December 19, 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 30, 1996 - BRIEFING 96-14

On December 11, 1996, we conducted an Operating Reactors Events Briefing (96-15) to inform senior managers from offices of the ACRS, AEOD, RES, NRR and regional offices of selected events that occurred since our last briefing on October 30, 1996. Attachment 1 lists the attendees. Attachment 2 presents the significant elements of the discussed events.

Attachment 3 contains reactor scram statistics for the weeks ending November 3, November 10, November 17, November 24, and December 1, 1996. Two significant events were identified for input into the NRC Performance Indicator Program (Attachment 4).

The statements contained in the attached briefing slides represent the best information currently available to the NRC. Future followup could produce new information that may alter the NRC's current view of the events discussed.

Attachments: As stated (4)

cc w/atts:
See next page

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

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OFFICE	PECB	E	PECB		PECB	E	PECB		C/PECB	N
NAME	KGray:kag		SKoenick		EBenner		EGoodwin for		AChaffee	
DATE	12/16/96		12/16/96		12/16/96		12/13/96		12/19/96	

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JKD

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PDR ORG NRRA
PDR

cc:

F. Miraglia, NRR (O-12G18)
F. Gillespie, NRR (O-12G18)
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. Ebneter, Region II
E. Merschoff, 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 (96-15)

DECEMBER 11, 1996

NAME	OFFICE	NAME	OFFICE
E. Benner	NRR	R. Meyer	RES
K. Gray	NRR	G. Marcus	NRR
R. Dennig	NRR	E. Kendrick	NRR
S. Koenick	NRR	S. Sanchez	NRR
E. Goodwin	NRR	C. Rossi	AEOD
N. Hunemuller	NRR	M. El-zeftawy	ACRS
T. Martin	NRR		

TELEPHONE ATTENDANCE
(AT ROLL CALL)

Regions
Region I
Region II
Region III
Region IV

Resident Inspectors

Misc.

ATTACHMENT 1

OPERATING REACTORS EVENTS BRIEFING 96-15

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

MULTIPLE PLANTS

CONCERNS ASSOCIATED WITH THE USE OF HIGH BURNUP FUEL DESIGNS AND LONGER CORE OPERATING CYCLES

PRESENTED BY:

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

ATTACHMENT 2

MULTIPLE PLANTS
CONCERNS ASSOCIATED WITH THE USE OF HIGH BURNUP FUEL DESIGNS AND LONGER CORE OPERATING CYCLES

PROBLEM:
SEVERAL POTENTIALLY SIGNIFICANT EVENTS HAVE OCCURRED WHERE A CONTRIBUTING CAUSE WAS THE USE OF HIGH BURNUP FUEL DESIGNS ASSOCIATED WITH LONGER FUEL CYCLES.

CAUSE:
INADEQUATE REVIEW OF THE IMPACT OF LONGER FUEL CYCLES ON FUEL DESIGN, OPERATION CHARACTERISTICS, OPERATING MARGIN, AND ACCIDENT ANALYSIS.

DISCUSSION OF INDIVIDUAL CONCERNS:

- AVG BURNUP HAS INCREASED (MWd/MTU = MEGAWATT-DAYS/METRIC TON URANIUM):
  - 25,000 → 42,000 MWd/MTU FOR BOILING WATER REACTORS (BWRs)
  - 36,000 → 46,000 MWd/MTU FOR PRESSURIZED WATER REACTORS (PWRs)

METALLURGICAL, MECHANICAL, AND CHEMICAL EFFECTS:

- FAILURE OF CONTROL RODS TO FULLY INSERT
  - WOLF CREEK: THIMBLE TUBE DISTORTION FROM EXCESSIVE COMPRESSIVE LOADING
  - SOUTH TEXAS PROJECT
  - FOREIGN REACTOR EVENTS

CONTACTS: E. BENNER, NRR/DRPM
S. KOENICK, NRR/DRPM

AIT: NO

REFERENCE: MULTIPLE

SIGEVENT: NO

- DISTINCTIVE CRUD PATTERN ON FUEL
  - "SPIDER WEB" PATTERN ON FUEL AT CRYSTAL RIVER AND THREE MILE ISLAND
  - CONTRIBUTING FACTORS:
    - ELEVATED BORON CONCENTRATION AT BEGINNING OF CYCLE
    - LOWER FLOW VELOCITY AT GAP BETWEEN FUEL ASSEMBLIES

