

November 16, 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  
November 15, 1989 - MEETING 89-40

On November 15, 1989, we conducted an Operating Reactors Events meeting (89-40) to brief senior managers from NRR, AEOD, ACRS, Commission staff, and regional offices on selected events that occurred since our last meeting on November 8, 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 11/05/89 and 11/12/89. We identified five significant events 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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11  
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OPERATING  
EXPERIENCE*

OFFICER	: EAB/DOEA	: C: EAB/DOEA	:	:	:	:
NAME	: MLReardon	: CJHaughney	:	:	:	:
DATE	: 11/16/89	: 11/16/89	:	:	:	:

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

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A handwritten signature in black ink that reads "Charles J. Haughney". The signature is written in a cursive style.

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

Enclosures:  
As stated

cc w/Encl.:  
See Next Page

LIST OF ATTENDEESOPERATING REACTORS EVENTS BRIEFING (89-40)

November 15, 1989

<u>NAME</u>	<u>ORGANIZATION</u>	<u>NAME</u>	<u>ORGANIZATION</u>
L. Trimble	OCM/JC	E. Rossi	NRR/DOEA
C. Patel	NRR/DRSP	P. Bobe	AEOD/LSP
C. Haughney	NRR/DOEA	R. Borchardt	OEDC
W. Troskoski	OE	L. Plisco	NRR/DONRR
L. Norrholm	OCM/KC	R. Aulock	NRR/TVA
P. Baranowsky	NRR/DOEA	R. Karsch	NRR/DOEA
R. Perfetti	OE	H. Alderman	ACRS
W. Swenson	NRR/PD3-3	R. Hermann	NRR/EMTE
R. Benedict	NRR/DOEA	A. Gilbert	NRR/DOEA
C. Thomas	NRR/DLPQ	J. Partlow	NRR/ADP
D. Fischer	NRR/DOEA	M. Reardon	NRR/DOEA
R. Kendall	NRR/DOEA	D. Brinkman	NRR/PD1-1
M. Hum	NRR/EMCE		



OPERATING REACTORS EVENTS BRIEFING 89-40  
EVENTS ASSESSMENT BRANCH  
LOCATION: 16B-11, WHITE FLINT  
WEDNESDAY, NOVEMBER 15, 1989, 11:00 A.M.

POINT BEACH UNITS 1 & 2

125 VDC SYSTEM CIRCUIT  
BREAKER DESIGN PROBLEM

ZION UNIT 1

STEAM GENERATOR CRACKING IN  
TRANSITION CONE TO UPPER  
SHELL GIRTH WELD

POINT BEACH UNITS 1 & 2  
125 VDC SYSTEM CIRCUIT BREAKER DESIGN PROBLEM  
NOVEMBER 7, 1989

PROBLEM

125 VDC SYSTEM LOAD FAULTS COULD CAUSE DAMAGE TO STATION BATTERIES.

CAUSE

CIRCUIT BREAKERS DO NOT HAVE INSTANTANEOUS TRIP DEVICES TO PROVIDE CIRCUIT PROTECTION AGAINST HIGH AMPERAGE SHORT DURATION FAULTS.

SAFETY SIGNIFICANCE

INABILITY TO CLEAR OR ISOLATE FAULTS CAN RESULT IN DEGRADATION OF MULTIPLE SAFETY RELATED CIRCUITS/EQUIPMENT. FAULTS IN NON-SAFETY RELATED CIRCUITS CAUSED BY A SEISMIC EVENT COULD POTENTIALLY AFFECT REDUNDANT SAFETY RELATED EQUIPMENT.

