June 3, 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
JUNE 1, 1994 - BRIEFING 94-18

On June 1, 1994, we conducted an Operating Reactors Events Briefing (94-18) to inform senior managers from offices of the Commission, NRR, EDO, AEOD and regional offices of selected events that occurred since our last briefing on May 25, 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 29, 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

DISTRIBUTION:

Central Files	KGray
PDR	TKoshy
LKilgore, SECY	JCarter
EAB R/F	

EAB/DORS	EAB/DORS	EAB/DORS	EAB/DORS
KGray:kag	TKoshy	EGoodwin	JCarter
06/02/94	06/1 /94	06/2 /94	06/2 /94

EAB/DORS	EAB/DORS
RDennig	AChaffee
06/ /94	06/3 /94

OFFICIAL RECORD COPY
DOCUMENT NAME: G:\KAG\ORTRANS

IDTR-5-1
Operating Experiences

130032

003058

9406140122 940603
PDR ORG NRRB
PDR

RETURN TO REGULATORY CENTRAL FILES D403

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 (T-4D18)
G. Holahan, AEOD (T-4A9)
L. Spessard, AEOD (T-4D28)
K. Brockman, AEOD (T-4A23)
S. Rubin, AEOD (T-4D28)
M. Harper, AEOD (T-4A9)
V. McCree, EDO (O-17G21)
F. Ingram, PA (O-2G5)
E. Beckjord, RES (T-10F2)
A. Bates, SECY (O-16G15)
T. Martin, Region I
R. Cooper, Region I
S. Ebneter, 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

B. Holian (PDIV-2)
T. Quay (PDIV-2)
J. Andersen (PDI-4)
J. Stolz (PDI-4)

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

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

June 3, 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
JUNE 1, 1994 - BRIEFING 94-18

On June 1, 1994, we conducted an Operating Reactors Events Briefing (94-18) to inform senior managers from offices of the Commission, NRR, EDO, AEOD and regional offices of selected events that occurred since our last briefing on May 25, 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 29, 1994. No significant events were identified for input into the NRC Performance Indicator Program.

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 (94-18)

JUNE 1, 1994

NAME	OFFICE	NAME	OFFICE
A. CHAFFEE	NRR	T. YAMADA	NRR
J. CARTER	NRR	B. GRIMES	NRR
K. GRAY	NRR	C. THOMAS	NRR
R. DENNIG	NRR	L. REYES	NRR
E. GOODWIN	NRR	J. ROE	NRR
T. KOSHY	NRR	J. CALVO	NRR
J. ANDERSEN	NRR	D. CHAMBERLAIN	OCM/IS
S. ROSENBERG	NRR	J. SORENSEN	OCM/KR
B. HOLIAN	NRR	J. TATUM	EDO
E. WANG	NRR	M. WEGNER	AEOD
G. HAMMER	NRR	G. HOLAHAN	AEOD

TELEPHONE ATTENDANCE
(AT ROLL CALL)

Regions
Region I
Region II
Region III
Region IV

Resident Inspectors

IIT/AIT Team Leaders

Misc.

ENCLOSURE 2

OPERATING REACTORS EVENTS BRIEFING 94-18

LOCATION: O-10B11, WHITE FLINT
WEDNESDAY, JUNE 1, 1994 11:00 A.M.

PALO VERDE, UNIT 2	REACTOR TRIP DUE TO INADVERTENT OPENING OF CONTAINMENT SPRAY ISOLATION VALVE
50-529	
940528	
MILLSTONE, UNIT 1	FAILURE DURING TESTING OF SAFETY RELIEF VALVES
50-245	
940529	

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

PALO VERDE, UNIT 2
REACTOR TRIP DUE TO INADVERTENT OPENING OF CONTAINMENT SPRAY ISOLATION VALVE
MAY 28, 1994

PROBLEM

MAINTENANCE ON INCORRECT TRAIN OF CONTAINMENT SPRAY (CS) ACTUATION RELAY CAUSED GRAVITY FLOW OF WATER FROM REFUELING WATER TANK (RWT) THROUGH LOWER SPRAY HEADER. SPRAY RESULTED IN REACTOR COOLANT PUMP TRIP AND THEREFORE, A REACTOR TRIP.

