

May 26, 1994

MEMORANDUM FOR: Brian K. Grimes, Director
 Division of Operating Reactor Support

FROM: Alfred E. Chaffee, Chief
 Events Assessment Branch
 Division of Operating Reactor Support

SUBJECT: OPERATING REACTORS EVENTS BRIEFING
 MAY 25, 1994 - BRIEFING 94-17

On May 25, 1994, we conducted an Operating Reactors Events Briefing (94-17) to inform senior managers from offices of the Commission, NRR, EDO, OE and regional offices of selected events that occurred since our last briefing on May 18, 1994. Enclosure 1 lists the attendees. Enclosure 2 presents the significant elements of the discussed events.

Enclosure 3 contains reactor scram statistics for the week ending May 22, 1994. No significant events were identified for input into the NRC Performance Indicator Program.

[original signed by]

Alfred E. Chaffee, Chief
 Events Assessment Branch
 Division of Operating
 Reactor Support

Enclosures: As stated

cc w/enclosures:
 See next page

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*IDR-5-1
 X-21M-6-meeting*

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RETURN TO REGULATORY CENTRAL FILES

D03'

cc:

W. Russell, NRR (O-12G18)
F. Miraglia, NRR (O-12G18)
F. Gillespie, NRR (O-12G18)
Acting ADPR, NRR (O-12G18)
S. Varga, NRR (O-14E4)
J. Calvo, NRR (O-14A4)
G. Lainas, NRR (O-14H3)
J. Roe, NRR (O-13E4)
J. Zwolinski, NRR (O-13H24)
E. Adensam, NRR (O-13E4)
A. Thadani, NRR (O-12G18)
B. Sheron, NRR (O-7D26)
M. Virgilio, NRR (O-8E2)
S. Rosenberg, NRR (O-10E4)
C. Rossi, NRR (O-9A2)
B. Boger, NRR (O-10H3)
F. Congel, NRR (O-10E2)
D. Crutchfield, NRR (O-11H21)
W. Travers, NRR (O-11B19)
D. Coe, ACRS (P-315)
E. Jordan, AEOD (MN-3701)
G. Holahan, AEOD (MN-9112)
L. Spessard, AEOD (MN-3701)
K. Brockman, AEOD (MN-3206)
S. Rubin, AEOD (MN-5219)
M. Harper, AEOD (MN-9112)
V. McCree, EDO (O-17G21)
F. Ingram, PA (O-2G5)
E. Beckjord, RES (NLS-007)
A. Bates, SECY (O-16G15)
T. Martin, Region I
R. Cooper, Region I
S. Ebnetter, Region II
J. Johnson, Region II
S. Vias, Region II
J. Martin, Region III
E. Greenman, Region III
L. Callan, Region IV
A. Beach, Region IV
K. Perkins, Region IV/WCFO

J. Andersen (PDI-4)
J. Stolz (PDI-4)
B. Mozafari (PDII-1)
W. Bateman (PDII-1)

bcc: Mr. Sam Newton, Manager
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Institute of Nuclear Power Operations
700 Galleria Parkway
Atlanta, GA 30339-5957



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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A handwritten signature in cursive script that reads "Alfred E. Chaffee".

Alfred E. Chaffee, Chief
Events Assessment Branch
Division of Operating
Reactor Support

Enclosures: As stated

cc w/enclosures:
See next page

ENCLOSURE 1

LIST OF ATTENDEES

OPERATING REACTORS EVENTS FULL BRIEFING (94-17)

MAY 25, 1994

<u>NAME</u>	<u>OFFICE</u>	<u>NAME</u>	<u>OFFICE</u>
A. CHAFFEE	NRR	M. RUBIN	NRR
J. CARTER	NRR	D. O'NEAL	NRR
K. GRAY	NRR	C. THOMAS	NRR
E. BENNER	NRR	C. ROSSI	NRR
R. DENNIG	NRR	L. REYES	NRR
N. HUNEMULLER	NRR	S. VARGA	NRR
J. TAPPERT	NRR	L. COBLENTZ	OEDO
A. CUBBAGE	NRR	J. BEALL	OE
J. ANDERSEN	NRR	D. CHAMBERLAIN	OCM/IS
A. KUGLER	NRR	J. SORENSEN	OCM/KR
E. GOODWIN	NRR		

TELEPHONE ATTENDANCE
(AT ROLL CALL)

Regions

Region I
Region II
Region III
Region IV

Resident Inspectors

P. Swetland (Millstone)
H. B. Robinson

IIT/AIT Team Leaders

Misc.

Technical Training Center

OPERATING REACTORS EVENTS BRIEFING 94-17

LOCATION: 10 B11, WHITE FLINT
WEDNESDAY, MAY 25, 1994 11:00 A.M.

