December 27, 1989

MEMORANDUM FOR: Charles E. Rossi, Director
Division of Operational Events Assessment

FROM: Charles J. Haughney, Chief
Events Assessment Branch
Division of Operational Events Assessment

SUBJECT: THE OPERATING REACTORS EVENTS MEETING
December 27, 1989 - MEETING 89-45

On December 27, 1989, we conducted an Operating Reactors Events meeting (89-45) to brief senior managers from NRR, AEOD, Commission staff, and regional offices on selected events that occurred since our last meeting on December 13, 1989. Enclosure 1 lists the attendees.

Enclosure 2 presents the significant elements of the discussed events. Enclosure 3 contains a summary of reactor scrams for the weeks ending 12/24/89 and 12/17/89. One significant event was identified for input into the NRC performance indicator program.

Original signed by:
Charles J. Haughney

Charles J. Haughney, Chief
Events Assessment Branch
Division of Operational Events Assessment

Enclosures:
As stated

cc w/Encl.:
See Next Page

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NAME	:MLReardon	:CJHaughney	:	:	:	:	:
DATE	:12/27/89	:12/27/89	:	:	:	:	:

DF03 per 900117 telcon w/ Jim Knight JRR

OFFICIAL RECORD COPY

OEX2
1/1

5-1 IDIT Operating Experience

cc:
T. Murley, NRR
F. Miraglia, NRR
J. Sniezek, NRR
J. Partlow, NRR
E. Jordan, AEOD
J. Taylor, EDO
E. BeckJord, RES
W. Russell, RI
S. Ebneter, RII
B. Davis, RIII
R.D. Martin, RIV
J.B. Martin, RV
W. Kane, RI
L. Reyes, RII
E. Greenman, RIII
J. Milhoan, RIV
R. Zimmerman, RV
S. Varga, NRR
B. Boger, NRR
G. Lainas, NRR
F. Congel, NRR
E. Weiss, AEOD
B. Clayton, EDO
J. Lieberman, OE
J. Guttmann, SECY
A. Thadani, NRR
J. Richardson, NRR
S. Rubin, AEOD
J. Forsyth, INPO
R. Barrett, NRR
M. Harper, AEOD
R. Newlin, GPA
J. Roe, NRR
H. Alderman, ACRS
D. Dilanni, NRR
L. Yandell, NRR
B. Buckley, NRR
H. Berkow, NRR

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

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David C. Fischer for

Charles J. Haughney, Chief
Events Assessment Branch
Division of Operational Events Assessment

Enclosures:
As stated

cc w/Encl.:
See Next Page

ENCLOSURE 1

LIST OF ATTENDEES

OPERATING REACTORS EVENTS BRIEFING (89-45)

December 27, 1989

NAME	ORGANIZATION	NAME	ORGANIZATION
J. Dyer	OEDO	E. Adensam	NRR/DRP
S. Saba	NRR/SELB	R. Gramm	NRR/DRIS
A. Mattson	NRR/DOEA	C. Carter	NRR/DOEA
S. Varga	NRR/DRP	C. Berlinger	NRR/DOEA
D. Fischer	NRR/DOEA	S. Mazumdar	AEOD/TPAB
K. Naidu	NRR/DRIS	B. Grimes	NRR/DRIS
B. Boger	NRR/ADR-1	C. Thomas	NRR/DLPQ
S. Hoffman	NRR/PD2-2	D. Roberts	NRR/PD2-2
B. Buckley	NRR/PD2-2	M. Moser	NRR/ILRB
R. Kendall	NRR/DOEA	M. Reardon	NRR/DOEA
P. Cortland	NRR/TVAP	H. Berkow	NRR/PD2-2

ENCLOSURE 2

OPERATING REACTORS EVENTS BRIEFING 89-45
EVENTS ASSESSMENT BRANCH
LOCATION: 16B-11, WHITE FLINT
WEDNESDAY, DECEMBER 27, 1989, 11:00 A.M.