- FRETTING OF FUEL RODS
  - GRID-TO-ROD FRETTING
  - FUEL ASSEMBLY VIBRATION
  - INDUCED BY GEOMETRY OF "VANTAGE 5" FUEL

- AXIAL POWER OFFSET ANOMALY
  - OFFSETS VARIED SIGNIFICANTLY FROM RELOAD PREDICTIONS (SEVERAL PWRs)
  - CONDITIONS CONCENTRATE BORON-LITHIUM COMPOUND IN CRUD LAYER OF FUEL ASSEMBLY UPPER SPANS.

CHANGES TO OPERATING STRATEGIES - OPERATOR KNOWLEDGE WEAKNESSES

- BWRs ALLOW ACCESS TO HIGHER ROD LINES AT REDUCED CORE FLOW.

- PWR BEGINNING-OF-LIFE MODERATOR TEMPERATURE COEFFICIENT (MTC) MAY BE MORE POSITIVE DUE TO HIGH BORON CONCENTRATION.

- END-OF-LIFE MTC MAY BE MORE NEGATIVE
  - CALVERT CLIFFS: REACTIVITY EXCURSION AND SCRAM AT LOW-POWER OPERATION DUE TO OVERFEED OF STEAM GENERATOR.

- END-OF-LIFE FLUX SHAPE
  - ARKANSAS NUCLEAR ONE: SCRAMMED DURING POWER ASCENSION WHEN CORE PROTECTION CALCULATORS EXCEEDED AXIAL SHAPE INDEX LIMITS.

- IMPACT OF BWR OPERATION AT REDUCED FLOW
  - CLINTON: RECIRC FLOW CONTROL VALVE FAILED FULLY OPEN, CAUSING POWER TO INCREASE TO 109%; CONTRIBUTING FACTOR WAS OPERATION AT HIGHER FLOW CONTROL LINE WITH REDUCED CORE FLOW.

CORE OPERATING LIMITS

- BWR - CRITICAL POWER RATIO
  - POWER UPRATES, MIXED CORES AND OPERATION IN MAXIMUM EXTENDED LOAD LINE LIMIT ANALYSIS REGION HAVE EFFECTIVELY REDUCED OPERATING MARGIN TO MINIMUM CRITICAL POWER RATIO (MCPR).

- PWR CORE OPERATING LIMIT - NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR
  - FACTOR INCREASED DUE TO LOADING OF HIGHER ENRICHMENT CORES AND REDUCED-LEAKAGE CORES

- PROXIMITY TO A THERMAL LIMIT
  - LIMERICK: MAXIMUM AVERAGE PLANAR RATIO THERMAL LIMIT EXCEEDED
  - CONTROL ROD BANKING SEQUENCE WAS NOT APPROPRIATE FOR HIGH-ENERGY CORE

- UNANTICIPATED APPROACH TO A THERMAL LIMIT
  - PECO UNITS EXPERIENCED INSTANCES WHERE LINEAR HEAT GENERATION RATE THERMAL LIMITS WERE UNEXPECTEDLY APPROACHED
  - EFFECT OF INCREASED BURNUP ON THERMAL LIMIT NOT ANTICIPATED

- GENERIC BWR MCPR DERIVATION DEFICIENCY
  - IN SOME INSTANCES, APPLICATION OF CYCLE SPECIFIC METHODOLOGY RESULTED IN INCREASED MCPR VALUE OVER THE APPROVED GENERIC METHODOLOGY

