

May 13, 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
 MAY 11, 1994 - BRIEFING 94-15

On May 11, 1994, we conducted an Operating Reactors Events Briefing (94-15) to inform senior managers from offices of the Commission, AEOD, EDO, NRR, and regional offices of selected events that occurred since our last briefing on April 20, 1994. Enclosure 1 lists the attendees. Enclosure 2 presents the significant elements of the discussed events.

Enclosure 3 contains reactor scram statistics for the weeks ending April 24, and May 1, 1994. There were no scrams reported for the week ending May 8, 1994. Four significant events were identified for input into the NRC Performance Indicator Program (Enclosure 4).

[original signed by]
 Alfred E. Chaffee, Chief
 Events Assessment Branch
 Division of Operating
 Reactor Support

Enclosures: As stated

cc w/enclosures:
 See next page

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*ID+R-5-1
 OPERATING EXPERIENCE*

X-01m-6-meeting

260032

DF03/1

cc:

W. Russell, NRR (12G18)
F. Miraglia, NRR (12G18)
F. Gillespie, NRR (12G18)
Acting ADPR, NRR (12G18)
S. Varga, NRR (14E4)
J. Calvo, NRR (14A4)
G. Lainas, NRR (14H3)
J. Roe, NRR (13E4)
J. Zwolinski, NRR (13H24)
E. Adensam, NRR (13E4)
A. Thadani, NRR (12G18)
B. Sheron, NRR (7D26)
M. Virgilio, NRR (8E2)
S. Rosenberg, NRR (10E4)
C. Rossi, NRR (9A2)
B. Boger, NRR (10H3)
F. Congel, NRR (10E2)
D. Crutchfield, NRR (11H21)
W. Travers, NRR (11B19)
D. Coe, ACRS (P-315)
E. Jordan, AEOD (MN-3701)
G. Holahan, AEOD (MN-9112)
L. Spessard, AEOD (MN-3701)
K. Brockman, AEOD (MN-3206)
S. Rubin, AEOD (MN-5219)
M. Harper, AEOD (MN-9112)
W. Bateman, EDO (17G21)
F. Ingram, PA (2G5)
E. Beckjord, RES (NLS-007)
A. Bates, SECY (16G15)
T. Martin, Region I
R. Cooper, Region I
S. Ebnetter, 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

J. Stang (PDIII-2)
J. Dyer (PDIII-2)

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

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A handwritten signature in cursive script, appearing to read "Alfred E. Chaffee".

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 (94-15)

MAY 11, 1994

<u>NAME</u>	<u>OFFICE</u>	<u>NAME</u>	<u>OFFICE</u>
K. GRAY	NRR	G. LAINAS	NRR
T. GREENE	NRR	T. YAMADA	NRR
R. DENNIG	NRR	G. ZECH	NRR
N. HUNEMULLER	NRR	M. RAZZAQUE	NRR
A. CHAFFEE	NRR	C. THOMAS	NRR
S. ROSENBERG	NRR	R. WESSMAN	NRR
D. BRINKMAN	NRR	C. ROSSI	NRR
J. STANG	NRR	L. REYES	NRR
A. CUBBAGE	NRR	B. GRIMES	NRR
C. PATEL	NRR	R. CAPRA	NRR
S. VARGA	NRR	R. JONES	NRR
W. HAASS	NRR	W. KOO	NRR
M. RUBIN	NRR	W. DEAN	OEDO
E. HACKETT	NRR	M. MILLER	RIV
J. STROSNIDER	NRR	R. SAVIO	OCM/IS
J. DYER	NRR	D. HICKMAN	AEOD
L. MARSH	NRR	G. LANIK	AEOD

TELEPHONE ATTENDANCE
(AT ROLL CALL)

Regions

Region I
Region II
Region III
Region IV

Resident Inspectors

Brunswick
M. Leach (Dresden)

IIT/AIT Team Leaders

Misc.

OPERATING REACTORS EVENTS BRIEFING 94-15

LOCATION: 10 B11, WHITE FLINT
WEDNESDAY, MAY 11, 1994 11:00 A.M.

