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

MAR 4 1988

MEMORANDUM FOR: Charles E. Rossi, Director
Division of Operational Events Assessment
Office of Nuclear Reactor Regulation

FROM: Wayne Lanning, Chief
Events Assessment Branch
Division of Operational Events Assessment
Office of Nuclear Reactor Regulation

SUBJECT: THE OPERATING REACTORS EVENTS MEETING
March 8, 1988 - MEETING 88-10

On March 8, 1988 an Operating Reactors Events meeting (88-10) was held to brief senior managers from NRR, RES, AEOD and Regional Offices on events which occurred since our last meeting on March 1, 1988. The list of attendees is included as Enclosure 1.

The events discussed and the significant elements of these events are presented in Enclosure 2. The Enclosure 3 presents a tabulation of long-term followup assignments to be completed, one event suggested for long term followup, and a summary of reactor scrams. Two significant events were identified for input to NRC's performance indicator program.

Wayne Lanning, Chief
Events Assessment Branch
Division of Operational Events Assessment
Office of Nuclear Reactor Regulation

Enclosures:
As stated

cc w/Enclo.:
See Next Page

I DIR-5-1
OPERATING
EXPERIENCE

cc:
T. Murley
F. Miraglia
E. Jordan
E. Beckjord
W. Russell, RI
B. Davis, RIII
J. Nelson Grace, RII
R. D. Martin, RIV
J. B. Martin, RV
W. Kane, RI
L. Reyes, RII
E. Greenman, RIII
J. Callan, RIV
D. Kirsch, RV
S. Varga
D. Crutchfield
B. Boger
G. Lainas
G. Holahan
L. Shao
J. Partlow
B. Grimes
F. Congel
E. Weiss
S. Black
T. Martin
J. Stone
R. Hernan
H. Bailey
J. Guttmann
A. Thadani
S. Rubin
J. Sniezek
J. Forsyth, INPO
A. DeAgazio
K. Perkins
H. Silver
H. Perkow
E. Reeves
E. Adensam
R. Lo

ENCLOSURE 1

LIST OF ATTENDEES

OPERATING REACTORS EVENTS BRIEFING (88-10)

March 8, 1988

NAME	ORGANIZATION	NAME	ORGANIZATION
J. Sniezek	NRR/DOEA	T. Murley	NRR
W. Lanning	NRR/DOEA	S. Varga	NRR/DRP
C. Schulten	NRR/DOEA	G. Klingler	NRR/PMAS
M.L. Reardon	NRR/DOEA	J. Heltemes	AEOD
A. Thadani	NRR/DEST	C.E. Rossi	NRR/DOEA
G. R. Mazetis	RES/DRPS	R. Jones	NRR/SRXB
W. Troskoski	OEDO	J. Ramsey	NRR/DOEA
G. Lainas	NRR/ADR II	J. Roe	NRR/DLPQ
D.H. Moran	OSP/TVA	J. Carter	NRR/DOEA
W. Jensen	NRR/DOEA	A. DeAgazio	NRR/PD 3-3
D. Tondi	NRR/DEST	R.W. Woodruff	NRR/DOEA
P. Kang	NRR/SELB	H. Berkow	NRR/PD 2-2
R. Lo	NRR/PD II-1	J. Partlow	NRR/DRIS
B. Boger	NRR/ADRI	M. Caruso	NRR/DRSP
P. Wen	NRR/DOEA	E.G.Adensam	NRR/DRPR
R. Cilimberg	NRR/RVIB	T.M. Novak	AEOD/DSP
E. Baker	NRR/RVIB	B. Hayes	OI

ENCLOSURE 2

OPERATING REACTORS EVENTS BRIEFING 88-10

LOCATION: 12-B-11 WHITE FLINT

TUESDAY, MARCH 08, 1988, 11:00 A.M.

THIS INFORMATION MAY ALSO BE OBTAINED BY DIALING EXTENSION 21449.