DEFICIENCIES IN THE DESIGN AND ANALYSIS PROCESS

- CORE RELOAD ANALYSIS DEFICIENCIES
  - INAPPROPRIATE OMISSION OF PEAK CLAD TEMPERATURE ANALYSIS AT PRAIRIE ISLAND
  - AT PALO VERDE, PROCEDURES AND DESIGN-BASIS DOCUMENTATION INCONSISTENT WITH RELOAD ANALYSIS ASSUMPTIONS
    - EVOLVED OVER SEVERAL FUEL CYCLES
  - INSUFFICIENT CONSIDERATION OF BWR MIXED CORE DESIGN RESULTS IN UNANTICIPATED POWER OSCILLATIONS (25% - 49%) AT WNP 2
    - 9x9 FUEL ASSEMBLIES OPERATED AT HIGHER THAN AVERAGE POWER AND LOWER THAN AVERAGE FLOW

- DEFICIENCIES IN MODELING CORE RESPONSE
  - MISPREDICTED SHUTDOWN MARGIN AT LIMERICK AND DUANE ARNOLD
  - ESTIMATED CRITICAL POSITION ERROR AT WNP 2 DUE TO INAPPROPRIATE TRAINING ON NEW CORE MONITORING SOFTWARE
  - VENDOR MISLOADED BURNABLE POISON RODS AND USED INCORRECT PATTERN OF GADOLINIUM RODS FOR FLUX MAPPING INPUT DATA AT ROBINSON

EMERGENCY CORE COOLING SYSTEM (ECCS) EVALUATION MODELS (LARGE-BREAK LOSS OF COOLANT ACCIDENT (LBLOCA))

- 10CFR50.46 ACCEPTANCE CRITERIA
  - ECCS COOLING PERFORMANCE MUST BE CALCULATED IN ACCORDANCE WITH AN ACCEPTABLE EVALUATION MODEL:
    - PEAK CLADDING TEMPERATURE (PCT) < 2200°F
    - MAX CLADDING OXIDATION < 0.17 * TOTAL CLADDING THICKNESS
    - MAX HYDROGEN GENERATION < 0.01 * HYPOTHETICAL AMOUNT OF ENTIRE VOLUME OF CLADDING REACTED
    - COOLABLE GEOMETRY
    - LONG-TERM COOLING
  - REPORTING REQUIREMENTS
    - ANNUAL REPORT OF CHANGES AND/OR ERRORS TO COMMISSION
    - 30 DAY REPORT FOR SIGNIFICANT CHANGES/ERRORS (ONE TIME OR CUMULATIVE RESULTING IN 50°F)

- EXPERIENCE WITH SIEMENS LBLOCA ECCS EVALUATION MODEL
  - JULY 1986: STAFF APPROVES SIEMENS (FORMERLY EXXON) LBLOCA ECCS MODEL
  - AUGUST 1991: MODEL WAS MODIFIED TO CORRECT FOR NONPHYSICAL BEHAVIOR
  - AUGUST 1995: STAFF NOTED SIGNIFICANT CHANGES TO PCT FROM 1991 MODEL CHANGES
  - JANUARY 1996 TO PRESENT: MEETINGS AND CORRESPONDENCE BETWEEN VENDOR, AFFECTED UTILITIES, AND STAFF WITH RESPECT TO MODEL CHANGES
  - NOVEMBER 29, 1996: NRC ISSUES LETTER TO SIEMENS CONTAINING SAFETY EVALUATION THAT CONCLUDED 1991 MODEL UNACCEPTABLE AND 1986 MODEL NEEDED TO BE CORRECTED.

- BASIS FOR REJECTION OF MODEL CHANGES
  1) NONPHYSICAL BEHAVIOR OF HEAT TRANSFER COEFFICIENT (HTC) VS. REFLOOD RATE
  2) INSUFFICIENT DATA IN RANGE OF CONCERN TO DEMONSTRATE CONSERVATISM
  3) USE OF NEW QUENCH TIME METHODOLOGY NOT SUPPORTED BY DATA COMPARISONS

  - PWR REFLOOD: COOLANT INJECTION THROUGH DOWNCOMER INTO LOWER PLENUM AND SUBSEQUENTLY TO THE BOTTOM OF CORE
  - HTC MODELS ARE BASED ON APPLICABLE EXPERIMENTAL DATA, INCLUDING WESTINGHOUSE FLECHT TESTS
  - AFFECTED PLANTS: PALISADES, HARRIS, MILLSTONE 2, ST. LUCIE, COMANCHE PEAK, ROBINSON, AND KEWAUNEE
  - PLANTS EXCEEDING 2200°F: COMANCHE PEAK AND ROBINSON ADJUSTED PEAKING FACTORS AND KEWAUNEE (CURRENTLY SHUTDOWN) STILL EVALUATING