DISCUSSION

- o FOUR BATTERIES ARE SHARED BETWEEN TWO UNITS.
- o TWO BATTERIES (D105 & D106) ARE DEDICATED TO "TMI LOADS". THE REMAINING TWO BATTERIES (D05 & D06) PROVIDE POWER USED FOR ACTUATION LOGICS AND CIRCUIT BREAKER CONTROL.
- o LICENSEE DISCOVERED THAT INSTANTANEOUS (MAGNETIC OVERLOAD) PROTECTION WAS MISSING FROM THE BREAKERS ASSOCIATED WITH D05 AND D06 DURING THEIR SELF-INITIATED SSFI OF THE ELECTRICAL SYSTEM.
- o THE PLANT DESIGN BASIS REQUIRES THAT EITHER BATTERY D05 OR D06 BE CAPABLE OF SUPPLYING ACCIDENT LOADS IN EITHER UNIT AND SHUTDOWN LOADS IN THE OTHER UNIT.
- o BATTERIES D05 AND D06 SUPPLY NON-SAFETY AS WELL AS SAFETY RELATED LOADS. THE LICENSEE BECAME CONCERNED THAT A SEISMIC EVENT COULD GENERATE FAULTS IN THE NON-SAFETY LOADS THAT COULD ADVERSELY AFFECT BOTH BATTERIES (CABLE TRAYS FOR NON-SAFETY CABLES ARE NOT SEISMICALLY SUPPORTED).