DRESDEN, UNIT 3

CORE SHROUD CRACKS

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

DRESDEN, UNIT 3
CORE SHROUD CRACKS
APRIL 1994

PROBLEM

CIRCUMFERENTIAL CRACK IN THE CORE SHROUD. THE CRACK WAS IN THE LOWER HEAT AFFECTED ZONE (HAZ) OF WELD H5 IN CORE PLATE SUPPORT RING WHICH IS 18 INCHES BELOW BOTTOM OF FUEL. ALSO WELD H3 HAD NUMEROUS CRACK INDICATIONS.

CAUSES

THE CAUSE OF THE CRACK IS UNKNOWN AT THIS TIME. THE LICENSEE IS INVESTIGATING INTERGRANULAR STRESS CORROSION CRACKING (IGSCC), IRRADIATION ASSISTED STRESS CORROSION CRACKING (IASCC), RESIDUAL STRESSES IN THE WELD AREAS, AND ENVIRONMENT AT THE WELD LOCATION.

SAFETY SIGNIFICANCE

A 360° THROUGH WALL FAILURE AT THE H5 WELD LOCATION COULD RESULT IN SHROUD MOVEMENT DURING DESIGN BASIS ACCIDENT CONCURRENT WITH A DESIGN BASIS EARTHQUAKE. THIS COULD AFFECT CONTROL ROD INSERTION. ALSO OF CONCERN ARE THE 2/3 CORE COVER CRITERION AND THE AFFECT OF THE SHROUD MOVEMENT ON THE CORE SPRAY SYSTEM.

COMMONWEALTH EDISON HAS STATED IF THERE WAS A 360° THROUGH WALL FAILURE AT WELD LOCATION H5, THE SHROUD WOULD NOT LIFT DURING THE FOLLOWING CONDITIONS: NORMAL OPERATION, A RECIRCULATION LINE BREAK ACCIDENT, AND A MAIN STEAM LINE BREAK ACCIDENT.

CONTACT: T. GREENE, NRR/DORS/OEAB
REFERENCE: PN39432

AIT: NO
SIGEVENT: NO

DISCUSSION

- DURING THE WEEK OF APRIL 25, VISUAL INSPECTIONS IDENTIFIED CRACKING IN THE VICINITY OF THE HAZ OF THE H5 WELD IN THE CORE SHROUD. THE CRACK EXTENDED 360° AROUND THE CIRCUMFERENCE OF THE SHROUD AND WAS LOCATED IN THE CORE PLATE SUPPORT RING. THE DEPTH OF THE CRACK, AS DETERMINED FROM ULTRASONIC TESTING, RANGED FROM 0.95 TO 1.55 INCHES.
- FURTHER VISUAL INSPECTIONS REVEALED INDICATIONS IN OTHER CORE SHROUD WELD AREAS.
- VISUAL INSPECTION OF SHROUD SEAM WELDS WAS RECOMMENDED BY GE IN SIL #572, DATED 10/01/93 AFTER CRACKING WAS FOUND AT BRUNSWICK IN 1993 AND A FOREIGN REACTOR IN 1990.
- GE OWNER'S GROUP GUIDELINES DID NOT HAVE SPECIFIC RECOMMENDATIONS TO INSPECT ALL WELDS.
- COMMONWEALTH EDISON INSPECTED QUAD CITIES, UNIT 1, SHROUD AND FOUND A SIMILAR CRACK AT WELD H5.

FOLLOWUP

- COMMONWEALTH EDISON IS CONSIDERING THREE OPTIONS:
 1. DETERMINE BY INSPECTION SHROUD INTEGRITY AND CONTINUE TO OPERATE FOR 6 MONTHS.
 2. PERFORM INTERIM SIMPLE REPAIR THAT WILL BE SAFE FOR ONE CYCLE.
 3. PERFORM PERMANENT REPAIR.

