

APR 10 1985

MEMORANDUM FOR: Hugh L. Thompson, Jr., Director
Division of Licensing

FROM: Dennis M. Crutchfield, Assistant Director
for Safety Assessment, DL

SUBJECT: SUMMARY OF THE OPERATING REACTORS EVENTS
MEETING ON APRIL 4, 1985

On April 4, 1985, an Operating Reactor Events meeting was held to brief the Office Director, the Division Directors and their representatives on events which occurred since our last meeting on March 7, 1985. The list of attendees is included as Enclosure 1.

The events discussed and the significant elements of these events are presented in Enclosure 2. In addition, the assignment of follow-up review responsibility was discussed. The assignments made during this meeting and the status of previous assignments are presented in Enclosure 3.

Completion dates have been assigned for items in Enclosure 3 following the March 7, 1985 OR Events Briefing. Each assignee should review Enclosure 3 with regard to their respective responsibilities and advise ORAB if the target completion date cannot be met. If an assignee has any questions, please contact D. Tarnoff, x29526.

131

Dennis M. Crutchfield, Assistant Director
for Safety Assessment, DL

Enclosures:
As Stated

cc w/encl:
See next page

DISTRIBUTION
Central Files
NRC PDR
ORAB Rdg
ORAB Members

*PREVIOUS CONCURRENCE SEE DATE

ORAB:DL*
DTarnoff:dm
4/4/85

ORAB:DL
RWessman
4/9/85

C:ORAB:DL
GHolahan
4/9/85

AD/SA:DL
DCrutchfield
4/10/85

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PDR MISC
8504220164 PDR

IDAR-5-1
OPERATING
EXPERIENCE

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ENCLOSURE 1

LIST OF ATTENDEES

OPERATING REACTORS EVENTS BRIEFING

APRIL 4, 1985

M. Caruso, DL/ORAB	R. Bernero, DSI/NRR
D. Tarnoff, DL/ORAB	F. Miraglia, DL/NRR
W. Long, ORB 2	J.P. Knight, DE/NRR
J. E. Knight, PSB	T. Novak, DL
M. Thadani, ORB 2	C. E. Rossi, EAB/IE
H. VanderMolen, SPEB	R. L. Baer, EGCB/IE
R. Singh, IE/RAB	R. C Jones, DSI/RSB
M. Virgilio, NRR/PPAS	D. Crutchfield, DL/SA
J. Stone, IE/VPB	C. Berlinger, DSI/CPB
J. Lyons, NRR/DL	R. Freeman, AEOD/ROAB
S. Black, NRR/DL	D. Zukor, AEOD/ROAB
L. Olshan, NRR/DL	L. Kintner, DL/LB-4
J. Youngblood, NRR/DL	R. Wessman, DL/ORAB
W. J. Collins, IE/EGCB	J. T. Beard, DL/ORAB
R. A.Hermann, NRR/DL	
E. G. Adensam, NRR/DL	
P. Cortland, IE/EGCB	
H. Bailey, IE/EAB	
R. Wright, NRR/DOE/EOB	
M. Chiramal, AEOD/ROAB	
K. Seyfrit, AEOD/ROAB	

OPERATING REACTOR EVENTS BRIEFING

APRIL 4, 1985

NORTH ANNA UNIT 2 - RECENT MAJOR ENGINE FAILURE OF EDG

GRAND GULF 1 - MALFUNCTION OF DIESEL GENERATOR

PALO VERDE 2 - WELD LEAKS IN UHS PIPING

BROWNS FERRY UNIT 3 - LEVEL INDICATOR EVENT

BYRON 1 - MSIV FAILURE DURING RECOVERY FROM LOSS OF OFFSITE
POWER TEST

EXXON ECCS CODE ERRORS AND $K_{(Z)}$

NORTH ANNA UNIT 2 - RECENT MAJOR ENGINE FAILURE OF EDG

MARCH 15, 1985 (J. T. BEARD)

- DURING SURVEILLANCE TEST, EDG "2J" TRIPPED ON HIGH CRANKCASE PRESSURE
 - INVESTIGATION FOUND COOLANT WATER IN TWO CYLINDERS, NEED FOR MAJOR REPAIRS, SIMILAR TO PREVIOUS FAILURES.
 - REPAIRS, TESTING NOT FINISHED WITHIN 72-HOUR LIMIT - UNIT SHUTDOWN ON MARCH 18, 1985
 - EDG OPERABLE AND UNIT RETURNED TO POWER ON MARCH 19, 1985
 - MAJOR PARTS REPLACED:
 - No. 10 CYLINDER LINER (SCORED, CRACKED)
 - No. 10 UPPER PISTON (SCORED)
 - 9 OF 12 UPPER PISTON PIN BUSHINGS
 - TWO LOWER CONNECTING ROD BEARINGS
 - LICENSEE HAS NOT DETERMINED CAUSE YET
- MANUFACTURER'S REPORT DUE APRIL 7-13, 1985
- DIESELS FUNCTIONED SATISFACTORILY DURING ACTUAL LOSS OF OFFSITE POWER EVENT OF MARCH 23, 1985
 - T.S. CHANGE CONCERNING REDUCED TESTING AND IMPLEMENTATION OF RELIABILITY PROGRAM IS UNDER REVIEW
 - AN EXIGENT FR NOTICE WAS ISSUED ON APRIL 2, 1985. COMMENT PERIOD CLOSES APRIL 17, 1985.

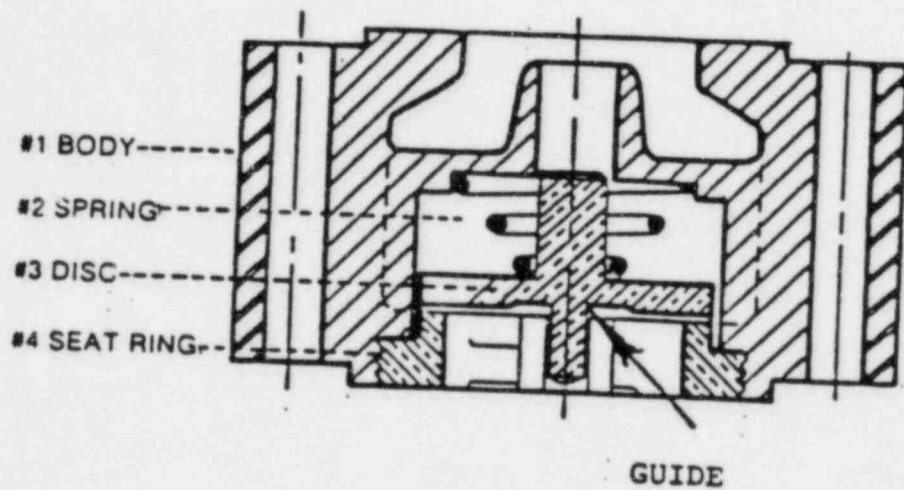
CHRONOLOGY OF MAJOR EDG ITEMS AT NORTH ANNA

<u>DATE</u>	<u>UNIT 1</u>	<u>UNIT 2</u>
AUGUST 1984	"1H" OVERLOADED TO 131% (1½ HOURS)	
DEC. 9, 1984		"2J" AND "2H" MAJOR ENGINE FAILURE
JAN. 13, 1985		"2J" TEST FAILURE (BROKEN RINGS) PLANT ENTERED EVERY 3-DAY TESTING
FEB. 1, 1985		EMERGENCY T.S. RELIEF REQUESTED - LESS TESTING
FEB. 4, 1985	"1H" MAJOR ENGINE FAILURE	
MAR. 13, 1985		SUPPLEMENTAL SUBMITTAL ON T.S. CHANGE REQUEST
MAR. 15, 1985		"2J" MAJOR ENGINE FAILURE
MAR. 23, 1985	ACTUAL PARTIAL LOSS OF OFFSITE POWER EVENT - EDGS PERFORMED SATISFACTORILY	
APRIL 2, 1985	EXIGENT FR NOTICE ISSUED FOR LICENSEE'S FEBRUARY 1 AND MARCH 13, 1985 TS CHANGE REQUEST. COMMENT PERIOD ENDS APRIL 17, 1985	