- GENERAL ELECTRIC LBLOCA MODEL
  - DURING AUDIT CONDUCTED BY HOPE CREEK, IDENTIFIED WEAKNESS IN VENDOR'S TRACKING OF ERRORS/CHANGES
  - EARLY 1996: TWO CHANGES REPORTED TO LICENSEE
  - DURING AUDIT, LICENSEE DISCOVERED 3 MORE CHANGES DATING BACK TO 1990
  - CUMULATIVE AFFECTS EXCEEDED SIGNIFICANT CHANGE REPORTING CRITERIA (50°F)
  - LICENSEE VERIFIED CALCULATED PCT REMAINED BELOW 2200°F

- LICENSEES HAVE IN SOME CASES RELIED ON VENDOR SUBMITTED REPORTS TO SATISFY REQUIREMENTS OF 50.46

NRC ACTIONS:

- TWO ACTION PLANS:

  (1) HIGH BURNUP FUEL: ASSESS FUEL PERFORMANCE FOR HIGH BURNUP FUEL AND EVALUATE ADEQUACY OF STANDARD REVIEW PLAN LICENSING ACCEPTANCE CRITERIA

  (2) CORE PERFORMANCE: ASSESS IMPACT OF RELOAD CORE DESIGN ACTIVITIES ON PLANT SAFETY THROUGH INSPECTIONS OF FUEL VENDORS, EVALUATION OF LICENSEE RELOAD ANALYSES, INDEPENDENT EVALUATION OF CORE PERFORMANCE INFORMATION, WITH REGIONAL TRAINING AND INTERACTION

  - PLAN 10 LICENSEE INSPECTIONS (WITH FIVE VENDOR FOLLOWUPS) FOR FY97-98.

  - CONTINUE VENDOR INSPECTIONS (18 MONTH INTERVAL)