CAUSE

I & C MAINTENANCE AT AN INCORRECT TRAIN.

SAFETY SIGNIFICANCE

UNANTICIPATED CHALLENGES TO PLANT AND OPERATORS.

DISCUSSION

- I & C TECHNICIANS WERE TASKED TO WORK ON ESFAS RELAY REPLACEMENT FOR "A" TRAIN.

- AT 9:13 THE TECHNICIANS INADVERTENTLY PULLED THE RELAY FOR CONTAINMENT SPRAY ISOLATION VALVE (SIBUV671) FOR TRAIN "B".

- THIS CAUSED WATER FROM THE RWT TO SPRAY THROUGH THE TRAIN "B" BOTTOM SPRAY HEADERS. (BELOW GRADE FOR ENSURING SPRAY COVERAGE IN A 90 DEGREE QUADRANT)

CONTACT: THOMAS KOSHY, NRR/DORS/OEAB AIT: NO
REFERENCE: 10 CFR 50.72 #27313 SIGEVENT: TBD

- AT 9:43 CONTROL ROOM RECEIVED HI/LO ALARM FROM CONTAINMENT EAST SUMP.

- SUSPECTING SECONDARY LEAKAGE FROM RECENT ACTION TO INCREASE FLOW, OPERATORS ISOLATED THE BLOWDOWN FOR STEAM GENERATOR 1 & 2.

- THE OPERATORS CONTINUED TO LOOK FOR RCS LEAKAGE BUT DID NOT CONSIDER THE POSSIBILITY OF HUMAN ERROR IN CS MAINTENANCE.

- AT 11:08 A CONTAINMENT ENTRY WAS MADE.

- AT 11:09 HI/LO ALARM FROM CONTAINMENT WEST SUMP.

- AT 11:15:01 REACTOR COOLANT PUMP B TRIPPED ON ELECTRICAL FAULT.

- THE WATER SPRAY CAUSED A PHASE-TO-PHASE ELECTRICAL FAULT AND CONSEQUENT DAMAGE OF THE CABLE TERMINATION BOX.

- AT 11:15:02 THE REACTOR TRIPPED FROM LOW DEPARTURE FROM NUCLEATE BOILING RATIO.

- PERSONNEL IN CONTAINMENT REPORTED WATER FLOWING FROM CONTAINMENT SPRAY HEADER.

- AT 11:31 OPERATORS CLOSED THE ISOLATION VALVE MANUALLY.

- LICENSEE ESTIMATED TOTAL SPRAY OF 7,500 GALLONS.

FOLLOW UP

- NRC MANAGEMENT CONDUCTED A CONFERENCE CALL AND DECIDED TO CONDUCT A SPECIAL INSPECTION WITH SUPPORT FROM NRR TECHNICAL BRANCHES.