GRAND GULF 1 MALFUNCTION OF DIESEL GENERATOR

MARCH 11, 1985 (L. KINTNER)

- GRAND GULF 1 SHUTDOWN SINCE FEBRUARY 13, 1985, TO REPAIR MAIN TUBINE CONDENSER.
- POTENTIAL DEFECTIVE CHECK VALVE IN STARTING AIR PIPING SYSTEM COULD RESULT IN DIESEL ENGINE UNAVAILABILITY.
- DURING SURVEILLANCE TESTS OF A TDI DIESEL GENERATOR, FLAMES WERE OBSERVED AT A FLEXIBLE COUPLING IN THE AIR START ASSEMBLY.
- DIESEL GENERATOR WAS SHUTDOWN AND THE AIR START VALVE ON NO. 6 CYLINDER WAS REMOVED.
- PIECE OF METAL (7/8" X 3/8" DIA) FOUND ON TOP OF PISTON.
- EXAMINATION OF CHECK VALVES (4 IN STARTING AIR SYSTEM) SHOWED PIECE OF METAL WAS A PIECE BROKEN OFF THE BOTTOM GUIDE OF A CHECK VALVE. ONE OTHER VALVE HAD CRACKED GUIDE AND OTHER TWO HAD NO VISUAL CRACKS.
- MALFUNCTION CAUSE WAS PIECE OF METAL THAT WAS CARRIED BY AIR FROM CHECK VALVE TO AIR START VALVE AND LODGED BETWEEN DISC AND SEAT, ALLOWING BURNING GASES FROM CYLINDER INTO AIR START ASSEMBLY.
- TDI EXAMINED CHECK VALVES AND FOUND FAILURE OF GUIDE WAS DUE TO CYCLIC FATIGUE.
- LICENSEE HAS REPLACED ALL CHECK VALVES FOR BOTH TDI-DIESEL GENERATORS.
- PART 21 REPORT ISSUED MARCH 12 BY TDI - 7 PLANTS HAVE TDI ENGINES WITH THIS ON-ENGINE MOUNTED AIR PIPING SYSTEM.



STARTING AIR CHECK VALVE

PALO VERDE 2 - WELD LEAKS IN UHS PIPING
MARCH 1, 1985 (W. J. COLLINS)

- PLANT PREOPERATIONAL TESTING
- ON MARCH 1, 1985 NRC RESIDENT INSPECTOR IDENTIFIED LEAKING WELD IN ESSENTIAL SPRAY POND PIPING SYSTEM (SOUTH SPRAY POND)
- PIPING IS EIGHT-INCH, TYPE 316L, SCHEDULE 10 STAINLESS MATERIAL
- LICENSEES INVESTIGATION AS OF MARCH 11, 1985 HAS SHOWN
 - ABOUT 135 INDICATIONS IN WELDS
 - 12 LEAKING WELDS
 - 18 OF 20 WELDS RADIOGRAPHED SHOW SOME DEGREE OF PITTING ATTACK
 - FURTHER INSPECTION OF SYSTEM IS IN PROGRESS
- ESPPS IS UNIT'S ULTIMATE HEAT SINK FOR SAFE SHUTDOWN AS WELL AS FOR EMERGENCY DIESEL GENERATORS
- LICENSEES INVESTIGATION OF CAUSE/REMEDY IS ONGOING
 - PIPE SAMPLE TO NALCO
 - PIPE SAMPLE TO BECHTEL
 - PIPE SAMPLE TO RENSSELAER
- BECHTEL PRELIMINARY ANALYSIS - INDICATES GALLIONELLA CELLS
- NALCO PRELIMINARY ANALYSIS - FOUND NO GALLIONELLA RESIDUALS
- RENSSELAER - THIRD SAMPLE TO ATTEMPT CONFIRMATION
- MICROBIOLOGICAL INDUCED CORROSION IS SUSPECTED BUT FURTHER WORK NEEDED TO CONFIRM. HAS BEEN PROBLEM AT OTHER PLANTS
- INFORMATION NOTICE HAS BEEN PREPARED

MICROBIOLOGICAL INDUCED CORROSION (MIC)

- CORROSIVE ACTION THAT OCCURS AS A DIRECT OR INDIRECT RESULT OF LIVING MICROORGANISMS IN CONTACT WITH MATERIALS OF CONSTRUCTION (N37 SPECIES KNOWN)
- HABITAT
 - SOILS - SEDIMENT
 - NATURAL FRESH WATER
 - SEA WATER
 - NATURAL PETROLEUM PRODUCTS
- PHYSIOLOGY
 - CAN TOLERATE - 10°C TO 90°C TEMP
 - 0 TO 10.5 PH
 - 0 TO 100 PERCENT OXYGEN CONC.
 - EXTREME HYDROSTATIC PRESSURE
- METABOLIC PROCESSES OF MICROORGANISMS SUSTAINED BY CHEMICAL REACTIONS
 - ACID PRODUCERS (ORGANIC-INORGANIC)
 - HYDROCARBON FEEDERS
 - SULFATE PRODUCERS
 - METAL ION CONCENTRATORS/OXIDIZERS
 - SLIME FORMERS (FORM CONCENTRATION CELL CORROSION ACTIVITY)
- EXAMPLES
 - DESULFOVIBRIO DESULFURICANS - SULFATE REDUCERS/DEOXIDIZERS
 - GALLIONELLA, SPHEROTILUS - OXIDIZE IRON TO FERROUS COMPOUNDS, GENERATE ACIDIC FERRIC CHLORIDE, AND MANGANIC CHLORIDES WHICH ARE AGGRESSIVE TO STAINLESS STEEL
- CORROSION MORPHOLOGY
 - EXTREME CAVITATIONOUS PITTING; DISTINCTLY DIFFERENT FROM CHEMICAL PITTING CORROSION

MIC - CASE HISTORIES

• PRAIRIE ISLAND UNIT 1

- CONSTRUCTION
- STAINLESS STEEL CONDENSATE STORAGE TANK (SOURCE OF POTABLE WATER FOR CONSTRUCTION)
- DEEP WELLS CONTAINING IRON AND SULFIDE BACTERIA
- SEVERE PITTING CORROSION OF WELL SEAMS

• NORTH ANNA UNITS 1 AND 2

- OPERATIONS - PROBLEM ONGOING
- 1981 UNIT 1; SERVICE WATER SUPPLY HEADER "B" RETURN HEADERS TO LUBE OIL COOLERS
- 1982 UNIT 1; SERVICE WATER SUPPLY HEADER "A"
- 1983 UNIT 1; SERVICE WATER SUPPLY HEADERS "A" AND "B"
- 1983 UNIT 2; SERVICE WATER SUPPLY HEADER "B"
- LAKE WATER SOURCE: HIGH OXYGEN AND LOW PH
 - SULFATE REDUCERS (SULFIDE PRODUCERS)
 - ENSHEATHED IRON BACTERIA
 - FILAMENTOUS IRON BACTERIA
- SEVERE PITTING CORROSION OF WELDS

• SALEM UNIT 1

- OPERATIONS
- REPLACEMENT 316 SS PIPING IN COMPONENT COOLANT WATER SYSTEM (REPLACED CEMENT-LINED PIPING TO HX'S)
- SHOCK CHLORINATION CONCENTRATION LIMITED BY EPA IN WARMER MONTHS
- MICROBES: IRON BACTERIA (POSSIBLY GALLIONELLA PRODUCING ACIDIC FERRIC CHLORIDE AND MANGANIC CHLORIDE)
- SEVERE PITTING CORROSION OF WELDS

