

JUL 12 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
 JULY 6, 1994 - BRIEFING 94-23

On July 6, 1994, we conducted an Operating Reactors Events Briefing (94-23) to inform senior managers from offices of the Commission, AEOD, NRR, OE and regional offices of selected events that occurred since our last briefing on June 29, 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 July 3, 1994. No significant events were identified for input into the NRC Performance Indicator Program.

/s/

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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 AChaffee
 07/12/94

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Alfred E. Chaffee Chief
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Division of Operating
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07/ /94

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TGreene
07/11/94

NH
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NHunemuller
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EAB/DORS
AChaffee
07/ /94



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

cc:

W. Russell, NRR (O-12G18)
F. Miraglia, NRR (O-12G18)
F. Gillespie, NRR (O-12G18)
R. Zimmerman, 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. Ebnetter, Region II
E. Merschhoff, Region II
S. Vias, Region II
J. Martin, Region III
E. Greenman, Region III
L. Cailan, Region IV
A. Beach, Region IV
K. Perkins, Region IV/WCFO

C. Poslusny (O-11H3)
J. Stone (O-14E21)
C. Miller (O-14E21)

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

ENCLOSURE 1

LIST OF ATTENDEES

OPERATING REACTORS EVENTS FULL BRIEFING (94-23)

JULY 6, 1994

<u>NAME</u>	<u>OFFICE</u>	<u>NAME</u>	<u>OFFICE</u>
T. GREENE	NRR	G. THOMAS	NRR
A. CHAFFEE	NRR	M. DAVIS	NRR
R. BENEDICT	NRR	W. SCOTT	NRR
E. GOODWIN	NRR	N. HUNEMULLER	NRR
S. ROSENBERG	NRR	W. LYON	NRR
E. BENNER	NRR	C. THOMAS	NRR
T. YAMADA	NRR	C. MILLER	NRR
D. CHAMBERLAIN	OCM	R. JONES	NRR
M. SATORIUS	OE	S. VARGA	NRR
C. POSLUSNY	NRR	J. CALVO	NRR
J. STONE	NRR	G. HOLAHAN	AEOD
P. RUSH	NRR		

TELEPHONE ATTENDANCE
(AT ROLL CALL)

Regions

Region I
Region II
Region III
Region IV

Resident Inspectors

T. Fish (Salem)

IIT/AIT Team Leaders

Misc.

OPERATING REACTORS EVENTS BRIEFING 94-23

LOCATION: 0-10B11, WHITE FLINT
WEDNESDAY, JULY 6, 1994 11:00 A.M.

SUSQUEHANNA, UNIT 2

REACTOR RECIRCULATION PUMP
INDUCED VIBRATIONS

SALEM UNIT 2

UNISOLABLE LEAK

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

SUSQUEHANNA, UNIT 2
REACTOR RECIRCULATION PUMP
INDUCED VIBRATIONS
JUNE 21, 1994

PROBLEM

EXCESSIVE STRUCTURE VIBRATION DUE TO INCREASED REACTOR RECIRCULATION (RR) PUMP SPEED.

CAUSE

THERE APPEARS TO BE A UNIQUE HARMONIC ASSOCIATED WITH THE RR PUMP SPEED BETWEEN 1570 AND 1580 RPM THAT IS TRANSMITTED TO THE SYSTEM FLUID. THERE IS NOT EXCESSIVE PUMP VIBRATION.

SAFETY SIGNIFICANCE

VIBRATIONS CAUSED BY THE RR PUMP SPEED CAN DAMAGE STRUCTURES, PIPING, OR EQUIPMENT WITHIN OR CONNECTED TO THE PRIMARY SYSTEM.

DISCUSSION

- ON JUNE 21, 1994 THE PUMP FLOW WAS INCREASED TO 108 MILLION POUNDS PER HOUR FOR UPRATE TESTING FROM 100% TO 105% OF FULL POWER.

CONTACT: T. GREENE, NRR/DORS/EAB
REFERENCE: MR 1-94-0073

AIT: NO
SIGEVENT: TBD

- ON JUNE 22 THE LICENSEE OBSERVED VIBRATION IN THE CONTAINMENT INSTRUMENT GAS PIPING OUTSIDE CONTAINMENT. SUBSEQUENT WALKDOWNS NOTICED THAT THE SUPPRESSION POOL (SP) HATCH COVERS WERE ALSO VIBRATING. THE VIBRATION APPEARED TO BE COMING FROM THE PRIMARY CONTAINMENT STRUCTURE.
- THE LICENSEE ATTRIBUTED THE EXCESSIVE CONTAINMENT, REACTOR BUILDING, AND PIPING VIBRATIONS TO THE INCREASED RR PUMP SPEED.
- ON JUNE 23 THE LICENSEE DECREASED THE RR PUMP SPEED. WHEN BOTH PUMPS' SPEEDS WERE 1515 RPM, VIBRATION AND NOISE LEVELS RETURNED TO NORMAL.