CONTACT: R. KENDALL  
REFERENCES: 10 CFR 50.72 # 17036

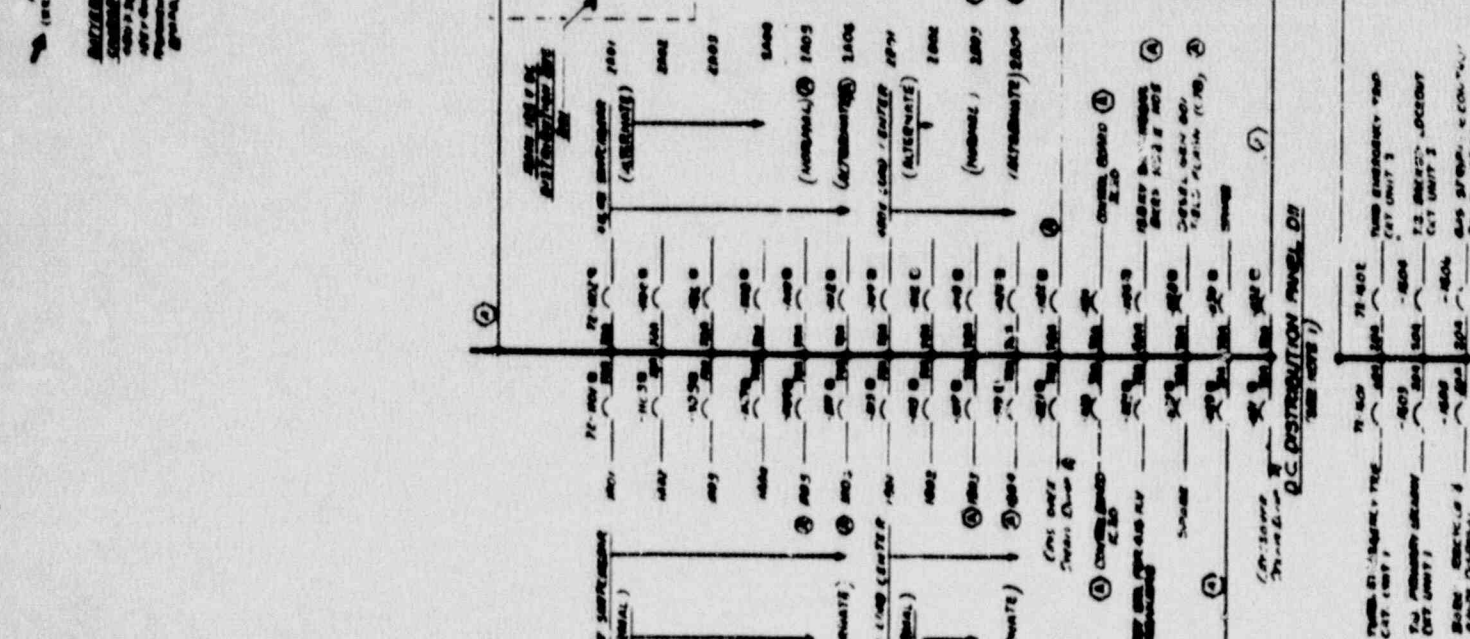
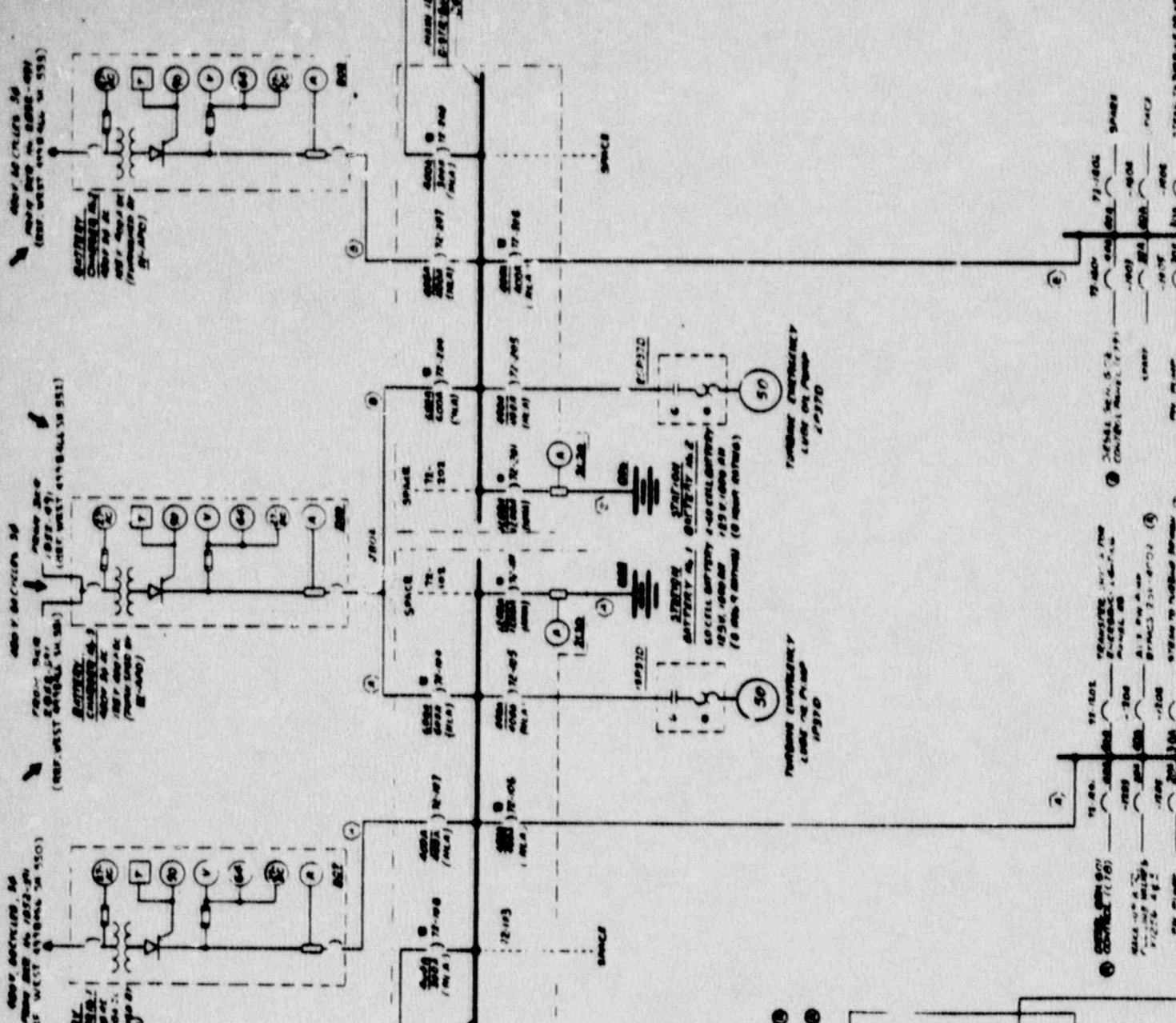
SIGEVENT: YES