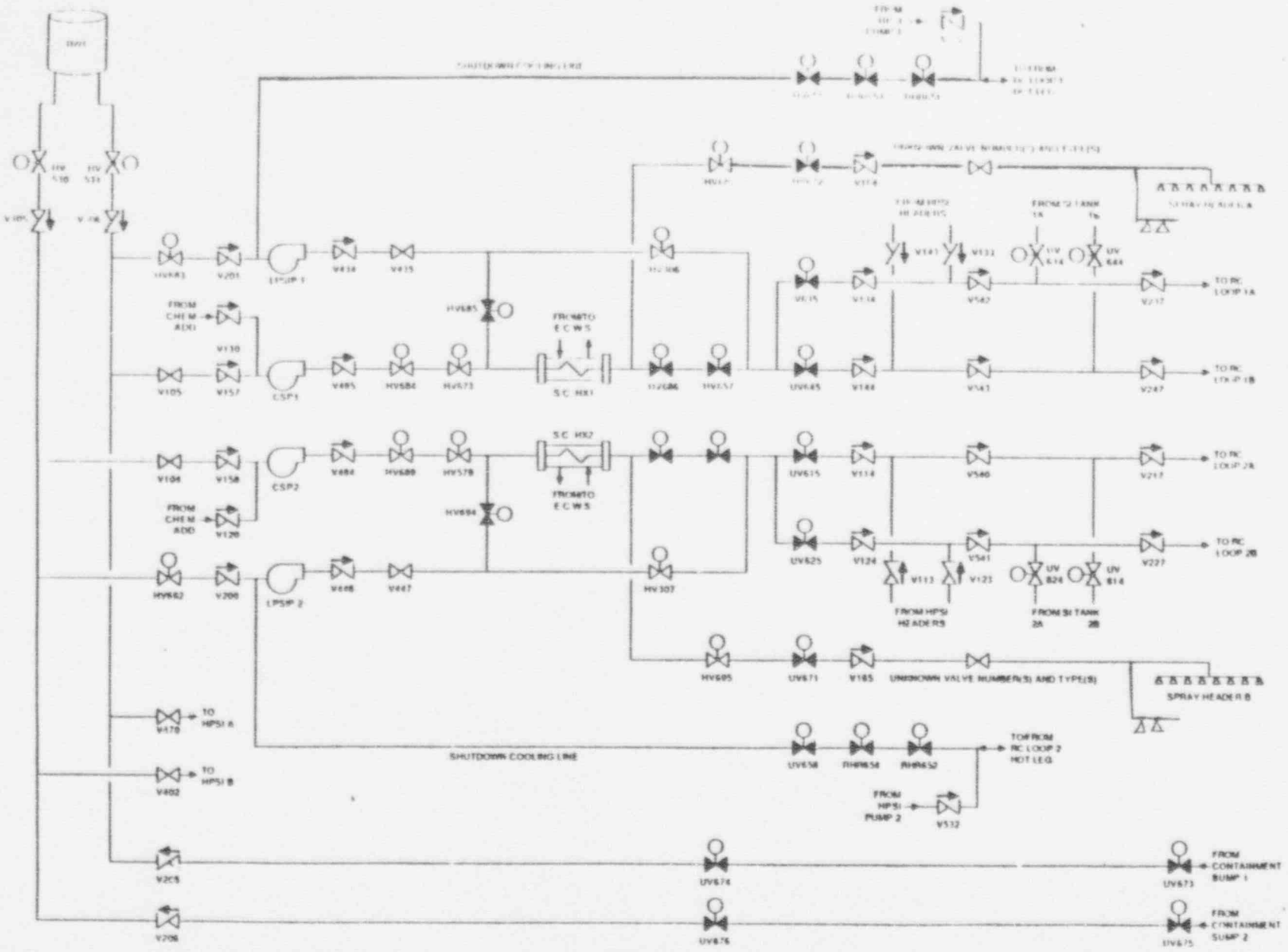

Figure 3.3-3. Palo Verde Low Pressure Safety Injection and Containment Spray Systems

