

October 9, 1990

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

FROM: Alfred E. Chaffee, Chief
 Events Assessment Branch
 Division of Operational Events Assessment

SUBJECT: THE OPERATING REACTORS EVENTS MEETING
 OCTOBER 3, 1990 - MEETING 90-24

On October 3, 1990, we conducted an Operating Reactors Events meeting (90-24) to inform senior managers from NRR, ACRS, AEOD, RES, Commission staff, and regional offices of selected events that occurred since our last briefing on September 19, 1990. Enclosure 1 lists the attendees. Enclosure 2 presents the significant elements of the discussed events.

Enclosure 3 contains reactor scram statistics for the weeks ending 09/23/90 and 09/30/90. Enclosure 4 tabulates two significant events which were identified for input into the NRC performance indicator program.

signed by

Alfred E. Chaffee, Chief
 Events Assessment Branch
 Division of Operational Events Assessment

Enclosures:
 As stated

cc w/Encl.:
 See Next Page

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OPERATING EXPERIENCES

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AME	:MLReardon	:DCFischer	:AEChaffee	:	:	:	:
ATE	:10/5/90	:10/5/90	:10/9/90	:	:	:	:

CC:

T. Murley, NRR
F. Miraglia, NRR
W. Russell, NRR
F. Gillespie, NRR
J. Partlow, NRR
S. Varga, NRR
F. Wessman, NRR
G. Lainas, NRR
D. Crutchfield, NRR
J. Zwolinski, NRR
B. Boger, NRR
W. Travers, NRR
J. Richardson, NRR
A. Thadani, NRR
F. Rosa, NRR
B. Grimes, NRR
F. Congel, NRR
J. Roe, NRR
T. Martin, RI
W. Kane, RI
C. Hehl, RI
S. Ebnetter, RII
L. Reyes, RII
B. Davis, RIII
E. Greenman, RIII
S. Collins, RIV
R.D. Martin, RIV
J.B. Martin, RV
R. Zimmerman, RV
P. Boehmert, ACRS
E. Jordan, AEOD
T. Ncvak, AEOD
L. Spessard, AEOD
E. Weiss, AEOD
S. Rubin, AEOD
M. Harper, AEOD
W. Bateman, EDO
R. Newlin, GPA
J. Cowan, INPO
E. Beckjord, RES
A. Bates, SECY

A. Johnson, NRR
R. Bevan, NRR
G. Knighton, NRR

LIST OF ATTENDEESOPERATING REACTORS EVENTS BRIEFING (90-24)

October 3, 1990

<u>NAME</u>	<u>ORGANIZATION</u>	<u>NAME</u>	<u>ORGANIZATION</u>
P. Boehnert	ACRS	A. Chaffee	NRR/DOEA
M. Cullingford	NRR/DONRR	P. Kang	NRR/SELB
D. Fischer	NRR/DOEA	E. Adensam	NRR/DRP
C. Rossi	NRR/DOEA	B. Grimes	NRR/DRIS
L. Norrholm	OCM/KC	M. Chiramal	AEOD/ROAB
M. Reardon	NRR/DOEA	R. Baer	RES/DSIR
N. Fields	NRR/DOEA	S. Newberry	NRR/SICB
L. Lambros	NRR/DST	R. Benedict	NRR/DOEA
K. Hart	SECY	W. Troskoski	OE
R. Pedersen	OE	J. Carter	NRR/DOEA
A. Young	NRR/DOEA	R. Bevan	NRR/PD5

OPERATING REACTORS EVENTS BRIEFING 90-24

EVENTS ASSESSMENT BRANCH

LOCATION: 10B-11, WHITE FLINT

WEDNESDAY, OCTOBER 3, 1990, 11:00 A.M.

