

October 29, 1996

MEMORANDUM TO: Thomas T. Martin, Director  
Division of Reactor Program Management

FROM: Alfred E. Chaffee, Chief [Original signed by]  
Events Assessment and  
Generic Communications Branch  
Division of Reactor Program Management

SUBJECT: OPERATING REACTORS EVENTS BRIEFING  
OCTOBER 23, 1996 - BRIEFING 96-13

On October 23, 1996, we conducted an Operating Reactors Events Briefing (96-13) to inform senior managers from offices of the Commission, OE, NRR and regional offices of selected events that occurred since our last briefing on October 16, 1996. Attachment 1 lists the attendees. Attachment 2 presents the significant elements of the discussed events.

Attachment 3 contains reactor scram statistics for the week ending October 20, 1996. One significant event was identified for input into the NRC Performance Indicator Program (Attachment 4).

Attachments: As stated (4)

cc w/atts:  
See next page

CONTACT: Kathy Gray, NRR  
(301) 415-1166

DISTRIBUTION: (w/atts)  
Central Files  
PUBLIC  
LKilgore, SECY  
PECB R/F

DF031/1

DOCUMENT NAME: G:\KAG\ORTRANS

To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy

OFFICE	PECB	E	PECB	E	PECB	C/PECB	N
NAME	KGray:kag <i>KGray</i>		SKoenick <i>SSR</i>		EGoodwin <i>S</i>	AChaffee <i>AC</i>	
DATE	10/28/96		10/29/96		10/29/96	10/29/96	

OFFICIAL RECORD COPY

*Operating  
ID+R-5-1-  
expenses  
Odm-6  
meeting*

010020  
9611010072 961029  
PDR ORG NRRB  
PDR

96-137

CC:

F. Miraglia, NRR (O-12G18)	R. Hernan, NRR (O-14B21)
F. Gillespie, NRR (O-12G18)	F. Hebdon, NRR (O-14B21)
R. Zimmerman, NRR (O-12G18)	
A. Thadani, NRR (O-12G18)	
B. Sheron, NRR (O-12G18)	
S. Varga, NRR (O-14E4)	
J. Zwolinski, NRR (O-14H3)	
J. Roe, NRR (O-13E4)	
E. Adensam, NRR (O-13E4)	
G. Lainas, NRR (O-7D26)	
G. Holahan, NRR (O-8E2)	
M. Virgilio, NRR (O-8E2)	
D. O'Neal, NRR (O-10E4)	
B. Boger, NRR (O-9E4)	
M. Markley, ACRS (T-2E26)	
E. Jordan, AEOD (T-4D18)	
C. Rossi, AEOD (T-4A9)	
F. Congel, AEOD (T-4D28)	
R. Barrett, AEOD (T-4A43)	
S. Rubin, AEOD (T-4D28)	
M. Harper, AEOD (T-4A9)	
W. Leschek, AEOD (T-4A9)	
V. McCree, EDO (O-17G21)	
J. Gilliland, PA (O-2G4)	
D. Morrison, RES (T-10F12)	
W. Hill, SECY (O-16G15)	
H. Miller, Region I	
R. Cooper, Region I	
S. Ebnetter, Region II	
E. Merschhoff, Region II	
S. Vias, Region II	
A. Beach, Region III	
J. Caldwell, Acting, Region III	
L. Callan, Region IV	
J. Dyer, Region IV	
K. Perkins, Region IV/WCFO	
G. Fader, INPO	
J. Zimmer, DOE	

LIST OF ATTENDEES

OPERATING REACTORS EVENTS FULL BRIEFING (96-13)

OCTOBER 23, 1996

<u>NAME</u>	<u>OFFICE</u>	<u>NAME</u>	<u>OFFICE</u>
A. Chaffee	NRR	W. Burton	NRR
K. Gray	NRR	G. Galletti	NRR
E. Goodwin	NRR	S. Sanchez	NRR
S. Koenick	NRR	R. Correia	NRR
T. Koshy	NRR	J. Wilcox	NRR
F. Hebdon	NRR	J. Beall	OCM/McGaffigan
R. Hernan	NRR	C. Ogle	OCM
C. Douth	NRR	J. Kauffman	OE
S. Athavale	NRR		

TELEPHONE ATTENDANCE  
(AT ROLL CALL)

Regions  
Region II  
Region III  
Region IV

Resident Inspectors  
M. Shannon, Sequoyah

Misc.

OPERATING REACTORS EVENTS BRIEFING 96-13

LOCATION: O-10B11, WHITE FLINT  
WEDNESDAY, OCTOBER 23, 1996 11:00 A.M.

