OL)AD	NMP	NYSEG	RGE	CONED	LILCO	C H	O & R	NMP C+E	NYSEG C+E	NMP (E)	NYSEG (E)	NYSEG (SE)
500	327	127	77	538	231	54	57	209	102	98	10	9
000	320	124	75	527	226	52	56	205	100	96	10	8
500	313	121	73	515	221	51	55	200	98	94	9	8
000	306	119	72	504	216	50	54	196	96	92	9	8
500	299	116	70	492	211	49	52	191	94	90	9	8
000	292	113	69	481	206	48	51	187	92	88	9	8
500	285	110	67	470	201	47	50	182	89	86	9	8
000	278	108	65	458	197	46	49	178	87	83	8	7
500	271	105	64	447	192	44	47	174	85	81	8	7
000	264	102	62	435	187	43	46	169	83	79	8	7
500	257	100	60	424	182	42	45	165	81	77	8	7
000	250	97	59	412	177	41	44	160	78	75	7	7
500	243	94	57	401	172	40	43	156	76	73	7	6
000	236	92	55	389	167	39	41	151	74	71	7	6
500	229	89	54	378	162	38	40	147	72	69	7	6
00	222	86	52	366	157	36	39	142	70	67	7	6
00	216	84	51	355	152	35	38	138	68	65	6	6
00	209	81	49	344	147	34	37	133	65	63	6	5
[illegible]	202	78	47	332	142	33	35	129	63	60	6	5
[illegible]	195	75	46	321	138	32	34	125	61	58	6	5
[illegible]	188	73	44	309	133	31	33	120	59	56	6	5
[illegible]	181	70	42	298	128	30	32	116	57	54	5	5
[illegible]	174	67	41	286	123	29	30	111	55	52	5	5
[illegible]	167	65	39	275	118	27	29	107	52	50	5	4
00	160	62	38	263	113	26	28	102	50	48	5	4
00	153	59	36	252	108	25	27	98	48	46	5	4
00	146	57	34	240	103	24	26	93	46	44	4	4
00	139	54	33	229	98	23	24	89	44	42	4	4
00	132	51	31	218	93	22	23	85	41	40	4	3
00	125	49	29	206	88	21	22	80	39	38	4	3

BUS VOLTAGE LIMITS

BUS NAME	PRE LOW	PRE HIGH	POST LOW	POST HIGH	SET BY
BØWLINE345	338	362	328	362	OR
BUCHANAN345	338	362	328	380	CE
CLAY345	345	362	328	362	NM
CØØPERS CØRNERS345	338	362	328	380	NY
DUNWØØDIE345	338	362	328	380	CE
(1) ED:C345	347	362	328	362	NM
FARRAGUT345	338	362	328	380	CE
FRASER345	338	362	328	380	NY
GARDENVILLE230	217	242	207	242	NY
GILBØA345	348	362	328	362	PA
GØETHALS345	338	362	328	380	CE
GØWANUS345	338	362	328	380	CE
HURLEY AVE	338	362	328	362	CH
LADENTØWN345	338	362	328	380	CE
LEEDS345	345	362	328	372	NM
(1) MARCY345	348	362	328	380	PA
MILLWØØD345	338	362	328	380	CE
NEWSCØTLAND345	348	362	328	362	NM
NIAGARA230	225	242	219	242	PA
NIAGARA345	338	362	328	362	PA
NØRTHPØRT138	135	145	131	145	LI
(2) ØAKDALE230	see pg2	242	207	242	NY
(2) ØAKDALE345	see pg2	362	325	380	NY
(2) PANNELL RØAD345	see pg2	358	328	362	RG
PLEASANT VALLEY345	338	362	328	380	CE
RAINEY345	338	362	328	380	CE
(3) RAMAPØ345	338	362	328	380	CE
RAMAPØ500	500	550	500	575	CE
RØSETØN345	338	362	328	362	CH
SØMERSET345	338	362	328	380	NY
SPRAINBRØØK345	338	362	328	380	CE
(2) STATIØN 80 345	see pg2	359	328	362	RG
ST LAWRENCE230	225	242	219	242	PA
(2) WATERCURE230	see pg2	242	207	242	NY

Notes

(1) Marcy 345kV bus voltage is reduced to 345kV prior to energizing the Massena-Marcy 765kV MSU-1 line. By exception, Marcy and Edic voltages are allowed below their pre-contingency low limits for this condition.

(2) Pre-contingency low limits for various HQ to NYPP transfers are listed on page 2 of this appendix.

(3) Voltage below 327kV at Ramapo may cause the loss of the Bowline Units.