GINNA UNIT 1

REACTOR TRIP WITH COMPLICATIONS
(AIT)

TROJAN UNIT 1

MAIN GENERATOR PARALLELED TO THE
GRID WHILE OUT-OF-PHASE

GINNA UNIT 1
REACTOR TRIP WITH COMPLICATIONS (AIT)
SEPTEMBER 26, 1990

PROBLEM

TURBINE DID NOT TRIP ON REACTOR TRIP SIGNAL. MSIV FULL CLOSURE TOOK FOUR TO FIVE MINUTES.

CAUSE

FOREIGN MATERIAL AND DEGRADED SPOOL IN THE SOLENOID VALVE MOST LIKELY INTERFERED WITH TURBINE TRIP CIRCUITRY. FULL MSIV CLOSURE MOST LIKELY DUE TO EITHER A PACKING PROBLEM OR A SMALL NEGATIVE DELTA-P ACROSS THE VALVE.

SAFETY SIGNIFICANCE

TURBINE TRIP ON REACTOR TRIP IS NOT A SAFETY FUNCTION. INADEQUATE MSIV CLOSURE DURING LOW OR NO STEAM FLOW COULD RESULT IN SMALL OFFSITE RELEASES IN THE EVENT OF A STEAM GENERATOR TUBE RUPTURE.

SEQUENCE OF EVENTS

- o REACTOR AT 97% POWER.
- o PLANT PERSONNEL DROPPED FLASHLIGHT ON TURBINE TRIP AUTO-STOP PROTECTION RELAYS FOR REACTOR TRIP BREAKER "A."
- o REACTOR TRIP
- o (NO TURBINE TRIP)
- o LOW PRESSURIZER PRESSURE ACTUATED REACTOR TRIP BREAKER "B."
- o TURBINE TRIPPED (7 SECONDS AFTER THE REACTOR TRIPPED).
- o REACTOR COOLANT REACHED LOW T-AVE CAUSING MFW ISOLATION. DURING MFW RECIRC, RELIEF VALVE FOR MFWP "A" CYCLED AND DID NOT RESEAT.
- o LOW-LOW STEAM GENERATOR LEVEL CAUSED MOTOR- AND TURBINE-DRIVEN AFW PUMPS TO START.

CONTACT: A. P. YOUNG

AIT: YES

SIGEVENT: NO

REFERENCES: 10 CFR 50.72 #19465, MORNING REPORT DATED 10/1/90,
AND PNO-1-90-84

- o OPERATORS MANUALLY CLOSED BOTH MSIV'S (5 TO 6 MINUTES AFTER REACTOR TRIP) TO MODERATE THE COOLDOWN. MSIV "A" REMAINED 1/4-INCH OPEN, 4 TO 5 MINUTES LATER, MSIV "A" CLOSED ON ITS OWN AFTER THE T-J AFWP WAS SECURED.
- o INTERMEDIATE RANGE DETECTORS DID NOT CORRESPOND AT THE LOW END OF THE SCALE.
- o MOISTURE-SEPARATOR-REHEATER "B" REHEATER MAIN SUPPLY VALVE WAS CLOSED, BUT INDICATED "MID-POSITION".