- o CIRCUIT BREAKERS FOR NON-SAFETY RELATED LOADS WERE REPLACED WITH BREAKERS HAVING INSTANTANEOUS TRIP DEVICES, OR THE LOADS WERE DISCONNECTED FROM THE BATTERIES. HOWEVER, CONCERNS REMAIN REGARDING THE LACK OF INSTANTANEOUS TRIP DEVICES IN BREAKERS THAT SUPPLY POWER TO SAFETY RELATED LOADS.
- o NRC HAS REQUESTED THE LICENSEE TO CONFIRM THROUGH ANALYSIS THAT FOR ACCIDENT CONDITIONS AT EITHER UNIT (INCLUDING THOSE INVOLVING LOSS OF OFFSITE POWER) AND FOR STATION BLACKOUT, THAT EITHER D05 OR D06 CAN SUPPLY THE NECESSARY ACCIDENT AND SHUTDOWN LOADS GIVEN A SINGLE FAILURE OF THE OTHER BATTERY.
- o ALL FOUR BATTERIES ARE NEW. THE LICENSEE HAS RECENTLY COMPLETED A LOAD ANALYSIS WHICH THEY BELIEVE DEMONSTRATES ADEQUATE CAPACITY OF THE BATTERIES.
- o PROBLEM APPEARS TO BE PLANT SPECIFIC.

#### FOLLOWUP

THE LICENSEE IS INVESTIGATING TO DETERMINE (1) THE BASIS FOR INSTALLING BREAKERS WITHOUT MAGNETIC OVERLOAD TRIP DEVICES, AND (2) WHAT DESIGN CHANGES MAY BE NECESSARY TO PROVIDE ADEQUATE FAULT PROTECTION. DESIGN CHANGES WILL BE REVIEWED BY THE ELECTRICAL SYSTEMS BRANCH.





REF. WEST 4410-100  
 REF. WEST 4410-100  
 REF. WEST 4410-100

ZION UNIT 1  
STEAM GENERATOR CRACKING IN TRANSITION  
CONE TO UPPER SHELL GIRTH WELD  
OCTOBER 22, 1989

PROBLEM

SURFACE AND SUBSURFACE CRACK INDICATIONS WERE FOUND BY ULTRASONIC TESTING (UT) OF THE TRANSITION CONE TO THE UPPER SHELL GIRTH WELD (GIRTH WELD) OF THE STEAM GENERATOR.

CAUSE

UNKNOWN

SAFETY SIGNIFICANCE

SIGNIFICANT STEAM GENERATOR (SG) SHELL CRACKING IS OF PARTICULAR CONCERN SINCE A SG-BREAK IS AN UNANALYZED EVENT. ALSO, THIS IS THE SECOND FINDING OF SIGNIFICANT SG CRACKING IN THE LAST 6 MONTHS.

BACKGROUND

- o ON APRIL 15, 1989, WHILE IN REFUELING, THE LICENSEE FOR INDIAN POINT 2 DISCOVERED A TOTAL OF ABOUT 290 CRACKS IN THE INNER CIRCUMFERENCE OF THE SG GIRTH WELD. THESE CRACKS WERE UP TO 1.42 INCHES DEEP. (THE SG WALL IS 3.5 INCHES THICK.)
- o IN THE MOST SEVERELY AFFECTED SG (SG "22"), THE LICENSEE SET A MAXIMUM GRINDOUT DEPTH OF 0.75 INCHES. THEREFORE, GRINDOUT DEPTHS EXCEEDING 0.75 INCHES IN SG "22" UNDERWENT WELD-BUILDUP AND POST-WELD HEAT TREATMENT.
- o INDIAN POINT 2 HAS GROUND-OUT ALL THE CRACKS IN ALL 4 SGs AND THE UNIT RESTARTED IN JULY 1989. NO SG REPLACEMENT IS SCHEDULED AT THIS TIME.
- o OTHER FINDINGS OF SG CRACKING INCLUDE SG LEAKAGE (THROUGH-WALL CRACKING) AT INDIAN POINT 3 IN 1982, AND SEVERE SG CRACKING AT SURRY 1 AND 2 IN 1985.