DAVIS BESSE 1	POSSIBLE COMMON MODE VALVES FAILURE
CRYSTAL RIVER 3	FEEDWATER MALFUNCTION TURBINE TRIP FAILED
FARLEY 1 & 2	POTENTIAL BINDING OF CHARGING PUMPS
ROBINSON 2	SINGLE FAILURE VULNERABILITY/ EDG TRIPS PREVENTED RESTART

DAVIS BESSE 1
POSSIBLE COMMON MODE VALVE FAILURE
MARCH 4, 1988

PROBLEM

SERVICE WATER (SW) OUTLET VALVE SE 1434 FOR COMPONENT COOLING WATER (CCW) HEAT EXCHANGER #2 DRIFTED FROM 100% OPEN TO 30% OPEN.

SIGNIFICANCE

POSSIBLE COMMON MODE FAILURE MECHANISM BY WHICH OUTLET VALVES TO BOTH DECAY HEAT REMOVAL (DHR) HEAT EXCHANGERS AND BOTH (CCW) HEAT EXCHANGERS MIGHT BE INOPERABLE SINCE THE VALVES ARE SIMILAR.

DISCUSSION

- PREVIOUS HISTORY OF VALVE FAILURE.
- MARCH 3 ONE VALVE DECLARED OUT-OF-SERVICE.
- AT 18:43 ON MARCH 4, THE LICENSEE WAS TROUBLESHOOTING VALVE SW 1434.
- VALVE SW 1434 DRIFTED FROM THE REQUIRED FULL OPEN POSITION TO 30% FULL OPEN. AIR REQUIRED TO REMAIN OPEN.
- BOTH TRAINS OF DHR WERE DECLARED INOPERATIVE SINCE CCW OUTLET VALVES OF DHR HEAT EXCHANGERS AND SW OUTLET VALVES OF CCW HEAT EXCHANGERS ARE THE SAME DESIGN.
- LICENSEE DECLARED ALERT.
- BY 18:55 LICENSEE HAD MANUALLY OPENED AND REMOVED POWER FROM VALVES FOR DHR AND CCW TRAIN # 2 ENDING THE ALERT.
- CONTINUING PROBLEM WITH CCW & SERVICE WATER VALVES DUE TO OVER TORQUE AND CORROSION.
- MODIFIED EMERGENCY PROCEDURES TO VERIFY VALVE POSITION.
- TWO TRAINS OF CCW AND DHR NOW OPERABLE.
- REFUELING OUTAGE STARTS 1:00 A.M. MARCH 10. PLANT TO BE DOWN FOR 6 MONTHS.

FOLLOWUP

- REGION TO REQUEST 50.59 EVALUATION TO JUSTIFY OPERATION WITH LOCKED OPEN VALVE.
- LICENSEE REDESIGNING SYSTEM.

CONTACT: W. JENSEN
REFERENCE: 50.72 #11668

CRYSTAL RIVER 3
FEEDWATER MALFUNCTION TURBINE TRIP FAILED
FEBRUARY 28, 1988

PROBLEM
A FEEDWATER MALFUNCTION CAUSED REACTOR TRIP. THE TURBINE DID NOT TRIP.

SIGNIFICANCE
B&W DESIGNED REACTORS HAVE A HISTORY OF SENSITIVITY TO FEEDWATER MALFUNCTIONS.