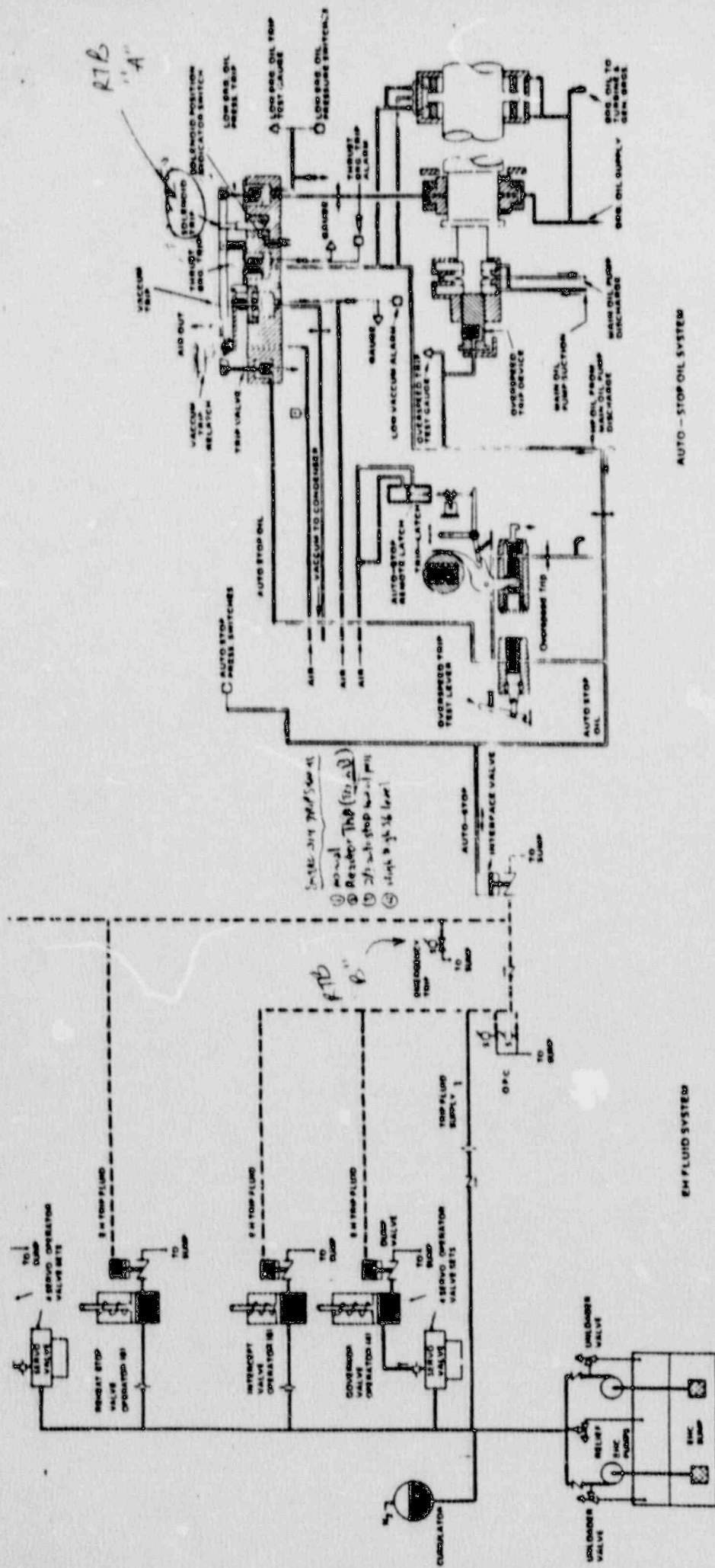
DISCUSSION

- o AIT INVESTIGATION REVEALED THAT FLASHLIGHT HIT ONLY 2 "A" CONTACTS ON 2 OF THE RELAYS FOR THE "A" REACTOR TRIP BREAKER. THESE RELAYS WERE APPROXIMATELY 3 INCHES APART.
- o REACTOR TRIP SIGNAL FAILED TO TRIP THE TURBINE DUE TO DEBRIS (BITS OF O-RING) FOUND IN THE PILOT ACTUATOR FOR THE SOLENOID TRIP (MANUFACTURED BY PARKER) AND A DEGRADED SPOOL IN THE SOLENOID VALVE. THIS IS BELIEVED TO HAVE INTERFERED WITH THE TURBINE TRIP CIRCUITRY. THE FAILED SOLENOID WAS REPLACED WITH AN UPGRADED MODEL WITH LESS RESTRICTIVE CLEARANCES.
- o MSIV "A" FAILED TO FULLY CLOSE PROBABLY DUE TO PACKING TIGHTNESS. VALVE WAS TESTED REPEATEDLY AND FOUND TO PERFORM AS DESIGNED. ANALYSIS BY WESTINGHOUSE VERIFIED THAT THESE VALVES WILL PERFORM THEIR SAFETY FUNCTION.
- o THE OFFSCALE READING ON THE INTERMEDIATE RANGE DETECTOR N35 WAS DUE TO THE DIFFERENT RESPONSES OF THE DETECTORS, HOWEVER, THOSE RESPONSES ARE WITHIN GINNA'S DESIGN.
- o DUAL INDICATION OF THE REHEATER SUPPLY VALVE WAS DUE TO A LIMIT SWITCH PROBLEM. THE SWITCH HAS BEEN REPAIRED.