PRAIRIE ISLAND UNIT 2	REACTOR TRIP AND PARTIAL LOSS OF OFFSITE POWER (AIT)
SURRY UNIT 1	REACTOR TRIP WITH COMPLICATIONS

PRAIRIE ISLAND UNIT 2
REACTOR TRIP AND PARTIAL LOSS OF OFFSITE POWER (AIT)
DECEMBER 21, 1989
DECEMBER 26, 1989

PROBLEM

FOLLOWING REACTOR TRIP, SLUGGISH OPERATION OF A MAIN GENERATOR OUTPUT BREAKER RESULTED IN LOSS OF POWER TO SAFETY-RELATED AND NON-SAFETY-RELATED LOADS FROM THE PREFERRED OFFSITE POWER FEED (VIA RESERVE TRANSFORMERS 2RX AND 2RY). FOLLOWING CORRECTIVE ACTIONS, A SIMILAR EVENT OCCURRED 5 DAYS LATER.

CAUSE

- o REACTOR TRIP WAS INITIATED ON A NEGATIVE FLUX RATE SIGNAL ATTRIBUTED TO THE FAILURE OF A CONTROL ROD MOTOR-GENERATOR (MG) SET VOLTAGE REGULATOR.
- o THE LICENSEE BELIEVES THAT COLD WEATHER (TEMPERATURES OF APPROX 20 DEGREES F BELOW ZERO) CAUSED SLUGGISH BREAKER OPERATION.

SAFETY SIGNIFICANCE

SLUGGISH OPERATION OF SWITCHYARD BREAKERS CAN PREVENT AUTOMATIC FAST TRANSFER OF POWER SOURCES TO SAFETY-RELATED BUSES AND/OR CAUSE UNNECESSARY CHALLENGES TO SAFETY-RELATED EQUIPMENT (CIRCUIT BREAKERS AND DIESEL GENERATORS). FAILURE TO SUCCESSFULLY IDENTIFY AND/OR CORRECT ROOT CAUSES CAN LEAD TO REPEAT EVENTS AND REPEAT CHALLENGES TO SAFETY SYSTEMS.

DISCUSSION

- o UNIT 2 MAIN GENERATOR OUTPUT BREAKERS (8H13 AND 8H14) ARE DESIGNED TO OPEN IN 2 CYCLES (1/30 SECOND) FOLLOWING A GENERATOR TRIP. BREAKERS 8H13 DID NOT OPEN UNTIL 12 CYCLES AFTER THE TRIP (1/5 SECOND), CAUSING PROTECTIVE RELAYING TO SENSE THAT THE BREAKER HAD FAILED, AND TO LOCK OUT 345KV BUS NO 1. THIS LOCKOUT RESULTED IN LOSS OF POWER TO PLANT LOADS FROM THE RESERVE TRANSFORMERS.

AIT: YES

CONTACT: R. KENDALL

SIGEVENT: NO

REFERENCES: 10 CFR 50.72 #s 17394, 17440, AND MORNING REPORTS 12/22 AND 12/26/89

DISCUSSION (CONTINUED)