MILLSTONE, UNIT 1

INADVERTENT DECREASE IN
REACTOR VESSEL WATER LEVEL

H. B. ROBINSON, UNIT 2

EMERGENCY DIESEL GENERATOR
ISSUES

PRESENTED BY: EVENTS ASSESSMENT BRANCH
DIVISION OF OPERATING REACTOR
SUPPORT, NRR

MILLSTONE, UNIT 1
INADVERTENT DECREASE IN REACTOR VESSEL WATER LEVEL
APRIL 10, 1994

PROBLEM

THE REACTOR VESSEL WATER LEVEL SUDDENLY DECREASED ABOUT 70 INCHES.

CAUSE

A STANDBY TRAIN OF LOW PRESSURE COOLANT INJECTION (LPCI) WAS CONNECTED TO AN OPERATING TRAIN OF SHUTDOWN COOLING, THEREBY ESTABLISHING A FLOW PATH FROM THE REACTOR VESSEL TO THE DRYWELL. THE VALVE LINEUP WAS THE RESULT OF A FAILURE TO ADEQUATELY REVIEW AND CORRECTLY ASSESS THE SIGNIFICANCE OF COMBINING TWO PROCEDURES.

SAFETY SIGNIFICANCE

POTENTIAL CHALLENGE TO SAFETY SYSTEM DUE TO UNEXPECTED AND LARGE LOSS OF REACTOR COOLANT SYSTEM INVENTORY.

DISCUSSION

- THE REACTOR WAS SHUT DOWN IN JANUARY FOR REFUELING. RESTART WAS INITIALLY SCHEDULED FOR APRIL.
- INITIALLY BOTH RECIRCULATION PUMPS WERE RUNNING. CORE SPRAY WAS IN PULL TO LOCK. LPCI WAS AVAILABLE AND A TRAIN OF SHUTDOWN COOLING WAS OPERATING.
- REACTOR VESSEL WATER LEVEL WAS 85".

CONTACT: J. CARTER, NRR/DORS/EAB
REFERENCE: 10 CFR 50.72 #27070

AIT: NO
SIGEVENT: TBD

- A LOGIC SYSTEM FUNCTION TEST PROCEDURE THAT HAD BEEN USED NUMEROUS TIMES IN THE PAST (EVERY REFUELING OUTAGE) WAS MODIFIED TO PERMIT INCORPORATION OF VALVE TESTING.
- MUCH OF THE EQUIPMENT PREVIOUSLY TAKEN OUT OF SERVICE DURING THE OUTAGE HAD BEEN RESTORED TO OPERABLE STATUS. THEREFORE, THE TEST WAS CONSIDERED A LOW SHUTDOWN RISK EVOLUTION.
- THE REVISED PROCEDURE HAD FORMAL CONCURRENCE. REVIEW PROCESS WAS NOT ADEQUATE.
- COMBINED PROCEDURE WAS THE PRODUCT PRIMARILY OF THE I & C GROUP; OPERATIONS WAS NOT INVOLVED IN THE PROCEDURE PREPARATION OR TRAINING. DID APPROVE PROCEDURE.
- INITIAL STEPS IN THE TEST PROCEDURE RACKED OUT THE LPCI PUMPS.
- THE PROCEDURE ALSO OPENED V-15A AND 15A, CAUSING WATER FROM THE REACTOR TO BE PUMPED BY THE SHUTDOWN COOLING SYSTEM AT ABOUT 2500 GPM THROUGH THE DRYWELL SPRAY; @ 16:10:20 ON 4/10/94.
- WITHIN ABOUT 2 MINUTES A HIGH LEVEL ALARM FOR THE DRYWELL SUMP WAS RECEIVED.
- ABOUT 2 ADDITIONAL MINUTES LATER THE DRYWELL SPRAY VALVES WERE CLOSED AND SHUTDOWN COOLING ISOLATED.

- A LEVEL ABOUT 8" LOWER WOULD HAVE INITIATED AUTOMATIC CLOSURE OF SHUTDOWN COOLING DISCHARGE AND SUCTION VALVES; IN ABOUT 30 SECONDS.
- CORE SPRAY WOULD HAVE RECEIVED A START SIGNAL WITH FURTHER DECREASE IN REACTOR VESSEL WATER LEVEL; HOWEVER, OPERATOR ACTION WOULD BE REQUIRED. LPCI HAD BEEN RACKED OUT.

FOLLOWUP

- LICENSEE PLACED ALL OTHER INTEGRATED TESTING ON HOLD PENDING REASSESSMENT OF PROCEDURES
 - SOME INTEGRATED PROCEDURES WERE YET TO BE COMPLETED.
- THE LICENSEE ISSUED A CONFIRMATORY LETTER:
 - PROCEDURE REVIEW
 - CONTAINMENT RECOVERY
- THE LICENSEE ASSEMBLED A SPECIAL INSPECTION TEAM TO THE SITE.
- A PRELIMINARY INSPECTION DID NOT DISCLOSE ANY ELECTRICAL GROUNDS WITHIN THE DRYWELL.