- COMMONWEALTH EDISON IS PREPARING A JUSTIFICATION FOR CONTINUED OPERATION FOR DRESDEN, UNIT 2 AND QUAD CITIES, UNIT 2.
- NRC HAS SENT COMMONWEALTH EDISON A REQUEST FOR ADDITIONAL INFORMATION.
- NRC ISSUED INFORMATION NOTICE (IN) 93-79, "CORE SHROUD CRACKING AT BELTLINE REGION WELDS IN BOILING-WATER REACTORS," ON SEPTEMBER 30, 1993. AN IN IS BEING PREPARED AND ADDITIONAL GENERIC COMMUNICATION IS BEING CONSIDERED.
- LEAD PROJECT MANAGER (DON BRINKMAN) IS PROVIDING A LIST OF QUESTIONS FOR BWR PROJECT MANAGERS WHOSE PLANTS ARE SCHEDULED FOR RESTARTING PRIOR TO MID-JULY. THE QUESTIONS WILL DEAL WITH RECENT SHROUD INSPECTION.
- NRC IS SCHEDULING A MEETING WITH BWR OWNER'S GROUP EXECUTIVE OVERSIGHT COMMITTEE ON SHROUD CRACKING ISSUES FOR THE WEEK OF JUNE 13, 1994.

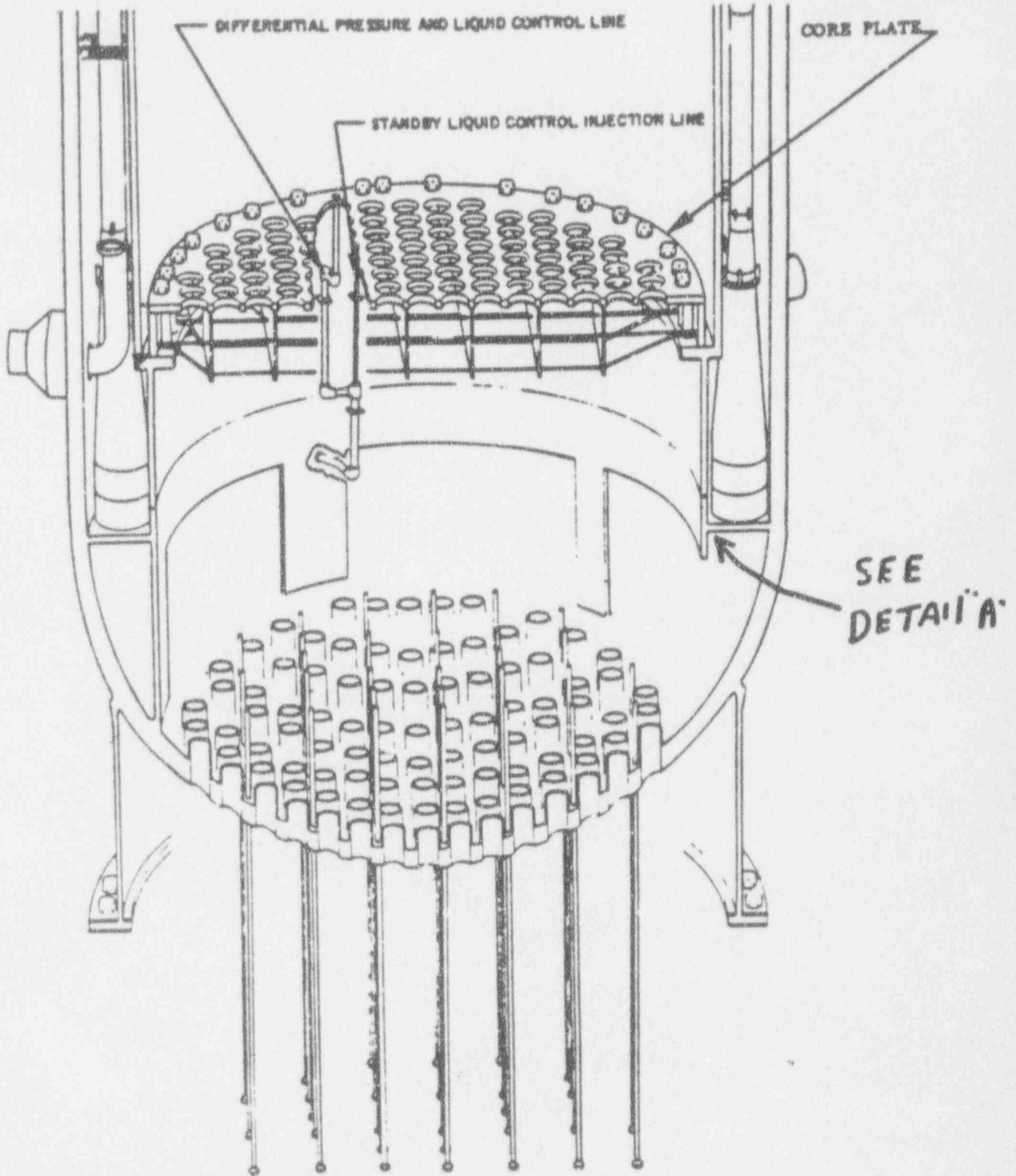
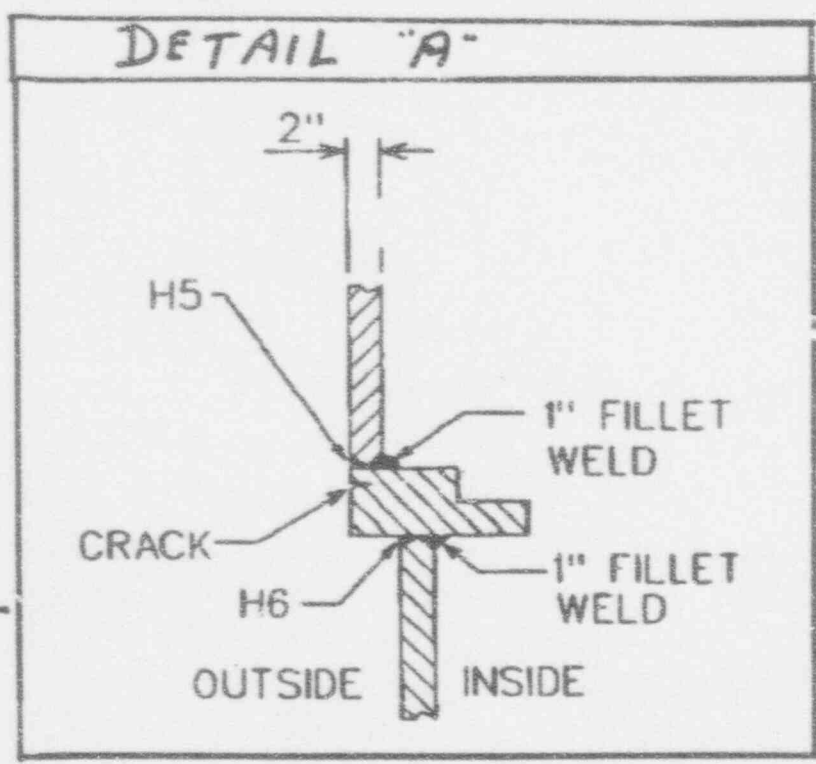
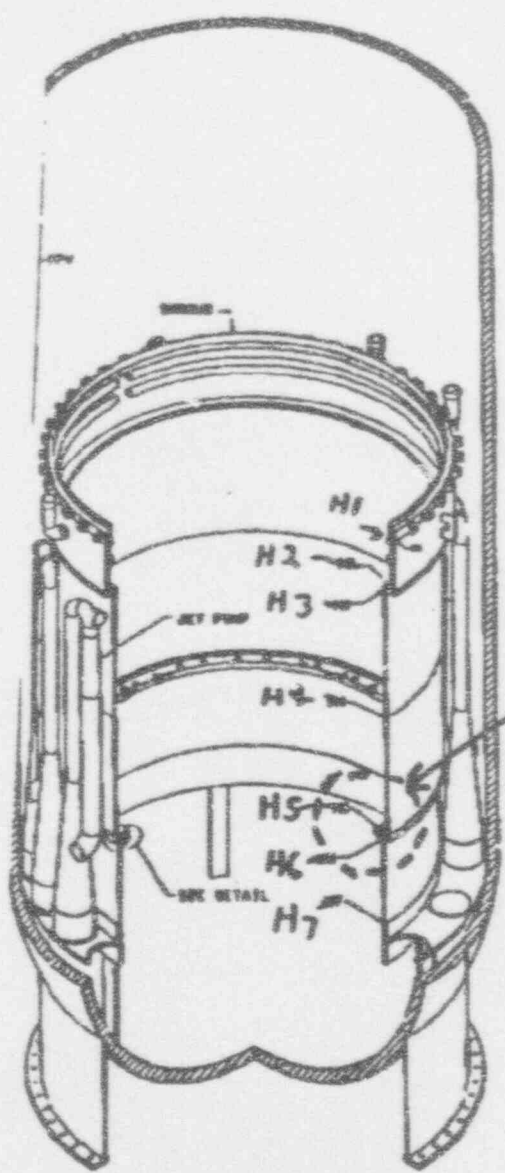