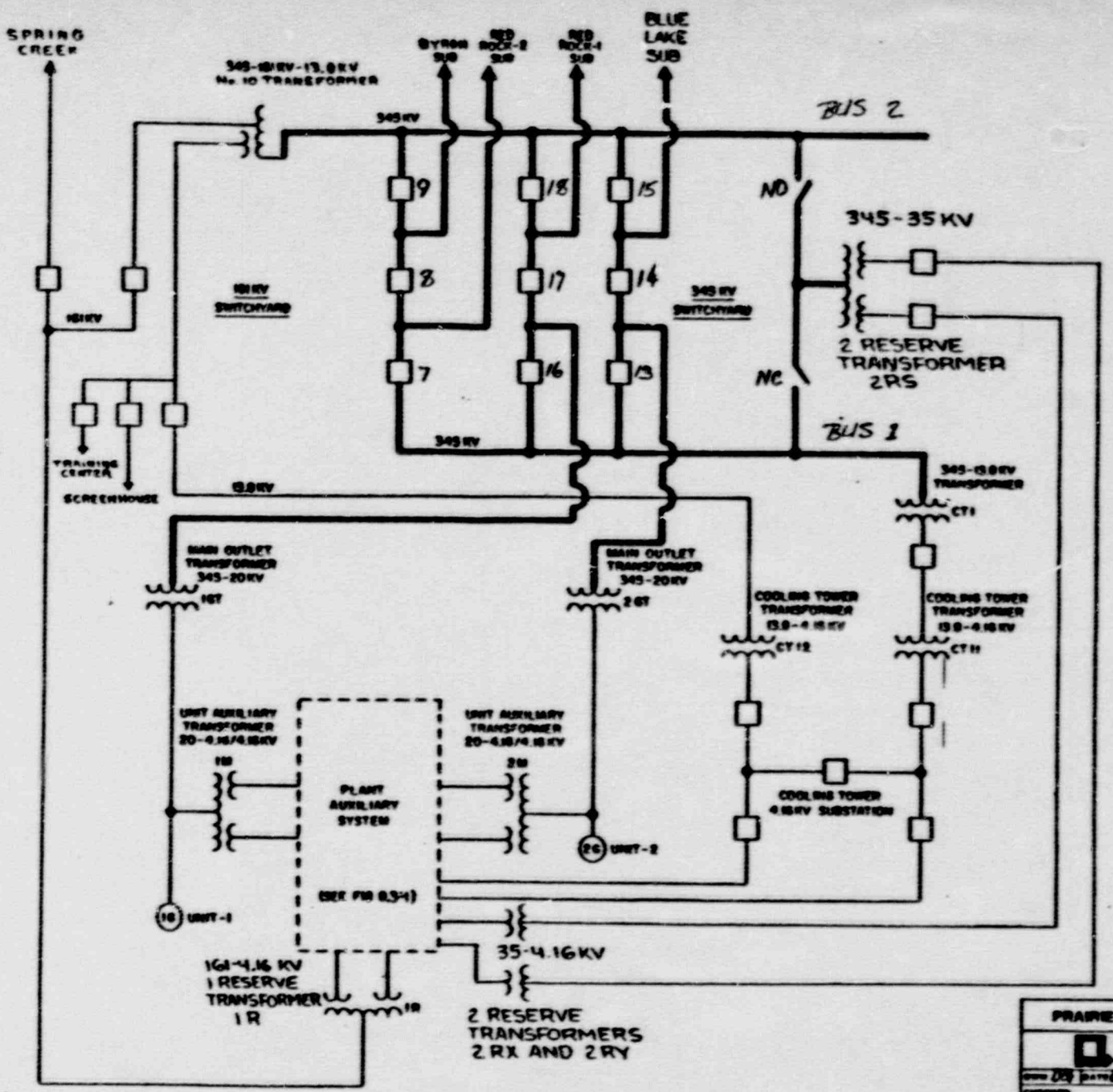
- o LOSS OF POWER TO 4.16KV NON-SAFETY BUSES CAUSED LOSS OF THE REACTOR COOLANT PUMPS. DECAY HEAT WAS REMOVED USING AUXILIARY FEEDWATER AND THE ATMOSPHERIC AND CONDENSER STEAM DUMP VALVES.
- o POWER TO THE ESF BUSES AUTOMATICALLY FAST TRANSFERRED TO ALTERNATE SOURCES. POWER REMAINED AVAILABLE TO SAFETY-RELATED LOADS. THE DIESEL GENERATORS AUTOMATICALLY STARTED, BUT WERE NOT LOADED.
- o BREAKERS ARE GENERAL ELECTRIC MODEL ATB362, AND ARE ORIGINAL PLANT EQUIPMENT. THE LICENSEE HAS NOT EXPERIENCED PREVIOUS PROBLEMS WITH COLD WEATHER OPERATION, BUT HAS EXPERIENCED PROBLEMS WITH O-RINGS AND SEALS USED IN THE BREAKERS. THE LICENSEE BELIEVES THAT COLD TEMPERATURES (PERHAPS IN CONJUNCTION WITH CHANGING BREAKER CHARACTERISTICS DUE TO AGING) CAUSED SLUGGISH OPERATION OF THE BREAKER. THE LICENSEE'S INVESTIGATION IS CONTINUING.

CORRECTIVE ACTIONS

- o THE FAILED CONTROL ROD MG SET VOLTAGE REGULATOR WAS REPLACED AND TESTED SATISFACTORILY.
- o THE LICENSEE HAS BUILT HEATED ENCLOSURES AROUND THE TRIP COILS AND AIR PRESSURE CONTROLS FOR CRITICAL SWITCHYARD BREAKERS.