DISCUSSION
- ON FEBRUARY 28, 1988 POWER WAS BEING REDUCED FOR MAINTENANCE ON THE MAIN GENERATOR.
- AT 45% POWER THE INTEGRATED CONTROL SYSTEM (ICS) BEGAN INCREASING FEEDWATER FLOW TO THE B STEAM GENERATOR (SG).
- CAUSED BY IMPROPER REG VALVE POSITIONING (YOKE NUT FLANGE FACE SEVERED, 2 1/2 INCHES OF PLAY)
- THE ICS SENSED THE MISMATCH OF POWER TO FEED FLOW, STOPPED INCREASING FEED FLOW AND CLOSED THE LOW LOAD VALVE.
- THE OPERATOR OPENED THE MAIN FEEDWATER CROSSTIE VALVE TO BALANCE FLOW TO THE 2 SGs.
- THE CROSSTIE VALVE IS INTERLOCKED TO CLOSE THE B-MAIN FEEDWATER REG VALVE.
- ALL FEEDWATER LOST TO B-SG.
- REACTOR TRIP ON HIGH REACTOR SYSTEM PRESSURE.
- THE TURBINE WOULD NOT TRIP AUTOMATICALLY OR MANUALLY FROM THE CONTROL BOARD.
- DEFECTIVE SOLENOID SPRING AND CORRODED FUSE HOLDER PREVENTED TRIP.
- OPERATOR TRIPPED THE MAIN GENERATOR 14 SECONDS AFTER REACTOR TRIP (OPENED GENERATORS BREAKERS) AND CLOSED MSIVs.
- TURBINE TRIPPED FROM THE YARD.
- THE B-SG LEVEL DECREASED TO THE EMERGENCY STEAM GENERATOR SETPOINT AND TWO AFW PUMPS WERE ACTUATED.
- PREVIOUS TURBINE TRIP FAILURE LAST YEAR FROM DIFFERENT CAUSE (FAILED LOCKOUT RELAY - LER 8711)

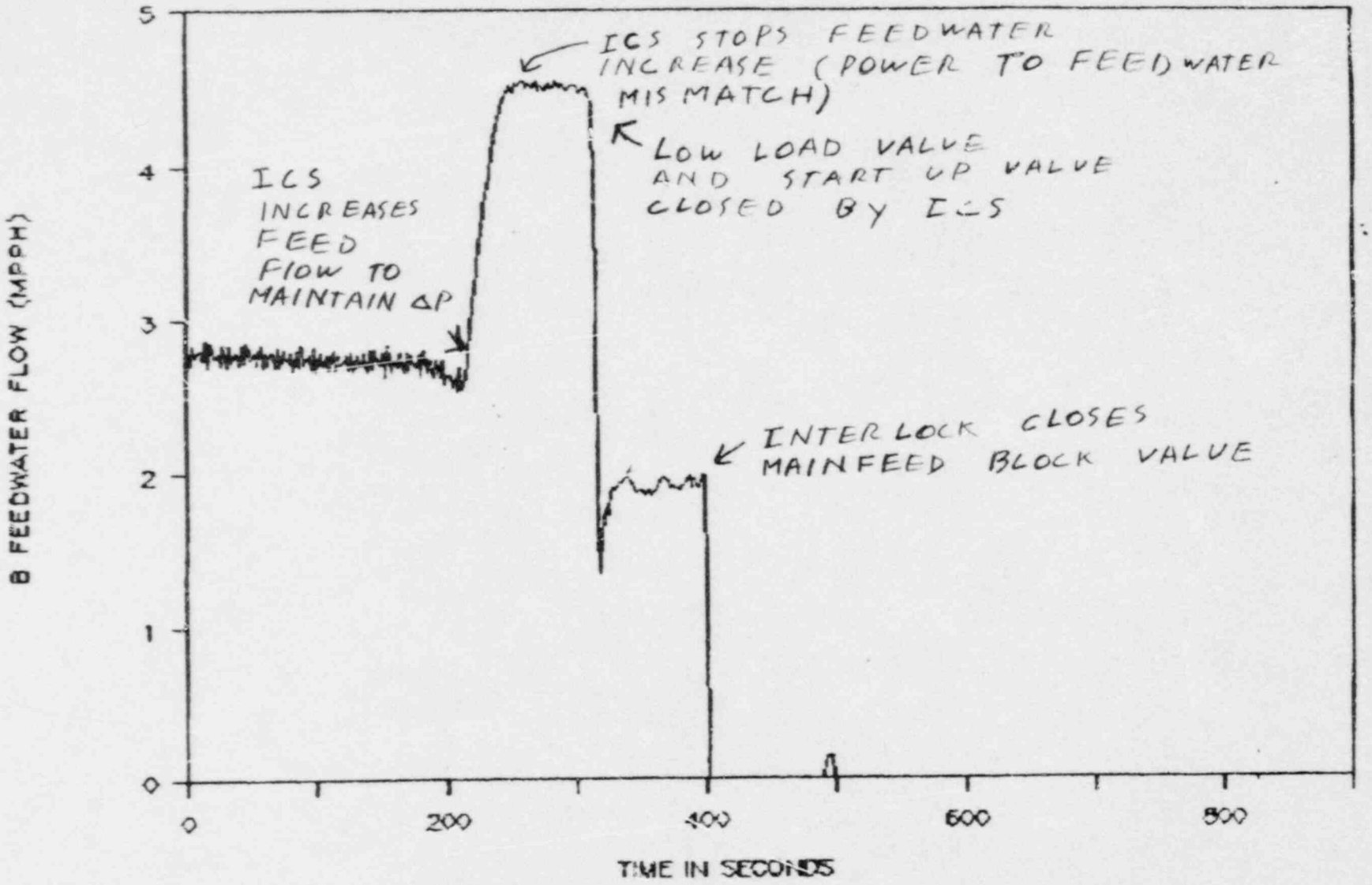
CONTACT: W. JENSEN
REFERENCE: 50.72 #11625