Figure 13
Differential Pressure and Standby Liquid Control Line

DRESDEN UNIT-3 CORE SHROUD



DETAIL - WELDS TYPE H5

REACTOR SCRAM

Reporting Period: 04/18/94 to 04/24/94

<u>DATE</u>	<u>PLANT & UNIT</u>	<u>POWER</u>	<u>TYPE</u>	<u>CAUSE</u>	<u>COMPLICATIONS</u>	<u>YTD ABOVE 15%</u>	<u>YTD BELOW 15%</u>	<u>YTD TOTAL</u>
04/18/94	BROWNS FERRY 2	14	SA	Equipment Failure	NO	1	1	2
04/22/94	COMANCHE PEAK 2	0	SA	Equipment Failure	NO	1	1	2
04/23/94	MILLSTONE 2	0	SM	Equipment Failure	NO	0	1	1
04/23/94	SAINT LUCIE 2	29	SA	Design or Installati	NO	1	0	1

REACTOR SCRAM

Reporting Period: 04/25/94 to 05/01/94

<u>DATE</u>	<u>PLANT & UNIT</u>	<u>POWER</u>	<u>TYPE</u>	<u>CAUSE</u>	<u>COMPLICATIONS</u>	<u>YTD ABOVE 15%</u>	<u>YTD BELOW 15%</u>	<u>YTD TOTAL</u>
04/26/94	WATERFORD 3	70	SA	Equipment Failure	NO	1	0	1
04/26/94	WASHINGTON NUCLEAR 2	50	SM	Equipment Failure	NO	1	0	1
04/27/94	POINT BEACH 1	0	SA	Operating Error	NO	0	1	1
04/27/94	GINNA 1	45	SA	Equipment Failure	NO	1	0	1
04/30/94	DRESDEN 2	99	SM	Equipment Failure	NO	1	0	1
05/01/94	SEQUOYAH 1	49	SA	Operating Error	NO	1	0	1

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
04/24/94

SCRAM CAUSE	NUMBER OF SCRAMS	1994	1993	1992	1991*	1990*
		WEEKLY AVERAGE (YTD)	WEEKLY AVERAGE	WEEKLY AVERAGE	WEEKLY AVERAGE	WEEKLY AVERAGE
POWER GREATER THAN OR EQUAL TO 15%						
EQUIPMENT FAILURE*	0	1.60	1.83	2.62	2.88	3.38
DESIGN/INSTALLATION ERROR*	1	0.06	0.04	-	-	-
OPERATING ERROR*	0	0.18	0.27	0.23	0.58	0.48
MAINTENANCE ERROR*	0	0.37	0.52	0.40	-	-
EXTERNAL*	0	0.12	0.13	-	-	-
OTHER*	0	0.00	0.02	0.23	-	-
Subtotal	1	2.33	2.81	3.48	3.46	3.86
POWER LESS THAN 15%						
EQUIPMENT FAILURE*	3	0.37	0.38	0.40	0.29	0.40
DESIGN/INSTALLATION ERROR*	0	0.06	-	-	-	-
OPERATING ERROR*	0	0.12	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	3	0.55	0.57	0.65	0.44	0.48
TOTAL	4	2.88	3.38	4.13	3.90	4.34