FOLLOWUP

- THE RR PUMP SHAFT PROBE INDICATED THAT VIBRATION BEGAN ABOUT THE SAME TIME AS EXCESSIVE NOISE LEVEL IN THE REACTOR BUILDING.
- THE LICENSEE ATTRIBUTED THE EXCESSIVE VIBRATION TO VANE PASSING PHENOMENON THAT CORRESPONDS TO A UNIQUE HARMONIC OF RR PUMP SPEED BETWEEN 1570 TO 1580 RPM. MEASUREMENT OF THE SP HATCH COVERS CONFIRMED VIBRATION FREQUENCY OF 131 HZ.
- LICENSEE RESTRICTED RR PUMP OPERATION TO NO MORE THAN 1515 RPM.
- LICENSEE IS EVALUATING THE EFFECTS OF THE EXCESSIVE VIBRATION ON PLANT COMPONENTS.

- EAB IS INVESTIGATING SIMILAR PROBLEMS THAT OCCURRED AT DRESDEN IN JULY 1993 AND AT HOPE CREEK IN 1987.
- REACTOR SYSTEMS BRANCH, MATERIALS AND CHEMICAL ENGINEERING BRANCH, MECHANICAL ENGINEERING BRANCH AND CIVIL ENGINEERING AND GEOSCIENCES BRANCH HAVE BEEN INFORMED.
- MATERIALS AND CHEMICAL ENGINEERING BRANCH DO NOT BELIEVE THAT THE VANE PASSING PHENOMENON IS ASSOCIATED WITH THE CORE SHROUD CRACKING. AT THE COMMONWEALTH EDISON'S PLANTS, THE BOAT SAMPLES DID NOT SHOW ANY INDICATION OF CYCLE FATIGUE.
- AN INFORMATION NOTICE IS BEING CONSIDERED.

SALEM UNIT 2
UNISOLABLE LEAK
JULY 2, 1994

PROBLEM

UNISOLABLE LEAK FROM REACTOR COOLANT PUMP SEAL PACKAGE
REQUIRED REACTOR COOLDOWN.

CAUSE

FLANGED JOINT IN 1-INCH PIPE LEAKED.

SAFETY SIGNIFICANCE

POTENTIAL 1-INCH DIAMETER UNISOLABLE REACTOR COOLANT LEAK.

DISCUSSION

• THURSDAY/FRIDAY (MODE 3)

- REACTOR IN HOT STANDBY
- VISUAL EVIDENCE OF SMALL LEAK (BORIC ACID
CRYSTALS, STEAM WISP)
- VERIFIED FLANGE BOLTS TORQUED TO 150 - 165 FOOT-
POUNDS

• SATURDAY (MODE 3)