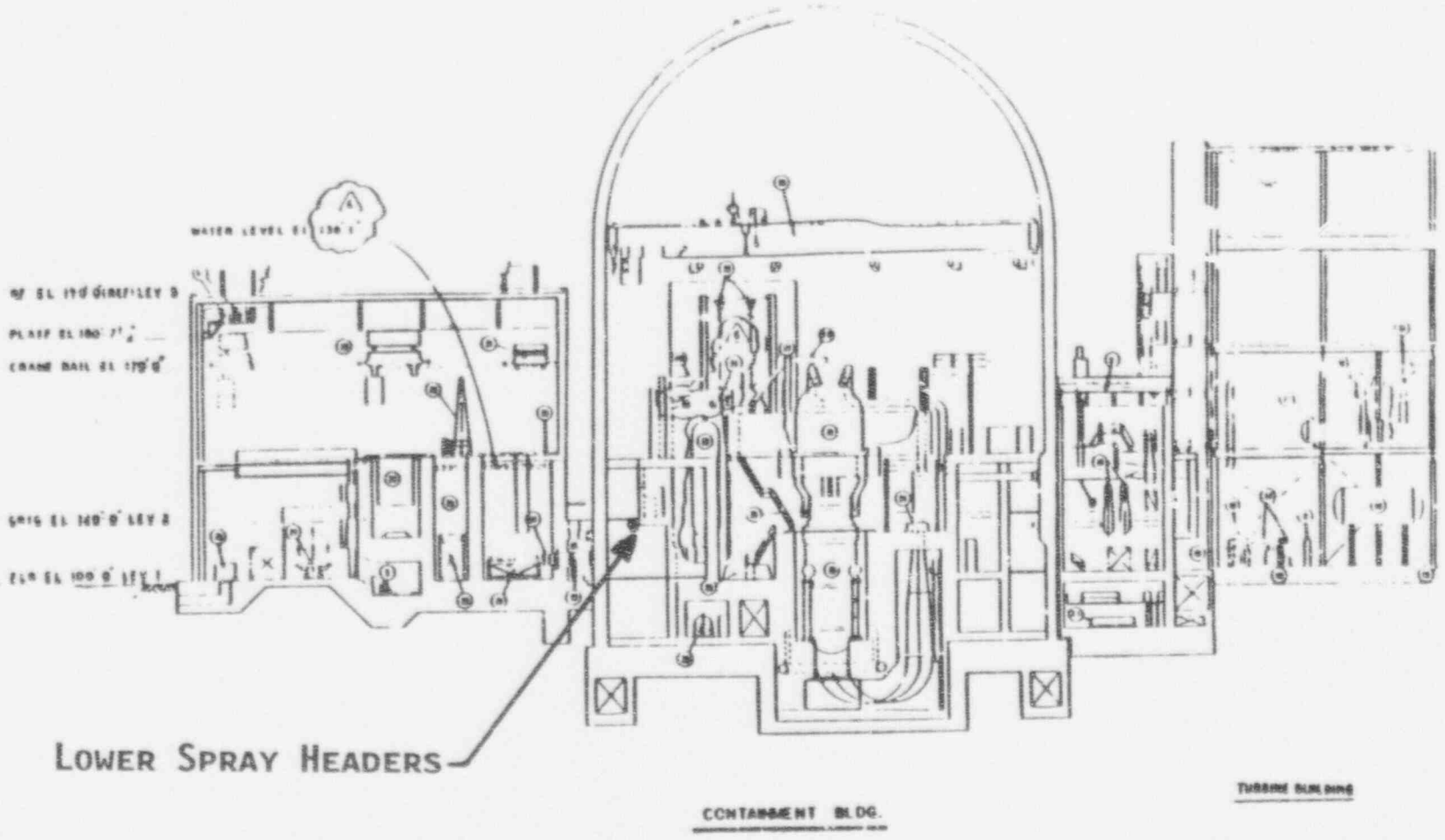

Figure 4-5. Elevation View of the Containment and Fuel Buildings and Partial Turbine Building at Palo Verde