FOLLOWUP

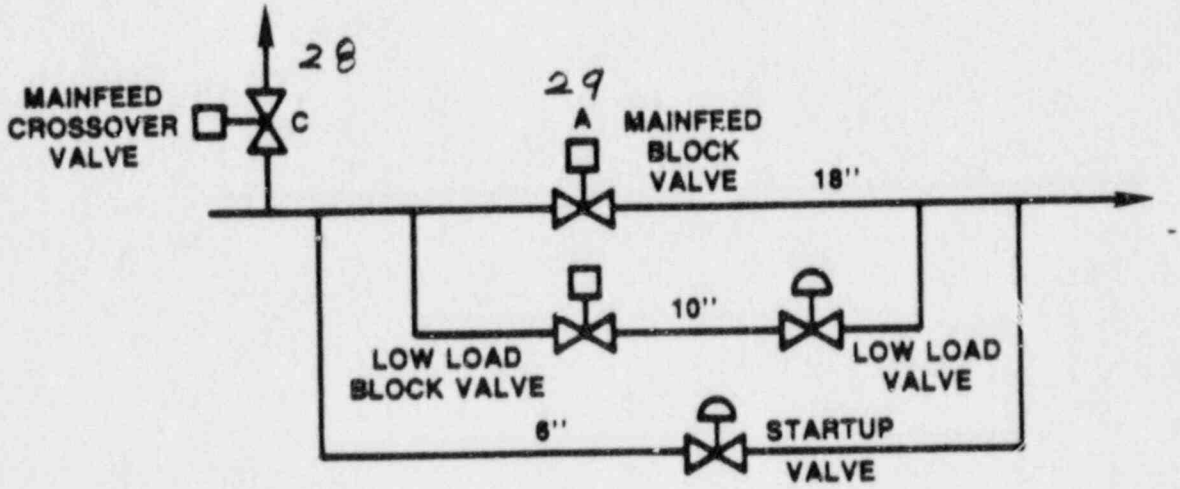
REGION II IS MONITORING LICENSEE'S REPAIRS OF THE MAIN FEEDWATER REG VALVE AND TURBINE TRIP SOLENOID.

REACTOR TRIP

2/29/88 11:49:10



CRYSTAL RIVER 3



Type II Feedwater Control

FARLEY 1 & 2
POTENTIAL BINDING OF CHARGING PUMPS
MARCH 3, 1988

PROBLEM
50 CU FT OF HYDROGEN WAS FOUND IN THE SUCTION HEADER FOR THE CHARGING PUMPS FOR EACH UNIT.