• LIMERICK UNIT 1

- OPERATIONS - JANUARY 1984
- MAIN CONDENSER - 3300 ADMIRALTY BRASS TUBES
- CRACKING AND PITTING FROM OD SIDE
- FOULING BY ORGANIC DEPOSITS (80 PERCENT) CONTAINING BACTERIA (20 PERCENT) (POSSIBLY IRON - SULFIDES - THIOBACILLUS THIOXIDANS PRODUCING CO_2 , H_2S , NH_3 , ORGANIC AND INORGANIC ACIDS)

MIC - CASE HISTORIES (CONTINUED)

• H. B. ROBINSON UNIT 2

- EXTENDED MAINTENANCE OUTAGE (JANUARY 1984 - NOVEMBER 1984)
- SCHEDULE 10, STAINLESS STEEL SECTIONS OF SERVICE WATER SYSTEM
- 54 WELDS LEAKING; 22 OUTSIDE/32 INSIDE CONTAINMENT
- ABOUT 800 SLEEVES TO REPAIR
- BACTERIAL STRAINS, TYPES, AND PREVENTIVE MEASURES BEING DETERMINED BY CP&L

• PALO VERDE'S UNITS 1 & 2

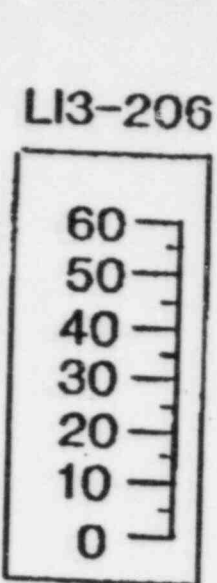
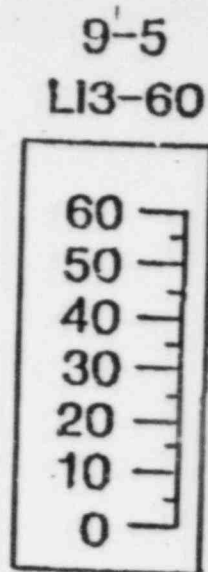
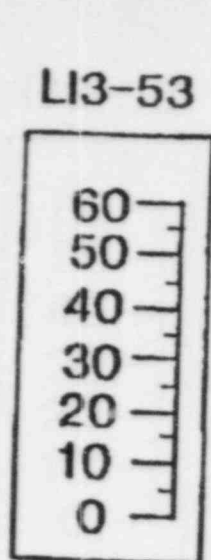
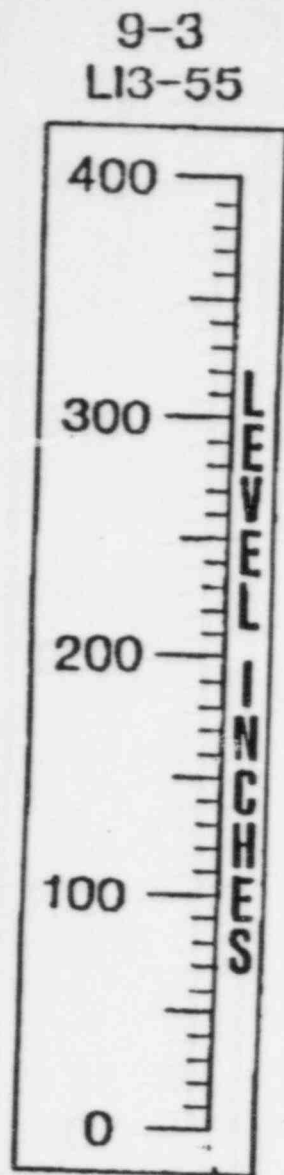
- PREOPERATIONAL TESTING- MARCH 1985
- ESSENTIAL SPRAY POND PIPING - (OTHERS BEING INSPECTED)
- 316L PIPING, 308L WELDS
- SAMPLES BEING ANALYSED BY:
 - NALCO - FIRST SAMPLE - NO BACTERIAL CARCASSES IDENTIFIED YET
 - BECHTEL - SECOND SAMPLE - PRELIMINARY ANALYSIS SHOWS GALLIONELLA
 - RPI - THIRD SAMPLE FOR CONFIRMATION
- BIOACTIVITY FOUND IN RAD WASTE TANK DURING CONSTRUCTION (WELL WATER USED FOR FLUSHING SYSTEMS IDENTIFIED AS SOURCE)

o COMANCHE PEAK UNIT 1

- MAIN CONDENSOR - MARCH 1985 - TENTATIVE PROBLEM

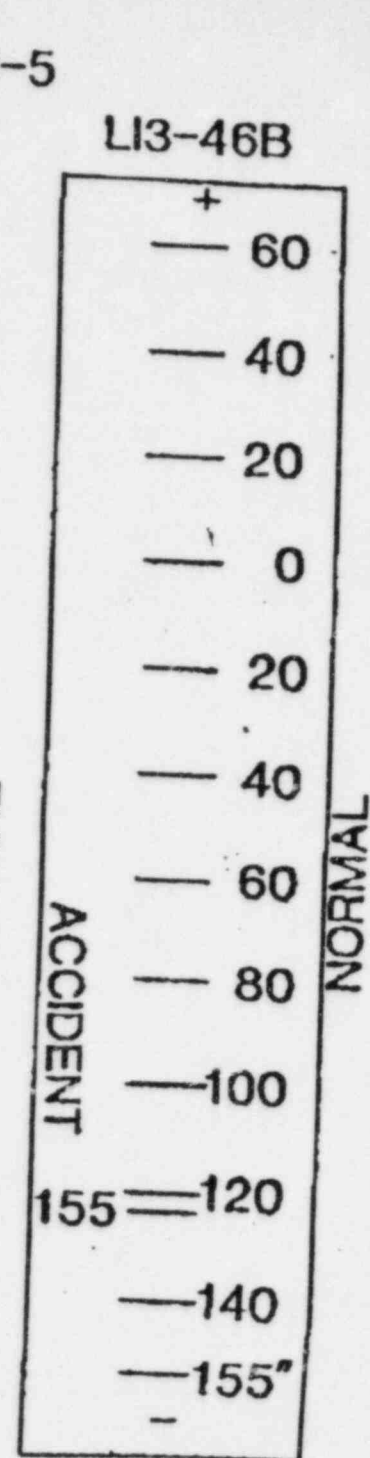
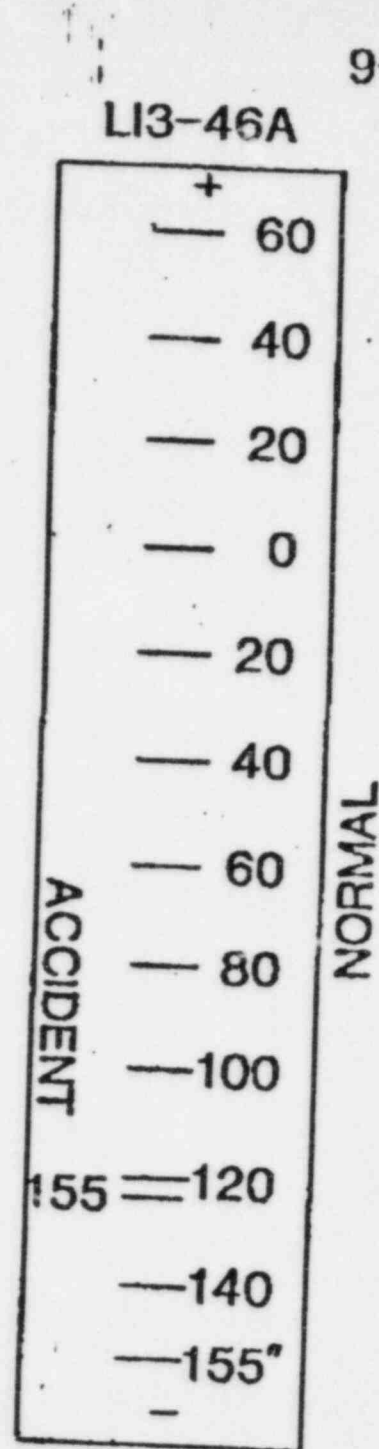
BROWNS FERRY UNIT 3 LEVEL INDICATOR EVENT OF
FEBRUARY 13, 1985 (W. LONG)