CONTACT: A. P. GILBERT

SIGEVENT YES

REFERENCE: MORNING REPORT DATED 11/14/89



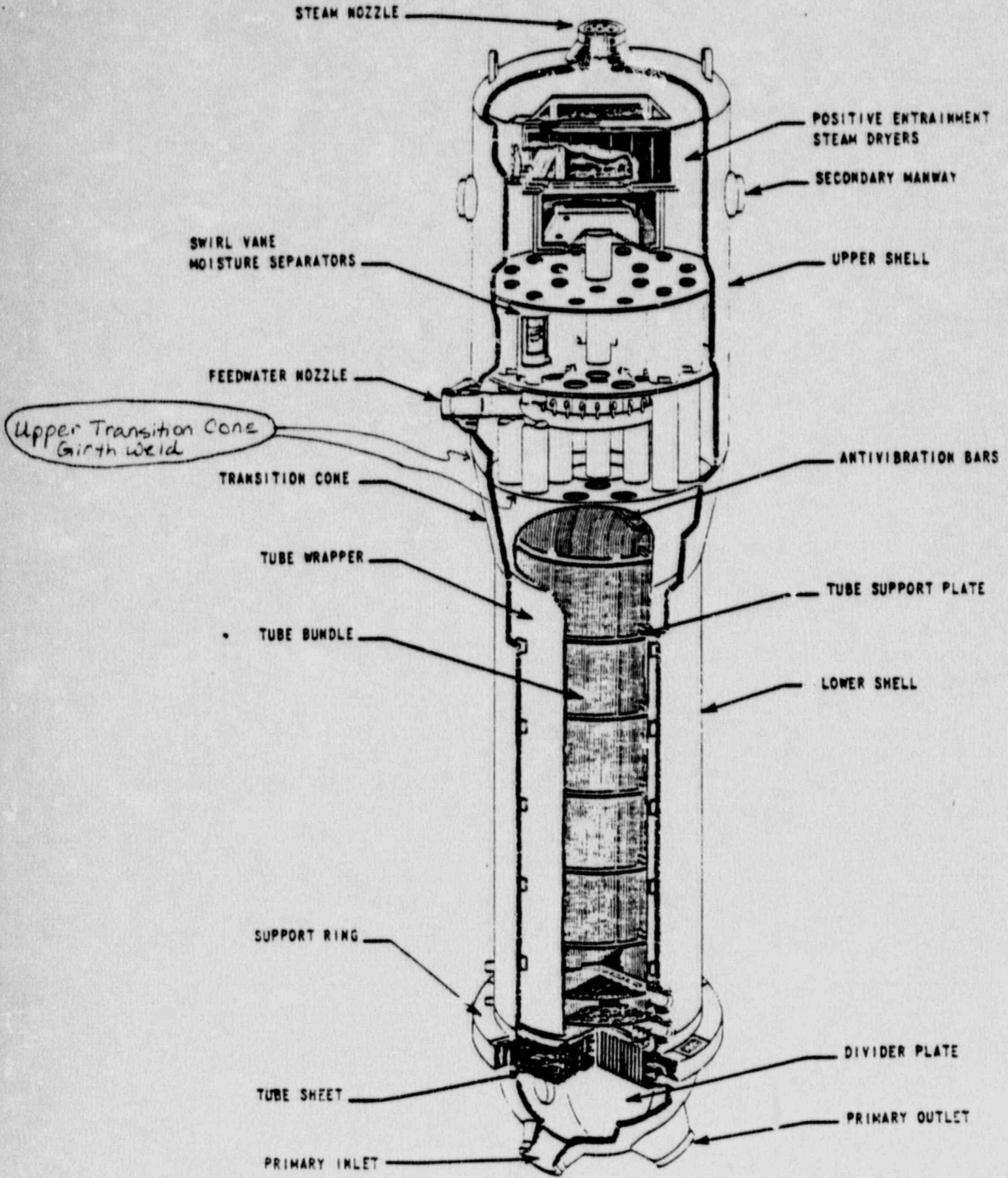
DISCUSSION

- o IN OCTOBER 1989, THE LICENSEE FOR ZION 1 PERFORMED UT OF THE GIRTH WELD AND DISCOVERED CRACK INDICATIONS IN ALL 4 SGs, THE MOST SEVERE CASE BEING SG "1D."
- o SURFACE AND SUBSURFACE INDICATIONS WERE IDENTIFIED IN THE INNER CIRCUMFERENCE OF THE GIRTH WELDS.
- o THE LICENSEE HAS GROUND-OUT THE SURFACE INDICATIONS WITHOUT WELD BUILDUP SINCE THE CRACK DEPTHS DID NOT EXCEED THE MINIMUM SG WALL THICKNESS. THE GROUND-OUT AREAS WERE UP TO 0.50 INCHES DEEP AND ABOUT 6 INCHES LONG.
- o THE LICENSEE IS INVESTIGATING THE NATURE AND EXTENT OF THE CRACK INDICATIONS.

FOLLOWUP

- o THE LICENSEE HAS PROVIDED A TEST SPECIMEN FOR METALLURGICAL ANALYSIS. ONCE THE LICENSEE HAS DETERMINED THE MECHANISM FOR CRACKING, THE MATERIALS & CHEMICAL ENGINEERING BRANCH (MTCB) WILL BE ABLE TO DETERMINE GENERIC APPLICABILITY BASED ON THE LICENSEE'S FINDINGS. WESTINGHOUSE HAS IDENTIFIED A ROOT CAUSE FOR THE INDIAN POINT 2 CRACKING - STRESSES APPLIED BY STANDING WATER TRAPPED BETWEEN THE DIFFUSER PLATE AND THE GIRTH WELD - WHICH MAY APPLY TO ZION 1.
- o IN THE WCAP-12293 ON THE INDIAN POINT 2 GIRTH WELD CRACKING, WESTINGHOUSE IDENTIFIED OTHER PLANTS THAT HAVE A SIMILAR CONFIGURATION TO THE INDIAN POINT 2 SG AND COULD BE SUSCEPTIBLE TO GIRTH WELD CRACKING.
- o TWO INFORMATION NOTICES HAVE BEEN PUT OUT ON THIS SUBJECT: INFORMATION NOTICE 82-37 ON THE INDIAN POINT 3 GIRTH WELD LEAK AND INFORMATION NOTICE 85-65 ON THE SURRY GIRTH WELD CRACKING. THE EVENTS ASSESSMENT BRANCH IS WORKING WITH MTCB TO PUT OUT AN INFORMATION NOTICE ON THE POTENTIAL SUSCEPTIBILITY OF PWRs TO GIRTH WELD CRACKING.