CURRENT STATUS

- ALL OPERATING AND TESTING PROCEDURES WERE REVIEWED AND INTEGRATED TESTING COMPLETED.
- COMPLETING POWER ASCENSION TESTING.
- INFORMATION NOTICE BEING DRAFTED BY REACTOR SYSTEMS BRANCH.

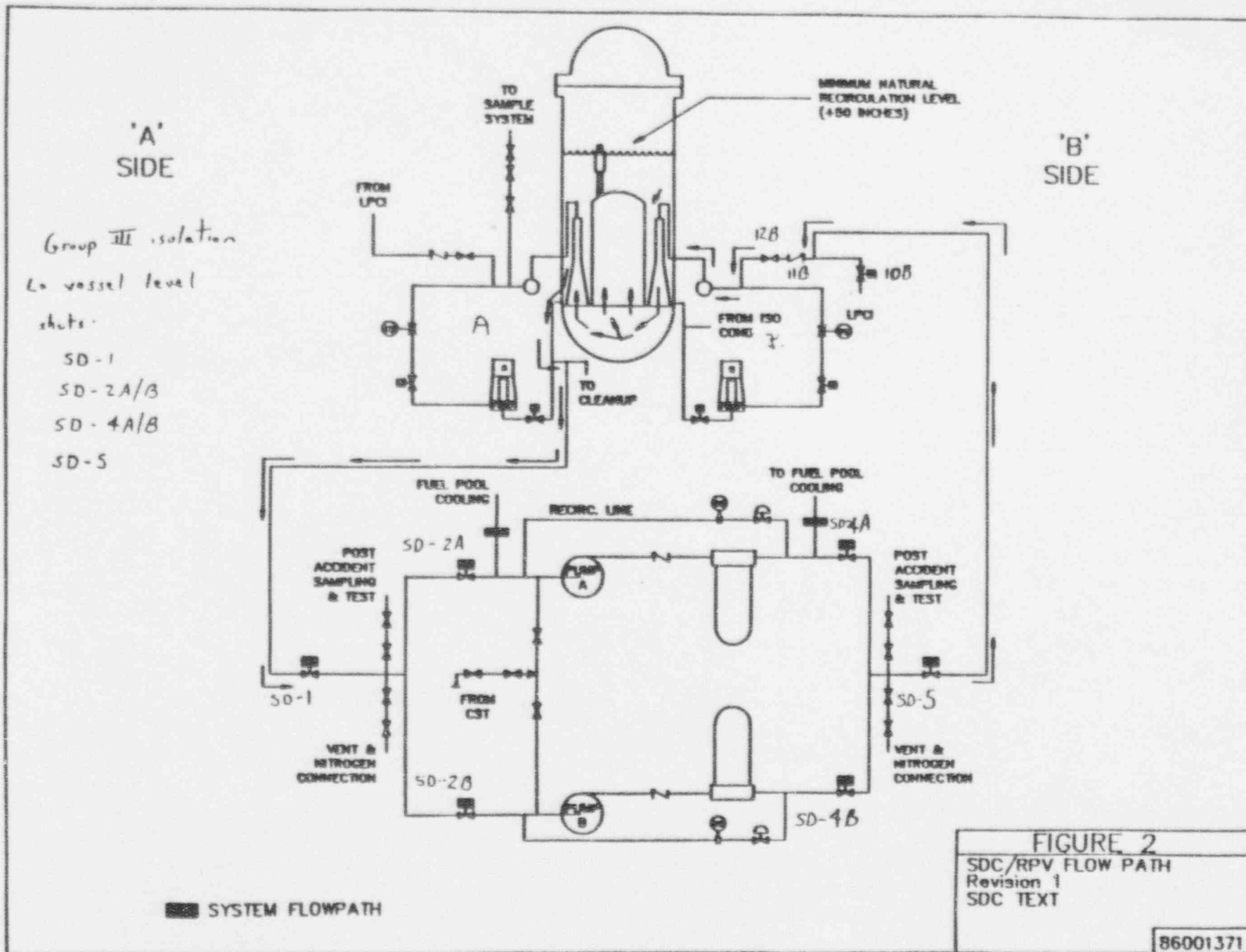


FIGURE 2
SDC/RPV FLOW PATH
Revision 1
SDC TEXT
86001371

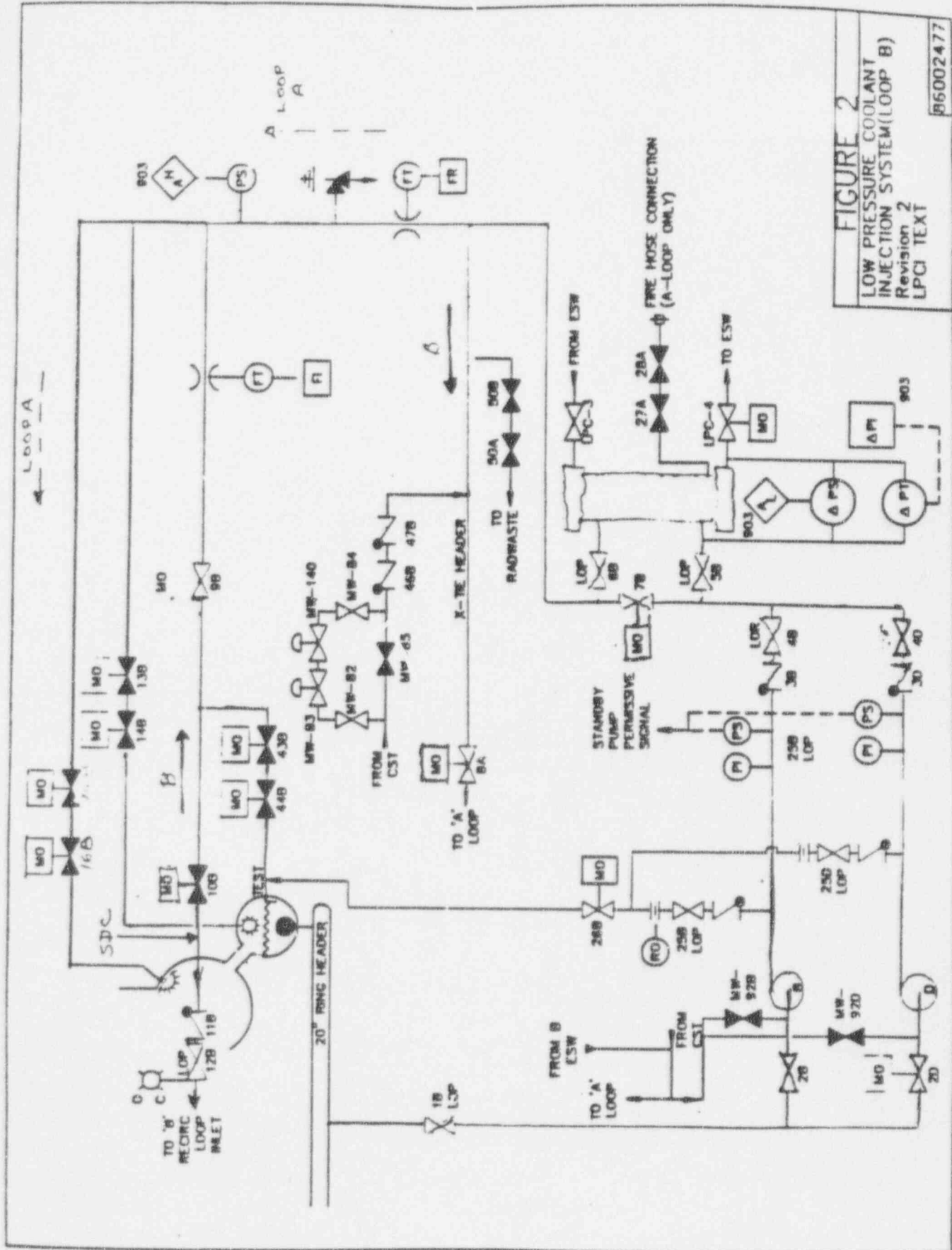


FIGURE 2
LOW PRESSURE COOLANT
INJECTION SYSTEM (LOOP B)
Revision 2
LPCI TEXT

96002477

H. B. ROBINSON, UNIT 2
EMERGENCY DIESEL GENERATOR ISSUES
OCTOBER 25, 1993 - PRESENT

PROBLEM

ONGOING EMERGENCY DIESEL GENERATOR (EDG) PROBLEMS.

CAUSE

VARIOUS CAUSES.

SAFETY SIGNIFICANCE

AVAILABILITY OF THE EDGs IN QUESTION IN THE EVENT OF A LOSS OF OFFSITE POWER.

BACKGROUND

- TWO EMERGENCY BUSES, EACH WITH DEDICATED EDG (A & B).
- EDGs ARE FAIRBANKS MORSE TWELVE CYLINDER, OPPOSED PISTON ENGINES COUPLED TO 2500 KW, 480 VAC GENERATORS.
- STARTING ACCOMPLISHED BY STARTING AIR APPLIED TO FIRST SIX CYLINDERS OF ENGINE THROUGH THE OPERATION OF SIX AIR START CHECK VALVES. AIR START CHECK VALVES ACTUATED BY SIX PILOT VALVES IN AIR START DISTRIBUTOR (ASD).