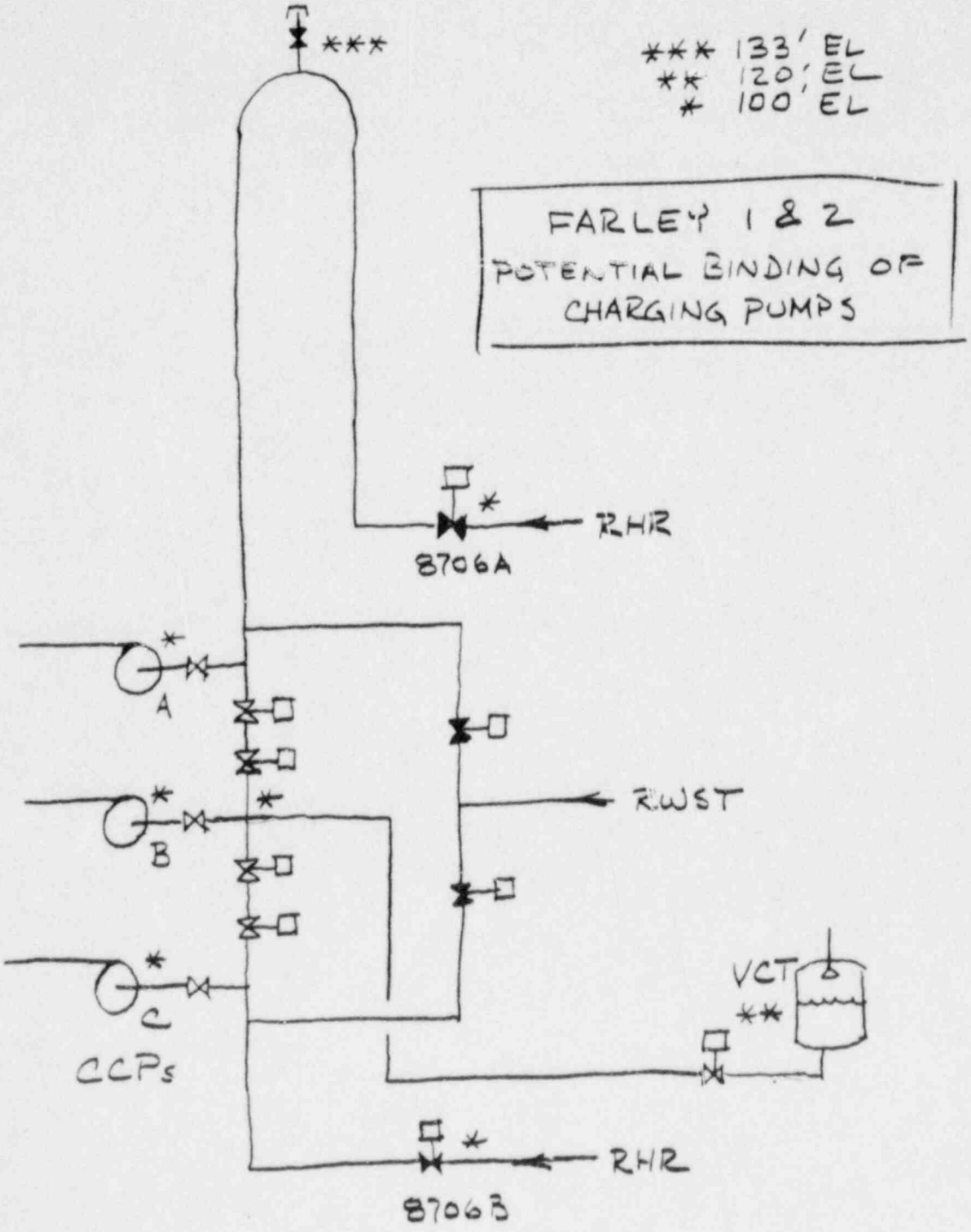
CAUSE
PIPING CONFIGURATION AND DIFFERENTIAL SOLUBILITY OF HYDROGEN.