- START UP IN PROGRESS FOLLOWING SHORT OUTAGE. REACTOR CRITICAL AT ABOUT 40 PSI ,286F
- DISCREPANCY IN LEVEL INSTRUMENTS NOTICED BY OPERATOR.
- HALF-SCRAM
- OPERATOR ADDS WATER, PESETS HALF-SCRAM
- LEVEL INSTRUMENTS STILL SHOW DISCREPANCY
- OPERATOR RESUMES PULLING RODS
- LEVEL DISCREPANCY DISAPPEARS
- INSTRUMENT SURVEILLANCE TESTS CONDUCTED
- EVENT REPORTED 43 HOURS LATER
- REGION II ADMINISTRATOR CALLS TVA, REQUEST JUSTIFICATION FOR CONTINUED OPERATION TVA SHUTS DOWN THE UNIT.



GE/MAC's

YARWAYS →



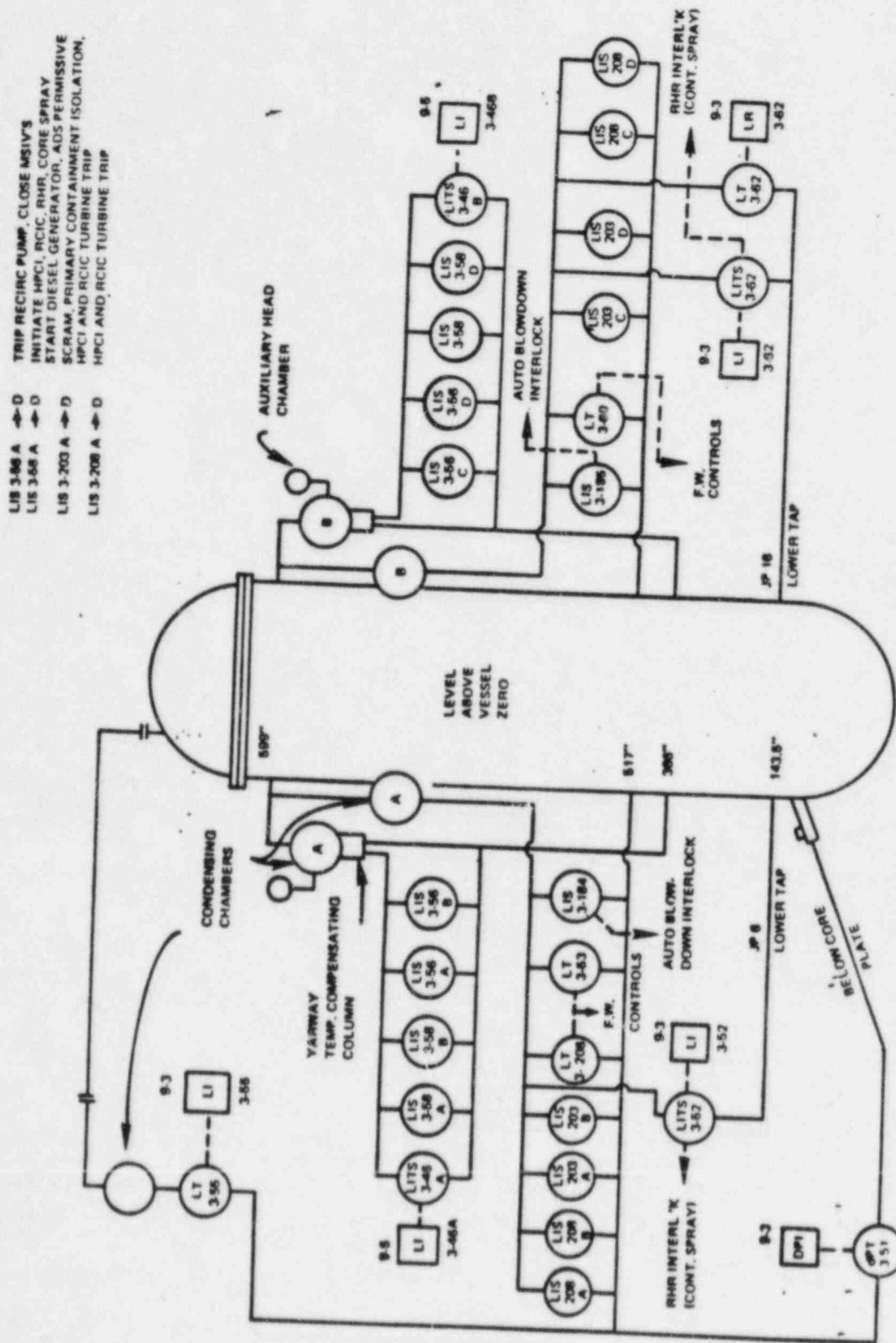


FIGURE 2.2-2 Reactor Vessel Level Instrumentation

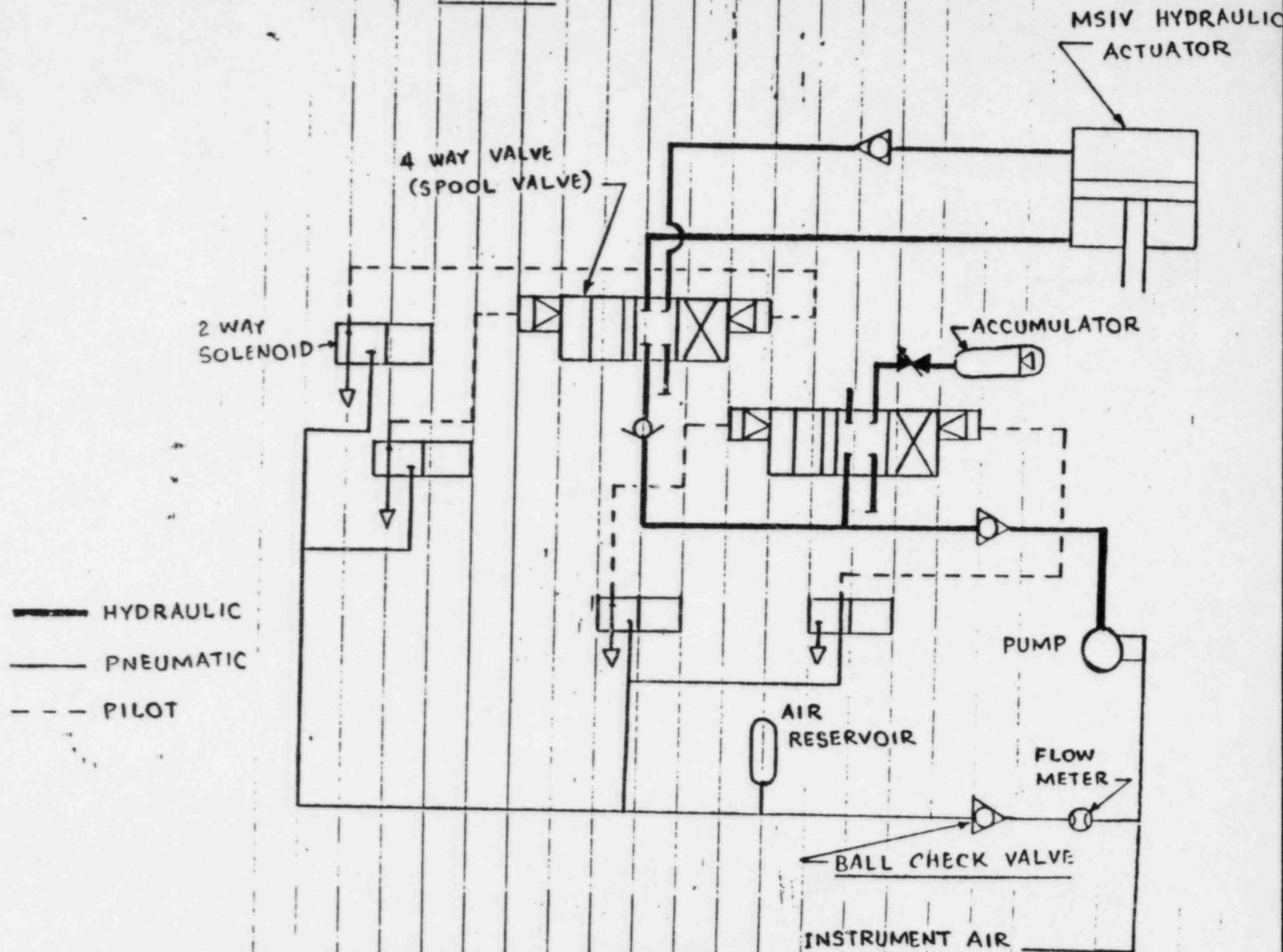
BYRON 1 - MSIV FAILURE DURING RECOVERY

FROM LOSS OF OFFSITE POWER TEST

MARCH 14, 1985 (L. OLSHAN)

- BYRON 1 CONDUCTING LOSS OF OFFSITE POWER TEST AT 22% POWER
- PLANT TRIPPED, AS EXPECTED
- LOST COMPRESSED AIR (AND PRESSURIZER SPRAYS) ON LOSS OF POWER, PER DESIGN
- PROBLEMS WITH RESTORING COMPRESSED AIR PRESSURE; SPRAYS NOT AVAILABLE
- PRIMARY COOLANT TEMPERATURES DECREASED STEADILY VIA HEAT TRANSFER TO SGs
- PRESSURIZER PRESSURE TRENDED UPWARD DUE TO CHARGING FLOW AND PZR HEATERS
- TRIED TO CONTROL PZR PRESSURE USING SG ATMOSPHERIC DUMP VALVES
- SAFETY INJECTION AND MSIV ISOLATION ACTUATED ON LOW STEAM LINE PRESSURE
- TWO MSIVs FAILED TO CLOSE DUE TO LEAKY BALL CHECK VALVE IN AIR SOLENOID CONTROL VALVE AFTER SLOW AIR SYSTEM PRESSURE DECAY
- SAFETY INJECTION CAUSED INCREASED PRESSURIZER PRESSURE AND PORV LIFTED
- PLANT STABILIZED
- CONFIRMATORY ACTION LETTER ISSUED BY REGION III
- LICENSEE INSTALLED EIGHT NEW BALL CHECK VALVES THAT PASSED SLOW PRESSURE DECAY TEST
- PART 21 REPORT ON PARKER-HANNAFIN BALL CHECK VALVES ISSUED BY LICENSEE
- FREQUENCY OF MSIV SURVEILLANCE TESTING INCREASED TO MONTHLY, FROM EVERY 18 MONTHS, UNTIL PERMANENT FIX IS IMPLEMENTED
- IE NOTICE BEING CONSIDERED

BYRON



EXXON ECCS CODE ERRORS AND $K(z)$
MARCH 19, 1985 (D. WIGGINTON/R. JONES)

- MARCH 19, 1985 DAILY HIGHLIGHT REPORTED ON EXXON ERRORS
- BRIEF HISTORY; BOB JONES, RSB
- TECHNICAL NATURE OF ERRORS AND $K(z)$ PROBLEM; BOB JONES
 - INPUT ERRORS
 - CODE ERRORS
 - AUGMENTATION FACTORS
 - $K(z)$, W AND CE
- PLANTS AFFECTED
- STATUS AND RESPONSES
- PLANNED ACTIONS

POTENTIALLY EFFECTED PLANTS AND STATUS

	AUGMENTATION FACTORS	CODE ERROR	INPUT ERROR	K(Z)