BUS VOLTAGE LIMITS

Pre-contingency low bus voltage limits for ranges of HQ-NYPP transfer (on the 7040 line) are as follows:

	Pre-Contingency Low Voltage Limits (kV) for Range of HQ-NYPP Transfer (+ towards NYPP)				
Bus Name	-1000 to +1000MW	1001 to 1350MW	1351 to 1850MW	1851 to 2000MW	2001 to 2350MW
Pannell Rd 345kV	339	339	341	341	342
Station 80 345kV	341	341	341	341	342
Oakdale 345kV	335	335	337	338	339
Oakdale 230kV	217	219	222	222	222
Watercure 230kV	220	222	224	225	225

CORRECTIVE PROCEDURES AND REQUIRED ACTIONS

STATE					
Normal	Warning	Alert	Major Emerg.	Restore	CORRECTIVE PROCEDURES
X	X	X	X	X	Modify Energy Transactions
X	X	X	X	X	Adjust Phase Angle Regulators
X	X	X	X	X	Adjust Generation
X	X	X	X	X	Activate Reserve(s)
X	X	X	X	X	Adjust Voltage (Reactors, Transformer Taps)
X	X	X	X	X	Prepare for Manual Voltage Reduction
	X	X	X	X	Manual Voltage Reduction
	X	X	X	X	Curtail Member Company Non-essential Use
		X	X	X	Curtail Interruptible Customer Load
		X	X	X	Request Large Customers to Curtail Load
		X	X	X	Request All Customers to Curtail Load (General Public Appeal)
			X	X	Quick Response Voltage Reduction
			X	X	Load Shedding
				X	Restore Load
					REQUIRED ACTIONS
					SPD ACTIONS
X	X	X	X	X	Determine State
	X	X	X	X	If a change of state occurs declare the power system to be operating in the new state
	X	X	X	X	Declare Emergency Transfer Criteria
	X	X	X	X	Determine action to return to normal state or more secure state
		X	X	X	Notify via hot line of conditions, resulting system state, and procedures to be implemented
					MEMBER ACTIONS
X	X	X	X	X	Notify SPD of Actual System Conditions
X	X	X	X	X	Request assistance via NYPP SPD as required
X	X	X	X	X	Initiate unilateral action if warranted by conditions
			X	X	Consider any request from SPD as an order and execute such requests
			X	X	Implement Member System restoration procedures
			X	X	Coordinate any restoration actions with SPD that will impact other systems

SUMMARY OF SYSTEM CONDITIONS FOR
OPERATING STATES OF THE NYPP BULK POWER SYSTEM

MONITORED CRITERIA	NORMAL	WARNING	ALERT	MAJOR EMERGENCY	RESTORATION
1. Transmission Facility Pre-Contingency Loadings*	at or below normal ratings	Above normal ratings but below LTE ratings for not more than 30 minutes or Emergency Transfer Criteria invoked but at or below Normal ratings.	Emergency Transfer Criteria invoked and loading above Normal rating but below LTE rating for not more than 4 hours.	Above LTE rating or above Normal rating but not more than LTE rating for 4 hours.	
2. Post-Contingency Loadings* a. Loss of Generation or Single Facility	Equal to or less than LTE rating	Predicted loading greater than LTE rating but less than or equal to STE rating	Greater than STE rating but with sufficient time to take corrective action following contingency. Emergency Transfer Criteria have not been exceeded for more than 30 minutes	STE rating will be exceeded and insufficient time will exist to implement corrective action or ETC has been invoked and criteria have been exceeded for more than 30 minutes	
b. Loss of two adjacent circuits on the same structure	Equal to or less than LTE rating	Emergency Transfer Criteria have been invoked Post-Contingency Loading may exceed STE rating.			
3. Actual Voltage**	Within pre-contingency limits.	Below its pre-contingency low limit or above its pre-contingency high limit but within post-contingency limits for less than 5 minutes.	Below its pre-contingency low limit or above its pre-contingency high limit for more than 5 minutes but less than 10 minutes. Above its post-contingency high limit for less than 5 minutes.	Below its pre-contingency low limit or above its pre-contingency high limit for 10 minutes and is indicative of a system problem. Below its pre-contingency low limit, is indicative of a system problem and appropriate voltage control measures have already been taken. Below post-contingency low limit and is indicative of a system problem. Above its post-contingency high limit, for 5 minutes.	
Post-Contingency Voltage	Predicted to be within post-contingency limits	Predicted to be below its post-contingency low limit or above its post-contingency high limit following a contingency, is indicative of a system problem, and the condition has existed for less than 5 minutes.	Predicted to be below its post-contingency low limit or above its post-contingency high limit following a contingency, is indicative of a system problem, and the condition has existed for 5 minutes but less than 10 minutes.	Predicted to be below its post-contingency low limit or above its post-contingency high limit following a contingency, is indicative of a system problem, and the condition has existed for 10 minutes.	