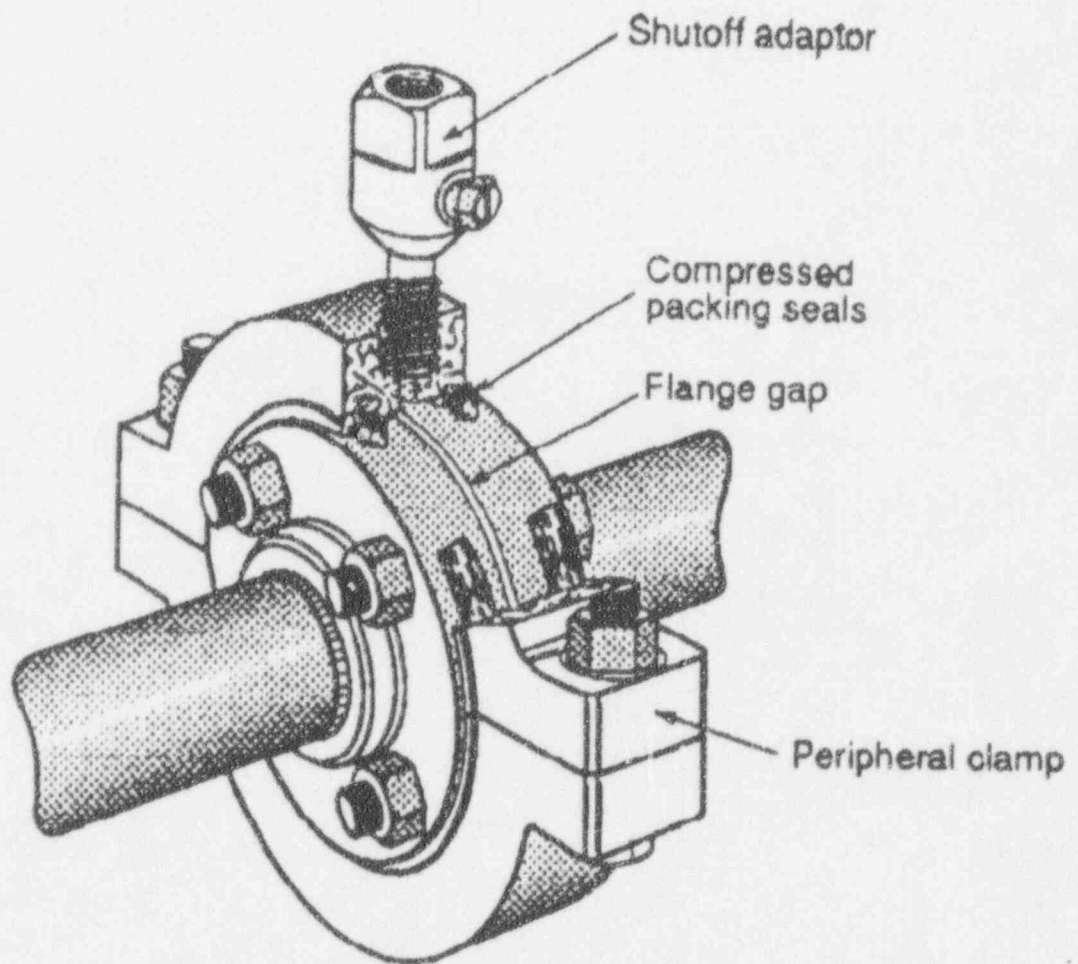
- INSTALLED LEAK SEALANT CLAMP, INJECTED SMALL AMOUNT
OF SEALANT.