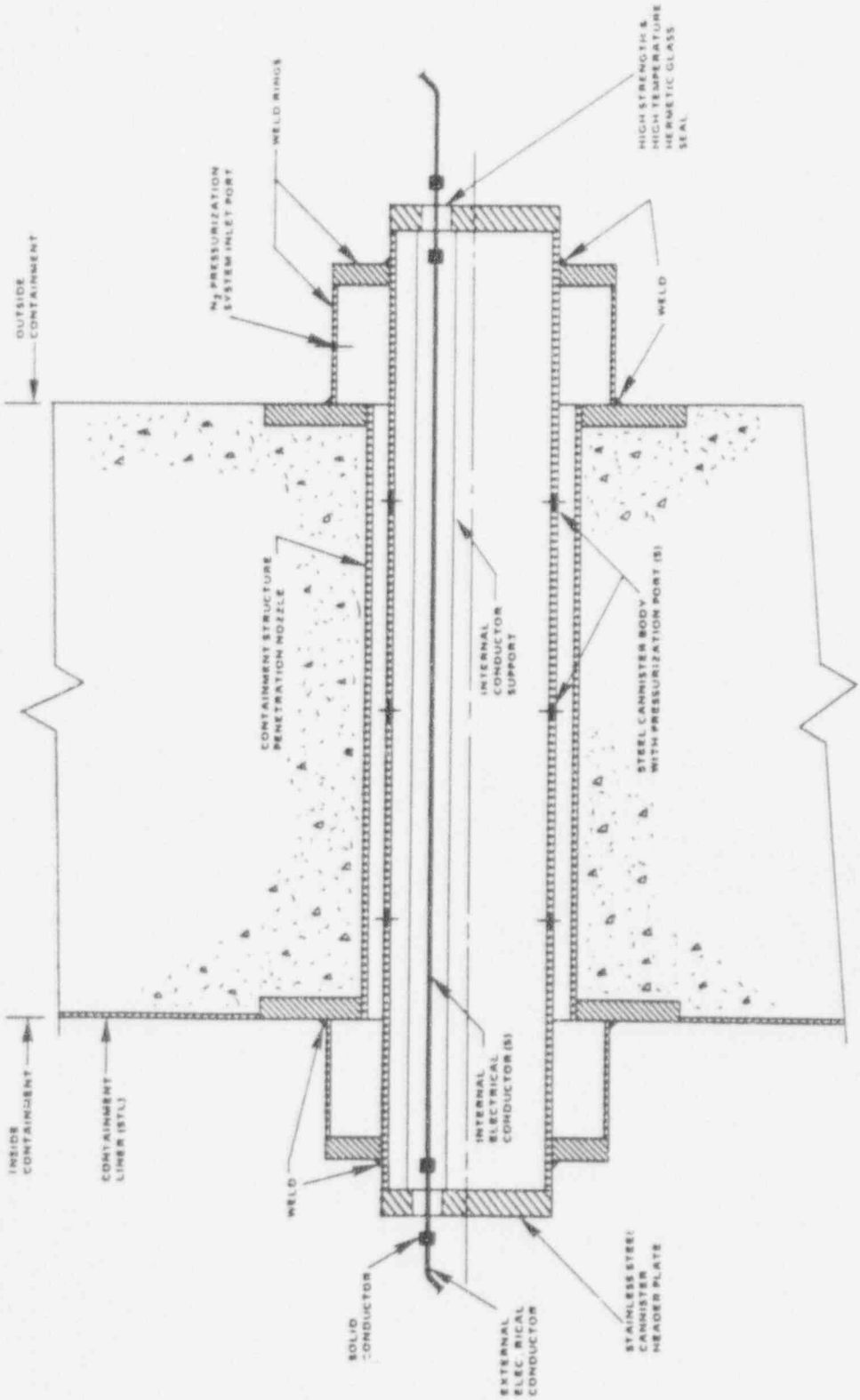

Figure 5.6-1 Typical Electrical Penetration

ns

MILLSTONE, UNIT 1
FAILURE DURING TESTING OF SAFETY RELIEF VALVES
MARCH 29, 1994

PROBLEM

ALL SIX SAFETY RELIEF VALVES (SRVs) FAILED TO LIFT AT THE SETPRESSURE IDENTIFIED IN THE TECHNICAL SPECIFICATIONS (TS).

CAUSE

BASED UPON PRIOR EXPERIENCE IN THE INDUSTRY WITH SRVs, LICENSEE SPECULATED THAT OXIDE BONDING BETWEEN THE PILOT VALVE SEAT AND DISK CAUSED LIFT PRESSURE TO "DRIFT."

SAFETY SIGNIFICANCE

HAD A ANTICIPATED TRANSIENT OR ACCIDENT OCCURRED WHILE AT POWER, FAILURE OF THE SRVs TO OPEN COULD HAVE LED TO A CHALLENGE TO THE PRIMARY SYSTEM INTEGRITY.

DISCUSSION

- REACTOR WAS SHUT DOWN IN JANUARY FOR REFUELING.

- SRVs ARE TWO STAGE PILOT OPERATED VALVES BY TARGET ROCK.