SCRAM TYPE	NO. OF SCRAMS	1994	1993	1992	1991	1990
		WEEKLY AVERAGE (YTD)	WEEKLY AVERAGE	WEEKLY AVERAGE	WEEKLY AVERAGE	WEEKLY AVERAGE
TOTAL AUTOMATIC SCRAMS	3	2.21	2.44	3.06	3.25	3.21
TOTAL MANUAL SCRAMS	1	0.68	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

COMPARISON OF WEEKLY SCRAM STATISTICS WITH INDUSTRY AVERAGES

PERIOD ENDING
05/01/94

<u>SCRAM CAUSE</u>	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*	4	1.74	1.83	2.62	2.88	3.38
DESIGN/INSTALLATION ERROR*	0	0.06	0.04	-	-	-
OPERATING ERROR*	1	0.23	0.27	0.23	0.58	0.48
MAINTENANCE ERROR*	0	0.35	0.52	0.40	-	-
EXTERNAL*	0	0.12	0.13	-	-	-
OTHER*	0	0.00	0.02	0.23	-	-
Subtotal	5	2.50	2.81	3.48	3.46	3.86
POWER LESS THAN 15%						
EQUIPMENT FAILURE*	0	0.35	0.38	0.40	0.29	0.40
DESIGN/INSTALLATION ERROR*	0	0.06	-	-	-	-
OPERATING ERROR*	1	0.17	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	1	0.58	0.57	0.65	0.44	0.48
TOTAL	6	3.08	3.38	4.13	3.90	4.34

<u>SCRAM TYPE</u>	NO. OF SCRAMS	1994 WEEKLY AVERAGE (YTD)	1993 WEEKLY AVERAGE	1992 WEEKLY AVERAGE	1991 WEEKLY AVERAGE	1990 WEEKLY AVERAGE
TOTAL AUTOMATIC SCRAMS	4	2.31	2.44	3.06	3.25	3.21
TOTAL MANUAL SCRAMS	2	0.75	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 05/01/94)--	53

OPERATING REACTOR PLANTS SIGNIFICANT EVENTS

QUERY> Event Type SIG & Close Out Date >= 04/01/94 & Close Out Date <= 05/06/94 & Event Type = "SIG"

<u>PLANT & UNIT</u>	<u>DATE OF EVENT</u>	<u>50.72 NUMBER</u>	<u>DESCRIPTION OF EVENT</u>	<u>SIGNIFICANCE</u>	<u>OR BRIEFING</u>	<u>PRESENTER</u>	<u>CLOSEOUT RECORD</u>
BEAVER VALLEY 2	10/17/93	0	FAILURE OF SPLINE COUPLING MAKES RECIRC SPRAY PUMP SUCTION VALVE INOPERABLE.	Safety-Related Cooling System	93-41	BENEDICT R.	HIGHLIGHT
BEAVER VALLEY 2	11/06/93	26326	EDG SEQUENCER FAILURE IN TWO TRAINS.	Safety-Related Cooling System	93-43	KOSHY T.	HIGHLIGHT
FERMI 2	12/25/93	26536	PLANT SCRAMMED FROM 93% POWER ON TURBINE TRIP WHEN THE TURBINE APPARENTLY THREW A BLADE.	OTHER - SCRAM WITH COMPLICATIONS	94-01	GREENE T.	HIGHLIGHT
MCGUIRE 2	12/27/93	26543	SCRAM WITH COMPLICATIONS CAUSED BY LOOP ENDING IN NATURAL CIRCULATION WITH ONE STEAM GENERATOR DRY.	Plant Power	94-01	BENNER E.	HIGHLIGHT