CONTACT: E. BENNER, NRR/DORS/EAB
REFERENCE: 10 CFR 50.72 #26397, 26812
PNO 2-94-007, MR 2-93-0136

AIT: NO
SIGEVENT: TBD

SEQUENCE OF EVENTS

- OCTOBER 25: EDG "B" FAILS TO START. INITIAL EFFORTS FAIL TO DETECT CAUSE.
- OCTOBER 26: EDG "B" SUCCESSFULLY STARTED TWICE. SUBSEQUENT TROUBLESHOOTING REVEALED SPRINGS FOR ASD PILOT AIR VALVES ASSOCIATED WITH CYLINDERS 2, 4, AND 6 BROKEN.
- OCTOBER 27: EDG "B" SUCCESSFULLY STARTED TWICE AFTER TEMPORARY REPLACEMENT SPRINGS INSTALLED (SPRINGS NOT QUALIFIED, THUS, TEMPORARY DESIGNATION).
- OCTOBER 29: EDG "B" SUCCESSFULLY STARTED AFTER ALL SPRINGS REPLACED WITH QUALIFIED SPRINGS.
- NOVEMBER 12: LICENSEE INITIATED STARTUP.
- NOVEMBER 15: INADEQUATE DEBRIS CONTROL DURING PAINT STRIPPING INTRODUCES STEEL SHOT INTO THE EDG CONTROL CABINET, CURRENT TRANSFORMER CUBICLE, GENERATOR ENCLOSURE, AND BLOWER DRIP PAN. DISCOVERED BY RESIDENT IN JANUARY.
- NOVEMBER 17: UNIT IS SHUT DOWN FOR FEEDWATER ISSUE.
- NOVEMBER 22: DURING ROUTINE SURVEILLANCE TEST, EDG "A" WOULD ONLY REACH 440 VOLTS (VERSUS REQUIRED 480 VOLTS). CAUSE WAS MIS-ADJUSTED VOLTAGE REGULATOR DISTURBED DURING EDG CONTROL PANEL PAINTING.

SUBSEQUENT SURVEILLANCE TEST ON EDG "B" RESULTED IN ENGINE NOT ROLLING WHEN STARTING AIR APPLIED. PILOT AIR VALVES 2 AND 6 FOUND BOUND IN ASD (PLANT AT POWER).

NOVEMBER 24: EDG "B" RETESTED. EDG "B" WOULD ONLY REACH 450 VOLTS (VERSUS REQUIRED 480 VOLTS). CAUSE SAME AS EDG "A" PROBLEM ON 11/22.

DECEMBER 7: EDG "B" STARTED SUCCESSFULLY, HOWEVER, ONE BROKEN ASD SPRING FOUND.

DECEMBER 21: EDG "B" ASD REPLACED.

SIX SUCCESSFUL TEST STARTS OF EDG "B" FROM 11/17 TO 12/25

DECEMBER 26: EDG "B" FAILS TO START. CAUSE APPEARS TO BE UNRELATED TO ASD FAILURES. FAILURE CAUSE NOT DETERMINED.

JANUARY 17: LICENSEE DECLARES NOTICE OF UNUSUAL EVENT DUE TO BOTH EDGs INOPERABLE (PLANT IN COLD SHUTDOWN).

EDG "B" UNDER CLEARANCE AND NOT AVAILABLE.

SERVICE WATER VALVE BODY-TO-BONNET LEAK CAUSED BY FREEZING OF LINE. LEAK RESULTED IN WATER POURING ONTO EDG "A" CONTROL CUBICLES.

FEBRUARY 12: EDG "B" FAILS TO MAINTAIN RATED LOAD. EDG DECLARED INOPERABLE. GOVERNOR REPLACED.