FOLLOWUP

EAB WILL FOLLOW THE RESULTS OF THE LICENSEE'S ROOT CAUSE INVESTIGATION OF THE SWITCHYARD BREAKER FAILURE TO DETERMINE POTENTIAL GENERIC IMPLICATIONS. REGION III WILL MONITOR THE LICENSEE'S INVESTIGATION, INCLUDING FACTORS WHICH LED TO EVENT RECURRENCE. AN AIT WILL BE SENT TO THE SITE.



PRAIRIE ISLAND NUCLEAR GENERATING PL

BECHTEL CORPORATION
Campbell, California

PLANT ELECTRICAL ARRANG

NORTHERN STATES POWER COMPANY
ENGINEERING DEPARTMENT
MINNEAPOLIS

FIGURE 8.2-2 REV

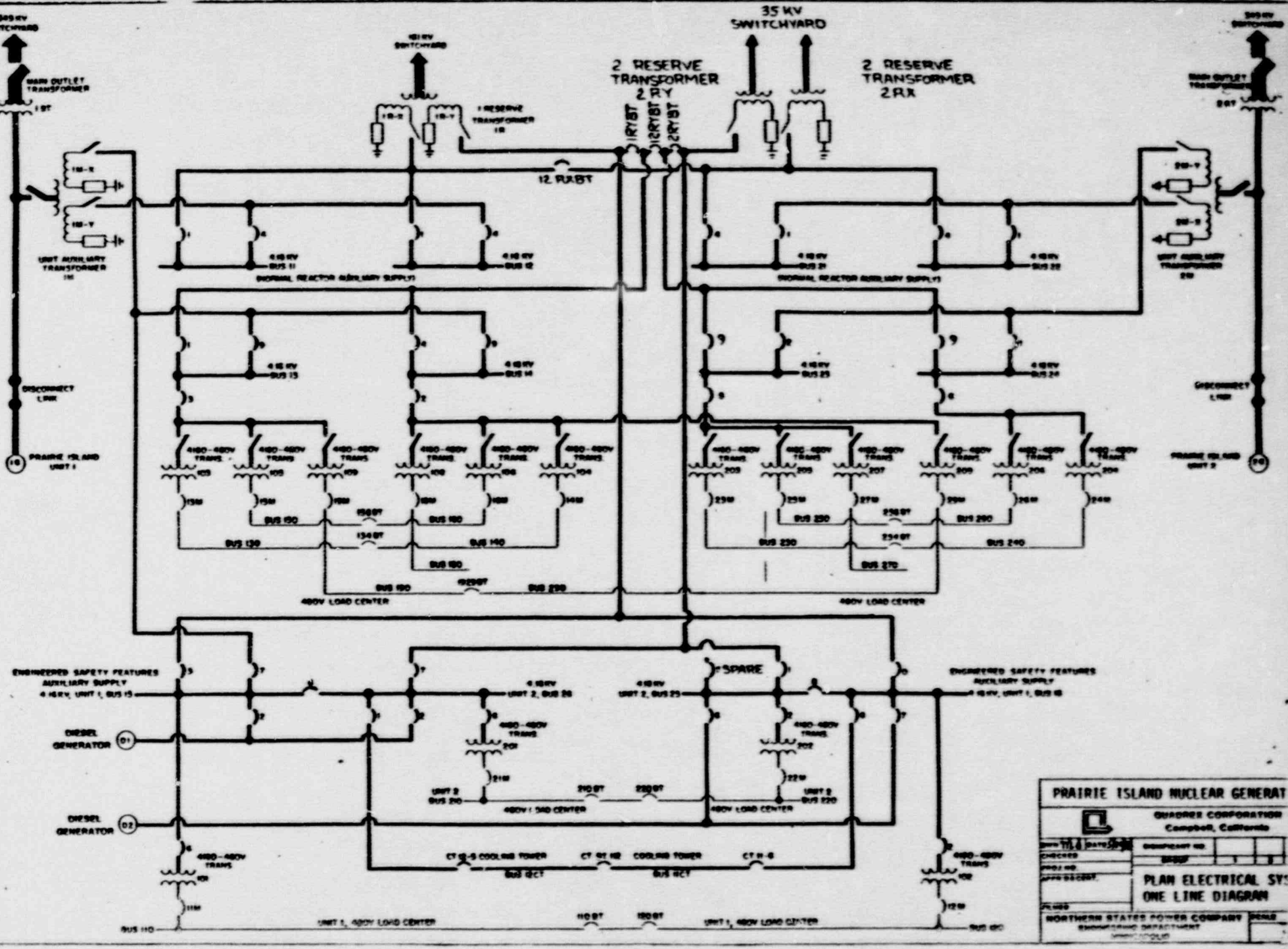


FIGURE 8.3-1 REV 1 12/82

SURRY UNIT 1
REACTOR TRIP WITH COMPLICATIONS
DECEMBER 21, 1989

PROBLEM

MANUAL REACTOR TRIP WITH COMPLICATIONS.