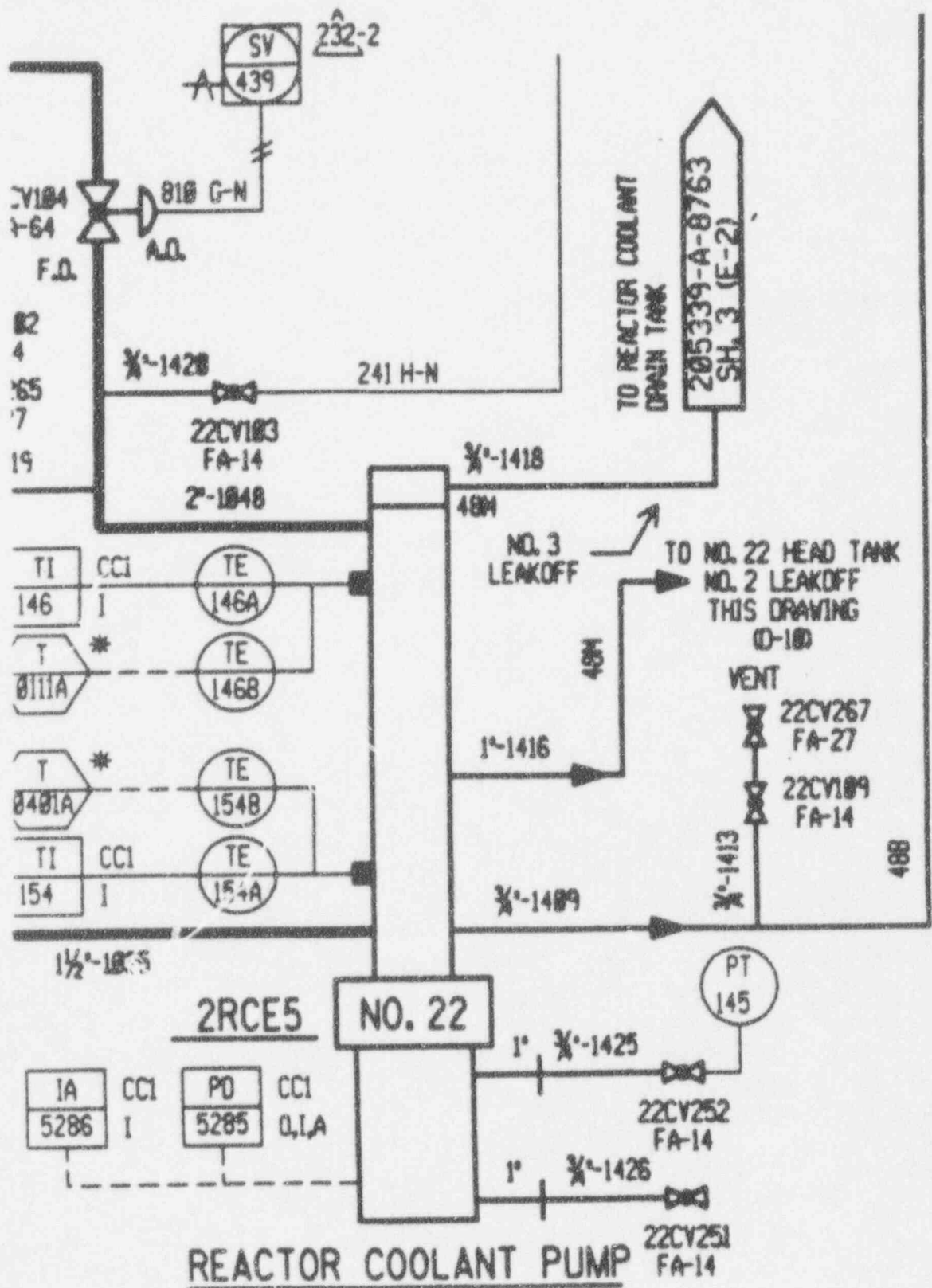
CONTACT: R. BENEDICT, NRR/DORS/EAB
REFERENCE: 10 CFR 50.72 # 27478

AIT: TBD
SIGEVENT: TBD

- LEAKAGE JUMPED TO 14 - 20 GALLONS PER MINUTE. WORK STOPPED. FOUR WORKERS SLIGHTLY CONTAMINATED.
 - PLANT WAS COOLED DOWN, DEPRESSURIZED. LEAK REDUCED TO 1 GPM.
 - CHOICES: MID-LOOP OR FREEZE SEAL FOR BLANK FLANGE INSTALLATION.
- MONDAY (MODE 5)
 - 3 OF 4 FLANGE BOLTS FOUND LOOSE. ALL BOLTS REPLACED, TORQUED. LEAK STOPPED.
 - FREEZE SEAL ESTABLISHED.
 - BLANK FLANGE INSTALLED.
- TUESDAY (MODE 5)
 - REACTOR IN COLD SHUTDOWN, PREPARING FOR STARTUP END OF WEEK.
- WEDNESDAY (MODE 5)
 - LICENSEE INVESTIGATING CAUSE OF LOOSE BOLTS

Flange — Peripheral Clamp





REACTOR SCRAM

Reporting Period: 06/27/94 to 07/03/94

<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>
06/27/94	COMANCHE PEAK 2	100	A	Equipment Failure	NO	2	1	3
06/29/94	SALEM 2	7	A	Equipment Failure	NO	0	1	1
07/02/94	ZION 1	82	A	Equipment Failure	NO	2	0	2

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
07/03/94

<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*	2	1.52	1.83	2.62	2.88	3.38
DESIGN/INSTALLATION ERROR*	0	0.08	0.04	-	-	-
OPERATING ERROR*	0	0.23	0.27	0.23	0.58	0.48
MAINTENANCE ERROR*	0	0.34	0.52	0.40	-	-
EXTERNAL*	0	0.15	0.13	-	-	-
OTHER*	0	0.00	0.02	0.23	-	-
Subtotal	2	2.32	2.81	3.48	3.46	3.86
POWER LESS THAN 15%						
EQUIPMENT FAILURE*	1	0.30	0.38	0.40	0.29	0.40
DESIGN/INSTALLATION ERROR*	0	0.04	-	-	-	-
OPERATING ERROR*	0	0.11	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	0.45	0.57	0.65	0.44	0.48
TOTAL	3	2.77	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	0	2.05	2.44	3.06	3.25	3.21
TOTAL MANUAL SCRAMS	0	0.61	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 07/03/94)--	73