FOLLOWUP

- o AN AIT WAS DISPATCHED TO THE SITE THURSDAY, SEPTEMBER 27, 1990. EXIT WAS HELD AND GINNA RESTARTED FRIDAY, SEPTEMBER 28, 1990.
- o LICENSEE WILL PERFORM THE FOLLOWING CORRECTIVE ACTIONS:
 - DURING NEXT REFUELING, LICENSEE WILL EXAMINE 2 OTHER PARKER SOLENOIDS OF SIMILAR DESIGN.

- LICENSEE WILL DO A POST-MORTEM EXAMINATION OF THE FAILED SOLENOID.
 - LICENSEE WILL EVALUATE THEIR PROGRAM FOR INSPECTION OF THE SOLENOID.
 - LICENSEE WILL PERFORM "END-TO-END" OR "OVERLAPPING" TESTS ON TURBINE TRIP CIRCUITRY TO FILL-IN THE VOIDS THAT WERE NOT INCLUDED IN PREVIOUS TESTS WHERE SAMPLES OF THE CIRCUIT WERE TESTED.
- o GINNA IS AT 97% POWER.



R7B
11 A

Inter-ship Trip System
 1. 20-psi
 2. Resistor Trip (100 psi)
 3. 2/3 auto stop level
 4. 1/3 auto stop level