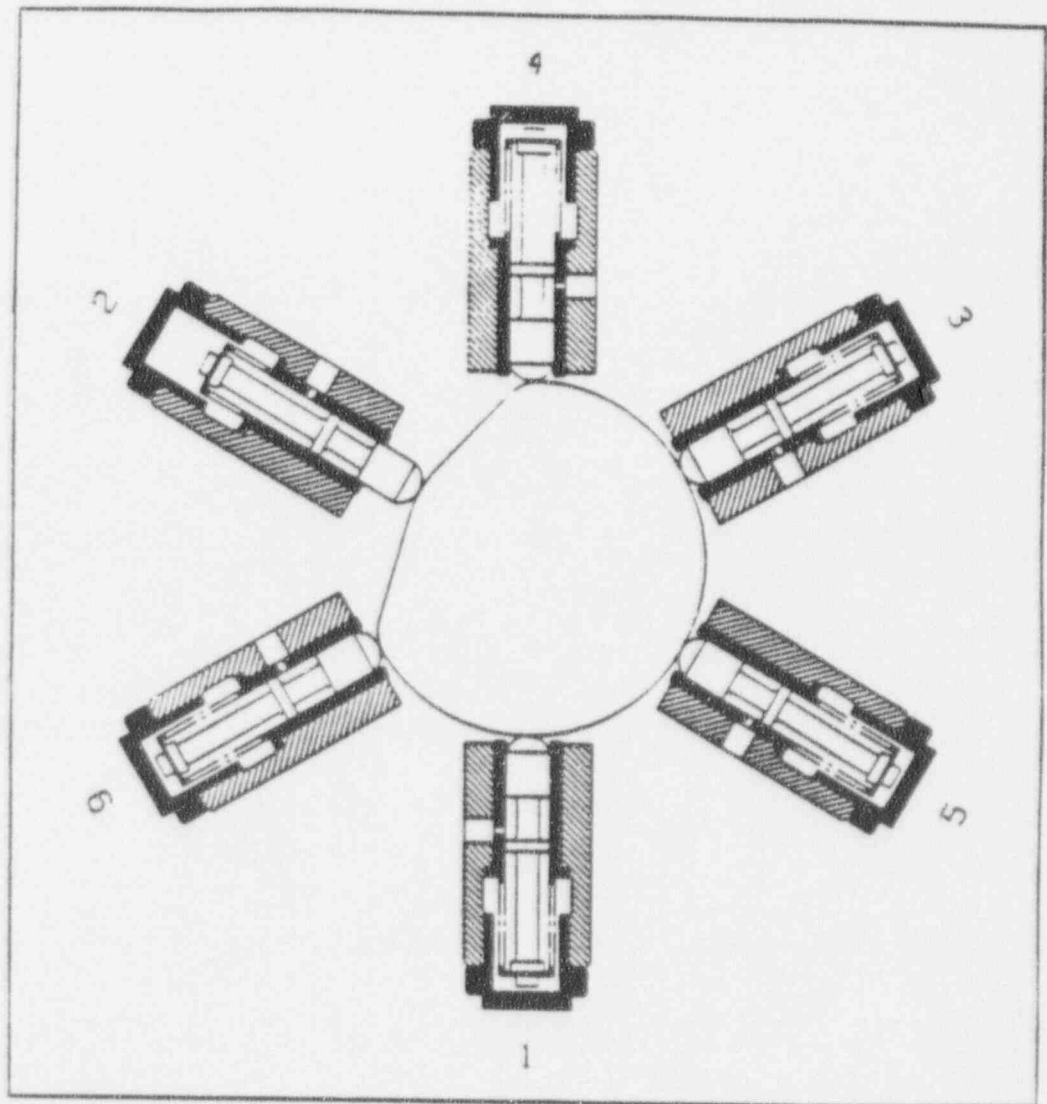
DURING RETEST, EDG EXPERIENCED KNOCKING AND WHITE SMOKE. CAUSE WAS A DISLODGED DAMPER PIN IN THE INTAKE AIR CHECK VALVE. ORIGINAL PIN WAS REINSTALLED AND EDG TESTED SUCCESSFULLY.

FEBRUARY 18: EDG "B" EXPERIENCES FAILURE OF SCAVENGING AIR BLOWER DURING TESTING. CAUSE WAS INTAKE AIR CHECK VALVE DAMPER PIN WHICH BECAME DISLODGED AND ENTERED THE BLOWER.