CAUSE

DEBRIS BLOWN FROM THE TURBINE BUILDING ROOF CAUSED A FAULT ON A RESERVE STATION SERVICE TRANSFORMER.

SAFETY SIGNIFICANCE

INADEQUATE PRECAUTIONS TO PREVENT NON-SAFETY-RELATED CONSTRUCTION ACTIVITIES FROM ADVERSELY IMPACTING THE OPERATION OF PLANT EQUIPMENT RESULTED IN UNNECESSARY CHALLENGES TO SAFETY-RELATED SYSTEMS AND EQUIPMENT.

DISCUSSION

- o UNUSUALLY HIGH WINDS BLEW PIECES OF TURBINE BUILDING ROOF INSULATION ONTO RESERVE STATION SERVICE TRANSFORMER (RSST) "A", CAUSING A PHASE-TO-GROUND FAULT AND TRANSFORMER LOCKOUT.
- o THE RSSTs PROVIDE PRIMARY OFFSITE POWER TO 4160 VAC EMERGENCY BUSES AND BACK-UP POWER TO LOADS NORMALLY SUPPLIED BY THE MAIN GENERATOR.
- o LOSS OF RSST "A" RESULTED IN LOSS OF POWER TO 4160 VAC EMERGENCY BUS 1J. EMERGENCY DIESEL GENERATOR NO 3 AUTOMATICALLY STARTED AND SUPPLIED POWER TO BUS 1J LOADS.
- o BUS 1J WAS PROVIDING POWER TO THE ANALOG ROD POSITION INDICATION SYSTEM. UPON LOSS OF POWER, THE INDIVIDUAL ROD POSITION INDICATORS (IRPI) WENT TO ZERO (THEIR LOSS OF POWER FAILURE MODE), AND THE ROD BOTTOM LIGHTS WERE DISABLED.
- o UPON RESTORATION OF POWER TO BUS 1J, THE ROD BOTTOM LIGHTS CAME ON, THE ROD BOTTOM DROPPED ROD BISTABLES INITIATED A TURBINE RUNBACK, AND THE IRPIs STARTED TO CLIMB BACK TO VALUES CORRESPONDING TO ACTUAL ROD POSITION.