CONTACT: J. CARTER, NRR/DORS/EAB AIT: NO
REFERENCE: 10 CFR 50.72 #27014 SIGEVENT: TBD

- TECHNICAL SPECIFICATIONS REQUIRES ALL SIX SRVs TO BE OPERABLE FOR POWER OPERATION. TS ALLOWS ONE PERCENT SETPOINT ERROR.

  -- SURVEILLANCE CHECKS SET POINT ON THREE SRVs DURING EACH REFUELING OUTAGE. MUST CHECK EVERY SECOND OUTAGE.

- FOUR SRVs MAY BE OPERATED BY ADS; ALL MAY BE MANUALLY OPENED.

- WYLE LABORATORIES WAS REFURBISHING THE SRVs.

- WYLE REPORTED THAT TWO SRVs DID NOT OPEN BEFORE REACHING MAXIMUM TEST PRESSURE OF ABOUT 1250 PSIG. THE OTHER FOUR SRVs OPENED AT PRESSURES ABOVE TS SET PRESSURE, ABOUT SIX PERCENT ON AVERAGE.

- DESIGN BASIS FOR THE SRVs IS TO PROTECT THE REACTOR COOLANT SYSTEM AGAINST OVERPRESSURE FOLLOWING MSIV CLOSURE.

- ANALYZED DBA WITH ASSUMPTION THAT THE FOUR "OPERATING" SRVs WOULD HAVE LIFTED AT "AS FOUND" TEST PRESSURE.

  -- PEAK SYSTEM PRESSURE WOULD HAVE BEEN ABOUT 1357 PSIG
  -- SAFETY LIMIT IS 1375 PSIG

- NO SRV CHALLENGES DURING THE LAST OPERATING CYCLE.

FOLLOWUP

- LICENSEE HAS REPLACED PILOT VALVE SEATS ON THREE SRVs WITH MODIFIED SEATS THAT USE A PLATINUM STELLITE ALLOY.

  - BWROG RECOMMENDATION
  - PLANS TO REVIEW OPERATING EXPERIENCE (OTHER LICENSEES)

- VALVES WERE REFURBISHED AND RECERTIFIED TO THE PROPER SET PRESSURE.

- LICENSEE COMPLETED REFUELING AND REACTOR IS AT POWER.

REACTOR SCRAM

Reporting Period: 05/23/94 to 05/29/94

DATE	PLANT & UNIT	POWER	TYPE	CAUSE	COMPLICATIONS	YTD ABOVE 15%	YTD BELOW 15%	YTD TOTAL
05/28/94	PALO VERDE 2	86	SA	Maintenance Error	NO	1	0	1

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

COMPARISON OF WEEKLY SCRAM STATISTICS WITH INDUSTRY AVERAGES

PERIOD ENDING
05/29/94

SCRAM CAUSE	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	1.46	1.83	2.62	2.88	3.38
DESIGN/INSTALLATION ERROR*	0	0.09	0.04	-	-	-
OPERATING ERROR*	0	0.28	0.27	0.23	0.58	0.48
MAINTENANCE ERROR*	1	0.38	0.52	0.40	-	-
EXTERNAL*	0	0.09	0.13	-	-	-
OTHER*	0	0.00	0.02	0.23	-	-
Subtotal	1	2.30	2.81	3.48	3.46	3.86
POWER LESS THAN 15%						
EQUIPMENT FAILURE*	0	0.33	0.38	0.40	0.29	0.40
DESIGN/INSTALLATION ERROR*	0	0.05	-	-	-	-
OPERATING ERROR*	0	0.14	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	0.52	0.57	0.65	0.44	0.48
TOTAL	1	2.82	3.38	4.13	3.90	4.34

SCRAM TYPE	NO. OF SCRAMS	1994 WEEKLY AVERAGE (YTD)	1993 WEEKLY AVERAGE	1992 WEEKLY AVERAGE	1991 WEEKLY AVERAGE	1990 WEEKLY AVERAGE
TOTAL AUTOMATIC SCRAMS	1	2.11	2.44	3.06	3.25	3.21
TOTAL MANUAL SCRAMS	0	0.70	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

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

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

4. "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 05/29/94)--	60