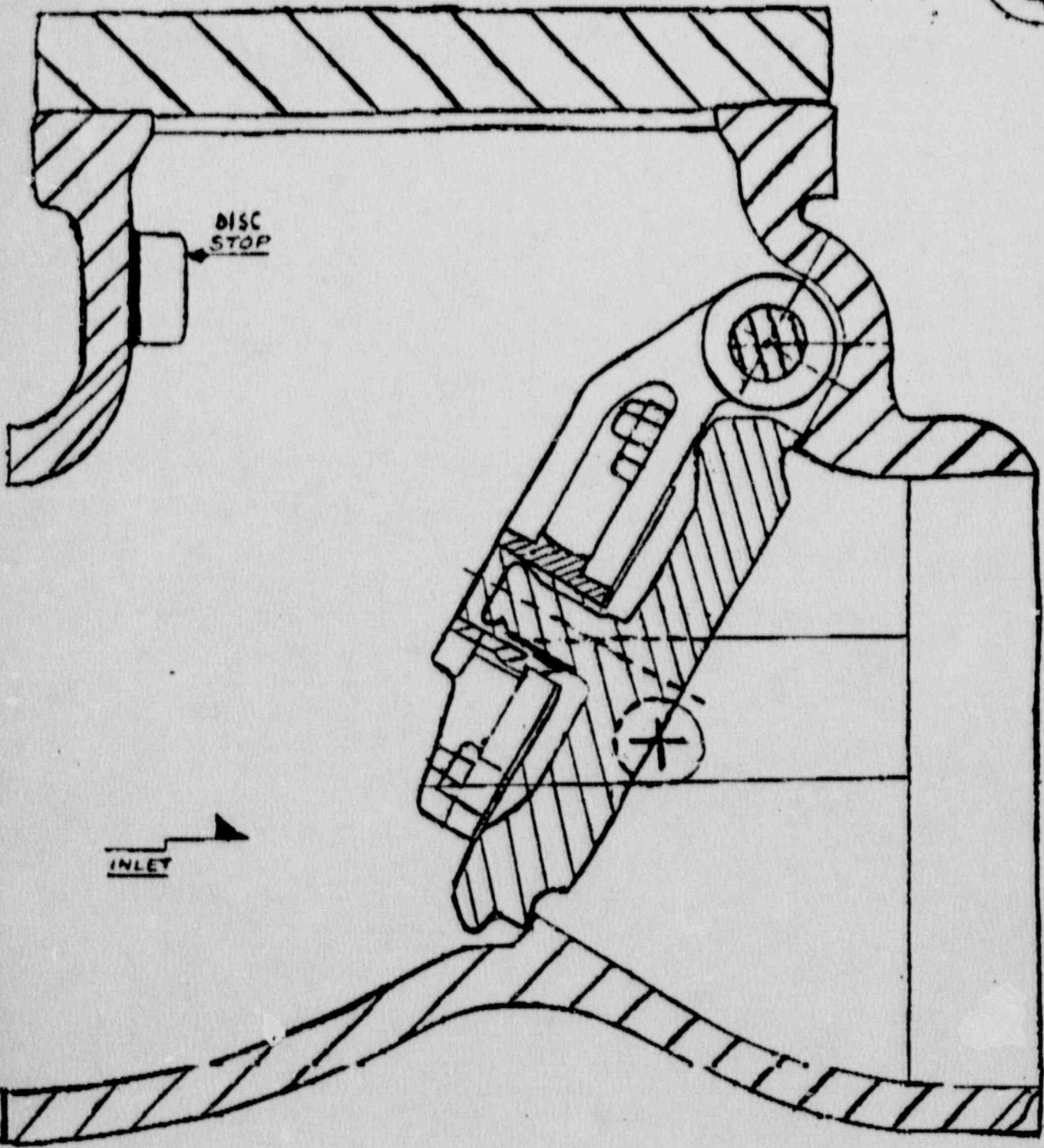
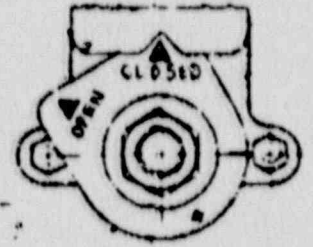
FIGURE A

GINNA TURBINE TRIP SYSTEM

AUTO-STOP OIL SYSTEM

EM FLUID SYSTEM

Local Position Indication



INLET

DISC STOP

Main Steam Isolation Valve

TROJAN UNIT 1
MAIN GENERATOR PARALLELED TO GRID WHILE OUT-OF PHASE
SEPTEMBER 27, 1990

PROBLEM

MAIN GENERATOR OUTPUT BREAKER WAS CLOSED WHILE 180 DEGREE PHASE DIFFERENCE EXISTED BETWEEN THE MAIN GENERATOR AND THE GRID.

CAUSE

EQUIPMENT FAILURE.

SAFETY SIGNIFICANCE

MINIMAL, POTENTIAL FOR LOSS OF OFFSITE POWER.

DISCUSSION

- o ON SEPTEMBER 27, 1990, TROJAN UNIT 1 WAS BEING RETURNED TO SERVICE FROM A SEPTEMBER 25, 1990 SHUTDOWN TO REPAIR A CONDENSER TUBE LEAK.
- o THE REACTOR WAS AT ABOUT 5.5% POWER, THE TURBINE WAS WARMED UP AND THE GENERATOR WAS READY TO PARALLEL TO THE GRID WHEN THE CONTROL ROOM OPERATOR ATTEMPTED TO CLOSE ONE OF THE TWO 100 PERCENT MAIN GENERATOR OUTPUT BREAKERS.
- o THE BREAKER DID NOT CLOSE AND AS PER PROCEDURE, THE OPERATOR PLACED THE BREAKER SWITCH IN THE TRIP POSITION, MOMENTARILY.
- o ABOUT 7 TO 10 SECONDS LATER, THE BREAKER SHUT WITH NO OPERATOR ACTION.
- o THE MAIN GENERATOR WAS APPROXIMATELY 180 DEGREES OUT-OF-PHASE WITH THE GRID AT THAT TIME.
- o THE RESULTING TRANSIENT CAUSED A 140 MW EXCURSION ON THE GRID AND SHOOK THE TURBINE BUILDING DECK.
- o BREAKER OPERATION INVOLVES ENERGIZING TWO SOLENOID OPERATED PILOT VALVES WHICH PORT AIR TO THE OPERATING PISTON. THE SOLENOIDS IN QUESTION ARE MANUFACTURED BY ASCO, WERE FOUND TO CONTAIN DEBRIS WHICH RESTRICTED AIR FLOW TO THE OPERATING PISTON.
- o NO REACTOR TRIP.