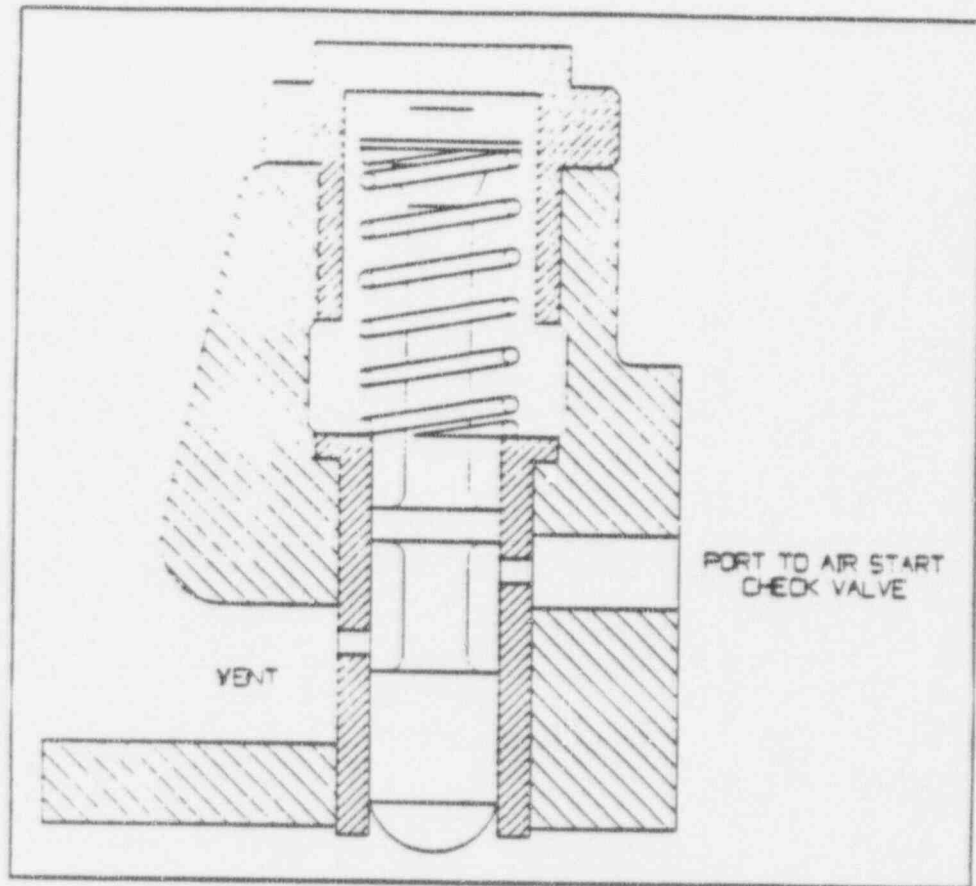
FOLLOWUP

- LICENSEE WILL UNDERGO COMPREHENSIVE PREVENTIVE MAINTENANCE PROGRAM FOR EDGs.
- CIVIL PENALTY OF \$37,500 ISSUED FOR NOVEMBER 22 ISSUES:
 - SIMULTANEOUS DEGRADATION OF BOTH EDGs WHILE AT POWER.
 - INADEQUATE CORRECTIVE ACTIONS FOR FAILURE OF EDG "B" TO START ON OCTOBER 25.