MONITORED CRITERIA	NORMAL	WARNING	ALERT	MAJOR EMERGENCY	RESTORATION
4. Reserve					
a. 10 Minute Reserve	Meets requirements specified in OP-2	Meets requirements specified in OP-2 but only if using Emergency Transfer Criteria	Meets requirements specified in OP-2 but only including quick response Voltage Reduction	10 Min Reserve deficiency exists after taking actions specified in OP-2 including purchase of operating capability.	
b. Operating Reserve	Meets requirements specified in OP-2	Meets requirements specified in OP-2 but only if using Emergency Transfer Criteria	Meets requirements specified in OP-2 but only using Emergency Transfer Criteria.	Operating Reserve deficiency exists after taking actions specified in OP-2 including purchase of operating capability.	
5. Stability Limits	Not exceeded	Not exceeded	Exceeded by less than 5% for less than 15 min.	Exceeded by 5% or less for 15 min. or more than 5%	
6. PCE	Less than ±100 MW or less than ±500 MW for less than 10 min.	More than ±100 MW but less than ±500 MW for more than 10 min.	Equal to or greater than ±500 MW for less than 10 minutes	Equal to or greater than ±500 MW for more than 10 min.	
7. Frequency	LT or equal to 60.05 GT or equal to 59.95	LT or equal to 60.06 GT or equal to 59.95	LT 60.10 and GT 60.05 GT 59.90 and LT 59.95	Equal or GT 60.10 and is sustained Equal OR LT 59.90 or continues to increase or decline	
8. Communication Facilities Availability	Sufficient to monitor system status	Sufficient to monitor system status	Sufficient to monitor system status	Insufficient to monitor system status and SPD determines system is in jeopardy	
9. Neighboring System	All operating under normal conditions	One or more systems not operating under normal conditions	One or more systems in Voltage Reduction	One or more systems in Voltage Reduction and requests NYPP assistance via Voltage Reduction	
10. Separation within NYPP	NO	NO	NO	YES	
11. Other			A situation involving impending severe weather exists		

* SEE EXCEPTIONS - APPENDIX E
** SEE EXCEPTIONS - APPENDIX B

EXCEPTIONS TO NYPP OPERATING CRITERIA

A. As Approved by the Operating Committee

1. The post-contingency flow on the Marcy-New Scotland 18 line is allowed to exceed its LTE rating for the loss of the Edic-New Scotland 14 line by the amount of relief that can be obtained by tripping the Gilboa pumping load as a single corrective action. Also, the post-contingency flow on the Edic-New Scotland 14 line is allowed to exceed its LTE rating for either the loss of the Marcy-New Scotland 18 line alone, or the double-circuit loss of the Marcy-New Scotland 18 and Adirondack-Porter 12 lines, by the amount of relief that can be obtained by tripping the Gilboa pumping load as a single corrective action.

   Operating Committee - January 27, 1988.

2. Allow post-contingency STE on Volney-Clay #6 & 9 Mile-Clay #8 for "normal" transfers.

   Operating Committee - October 25, 1979

3. For transfers to NE & SENY, with sufficient generation at Gilboa, allow post-contingency STE on NS-Leeds.

   Operating Committee - October 25, 1979

4. NMPC to be fully responsible for monitoring all NMPC 345/115, 345/230 and 230/115kV transformer overloads and contingency overloads. The NYPP is to notify NMPC of any overloads and contingency overloads it detects, but not to invoke these limits, unless requested to do so by NMPC.

   Operating Committee - October 25, 1979

5. Allow post-contingency loading to STE on Gilboa-Leeds (GL-3) with four generators on at Gilboa.

   Operating Committee - December 7, 1983

6. Allow post-contingency STE loadings on L33P & L34P, provided there is sufficient control remaining on the phase angle regulators to return the loadings to LTE within 15 minutes.

   Operating Committee - October 17, 1984

7. Allow the post-contingency loading on Con Edison feeder 21192 to exceed its STE rating for the simultaneous loss of circuits Goethals-Fresh Kills #21 and Gowanus-Goethals-Fresh Kills #26.

   Operating Committee - December 6, 1984

8. The post-contingency flow on W97 (or W98), for the loss of W98 (or W97), may exceed its LTE rating up to its STE rating if the contingency W98 (or W97) and Y88 does not cause resultant flows on any other feeder to exceed their Normal Transfer Criteria.