CONTACT: N. FIELDS
REFERENCE: PNO-V-90-38A

SIGEVENT: NO

FOLLOWUP

- o LICENSEE HAS INSPECTED THE GENERATOR AND THE THREE LOW PRESSURE TURBINES. SOME LOOSE DOWELS WERE FOUND IN THE BLADES OF ONE OF THE LP TURBINES; HOWEVER, LICENSEE DOES NOT ATTRIBUTE THIS PROBLEM TO THIS EVENT.
- o UNIT IS CURRENTLY IN MODE 3, PLANNING STARTUP WITHIN APPROXIMATELY 48 HOURS.
- o THE REGION IS FOLLOWING THE LICENSEE'S ACTIONS.

REACTOR SCRAM SUMMARY
WEEK ENDING 09/30/90

ENCLOSURE 3

1. PLANT SPECIFIC DATA

DATE	SITE	UNIT	POWER	SIGNAL	CAUSE	COMPLI- CATIONS	YTD	YTD	YTD
							ABOVE	BELOW	TOTAL
							15%	15%	
09/25/90	WNP	2	40	M	EQUIPMENT	NO	1	0	1
09/26/90	GINNA	1	97	A	PERSONNEL	NO	3	1	4
09/27/90	BRUNSWICK	1	22	A	EQUIPMENT	NO	1	0	1
09/27/90	BRUNSWICK	2	100	A	EQUIPMENT	NO	3	2	5
09/28/90	ARKANSAS	2	78	M	EQUIPMENT	NO	3	1	4
09/29/90	SOUTH TEXAS	1	100	M	PERSONNEL	NO	6	1	7
09/29/90	BRAIDWOOD	1	99	A	EQUIPMENT	NO	3	0	3

REACTOR SCRAM SUMMARY
WEEK ENDING 09/23/90

1. PLANT SPECIFIC DATA

DATE	SITE	UNIT	POWER	SIGNAL	CAUSE	COMPLI- CATIONS	YTD	YTD	YTD
							ABOVE	BELOW	TOTAL
							15%	15%	
09/18/90	DUANE ARNOLD	1	52	A	EQUIPMENT	NO	4	0	4
09/19/90	SEDUOYAH	1	61	A	EQUIPMENT	NO	2	1	3
09/20/90	HADDAM NECK	1	49	M	EQUIPMENT	NO	2	1	3
09/22/90	ZION	2	40	A	EQUIPMENT	NO	3	0	3

II. COMPARISON OF WEEKLY STATISTICS WITH INDUSTRY AVERAGES

SCRAMS FOR WEEK ENDING
09/30/90

SCRAM CAUSE	POWER	NUMBER OF SCRAMS (5)	1990 WEEKLY AVERAGE YTD	1989 WEEKLY AVERAGE	1988 WEEKLY AVERAGE	1987 WEEKLY AVERAGE	1986 WEEKLY AVERAGE (3)(4)
** POWER >15%							
EQUIP. RELATED	>15%	5	3.4	2.9	3.1	3.9	4.3
PERS. RELATED(6)	>15%	2	0.7	1.0	1.0	1.3	1.8
OTHER(7)	>15%	0	0.0	0.1	0.5	1.2	0.4
** Subtotal **		7	4.1	4.0	4.6	6.4	6.5
** POWER <15%							
EQUIP. RELATED	<15%	0	0.4	0.4	0.5	1.2	1.4
PERS. RELATED	<15%	0	0.1	0.3	0.3	0.6	0.8
OTHER	<15%	0	0.0	0.7	0.1	0.3	0.2
** Subtotal **		0	0.5	1.4	0.9	2.1	2.4
*** Total ***		7	4.6	5.4	5.5	8.5	8.9