CONTACT: N. FIELDS AND R. KENDALL SIGEVENT: NO

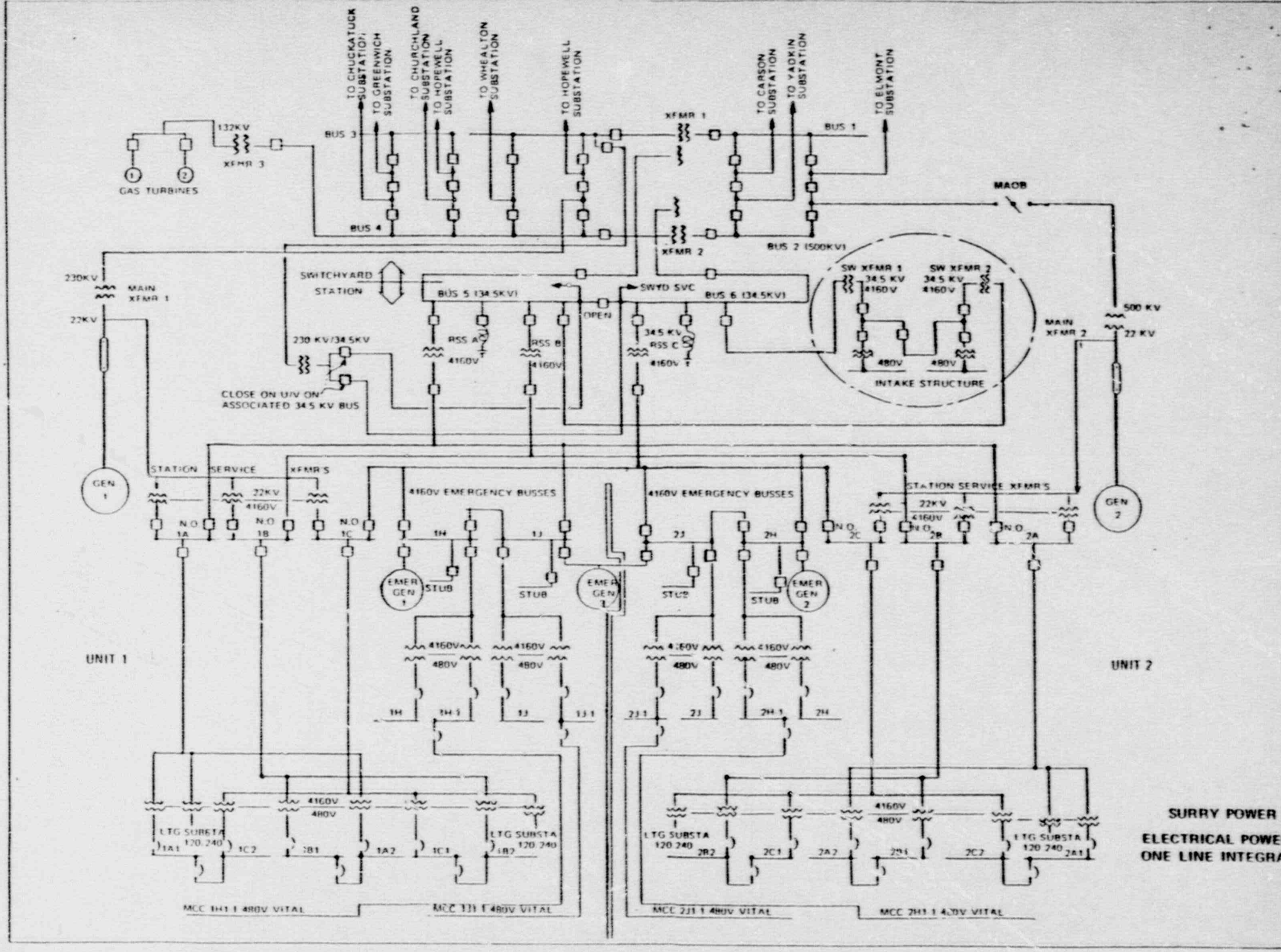
REFERENCES: 10 CFR 50.72 # 17402 AND MORNING REPORT 12/22/89

DISCUSSION (CONTINUED)

- o THE REACTOR WAS TRIPPED MANUALLY.
- o A RELAY FAILURE PREVENTED AUTOMATIC TRIP OF THE MAIN GENERATOR. THE GENERATOR WAS TRIPPED MANUALLY.
- o REACTOR COOLANT PUMP "A" WAS LOST SINCE ITS NORMAL POWER SUPPLY (STATION SERVICE TRANSFORMER) AND ITS BACK-UP SUPPLY (RSST "A") WERE BOTH LOST. RCPS "B" AND "C" WERE UNAFFECTED.
- o CONTRARY TO DESIGN, THE "N31" SOURCE RANGE CHANNEL FAILED TO ENERGIZE FOLLOWING THE TRIP BECAUSE OF FAILURE OF ITS ASSOCIATED POWER SUPPLY OVERVOLTAGE PROTECTION CIRCUIT.
- o ALL OTHER PLANT EQUIPMENT APPEARED TO RESPOND NORMALLY.

FOLLOWUP

- o BECAUSE OF THE POWER SHORTAGE IN THE LICENSEE'S SERVICE AREA, THE LICENSEE REQUESTED, AND WAS GRANTED, PERMISSION TO RESTART WITHOUT HAVING TO PERFORM CERTAIN REQUIRED RPS SURVEILLANCES.
- o THE RESIDENT IS FOLLOWING THE LICENSEE'S ACTION.
- o NO FURTHER FOLLOWUP IS PLANNED BY HEADQUARTERS STAFF.