   This exception does not apply if either W97, W98, Y88, Indian Point 3, or the overload relay system is out of service.

   Operating Committee - May 30, 1985

9. Allow the post-contingency flow on the Oswego-Volney #12 line to exceed its STE rating for the simultaneous loss of the Oswego-Elbridge-Lafayette #17 line and the Oswego-Volney #11 line for the following conditions:

   a. Nine Mile #2 is not on-line, and
   b. The Volney-Clay #6 line is in service.

   If the Volney-Clay #6 line is out of service, then the total output of the Oswego #5, Oswego #6, Nine Mile #1, and Fitzpatrick units must not be greater than 2910 MW for this exception to be valid.

   Operating Committee - September 25, 1986

10. Allow the post-contingency flow on the Marcy AT-1 bank to exceed its STE rating for the loss of the Marcy AT-2 bank, provided that the overload relay protection on the AT-1 bank is in-service.

    Operating Committee - November 20, 1986

11. Allow the post-contingency flow on the Plattsburgh-Vermont PV-20 tie-line to be operated up to the STE rating for the loss of the Hydro-Quebec System (simultaneous loss of all HQ HVDC ties) only. Operate to LTE rating on PV-20 for all other contingencies.

    Operating Committee - November 20, 1986

12. Allow the post-contingency flow on the Marcy Transformer T2 to exceed its LTE rating up to its STE rating following the loss of Marcy Transformer T1.

    Operating Committee - July 23, 1987

B. <u>Operation Limitations by Member Company Directives</u>

   1. ConEdison operates to post-contingency STE ratings on underground circuits based on the ability to reduce the loading to LTE ratings within 15 minutes and not exceed LTE ratings on any other facilities.

      The following PS&G tie feeders are operated to post-contingency LTE ratings:

A2253 Linden-Goethals 230kV

B3402 Hudson-Farragut 345kV

C3403 Hudson-Farragut 345kV

2. The following feeders on the Consolidated Edison System have STE ratings which are limited by disconnect or wavetrap restrictions and not by conductor sagging limitations. These feeders will be operated above normal and up to LTE (for 4 hours) without changing their STE ratings:

F30 Pleasant Valley-Wood St.
F31 Pleasant Valley-Wood St.
F36 Pleasant Valley-Wood St.
F37 Pleasant Valley-Wood St.
W64 Eastview-SprainBrook
W65 Eastview-SprainBrook
69 Ramapo-South Mahwah
70 Ramapo-South Mahwah
W72 Ramapo-Ladentown
W75 SprainBrook-Dunwoodie (Winter Rating Period Only)
W79 Eastview-SprainBrook
W80 Wood St.-Millwood West
W81 Wood St.-Millwood West
W82 Millwood West-Eastview
W85 Millwood West-SprainBrook
Y86 Wood St.-Pleasantville
Y87 Wood St.-Pleasantville
Y88 Ladentown-Buchanan South
W89 Pleasantville-Dunwoodie
W90 Pleasantville-Dunwoodie
W93 Buchanan North-Eastview
Y94 Ramapo-Buchanan North
W99 Millwood West-Eastview

3. The following feeders on the Consolidated Edison System have overload relay protection. These feeders will be operated above normal and up to LTE (for 4 hours) without changing their STE ratings:

W97 Buchanan South-Millwood West

W98 Buchanan South-Millwood West

ATTACHMENT 5 to JPN-90-077

NIAGARA-MCHAWK MEMO

New York Power Authority

JAMES A. FITZPATRICK NUCLEAR POWER PLANT
Docket No. 50-333

NIAGARA MOHAWK

NIAGARA MOHAWK POWER CORPORATION/300 ERIE BOULEVARD WEST, SYRACUSE, N.Y. 13202/TELEPHONE (315) 474-1511

November 30, 1990

Mr. Philip A. Nelson
New York Power Authority
P.O. Box 191
Marcy, NY 13403

Dear Phil:

This memo is to confirm our recent discussions concerning the operation of our facilities in the vicinity of the Oswego/FitzPatrick/Nine Mile Point generation stations.

As agreed between our operating staffs, Niagara Mohawk will operate so as to maintain the bus voltage at Nine Mile Point to no higher than 120 kV under normal circumstances. This, accordingly, will result in acceptable voltages at the FitzPatrick 115 kV bus; acceptable being defined by the Authority.

If we can be of further assistance, please let me know.

Sincerely,

Clement E. Nadeau
Manager
System Power Control

CEN/ry