H. B. ROBINSON 2				
PALISADES				
FORT CALHOUN 1		✓		
ST. LUCIE 1	✓	✓	✓	
GINNA				✓
D. C. COOK 1		✓		✓
D. C. COOK 2				✓
KEWAUNEE	✓	✓		✓
PRAIRIE ISLAND 1&2	✓	✓		✓

EXXON LOCA ISSUES

- SERIES OF PROBLEMS EXISTED WITH EXXON LOCA ANALYSES OVER LAST YEAR
- PROBLEMS FIRST SURFACED IN MAY, 1984, DURING COOK 2 CYCLE 5 REVIEW
- ON MARCH 15, 1985, EXXON NOTIFIED NRC OF CODE ERROR IN TOODEE 2 CODE
- ACTIONS INITIATED TO RESOLVE ALL EXXON LOCA ISSUES
- EXXON LOCA ISSUES
 - HEAT TRANSFER AUGMENTATION FACTORS
 - CODE ERROR
 - INPUT ERROR
 - VALIDITY OF USING WESTINGHOUSE $K(z)$ CURVE WITH EXXON ANALYSIS METHODS

HEAT TRANSFER AUGMENTATION FACTORS

- HEAT TRANSFER AUGMENTATION FACTORS FOR REFLOOD HEAT TRANSFER DISAPPROVED BY STAFF IN MAY, 1984 FOR USE IN THE EXXON ECCS MODEL.
- KEWAUNEE AND PRAIRIE ISLAND SUBMITTALS IN DECEMBER 1984 CONTINUED TO USE AUGMENTATION FACTORS.
- RAISED QUESTION WHY WERE ANALYSES STILL BEING SUBMITTED WITH DISAPPROVED MODELS.

CORE ERROR

- DURING EFFORTS TO REVIEW PREVIOUS ANALYSES FOR AUGMENTATION FACTOR PROBLEM, EXXON FOUND CODE ERROR, 1. 001 1 11
- ERROR RESULTS IN AUGMENTATION FACTOR BEING USED IN CODE EVEN WHEN USER THINKS THEY ARE "TURNED OFF", 1 11 11 11 11
- IMPACTS SEVERAL LICENSEES

INPUT ERROR

- EXXON FOUND INPUT ERROR WHILE PERFORMING ANALYSES TO CORRECT CODE ERROR.
- ERROR REFLECTS WRONG ASSUMPTION OF MIXING VANES IN ST. LUCIE 1 FUEL, RESULTED IN $PCT > 2200^{\circ}F$
- ST. LUCIE IMPOSED ADMINISTRATIVE CONTROLS TO LOWER FQ. REANALYSIS HAS BEEN PERFORMED AND FQ VALUE RESTORED.

VALIDITY OF WESTINGHOUSE K(z) CURVE WITH EXXON ANALYSIS METHODS

- K(z) CURVE IN WESTINGHOUSE PLANT TECH SPECS DEFINE ALLOWABLE CORE PEAKING FACTORS AS FUNCTION OF CORE ELEVATION TO ASSURE COMPLIANCE WITH 10CFR50.46.
- EXXON ASSUMED WESTINGHOUSE K(z) CURVE APPLIED TO EXXON FUEL
- ASSUMPTION QUESTIONED IN MAY, 1984, DURING D.C. COOK 2 CYCLE 5 REVIEW
- EXXON ANALYSES IN SEPTEMBER, 1984, FOR H.B. ROBINSON CYCLE 10 DID NOT VERIFY WESTINGHOUSE K(z) CURVE. K(z) CURVE WAS REVISED.
- SUBSEQUENT QUESTIONING ON K(z) RESULTED IN
 - D.C. COOK 2 IMPOSING ADMINISTRATIVE CONTROLS ON K(z)
 - KEWAUNEE ESTIMATES THAT 30% DERATE MAY BE REQUIRED TO ENSURE COMPLIANCE WITH 50.46.
- UNCLEAR WHETHER CE PLANTS FUELED BY EXXON HAVE SIMILAR PROBLEM. LICENSEES REQUESTED TO CONFIRM THEIR TECH SPECS.