ZION UNIT 1





PERFORMANCE INDICATORS SIGNIFICANT EVENTS

PLANT NAME	EVENT DATE	EVENT DESCRIPTION	BTR SIGNIFICANCE
COMANCHE PEAK 1	07/02/89	LEAKING AIR BLOCK VALVES AND AIR START VALVES COULD CAUSE CAUSE DAMAGE TO DIESEL GENERATORS. PROBLEM APPEARS TO BE GENERIC TO TDI DIESELS.	0 POTENTIAL FOR OR ACTUAL DEGRADATION OF SAFETY-RELATED EQUIPMENT.
DRESDEN 2	10/23/89	LEAKAGE OF FEEDWATER INTO THE HPCI SYSTEM THRU THE INJECTION VALVES RESULTED IN WATER HAMMER AND THE POTENTIAL OF THERMAL STRATIFICATION AND STEAM BINDING.	0 POTENTIAL FOR OR ACTUAL DEGRADATION OF SAFETY-RELATED EQUIPMENT.
POINT BEACH 1 & 2	11/07/89	CIRCUIT BREAKERS DO NOT HAVE INSTANTANEOUS TRIP DEVICES TO PROVIDE CIRCUIT PROTECTION AGAINST HIGH AMPERAGE SHORT DURATION FAULTS. SEISMIC EVENT COULD CREATE FAULT CONDITIONS THAT COULD POTENTIALLY DAMAGE REDUNDANT BATTERIES.	0 POTENTIAL FOR OR ACTUAL DEGRADATION OF SAFETY-RELATED EQUIPMENT.
QUAD CITIES 1 & 2	06/09/89	INCORRECT VALVES & VALVES INSTALLED BACKWARDS ON INSTRUMENT AIR LINE. THE SIX 18" BUTTERFLY VALVES WOULD NOT CLOSE IF INSTRUMENT AIR WAS LOST WHILE DRYWELL WAS BEING PURGED. CONTAINMENT INTEGRITY COULD NOT BE INSURED.	0 POTENTIAL FOR OR ACTUAL DEGRADATION OF CONTAINMENT OR SAFETY-RELATED STRUCTURES.
ZION 1	10/22/89	SURFACE AND SUBSURFACE CRACK INDICATIONS WERE FOUND BY UNTRASONIC TESTING (UT) OF THE TRANSITION CONE UPPER BIRTH WELD (BIRTH WELD) OF THE STEAM GENERATOR.	0 POTENTIAL FOR OR ACTUAL DEGRADATION OF SAFETY-RELATED EQUIPMENT.