- INTERACTION WITH INDUSTRY GROUPS

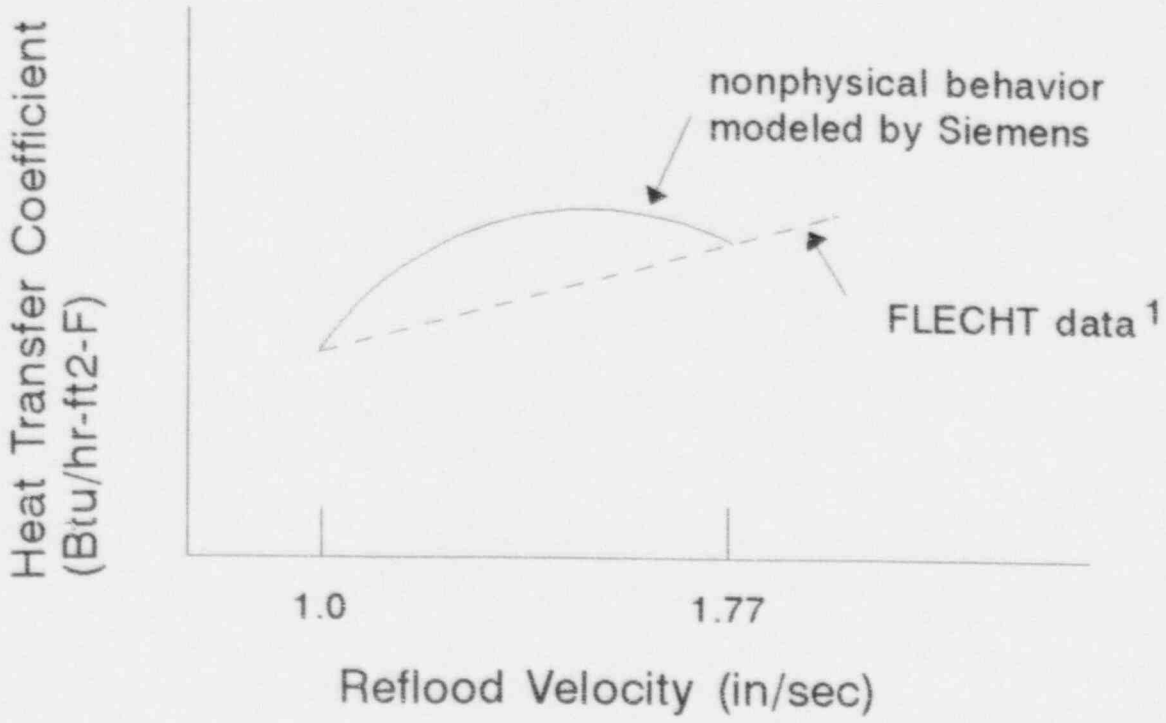
- EVENT FOLLOWUP OF INDIVIDUAL EVENTS, i.e., MCPR, STUCK RODS

- ISSUANCE OF SEVERAL GENERIC COMMUNICATIONS

- CONDUCTED CORE PERFORMANCE WORKSHOP FOR INDUSTRY (10/96)

- VENDOR INSPECTION BRANCH WILL LEAD INSPECTION AT SIEMENS (2/97)

BEHAVIOR OF HEAT TRANSFER COEFFICIENT WITH RESPECT TO REFLOOD VELOCITY



1: FLECHT (Full length emergency cooling heat transfer) experimental data

FIGURE 1

REACTOR SCRAM

Reporting Period: 11/25/96 to 12/01/96

DATE	PLANT & UNIT	POWER	TYPE	CAUSE	COMPLICATIONS	YTD ABOVE 15%	YTD BELOW 15%	YTD TOTAL
11/27/96	VOGTLE 1	100	SA	Maintenance Error	NO	2	0	2
11/27/96	GRAND GULF 1	0		Equipment Failure	NO	1	1	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
12/01/96

SCRAM CAUSE	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	0	1.58	1.83	1.52	1.83	2.62
DESIGN/INSTALLATION ERROR	0	0.10	0.12	0.08	0.04	-
OPERATING ERROR	0	0.06	0.15	0.21	0.27	0.31
MAINTENANCE ERROR	1	0.52	0.38	0.54	0.52	0.50
EXTERNAL	0	0.15	0.21	0.17	0.13	-
OTHER	0	0.08	0.06	-	0.02	-
Subtotal	1	2.49	2.75	2.52	2.81	3.43
POWER LESS THAN 15%						
EQUIPMENT FAILURE	1	0.21	0.10	0.27	0.38	0.42
DESIGN/INSTALLATION ERROR	0	0.00	-	0.02	-	-
OPERATING ERROR	0	0.08	0.13	0.08	0.13	0.15
MAINTENANCE ERROR	0	0.06	0.08	-	0.02	0.08
EXTERNAL	0	0.00	-	-	0.04	-
OTHER	0	0.00	-	-	-	-
Subtotal	1	0.35	0.31	0.37	0.57	0.65
TOTAL	2	2.84	3.06	2.89	3.38	4.08

SCRAM TYPE	NO. OF SCRAMS	1996 WEEKLY AVERAGE (YTD)	1995 WEEKLY AVERAGE	1994 WEEKLY AVERAGE	1993 WEEKLY AVERAGE	1992 WEEKLY AVERAGE
TOTAL AUTOMATIC SCRAMS	1	1.77	1.92	2.19	2.44	3.06
TOTAL MANUAL SCRAMS	0	1.06	1.13	0.69	0.94	1.02

TOTALS MAY DIFFER BECAUSE OF ROUNDING OFF

REACTOR SCRAM

Reporting Period: 11/18/96 to 11/24/96

DATE	PLANT & UNIT	POWER	TYPE	CAUSE	COMPLICATIONS	YTD ABOVE 15%	YTD BELOW 15%	YTD TOTAL
11/22/96	DIABLO CANYON 1	100	3A	Equipment Failure	NO	3	0	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
11/24/96