REACTOR TRIPS

° 37* REACTOR TRIPS IN PAST MONTH

-	EQUIPMENT PROBLEM	-	19
-	PERSONNEL ACTIVITIES	-	13
-	MANUAL	-	4
-	TEST	-	1

*ONLY INDICATES PLANTS WITH FULL POWER LICENSE

OTHER EVENTS OF INTEREST

V.C. SUMMER - PREMATURE CRITICALITY

CATAWBA 1 - XENON TRANSIENT DURING STARTUP TESTING

DUANE ARNOLD - PIPE CRACKS IN RECIRCULATION SYSTEM RISERS

SAN ONOFRE UNIT 3 - INADVERTENT SI AND HIGH PRESSURIZER LEVEL

SALEM UNIT 2 - REACTOR TRIP "FIRST OUT" ALARM

HADDAM NECK - FEEDWATER LINE CRACK

TROJAN - HEATER DRAIN PUMP DISCHARGE PIPE RUPTURE

V.C. SUMMER - PREMATURE CRITICALITY
FEBRUARY 28, 1985 (J. HOPKINS)

- PLANT STARTING UP AFTER A SHUTDOWN DUE TO ROD CONTROL SYSTEM PROBLEM.
- PLANT TRIPPED AT 6% POWER DUE TO HIGH STARTUP RATE (ABOUT 17 DPM).
- ECP WAS INCORRECTLY CALCULATED BY APPROX. 130 STEPS.
- ECP MISCALCULATION DUE TO INCORRECT XENON CALCULATION.
- OPERATOR PERFORMING STARTUP WAS TEMPORARILY RELIEVED OF DUTIES.
- THE PLANT IS UPGRADING ITS ECP PROCEDURE.
- REGION II IS CONSIDERING ENFORCEMENT ACTION.

CATAWBA 1 - XENON TRANSIENT DURING STARTUP TESTING

MARCH 19, 1985 (K. JABBOUR)

- ROD DROP TESTING BEING CONDUCTED AT 48% POWER.
- WITHDRAWAL OF ROD DELAYED ABOUT 10 HOURS DUE TO DIFFICULTY WITH NEUTRON MONITORING SYSTEM.
- INADVERTENT XENON TRANSIENT DEVELOPED FOLLOWING DELAYED REMOVAL OF THE HIGHEST WORTH CONTROL ROD ON MARCH 18, 1985.
- LICENSEE REDUCED POWER TO 12% ON MARCH 19 TO STABILIZE THE IMBALANCE. THEN INCREASED POWER TO 37% TO BURN OUT THE XENON.
- CONTROL ROD REMOVAL DELAY DUE TO PROBLEMS WITH INSTRUMENTATION REQUIRED FOR THE TEST. INSTRUMENTATION PROBLEM CAUSED TERMINATION OF TEST.
- PN ISSUED BY REGION II

DUANE ARNOLD PIPE CRACKS IN RECIRCULATION SYSTEM RISERS
MARCH 13, 1985 (M. THADANI)

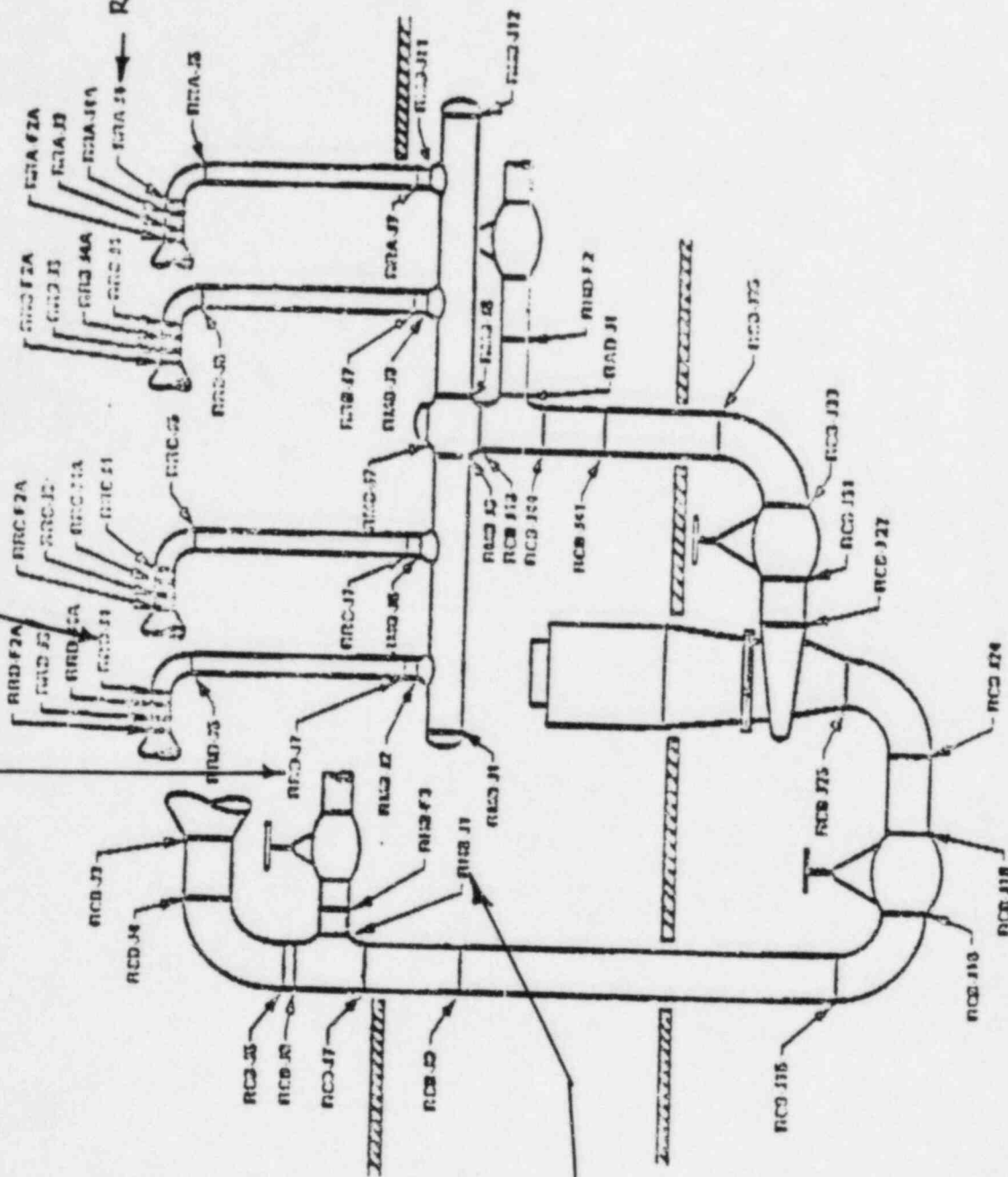
- PLANT IS IN REFUELING OUTAGE UNDERGOING INSPECTION OF STAINLESS STEEL PIPING REQUIRED BY GENERIC LETTER 84-11.
- ON MARCH 13, 1985, A $\frac{1}{2}$ INCH THROUGHWALL AXIAL CRACK WAS DISCOVERED IN THE RECIRCULATION LOOP "B" 10 INCH RISER, AFTER "IHSI" PROCEDURE. ON APRIL 2, 1985, A POST IHSI THROUGHWALL CRACK WAS DISCOVERED ON RHR-J7 WELD IN LOOP B PRIOR "UT" ON THE SAME WELDS DID NOT SHOW ANY CRACK INDICATIONS.
- "UT" CRACK INDICATIONS HAVE BEEN FOUND AT TWO OTHER LOCATIONS OF THE RISER PIPE WELDS IN THE RECIRCULATION LOOP B AND TWO LOCATIONS IN LOOP A.
- THE CRACK LOCATIONS ARE SHOWN IN THE ATTACHED DIAGRAMS.
- AS OF APRIL 2, 1985, THE "UT" AND "IHSI" EXAMINATIONS OF ALL WELDS (107) HAD BEEN COMPLETED. POST IHSI EXAMINATION IS IN PROGRESS.
- THE STATUS OF THE DUANE ARNOLD PIPE CRACK SITUATION WAS DISCUSSED WITH THE MATERIALS ENGINEERING BRANCH. THE DUANE ARNOLD EXPERIENCE IS VIEWED AS TYPICAL OF OTHER SIMILAR BOILERS. NO UNIQUE SAFETY CONCERN IS FORESEEN.