REACTOR SCRAM SUMMARY  
WEEK ENDING 11/12/89

1. PLANT SPECIFIC DATA

DATE	SITE	UNIT	POWER SIGNAL CAUSE	COMPLI- CATIONS	YTD	YTD	YTD TOTAL	
					ABOVE 15%	BELOW 15%		
11/07/89	GRAND BULF	1	100 A	EQUIPMENT	NO	3	0	3
11/10/89	LIMERICK	2	98 A	EQUIPMENT	YES	1	0	1
11/10/89	ARKANSAS	1	74 A	PERSONNEL	NO	3	0	3
11/12/89	FARLEY	1	34 A	EQUIPMENT	NO	1	0	1
11/12/89	FITZPATRICK	1	11 A	EQUIPMENT	NO	1	1	2

SUMMARY OF COMPLICATIONS

SITE	UNIT	COMPLICATIONS
LIMERICK	2	HPCI STARTED AND TRIPPED SIX TIMES IN ONE MINUTE FOLLOWING SCRAM RELAYS SET TOO LOW AND HPCI TURBINE OVERSPEEDED DUE TO NO LOAD.

REACTOR SCRAM SUMMARY  
WEEK ENDING 11/05/89

1. PLANT SPECIFIC DATA

DATE	SITE	UNIT	POWER SIGNAL CAUSE	COMPLI- CATIONS	YTD	YTD	YTD TOTAL	
					ABOVE 15%	BELOW 15%		
10/31/89	PALD VERDE	2	66 A	EQUIPMENT	NO	3	0	3
11/05/89	VOGTLE	2	100 M	PERSONNEL	NO	5	1	6
11/05/89	FITZPATRICK	1	100 A	EQUIPMENT	NO	1	0	1



11. COMPARISON OF WEEKLY STATISTICS WITH INDUSTRY AVERAGES

SCRAMS FOR WEEK ENDING  
11/12/89

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%	3	3.0	3.1	3.9	4.3	5.4
PERS. RELATED(6)	>15%	1	1.1	1.0	1.3	1.8	2.0
OTHER(7)	>15%	0	0.1	0.5	1.2	0.4	0.6
** Subtotal **		4	4.2	4.6	6.4	6.5	8.0
** POWER <15%							
EQUIP. RELATED	<15%	1	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 **		1	0.7	0.9	2.1	2.4	2.4
*** Total ***		5	4.9	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	0.9	1.0	1.4	1.0	1.0
AUTOMATIC SCRAMS	5	3.9	4.5	7.0	7.9	9.4

# 11. COMPARISON OF WEEKLY STATISTICS WITH INDUSTRY AVERAGES

## SCRAMS FOR WEEK ENDING 11/05/89

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%	2	3.0	3.1	3.9	4.3	5.4
PERS. RELATED(6)	>15%	1	1.1	1.0	1.3	1.8	2.0
OTHER(7)	>15%	0	0.1	0.5	1.2	0.4	0.6
** Subtotal **		3	4.2	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 ***		3	4.9	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	1	0.9	1.0	1.4	1.0	1.0
AUTOMATIC SCRAMS	2	3.9	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 OF 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.