SCRAM CAUSE	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	1	1.62	1.83	1.52	1.83	2.62
DESIGN/INSTALLATION ERROR	0	0.11	0.12	0.08	0.04	-
OPERATING ERROR	0	0.06	0.15	0.21	0.27	0.31
MAINTENANCE ERROR	0	0.51	0.38	0.54	0.52	0.50
EXTERNAL	0	0.15	0.21	0.17	0.13	-
OTHER	0	0.09	0.06	-	0.02	-
Subtotal	1	2.54	2.75	2.52	2.81	3.43
POWER LESS THAN 15%						
EQUIPMENT FAILURE	0	0.19	0.10	0.27	0.38	0.42
DESIGN/INSTALLATION ERROR	0	0.00	-	0.02	-	-
OPERATING ERROR	0	0.09	0.13	0.08	0.13	0.15
MAINTENANCE ERROR	0	0.06	0.08	-	0.02	0.08
EXTERNAL	0	0.00	-	-	0.04	-
OTHER	0	0.00	-	-	-	-
Subtotal	0	0.34	0.31	0.37	0.57	0.65
TOTAL	1	2.88	3.06	2.89	3.38	4.08

SCRAM TYPE	NO. OF SCRAMS	1996 WEEKLY AVERAGE (YTD)	1995 WEEKLY AVERAGE	1994 WEEKLY AVERAGE	1993 WEEKLY AVERAGE	1992 WEEKLY AVERAGE
TOTAL AUTOMATIC SCRAMS	1	1.79	1.92	2.19	2.44	3.06
TOTAL MANUAL SCRAMS	0	1.09	1.13	0.69	0.94	1.02

TOTALS MAY DIFFER BECAUSE OF ROUNDING OFF

REACTOR SCRAM

Reporting Period: 11/11/96 to 11/17/96

DATE	PLANT & UNIT	POWER	TYPE	CAUSE	COMPLICATIONS	YTD ABOVE 15%	YTD BELOW 15%	YTD TOTAL
11/12/96	MONTICELLO 1	100	SM	Maintenance Error	NO	3	0	3
11/12/96	NORTH ANNA 2	100	SA	Equipment Failure	NO	1	0	1
11/16/96	SEQUOYAH 1	36	SM	Equipment Failure	NO	2	0	2
11/17/96	CALVERT CLIFFS 2	100	SA	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
11/17/96

SCRAM CAUSE	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	3	1.63	1.83	1.52	1.83	2.02
DESIGN/INSTALLATION ERROR	0	0.11	0.12	0.08	0.04	-
OPERATING ERROR	0	0.07	0.15	0.21	0.27	0.31
MAINTENANCE ERROR	1	0.52	0.38	0.54	0.52	0.50
EXTERNAL	0	0.15	0.21	0.17	0.13	-
OTHER	0	0.09	0.06	-	0.02	-
Subtotal	4	2.57	2.75	2.52	2.81	3.43
POWER LESS THAN 15%						
EQUIPMENT FAILURE	0	0.20	0.10	0.27	0.29	0.42
DESIGN/INSTALLATION ERROR	0	0.00	-	0.02	-	-
OPERATING ERROR	0	0.09	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	0.36	0.31	0.37	0.57	0.65
TOTAL	4	2.93	3.06	2.89	3.38	4.08

SCRAM TYPE	NO. OF SCRAMS	1996 WEEKLY AVERAGE (YTD)	1995 WEEKLY AVERAGE	1994 WEEKLY AVERAGE	1993 WEEKLY AVERAGE	1992 WEEKLY AVERAGE
TOTAL AUTOMATIC SCRAMS	2	1.80	1.92	2.19	2.44	3.06
TOTAL MANUAL SCRAMS	2	1.11	1.13	0.69	0.94	1.02

TOTALS MAY DIFFER BECAUSE OF ROUNDING OFF

REACTOR SCRAM

Reporting Period: 11/04/96 to 11/10/96

DATE	PLANT & UNIT	POWER	TYPE	CAUSE	COMPLICATIONS	YTD ABOVE 15%	YTD BELOW 15%	YTD TOTAL
11/05/96	NINE MILE POINT 1	100	SA	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
11/10/96