75% - RRD-J7

2007 B

RR A - J4 - THRU - WALL

THRU-WALL - RHR - 57

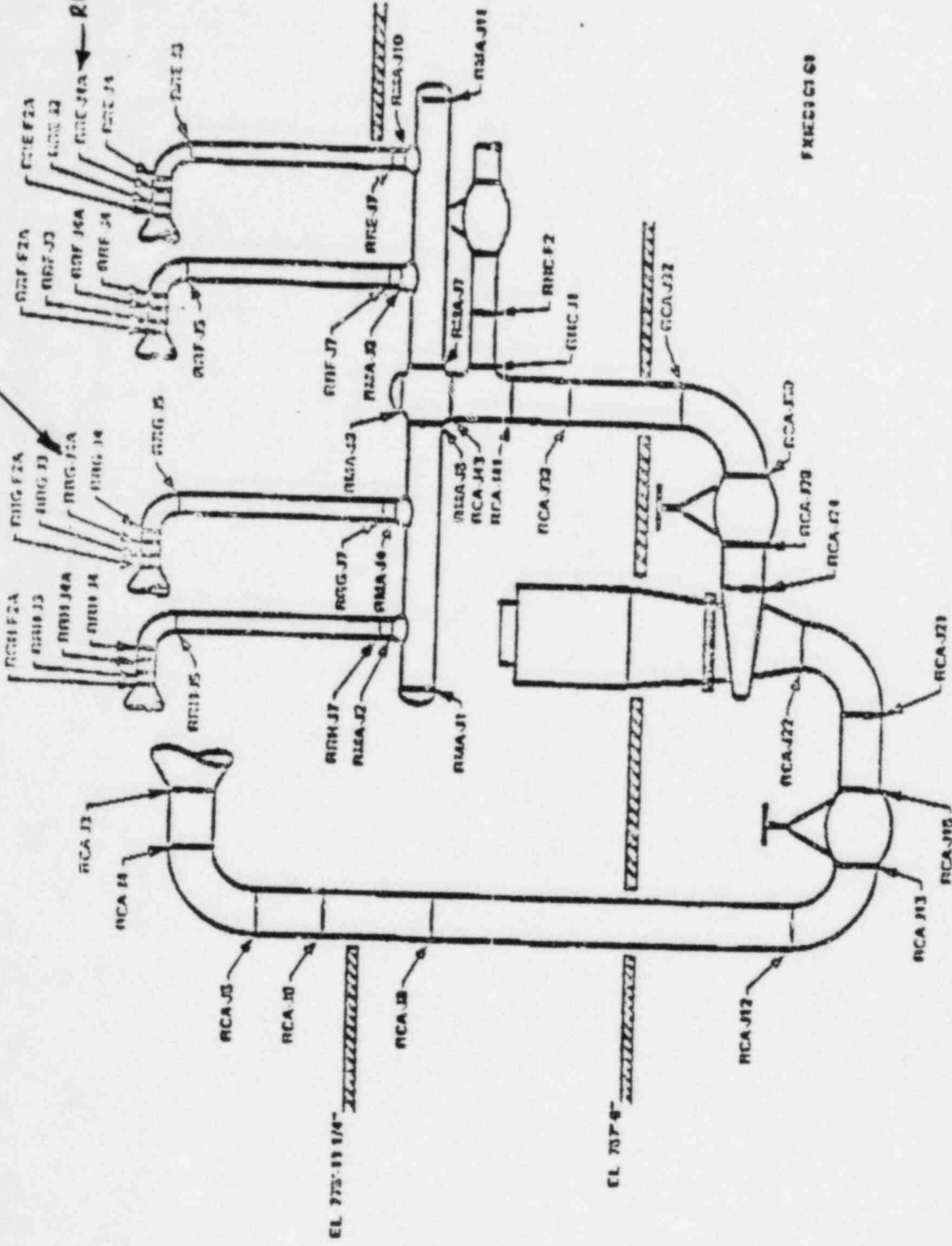


REACTOR RECIRCULATION SYSTEM
LOOP B - DUANE ARNOLD ENERGY CENTER

100P A

RRE-J4A-70%

RRE-J4A-70%



REACTOR REGULATION SYSTEM
LOOP A - GUNNIE ARMOLD ENERGY CENTER

SAN ONOFRE UNIT 3 - INADVERTENT SI AND HIGH PRESSURIZER LEVEL
MARCH 13, 1985 (H. R. R. D.)

- PLANT BEING COOLED DOWN FROM MODE 4 TO MODE 5
- OPERATORS DID NOT BYPASS LOW PRESSURE SI SIGNAL
- SI OCCURRED AT 2:43 P.M. WHEN RCS PRESSURE REACHED 305 PSIG
- DIESELS STARTED, ALL ESF PUMPS STARTED, SIT TANKS DISCHARGED
- PUMPS SECURED BY OPERATORS, MAXIMUM PRESSURE REACHED WAS LESS THAN 400 PSIG, WITHIN P.T. LIMITS
- PRESSURIZER LEVEL WENT OFF-SCALE (HIGH); RCS WAS SOLID (FLOATING ON SIT); TANKS AT ABOUT 360-380 PSIG

SALEM UNIT 2 - REACTOR TRIP "FIRST OUT" ALARM

MARCH 22, 1985 (D. FISCHER)

- UNIT 2 STARTING UP FOLLOWING SECOND REFUELING
- SALEM UNIT 2 WAS IN HOT STANDBY, AND ONE GROUP OF CONTROL RODS WAS WITHDRAWN FOR POSITION INDICATION SYSTEM CALIBRATION.
- DURING FUNCTIONAL TESTING OF THE REACTOR TRIP BREAKERS (RTB), A REACTOR TRIP "FIRST OUT" ALARM ANNUNCIATED IN THE CONTROL ROOM.
- SINCE NO DEMAND FOR REACTOR TRIP EXISTED, THE RTBS PROPERLY REMAINED SHUT.
- AFTER ASSESSING THE SITUATION, THE SENIOR SHIFT SUPERVISOR OPENED THE TRIP BREAKERS.
- DURING TROUBLESHOOTING, A MISALIGNED CONTACT IN THE "2B" RTB FOR THE P-4 CIRCUITRY (INITIATES TURBINE TRIP IN EVENT OF REACTOR TRIP) WAS FOUND WHICH CAUSED THE ERRONEOUS ALARM BY INDICATING BREAKER POSITION AS "OPEN" INTERMITTENTLY.
- THE SWITCH HAS BEEN REPAIRED AND PREPARATIONS FOR PLANT STARTUP ARE CONTINUING.
- THE LICENSEE IS INSPECTING ALL OTHER SIMILAR SWITCHES PRIOR TO RESTART.
- THE RESIDENT INSPECTORS HAVE REVIEWED THIS OCCURRENCE AND ARE CONTINUING TO REVIEW STARTUP PREPARATIONS.