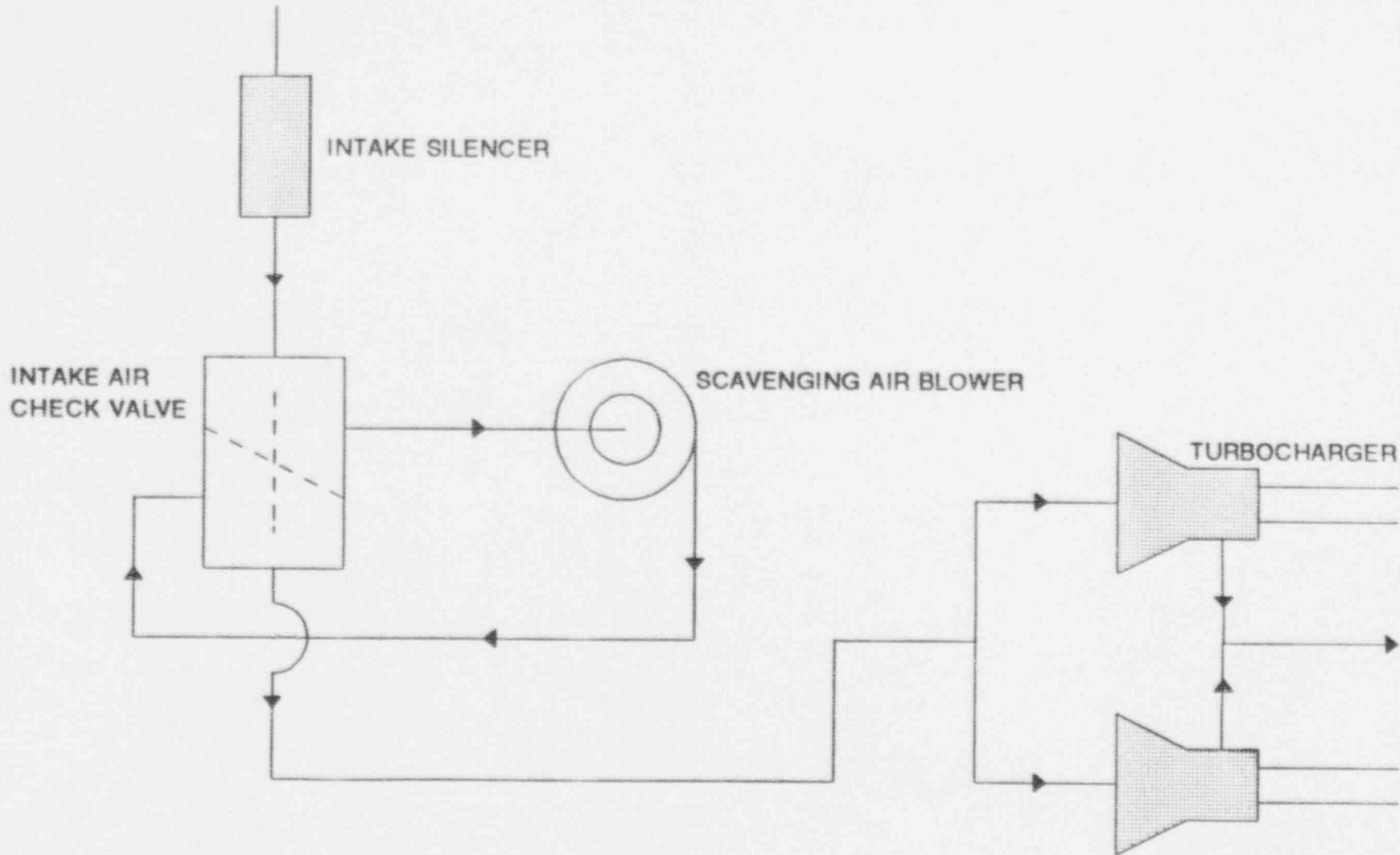
Air Distributor



Air Start Pilot Valve



ROBINSON EDG AIR INTAKE SYSTEM



REACTOR SCRAM

Reporting Period: 05/16/94 to 05/22/94

<u>DATE</u>	<u>PLANT & UNIT</u>	<u>POWER</u>	<u>TYPE</u>	<u>CAUSE</u>	<u>COMPLICATIONS</u>	YTD ABOVE <u>15%</u>	YTD BELOW <u>15%</u>	YTD TOTAL
05/18/94	MAINE YANKEE 1	100	SA	Operating Error	NO	1	0	1

Note: Year To Date (YTD) Totals Include Events Within The Calendar Year Indicated By The End Date Of The Specified Reporting Period

COMPARISON OF WEEKLY SCRAM STATISTICS WITH INDUSTRY AVERAGES

PERIOD ENDING
05/22/94

<u>SCRAM CAUSE</u>	NUMBER OF SCRAMS	1994 WEEKLY AVERAGE (YTD)	1993 WEEKLY AVERAGE	1992 WEEKLY AVERAGE	1991* WEEKLY AVERAGE	1990* WEEKLY AVERAGE
POWER GREATER THAN OR EQUAL TO 15%						
EQUIPMENT FAILURE*	0	1.53	1.83	2.62	2.88	3.38
DESIGN/INSTALLATION ERROR*	0	0.10	0.04	-	-	-
OPERATING ERROR*	1	0.30	0.27	0.23	0.58	0.48
MAINTENANCE ERROR*	0	0.35	0.52	0.40	-	-
EXTERNAL*	0	0.10	0.13	-	-	-
OTHER*	0	0.00	0.02	0.23	-	-
Subtotal	1	2.38	2.81	3.48	3.46	3.86
POWER LESS THAN 15%						
EQUIPMENT FAILURE*	0	0.35	0.38	0.40	0.29	0.40
DESIGN/INSTALLATION ERROR*	0	0.05	-	-	-	-
OPERATING ERROR*	0	0.15	0.13	0.13	0.15	0.08
MAINTENANCE ERROR*	0	0.00	0.02	0.06	-	-
EXTERNAL*	0	0.00	0.04	-	-	-
OTHER*	0	0.00	-	0.06	-	-
Subtotal	0	0.55	0.57	0.65	0.44	0.48
TOTAL	1	2.93	3.38	4.13	3.90	4.34

<u>SCRAM TYPE</u>	NO. OF SCRAMS	1994 WEEKLY AVERAGE (YTD)	1993 WEEKLY AVERAGE	1992 WEEKLY AVERAGE	1991 WEEKLY AVERAGE	1990 WEEKLY AVERAGE
TOTAL AUTOMATIC SCRAMS	1	2.17	2.44	3.06	3.25	3.21
TOTAL MANUAL SCRAMS	0	0.74	0.94	1.02	0.65	1.19

TOTALS MAY DIFFER BECAUSE OF ROUNDING OFF

* Detailed breakdown not in database for 1991 and earlier

- EXTERNAL cause included in EQUIPMENT FAILURE

- MAINTENANCE ERROR and DESIGN/INSTALLATION ERROR causes included in OPERATING ERROR

- OTHER cause included in EQUIPMENT FAILURE 1991 and 1990

NOTES

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.

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

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

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

OEAB SCRAM DATA

Manual and Automatic Scrams for 1987	-----	435
Manual and Automatic Scrams for 1988	-----	291
Manual and Automatic Scrams for 1989	-----	252
Manual and Automatic Scrams for 1990	-----	226
Manual and Automatic Scrams for 1991	-----	206
Manual and Automatic Scrams for 1992	-----	212
Manual and Automatic Scrams for 1993	-----	175
Manual and Automatic Scrams for 1994	--(YTD 05/22/94)--	59