SCRAM CAUSE	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	1	1.60	1.83	1.52	1.83	2.62
DESIGN/INSTALLATION ERROR	0	0.11	0.12	0.08	0.04	-
OPERATING ERROR	0	0.07	0.15	0.21	0.27	0.31
MAINTENANCE ERROR	0	0.51	0.38	0.54	0.52	0.50
EXTERNAL	0	0.16	0.21	0.17	0.13	-
OTHER	0	0.09	0.06	-	0.02	-
Subtotal	1	2.54	2.75	2.52	2.81	3.43
POWER LESS THAN 15%						
EQUIPMENT FAILURE	0	0.20	0.10	0.27	0.38	0.42
DESIGN/INSTALLATION ERROR	0	0.00	-	0.02	-	-
OPERATING ERROR	0	0.09	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	0.36	0.31	0.37	0.57	0.65
TOTAL	1	2.90	3.06	2.89	3.38	4.08

SCRAM TYPE	NO. OF SCRAMS	1996 WEEKLY AVERAGE (YTD)	1995 WEEKLY AVERAGE	1994 WEEKLY AVERAGE	1993 WEEKLY AVERAGE	1992 WEEKLY AVERAGE
TOTAL AUTOMATIC SCRAMS	1	1.80	1.92	2.19	2.44	3.06
TOTAL MANUAL SCRAMS	0	1.09	1.13	0.69	0.94	1.02

TOTALS MAY DIFFER BECAUSE OF ROUNDING OFF

REACTOR SCRAM

Reporting Period: 10/28/96 to 11/03/96

DATE	PLANT & UNIT	POWER	TYPE	CAUSE	COMPLICATIONS	YTD ABOVE 15%	YTD BELOW 15%	YTD TOTAL
10/29/96	BROWNS FERRY 2	100	SA	Equipment Failure	NO	2	0	2
11/02/96	HOPE CREEK 1	29	SM	Equipment Failure	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
11/03/96

SCRAM CAUSE	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	2	1.61	1.83	1.52	1.83	2.62
DESIGN/INSTALLATION ERROR	0	0.11	0.12	0.08	0.04	-
OPERATING ERROR	0	0.07	0.15	0.21	0.27	0.31
MAINTENANCE ERROR	0	0.52	0.38	0.54	0.52	0.50
EXTERNAL	0	0.16	0.21	0.17	0.13	-
OTHER	0	0.09	0.06	-	0.02	-
Subtotal	2	2.56	2.75	2.52	2.81	3.43
POWER LESS THAN 15%						
EQUIPMENT FAILURE	0	0.20	0.10	0.27	0.38	0.42
DESIGN/INSTALLATION ERROR	0	0.00	-	0.02	-	-
OPERATING ERROR	0	0.09	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	0.36	0.31	0.37	0.57	0.65
TOTAL	2	2.92	3.06	2.89	3.38	4.08

SCRAM TYPE	NO. OF SCRAMS	1996 WEEKLY AVERAGE (YTD)	1995 WEEKLY AVERAGE	1994 WEEKLY AVERAGE	1993 WEEKLY AVERAGE	1992 WEEKLY AVERAGE
TOTAL AUTOMATIC SCRAMS	1	1.82	1.92	2.19	2.44	3.06
TOTAL MANUAL SCRAMS	1	1.11	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 12/01/96)--	136

OPERATING REACTOR PLANTS SIGNIFICANT EVENTS

SORT> Event Date
QUERY> Event Type SIG & Close Out Date >= 10/22/96 & Close Out Date <= 11/19/96

PLANT & UNIT	DATE OF EVENT	50.72 NUMBER	DESCRIPTION OF EVENT	SIGNIFICANCE	OR BRIEFING	PRESENTER	CLOSEOUT RECORD
HOPE CREEK 1	03/14/96	0	Programmatic weaknesses resulted in violations and imposition of civil penalty. Classification based on repeated failures to plan appropriate testing of equipment following maintenance.	Reactor Protection System		KOTZALAS M.	HIGHLIGHT
SEQUOYAH 2	10/11/9631138		Scram with complications - impulse pressure switch failure and auxiliary feedwater inoperable.	Safety-Related Cooling System	96-13	KOENICK S.	HIGHLIGHT

ATTACHMENT 4