SIGNIFICANCE
BINDING OF ONE TRAIN OF HPSI PUMPS WHEN THE LPSI PUMPS TRANSFER FROM THE RWST TO THE CONTAINMENT SUMP DURING A LARGE LOCA.

DISCUSSION
- ON 02/26/88, THE LICENSEE WAS CONCERNED ABOUT THE BORON CONCENTRATION IN UNIT 1 AND PREPARED TO TAKE A COOLANT SAMPLE FROM THE CHARGING PUMP SUCTION HEADER AT THE POINT SHOWN ON THE ATTACHED DIAGRAM.
- A RUN OF PIPING CONNECTED TO ONE END OF THE SUCTION HEADER IS ELEVATED.
- 54 CU FT HYDROGEN WAS VENTED BEFORE COOLANT WAS ORTAINED.
- UNIT 2 WAS VENTED AND 51 CU FT OF HYDROGEN WAS FOUND.
- THE VOLUME CONTROL TANK IS APPARENTLY THE SOURCE OF HYDROGEN.
- SOLUBILITY OF HYDROGEN IS DIRECTLY PROPORTIONAL TO PRESSURE.
- 6 CU FT OF GAS WILL BIND A CHARGING PUMP.
- TRANSPORT RATE TO THE HEADER IS APPROX 5 CU FT PER DAY.
- THE LICENSEE IS VENTING EVERY 8 HR AND CONSIDERS THE PUMPS OPERABLE.

FOLLOWUP
- WESTINGHOUSE IS PROVIDING A WRITTEN SAFETY ANALYSIS.
- BECHTEL IS DETERMINING THE REASON FOR THE PIPE ELEVATION.
- EAB IS CONTINUING TO FOLLOW THIS EVENT.

CONTACT: R. WOODRUFF
REFERENCE: DR 03/07/88


*** 133' EL
** 120' EL
* 100' EL
FARLEY 1 & 2
POTENTIAL BINDING OF CHARGING PUMPS
***
*
RHR
8706A
A
B
C
CCPs
RWST
VCT
**
RHR
8706B

ROBINSON 2
SINGLE FAILURE VULNERABILITY/EDG TRIPS PREVENTED RESTART

PROBLEMS

- o SI PUMPS SUSCEPTABLE TO SINGLE FAILURE.
- o POSSIBLE COMMON MODE FAILURE OF EDGs.