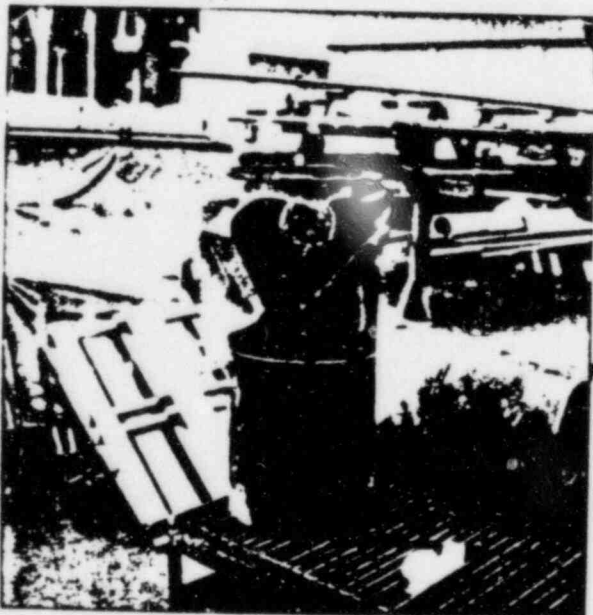
HADDAM NECK - FEEDWATER LINE CRACK
MARCH 16, 1985 - (P. CORTLAND)

- PLANT STATUS: 50% POWER DUE TO AVAILABILITY OF ONE FEED PUMP
- SEQUENCE OF EVENTS: MANUAL TRIP BECAUSE WATER AND STEAM WERE DISCOVERED ISSUING FROM A STRAIGHT SECTION OF 8" PIPE DOWNSTREAM OF FEEDWATER HEATER 1B.
- SAFETY SIGNIFICANCE:
 - (1) PERSONNEL SAFETY
 - (2) MOISTURE COULD CAUSE ELECTRICAL PROBLEMS
- FINDINGS:
 - (1) THERE WAS WATER/STEAM EROSION, 12" DOWNSTREAM OF A THROTTLING VALVE
 - (2) THE RUPTURE WAS 1 1/2" LONG BY 1/2" WIDE
 - (3) THIS WAS AN AREA DEEMED UNLIKELY TO FAIL AND WAS NOT SUBJECT TO REGULAR INSPECTION
 - (4) THIS FAILURE TOOK SEVERAL YEARS TO DEVELOP.
- LICENSEE CORRECTIVE ACTION:
 - (1) THE PIPE WAS REPLACED
 - (2) PERIODIC INSPECTION,
- GENERIC IMPLICATION: OLDER PLANTS ARE HAVING EROSION FAILURES AND PERSONNEL INJURIES.
- NRC FOLLOWUP ACTION: DISCUSSES WITH INPO TO URGE LICENSEES TO PERFORM PERIODIC INSPECTIONS OF AREAS SUSCEPTIBLE TO EROSION

TROJAN - HEATER DRAIN PUMP DISCHARGE PIPE RUPTURE

MARCH 9, 1985 (C. TRAMMELL)

- HEATER DRAIN PUMP DISCHARGE PRESSURE INCREASED AS USUAL AFTER A REACTOR/TUPBINE TRIP. A LARGE RUPTURE OCCURRED.
- 14" PIPE. NORMALLY AT 350°F/ 350 PSI (SUBCOOLED).
- PIPE WAS IMMEDIATELY DOWNSTREAM OF A GLOBE VALVE.
- CAUSE: EROSION. PIPE WALL WAS .091 "VERSUS THE REQUIRED .291" MINIMUM. THINNING ALSO NOTED AT OTHER LOCATIONS. HIGH VELOCITY.
- ONE PERSON BURNED (SECOND DEGREE, 50% OF BODY), RECOVERING NOW.
- IE TO ISSUE AN INFORMATION NOTICE REGARDING THIS AND SIMILAR PIPING PROBLEMS.



INCOMPLETE ITEMS

Meeting Date	Responsible Branch	Task Description	To Be Completed By:	Comment
9/8/83	DL/Lead Pm	Follow-up Briefing on BWR Vacuum Breakers after CSB evaluation complete	5/31/85	Closed. This issue has been prioritized as a low priority item. No additional staff action planned at this time.
4/10/84	DL/ORAB; DSI/CSB and AEB, DHFS AEOD, RES	ORAB to chair a meeting between NRR Divisions, IE, AEOD and RES to discuss operating experience related to containment systems vulnerability to degradation resulting from errors or design features. Meeting participants will make brief presentations in their area of expertise.	5/31/85	Closed. The San Onofre event which initiated this follow-up actions was rejected as a potential AO. No additional staff action planned at this time.
4/26/84	DST/GIB DL (Lead PM)	Review recent Waterhammer events at Maine Yankee, Palisades, Salem-2 and Calvert Cliffs. Determine Generic implications and need for additional staff action. DL (Lead PM) will coordinate RAI.	5/31/85	Closed. DST has reviewed the plant specific responses. INPO SER 69-84 issued September 28, 1984.

Meeting Date	Responsible Branch	Task Description	To Be Completed By:	Comment
8/7/84	DL/PM (Salem)	Determine if Velan (PORV) block valve qualified to close against 7/25/84 steam blow down transient at Salem 2. Check EPRI Test Program results	5/31/85	
8/7/84	DL/ORAB	Coordinate NRR review of Region I report on Susquehanna 2 Station Blackout; setup meeting to decide followup actions	5/31/85	In progress
10/16/84	ORAB/IE	Follow-up briefing after cause of Palisades RCP failure and generic implications determined	5/31/85	
11/29/84	DL/PM (Duane Arnold)	Issue TAC to DSI/PSB to re-review station adequacy analysis in light of 10/22 start-up transformer failure event	5/31/85	
12/13/84	DL/PM, ORAB TDI DG Task Force	Review multiple DG failures at North Anna-2 to identify potential common mode failure mechanism	5/31//85	
12/13/84	DL/PM	Determine worker exposure from CRD screen replacement operation at Monticello forward to H. R. Denton in note	5/31/85	Complete. March 25, 1985 memo D.P. Vassallo to H. Denton.

Meeting Date	Responsible Branch	Task Description	To Be Completed By:	Comment
1/3/85	DL/PM Susquehanna	Find out about existence of widespread potential maintenance problem or CRD air system contamination	5/31/85	In progress
1/3/85	DL/PM, ORAB	Determine if a change in Tech Specs should be considered in view of Susquehanna scram solenoid problem	5/31/85	ICSB reviewing licensee's submittal for Tech. Specs. change
1/3/85	DL (P.Kadambi)	Summarize B&W licensing responses to questions subsequent to Rancho Seco loss of NNI event and present at follow-up OR Events briefing	5/31/85	
1/3/85	ICSB F. Rosa	Consider need for additional requirements on alarms/annunciators	5/31/85	
1/3/85	IE	Evaluate incident response criteria concerning loss of plant annunciators	5/31/85	
1/3/85	IE	Prepare Information Notice regarding degradation of safety injection pumps due to boron crystallization	5/31/85	
1/17/85	IE/ORAB	Continue review of Sequoyah and North Anna trip breaker failures for preparation of Information Notice and determination of need for additional action	5/31/85	

Meeting Date	Responsible Branch	Task Description	To Be Completed By:	Comment
1/31/85	DL/DSI	Schedule meeting w/Owners to clarify GL 84-15 requests. Compile list of plants with .95 D/G reliability	5/31/85	
3/07/85	DL/PM Browns Ferry 3	PM will brief D. Eisenhut regarding 2/13 Report of Water Level Instrument Discrepancy	3/27/85	Complete OR Events Briefing 4/4/85