TO CHUCKATUCK SUBSTATION
TO GREENWICH SUBSTATION
TO CHURCHLAND SUBSTATION
TO HOPEWELL SUBSTATION
TO WHEALTON SUBSTATION
TO HOPEWELL SUBSTATION
TO CARSON SUBSTATION
TO YADKIN SUBSTATION
TO ELMONT SUBSTATION
132KV
XFMR 3
GAS TURBINES
BUS 3
BUS 4
XFMR 1
XFMR 2
BUS 1
BUS 2 (500KV)
MAOB
230KV
MAIN XFMR 1
22KV
SWITCHYARD STATION
BUS 5 (34.5KV)
SWYD SVC
BUS 6 (34.5KV)
OPEN
230 KV/34.5KV
RSS A
RSS B
RSS C
4160V
CLOSE ON U/V ON ASSOCIATED 34.5 KV BUS
SW XFMR 1
SW XFMR 2
34.5 KV
4160V
480V
INTAKE STRUCTURE
MAIN XFMR 2
500 KV
22 KV
GEN 1
GEN 2
STATION SERVICE XFMR'S
22KV
4160V
N.O
4160V EMERGENCY BUSSES
EMER GEN
STUB
UNIT 1
UNIT 2
LTG SUBSTA
120 240
MCC 1H1 1 480V VITAL
MCC 1J1 1 480V VITAL
MCC 2J1 1 480V VITAL
MCC 2H1 1 480V VITAL
SURRY POWER ST
ELECTRICAL POWER
ONE LINE INTEGRAT

ENCLOSURE 3

PERFORMANCE INDICATORS SIGNIFICANT EVENTS

PLANT NAME	EVENT DATE	EVENT DESCRIPTION	QTR	SIGNIFICANCE
ARKANSAS 1	12/05/89	POTENTIAL DESRADATION OF THE RCS BOUNDARY. SEVERE BORIC ACID CORROSION. CORROSION SEVERE ENOUGH TO CAUSE TWO OF EIGHT BOLTS ON CRDM TO BECOME LOOSE.	1	POTENTIAL FOR OR ACTUAL DEGRADATION OF PRIMARY COOLANT PRESSURE BOUNDARY.

REACTOR SCRAM SUMMARY
WEEK ENDING 12/24/89

I. PLANT SPECIFIC DATA

DATE	SITE	UNIT	POWER	SIGNAL	CAUSE	COMPLI-CATIONS	YTD ABOVE 15%	YTD BELOW 15%	YTD TOTAL
12/18/89	FERMI	2	20	A	PERSONNEL	NO	3	0	3
12/20/89	PEACH BOTTOM	2	100	A	PERSONNEL	NO	4	0	4
12/21/89	PRAIRIE ISLAND	2	100	A	EQUIPMENT	NO	2	0	2
12/21/89	SURRY	1	100	M	EQUIPMENT	YES	2	0	2
12/23/89	FERMI	2	40	M	EQUIPMENT	NO	4	0	4
12/23/89	WATERFORD	3	100	M	EQUIPMENT	NO	2	0	2
12/23/89	TURKEY POINT	4	92	A	EQUIPMENT	NO	2	0	2
12/24/89	SUSQUEHANNA	1	100	A	PERSONNEL	NO	3	1	4

SUMMARY OF COMPLICATIONS

SITE	UNIT	COMPLICATIONS
SURRY	1	MAIN GENERATOR DID NOT AUTOMATICALLY TRIP AND ONE SOURCE RANGE NUCLEAR INSTRUMENT FAILED TO AUTOMATICALLY ENERGIZE FOLLOWING THE REACTOR TRIP.

REACTOR SCRAM SUMMARY
WEEK ENDING 12/17/89

I. PLANT SPECIFIC DATA

DATE	SITE	UNIT	POWER	SIGNAL	CAUSE	COMPLI-CATIONS	YTD ABOVE 15%	YTD BELOW 15%	YTD TOTAL
12/13/89	INDIAN POINT	2	100	A	EQUIPMENT	NO	2	0	2