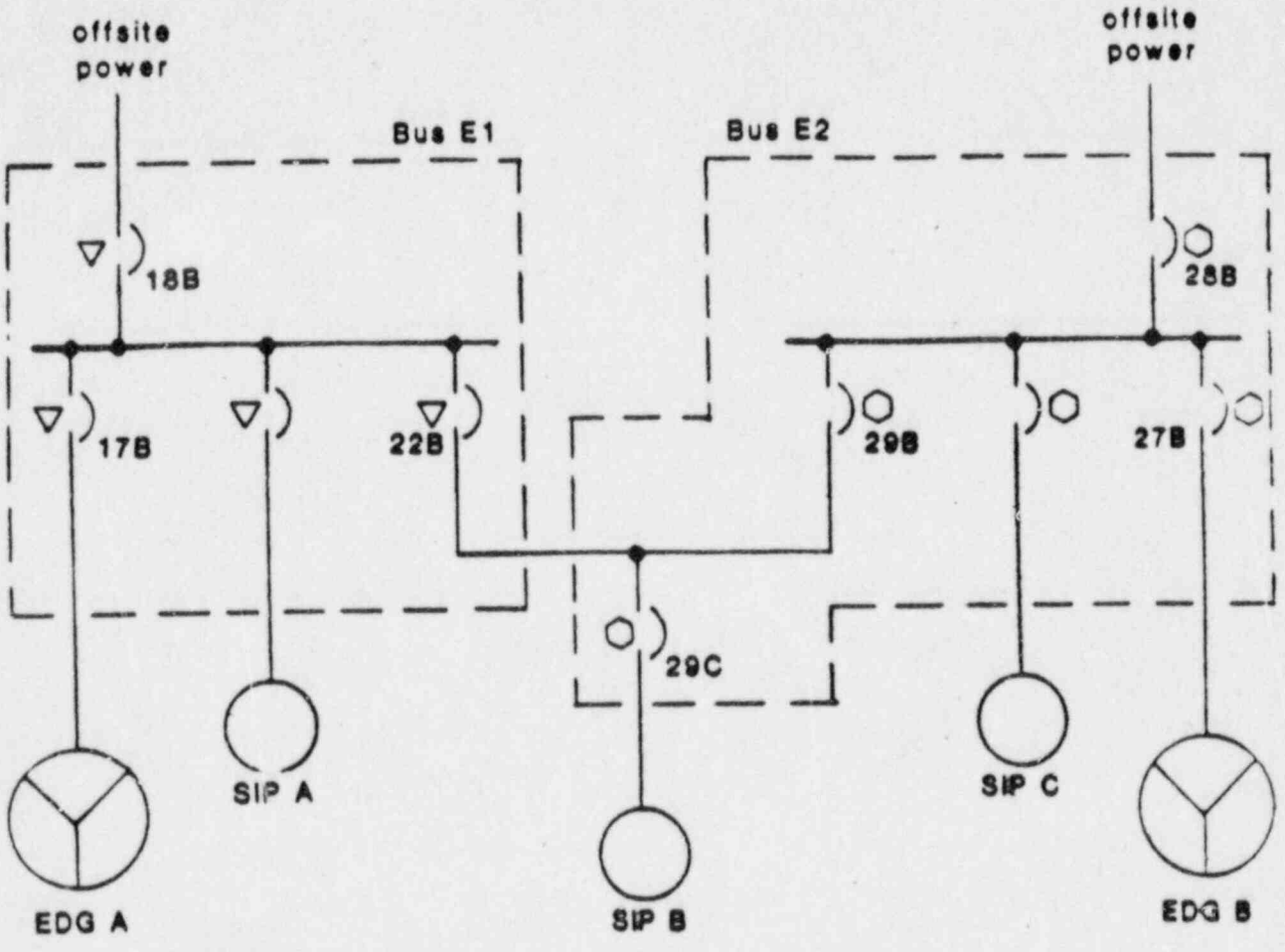
DISCUSSION

- o 01/29 - UNIT SHUTDOWN BECAUSE SINGLE FAILURE OF EMERGENCY ELECTRICAL DISTRIBUTION CAN RENDER 2 OF 3 SI PUMPS INOPERABLE.
- o 01/30 - 02/10 - IDENTIFIED MANY SINGLE FAILURE SCENARIOS. FIVE SCENARIOS RESOLVED BY MODIFICATIONS.
- o 02/07 - ADDITIONAL SINGLE FAILURE OF D.G. VOLTAGE REGULATOR IDENTIFIED.
- o 02/16 - ONE SI PUMP; LARGE BREAK OK WITH SMALL CHANGE IN F_Q; SMALL BREAK NEEDS OPERATOR MANUAL SWITCHOVER OF "B" SI PUMP WITHIN 30 MINUTES OF S.F. OF EMERGENCY ELECTRICAL SYSTEM.
- o 02/19 - PNSC REJECTED MANUAL SWITCHOVER OF "B" SI PUMP.
- o 02/24, 02/26, 03/01 - TS CHANGE FOR 60% POWER LEVEL.
- o 03/07 - T.S. CHANGE GRANTED.
- o BOTH EDGs (FAIRBANKS-NORRIS) EXPERIENCED 8 OVERSPEED TRIPS DURING PAST 8 MONTHS.
- o UNDERLYING CAUSES UNKNOWN.
- o INCREASED SURVEILLANCE TESTING TO WEEKLY.