MANUAL VS AUTO SCRAMS

TYPE	NUMBER OF SCRAMS	1990 WEEKLY AVERAGE YTD	1989 WEEKLY AVERAGE	1988 WEEKLY AVERAGE	1987 WEEKLY AVERAGE	1986 WEEKLY AVERAGE
MANUAL SCRAMS	3	1.3	0.9	1.0	1.4	1.0
AUTOMATIC SCRAMS	4	3.3	3.8	4.5	7.0	7.9

II. COMPARISON OF WEEKLY STATISTICS WITH INDUSTRY AVERAGES

SCRAMS FOR WEEK ENDING 09/23/90

SCRAM CAUSE	POWER	NUMBER OF SCRAMS(5)	1990 WEEKLY AVERAGE YTD	1989 WEEKLY AVERAGE	1988 WEEKLY AVERAGE	1987 WEEKLY AVERAGE	1986 WEEKLY AVERAGE (3)(4)
** POWER >15%							
EQUIP. RELATED	>15%	4	3.4	2.9	3.1	3.9	4.3
PERS. RELATED(6)	>15%	0	0.6	1.0	1.0	1.3	1.8
OTHER(7)	>15%	0	0.0	0.1	0.5	1.2	0.4
** Subtotal **		4	4.0	4.0	4.6	6.4	6.5
** POWER <15%							
EQUIP. RELATED	<15%	0	0.4	0.4	0.5	1.2	1.4
PERS. RELATED	<15%	0	0.1	0.3	0.3	0.6	0.8
OTHER	<15%	0	0.0	0.7	0.1	0.3	0.2
** Subtotal **		0	0.5	1.4	0.9	2.1	2.4
*** Total ***		4	4.5	5.4	5.5	8.5	8.9

MANUAL VS AUTO SCRAMS

TYPE	NUMBER OF SCRAMS	1990 WEEKLY AVERAGE YTD	1989 WEEKLY AVERAGE	1988 WEEKLY AVERAGE	1987 WEEKLY AVERAGE	1986 WEEKLY AVERAGE
MANUAL SCRAMS	1	1.3	0.9	1.0	1.4	1.0
AUTOMATIC SCRAMS	3	3.2	3.8	4.5	7.0	7.9

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.

OEAB SCRAM DATA

Manual and Automatic Scrams for 1986	-----	461
Manual and Automatic Scrams for 1987	-----	439
Manual and Automatic Scrams for 1988	-----	287
Manual and Automatic Scrams for 1989	-----	244
Manual and Automatic Scrams for 1990 (YTD 09/30/90)	---	169

PERFORMANCE INDICATORS SIGNIFICANT EVENTS

ENCLOSURE 4

PLANT NAME	EVENT DATE	QTR SIGNIFICANCE	EVENT DESCRIPTION
MONTICELLO	09/11/90	0 POTENTIAL FOR OR ACTUAL DEGRADATION OF SAFETY-RELATED EQUIPMENT.	FAILURE OF A NONSEISMIC FIRE SUPPRESSION PIPE COULD CAUSE LOSS OF BOTH EMERGENCY DIESEL GENERATORS.
SEQUOYAH 2	08/22/90	0 DEGRADATION OF AN EMERGENCY CORE OR CONTAINMENT COOLING SYSTEM.	GAS BUILDUP IN THE CHARGING SYSTEM (HYDROGEN).