SEQUOYAH, UNIT 2

REACTOR TRIP WITH  
COMPLICATIONS

PRESENTED BY:

EVENTS ASSESSMENT AND GENERIC COMMUNICATIONS BRANCH  
DIVISION OF REACTOR PROGRAM MANAGEMENT, NRR

SEQUOYAH, UNIT 2  
REACTOR TRIP WITH COMPLICATIONS  
OCTOBER 11, 1996

PROBLEM

UNEXPECTED TURBINE RUNBACK COINCIDENT WITH INABILITY TO CONTROL THREE AUXILIARY FEEDWATER (AFW) PUMPS LEAD TO MANUAL REACTOR TRIP.

CAUSE

TWO FAILED PRESSURE SWITCHES AND FEEDWATER PUMP TRIP CAUSED MAIN TURBINE RUNBACK TRANSIENT.

POOR MAINTENANCE PRACTICES COMPLICATED EVENT.

SAFETY SIGNIFICANCE

REACTOR TRIP WITH COMPLICATIONS.

CHALLENGE TO SAFETY SYSTEM FROM A NON-1E PRESSURE SWITCH FAILURE.

BACKGROUND

LOSS OF A FEED PUMP AT POWER LEVEL > 80% PRODUCES:

- TURBINE RUNBACK;
- ANTICIPATORY START SIGNAL TO AFW SYSTEM FOR POTENTIAL LOSS OF SECONDARY HEAT SINK; AND
- AFW RUNS IN AUTOMATIC STEAM GENERATOR LEVEL CONTROL MODE.

CONTACT: S. KOENICK, NRR/DRPM/PECB  
REFERENCES: 10 CFR 50.72 #31138 AND  
PNO-II-96-071

AIT: NO  
SIGEVEN: YES

SEQUENCE OF EVENTS

- OPERATORS COMMENCED CONTROLLED PLANT SHUTDOWN IN RESPONSE TO REACTOR COOLANT PUMP (RCP) #4 SEAL #2 LEAKOFF FLOW OF 1.5 GPM EXCEEDING PROCEDURAL LIMIT OF 0.5 GPM.
- FOLLOWING MANUAL TRIP OF MAIN FEEDWATER PUMP (BY PROCEDURE BELOW 50% POWER), PLANT EXPERIENCED UNEXPECTED TURBINE RUNBACK AND AUTOSTART OF AFW PUMPS.
- 10 OF 12 STEAM DUMPS OPENED ON DEMAND (PRIOR TO EVENT TWO ISOLATED BECAUSE OF LEAKAGE).
- OPERATORS MANUALLY TRIPPED REACTOR IN RESPONSE TO UNEXPECTED PLANT PERFORMANCE.
- MAIN FEEDWATER ISOLATION OCCURRED AT LOW Tavg 550 F; ONE MFIV FAILED TO CLOSE.
- OPERATORS WERE UNABLE TO TAKE MANUAL CONTROL OF AFW LEVEL CONTROL VALVES FOR MOTOR DRIVEN AND SPEED CONTROL FOR TURBINE DRIVEN PUMPS.
- OPERATORS TRIPPED THE TWO MOTOR DRIVEN PUMPS AND PLACED THEM IN PULL-TO-LOCK AND THROTTLED TURBINE DRIVEN FLOW WITH LEVEL CONTROL VALVES TO FOUR STEAM GENERATORS.
- STEAM DUMPS ATTEMPT TO MODULATE PLANT TO NO LOAD Tavg (547 F) AND INTERLOCK ACTUATES TO BLOCK STEAM DUMPS AT LOWLOW Tavg (540 F).
- REACTOR COOLANT SYSTEM EXPERIENCED COOLDOWN TO APPROXIMATELY 538 F REQUIRING OPERATORS TO EMERGENCY BORATE.

- DECAY HEAT WAS REMOVED VIA STEAM DUMPS TO CONDENSER.

#### DISCUSSION OF COMPLICATIONS

RCP #4 SEAL #2 LEAKOFF FLOW 1.5 GPM EXCEEDING PROCEDURAL LIMIT

CAUSE: FAILED O-RING IN ASCO SOLENOID VALVE CLOSED SEAL RETURN ISOLATION VALVE;

EFFECT: OPERATORS COMMENCED SHUTDOWN IN RESPONSE TO #2 SEAL FLOW ON #4 RCP EXCEEDING PROCEDURAL LIMIT.

UNEXPECTED TURBINE RUNBACK COINCIDENT WITH AUTO START OF ALL AFW PUMPS

CAUSE: 2 PRESSURE SWITCH CONTACT FAILURES (MOISTURE INDUCED CORROSION) LOCKED-IN SIGNAL FOR > 80% POWER;

EFFECT: MAIN FEEDWATER PUMP TRIPPED CAUSING TURBINE RUNBACK; AUTO START OF AFW, AND MDAFW FLOW CONTROL VALVES GOING FULL OPEN AND TDAFW PUMP GOING TO FULL SPEED ACCORDING TO DESIGN.

UNABLE TO RESET AFW START SIGNAL BECAUSE > 80% POWER SIGNAL NEVER CLEARED.