II. COMPARISON OF WEEKLY STATISTICS WITH INDUSTRY AVERAGES

SCRAMS FOR WEEK ENDING
12/24/89

SCRAM CAUSE	POWER	NUMBER OF SCRAMS(5)	1989 WEEKLY AVERAGE YTD	1988 WEEKLY AVERAGE	1987 WEEKLY AVERAGE	1986 WEEKLY AVERAGE (3)(4)	1985 WEEKLY AVERAGE (8)(9)
** POWER >15%							
EQUIP. RELATED	>15%	5	2.9	3.1	3.9	4.3	5.4
PERS. RELATED(6)	>15%	3	1.0	1.0	1.3	1.8	2.0
OTHER(7)	>15%	0	0.1	0.5	1.2	0.4	0.6
** Subtotal **		8	4.0	4.6	6.4	6.5	8.0
** POWER <15%							
EQUIP. RELATED	<15%	0	0.4	0.5	1.2	1.4	1.3
PERS. RELATED	<15%	0	0.3	0.3	0.6	0.8	0.9
OTHER	<15%	0	0.0	0.1	0.3	0.2	0.2
** Subtotal **		0	0.7	0.9	2.1	2.4	2.4
*** Total ***		8	4.7	5.5	8.5	8.9	10.4

MANUAL VS AUTO SCRAMS

TYPE	NUMBER OF SCRAMS	1989 WEEKLY AVERAGE YTD	1988 WEEKLY AVERAGE	1987 WEEKLY AVERAGE	1986 WEEKLY AVERAGE	1985 WEEKLY AVERAGE
MANUAL SCRAMS	3	0.9	1.0	1.4	1.0	1.0
AUTOMATIC SCRAMS	5	3.8	4.5	7.0	7.9	9.4

II. COMPARISON OF WEEKLY STATISTICS WITH INDUSTRY AVERAGES

SCRAMS FOR WEEK ENDING
12/17/89

SCRAM CAUSE	POWER	NUMBER OF SCRAMS(5)	1989 WEEKLY AVERAGE YTD	1988 WEEKLY AVERAGE	1987 WEEKLY AVERAGE	1986 WEEKLY AVERAGE (3)(4)	1985 WEEKLY AVERAGE (8)(9)
** POWER >15%							
EQUIP. RELATED	>15%	1	2.9	3.1	3.9	4.3	5.4
PERS. RELATED(6)	>15%	0	1.0	1.0	1.3	1.8	2.0
OTHER(7)	>15%	0	0.1	0.5	1.2	0.4	0.6
** Subtotal **		1	4.0	4.6	6.4	6.5	8.0
** POWER <15%							
EQUIP. RELATED	<15%	0	0.4	0.5	1.2	1.4	1.3
PERS. RELATED	<15%	0	0.3	0.3	0.6	0.8	0.9
OTHER	<15%	0	0.0	0.1	0.3	0.2	0.2
** Subtotal **		0	0.7	0.9	2.1	2.4	2.4
*** Total ***		1	4.7	5.5	8.5	8.9	10.4

MANUAL VS AUTO SCRAMS

TYPE	NUMBER OF SCRAMS	1989 WEEKLY AVERAGE YTD	1988 WEEKLY AVERAGE	1987 WEEKLY AVERAGE	1986 WEEKLY AVERAGE	1985 WEEKLY AVERAGE
MANUAL SCRAMS	0	0.8	1.0	1.4	1.0	1.0
AUTOMATIC SCRAMS	1	3.8	4.5	7.0	7.9	9.4

NOTES

1. PLANT SPECIFIC DATA BASED ON INITIAL REVIEW OF 50.72 REPORTS FOR THE WEEK OF INTEREST. PERIOD IS MIDNIGHT SUNDAY THROUGH MIDNIGHT SUNDAY. SCRAMS ARE DEFINED AS REACTOR PROTECTIVE ACTUATIONS WHICH RESULT IN ROD MOTION, AND EXCLUDE PLANNED TESTS OR SCRAMS AS PART OF PLANNED SHUTDOWN IN ACCORDANCE WITH A PLANT PROCEDURE. THERE ARE 111 REACTORS HOLDING AN OPERATING LICENSE.

2. COMPLICATIONS: RECOVERY COMPLICATED BY EQUIPMENT FAILURES OR PERSONNEL ERRORS UNRELATED TO CAUSE OF SCRAM.

3. PERSONNEL RELATED PROBLEMS INCLUDE HUMAN ERROR, PROCEDURAL DEFICIENCIES, AND MANUAL STEAM GENERATOR LEVEL CONTROL PROBLEMS.

4. "OTHER" INCLUDES AUTOMATIC SCRAMS ATTRIBUTED TO ENVIRONMENTAL CAUSES (LIGHTNING), SYSTEM DESIGN, OR UNKNOWN CAUSE.