CONTACT: R. LO, P. FREDERICKSON (RII)
REFERENCE:

Carolina Power & Light Co.
H. B. Robinson

Emergency Bus Layout For
Safety Injection Pumps



▽ = Breaker control from Train A battery

⬡ = Breaker control from Train B battery

Breaker - open

Breaker - closed

EDG - Emergency Diesel Generator

SIP -Safety Injection Pump

ENCLOSURE 3

LONGTERM FOLLOWUP ASSIGNMENTS TO BE COMPLETED

ORGANIZATION	LONGTERM FOLLOWUPS OUTSTANDING				
	02/09/88	02/16/88	02/23/88	03/01/88	03/08/88
AEOD	0	0	0	1	1
EAB	0	2	2	2	2
EMTB	0	0	1	0	0
ESGB	1	1	1	1	1
HLFB	1	1	1	1	1
ICSB	2	2	2	2	2
OGCB	1	1	1	1	1
OTSB	1	1	1	1	1
PD2-2	1	1	1	1	1
PD2-3	1	1	1	1	1
PD3-2	1	1	1	1	1
PD5	2	2	2	2	2
RIII	0	1	1	1	1
RVIB	4	4	3	2	2
SELB	5	5	6	5	5
SPLB	5	5	5	5	5
SRXB	2	3	4	3	3
TOTAL	27	31	33	30	30

SUGGESTED LONGTERM FOLLOWUP

DATE OF EVENT	PLANT NAME AND UNIT	SIGNIFICANT EVENT	INITIAL FOLLOWUP ASSIGNMENT	SUGGESTED RESOLUTION	SUGGEST TRANSFER TO:	EXPECTED COMPLETION DATE
02/22/88	OYSTER CREEK 1	.F.	RPS SCRAM INSTRUMENT BARKSDALE SETPOINT DRIFT.	TAC ASSIGNED FOR BARKSDALE INSTRUMENT FAILURES. FOLLOWUP VENDOR CORRECTIVE ACTIONS TO DETERMINE GENERICA APPLICABILITY OF MICRO SWITCH COMPONENT FAILURES IN BARKSDALE INSTRUMENTS, IF ANY.	NRR/RVIB	/ /

PERFORMANCE INDICATORS SIGNIFICANT EVENTS

PLANT NAME	EVENT DATE	EVENT DESCRIPTION	QTR	SIGNIFICANCE
BRUNSWICK 2	01/02/88	PRIMARY CONTAINMENT ISOLATION VALVES IN TWO DRAIN TRANSFER LINES FAILED TO CLOSE	0	POTENTIAL FOR OR ACTUAL DEGRADATION OF CONTAINMENT OR SAFETY-RELATED STRUCTURES
INDIAN POINT 2	01/03/88	STEAM GENERATOR ALLOWED TO DRY OUT IN VIOLATION OF PROCEDURES. PLANT MANAGEMENT NOT INFORMED BY OPERATORS	0	ADMINISTRATIVE, PROCEDURAL AND COMMUNICATION PROBLEM

REACTOR SCRAM SUMMARY
WEEK ENDING 03/06/88

I. PLANT SPECIFIC DATA

DATE	SITE	UNIT	POWER	SIGNAL	CAUSE	COMPLI-CATIONS	YTD ABOVE 15%	YTD BELOW 15%	YTD TOTAL
03/02/88	KEWAUNEE	1	93	A	EQUIPMENT	NO	1	0	1
03/03/88	DIABLO CANYON	2	100	A	EQUIPMENT	NO	1	0	1
03/04/88	SUSQUEHANNA	1	100	A	EQUIPMENT	NO	1	0	1
03/05/88	COOPER	1	25	M	PERSONNEL	NO	2	0	2
03/05/88	NINE MILE PT	2	100	A	EQUIPMENT	NO	2	0	2

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 109 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.

MAR 10 1988

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Division of Operational Events Assessment
Office of Nuclear Reactor Regulation

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DATE	:03/09/88	:03/09/88	:	:	:	:	:

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