MAIN FEEDWATER ISOLATION VALVE FAILED TO CLOSE

CAUSE: MOISTURE INDUCED CORROSION OF MAGNETIC BRAKE IN MOV BLOCKED ROTOR;

EFFECT: MOV FAILURE (SEIZED MOTOR).

## INDICATIONS OF WATER HAMMER ON #11 STEAM DUMP LINE TO CONDENSER

CAUSE: LEVEL CONTROL FAILURE ON STEAM DUMP DRAIN TANK CAUSED CONDENSATE TO BACK UP IN STEAM DUMP LINE;

EFFECT: HANGER DAMAGE; PIPE DEFORMATION; AND TWO CRACKS ON WELD CONNECTING LINE WITH MAIN STEAM HEADER (BOTH LESS THAN TWO INCHES IN LENGTH AND 0.5 INCHES DEEP/PIPE THICKNESS NOMINAL 1.25 INCHES).

FOLLOWUP

- REGION II CONDUCTED SPECIAL INSPECTION TO REVIEW EVENT.
- REGION II TO ISSUE TIA TO NRR TO ASSESS EMERGENCY FEEDWATER CONTROLS.
- NRR REVIEWING GENERIC IMPLICATIONS.



# REACTOR SCRAM

Reporting Period: 10/14/96 to 10/20/96

<u>DATE</u>	<u>PLANT &amp; 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 <u>TOTAL</u>
10/14/96	VOGTLE 2	50	SM	Equipment Failure	NO	1	0	1
10/15/96	PEACH BOTTOM 2	70	SA	Equipment Failure	NO	2	0	2
10/18/96	COMANCHE PEAK 2	100	SA	Equipment Failure	NO	3	0	3
10/20/96	ROBINSON 2	20	SA	Equipment Failure	NO	2	0	2

Attachment 3

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  
10/20/96

<u>SCRAM CAUSE</u>	NUMBER OF SCRAMS	1996 WEEKLY AVERAGE (YTD)	1995 WEEKLY AVERAGE	1994 WEEKLY AVERAGE	1993 WEEKLY AVERAGE	1992 WEEKLY AVERAGE
POWER GREATER THAN OR EQUAL TO 15%						
EQUIPMENT FAILURE	4	1.57	1.83	1.52	1.83	2.62
DESIGN/INSTALLATION ERROR	0	0.12	0.12	0.08	0.04	-
OPERATING ERROR	0	0.07	0.15	0.21	0.27	0.31
MAINTENANCE ERROR	0	0.55	0.38	0.54	0.52	0.50
EXTERNAL	0	0.17	0.21	0.17	0.13	-
OTHER	0	0.10	0.06	-	0.02	-
Subtotal	4	2.58	2.75	2.52	2.81	3.43
POWER LESS THAN 15%						
EQUIPMENT FAILURE	0	0.21	0.10	0.27	0.38	0.42
DESIGN/INSTALLATION ERROR	0	0.00	-	0.02	-	-
OPERATING ERROR	0	0.10	0.13	0.08	0.13	0.15
MAINTENANCE ERROR	0	0.07	0.08	-	0.02	0.08
EXTERNAL	0	0.00	-	-	0.04	-
OTHER	0	0.00	-	-	-	-
Subtotal	0	0.38	0.31	0.37	0.57	0.65
TOTAL	4	2.96	3.06	2.89	3.38	4.08

<u>SCRAM TYPE</u>	NO. OF SCRAMS	1996 WEEKLY AVERAGE (YTD)	1995 WEEKLY AVERAGE	1994 WEEKLY AVERAGE	1993 WEEKLY AVERAGE	1992 WEEKLY AVERAGE
TOTAL AUTOMATIC SCRAMS	3	1.83	1.92	2.19	2.44	3.06
TOTAL MANUAL SCRAMS	1	1.12	1.13	0.69	0.94	1.02

TOTALS MAY DIFFER BECAUSE OF ROUNDING OFF

## 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	-----	150
Manual and Automatic Scrams for 1995	-----	159
Manual and Automatic Scrams for 1996	--(YTD 10/20/96)--	124

OPERATING REACTOR PLANTS SIGNIFICANT EVENTS

No Sort Specified

QUERY> Event Type SIG & Close Out Date >= 10/09/96

<u>PLANT &amp; UNIT</u>	<u>DATE OF</u> <u>EVENT</u>	<u>50.72</u> <u>NUMBER</u>	<u>DESCRIPTION OF EVENT</u>	<u>SIGNIFICANCE</u>	<u>OR</u> <u>BRIEFING</u>	<u>PRESENTER</u>	<u>CLOSEOUT</u> <u>RECORD</u>
DRESDEN 3	06/11/96	0	In June 1996 at Dresden 3, a circuit breaker for a low-pressure coolant injection pump failed to open on demand from the control room. The licensee found hardened grease in the breaker mechanism.	Safety-Related Cooling System		HODGE V.	HIGHLIGHT

Attachment 4