MAR 1 9 1987

MEMORANDUM FOR: Harold R. Denton, Director Office of Nuclear Reactor Regulation

- FROM: Gary M. Holahan, Director Operating Reactors Assessment Staff
- SUBJECT: SUMMARY OF THE OPERATING REACTORS EVENTS MEETING ON MARCH 9, 1987 - MEETING 87-06

On March 6, 1987, an Operating Reactor Events meeting (87-06) was held to brief the Office Director, the Division Directors and their representatives on events which occurred since our last meeting on March 2, 1987. The list of attendees is included as Enclosure 1.

The events discussed and the significant elements of these events are presented in Enclosure 2. Enclosure 3 provides a summary of those presented events that will be input to NRC's performance indicator program as significant events.

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Gary M. Holahan, Director Operating Reactors Assessment Staff

Enclosures: As stated

cc w/Encl.: See Next Page

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Harold R. Denton

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cc: R. Vollmer J. Taylor C. Heltemes R. Starostecki D. Ross T. Murley, Reg. I J. Nelson Grace, Reg. II J. Keppler, Reg. III R. D. Martin, Reg. IV J. B. Martin, Reg. V W. Kane Reg. I S. Ebneter, Reg. I R. Walker, Reg. II C. Norelius, Reg. III E. Johnson. Reg. IV D. Kirsch, Reg. V H. Thompson F. Miraglia R. Bernero T. Speis W. Russell T. Novak F. Schroeder W. Houston B. Sheron B. Boger D. Crutchfield E. Rossi G. Lainas V. Benaroya W. Regan D. Vassallo E. Jordan J. Rosenthal R. Baer E. Weiss R. Hernan S. Showe S. Rubin G. Arlotto

G. Edison H. Nicolaras J. Stolz P. Leech W. Butler

ENCLOSURE 1

LIST OF ATTENDEES

OPERATING REACTORS EVENTS BRIEFING (87-06)

MARCH 9, 1987

NAME	DIVISION	NAME	DIVISION
G. Holahan	NRR	K. Wolley	EPER
M. Virgilio	NRR	G. Edison	NRR
D. Tondi	NRR	R. Hernan	NRR
M. Caruso	NRR	W. Swenson	NRR
K. Eccleston	NRR	F. Cherny	NRR
R. Emch	NRR	G. Dick	NRR
D. Vassallo	NRR	S. Stern	NRR
L. Crocker	NRR	G. Murphy	ORNL
P. Leech	NRR	B. Boger	NRR
J. Jankovich	NRR	A. Dromerick	IE
M. Chiramal	AEOD	R. Baer	IE
J. Rosenthal	IE	R. Bernero	NRR
F. Schroeder	NRR	P. Gwynn	OCM
D. Tarnoff	NRR		

OPERATING REACTORS EVENTS BRIEFING 87-06

MARCH 9, 1987

SIGNIFICANT EVENTS

OCONEE 1, 2, AND 3

UNDERSIZED STEAM RELIEF VALVES ON STEAM SUPPLY LINES TO EFW TURBINE

PERRY 1

REACTOR SCRAM AND HPCS INJECTION DUE TO LOSS OF FEEDWATER

3/10/87

OCONEE 1, 2 AND 3 - UNDERSIZED STEAM RELIEF VALVES ON STEAM SUPPLY LINES TO EFW TURBINES MARCH 2, 1987 - (G. EDISON, NRR)

PROBLEM:

RELIEF VALVES WITHOUT SUFFICIENT CAPACITY INSTALLED ON MAIN STEAM PIPING AND AUXILIARY STEAM PIPING TO TURBINE-DRIVEN EMERGENCY

FEEDWATER (TDEFW) PUMP

CAUSE :

DEFICIENT ENGINEERING DESIGN

SIGNIFICANCE:

POTENTIAL TO DISABLE TDEFW TRAIN FUNCTIONAL CAPABILITY

• POTENTIAL FOR RUPTURE OF THE TDEFW STEAM SUPPLY HEADER DISCUSSION:

- ON 2/27/87 DUKE POWER COMPANY COMPLETED AN ANALYSIS WHICH SHOWED THE POTENTIAL FOR FAILURE OF THE TDEFW PUMP/PIPING BECAUSE OF POSSIBLE OVERPRESSURIZATION OF THE AUXILIARY STEAM SYSTEM THE WORST CASE SCENARIO ASSUMES THE FOLLOWING CONDITIONS:
 - STATION BLACKOUT CONDITIONS EXIST, I.E., LOSS OF OFFSITE POWER AND ONSITE EMERGENCY POWER (KEOWEE HYDRO PLANT)
 - REACTOR TRIPPED: ISOLATE MAIN STEAM LINE
 - MS-126 AND MS-129 CONTROL VALVES FAIL WIDE OPEN
 - TDEFW PUMP HAS RECEIVED START SIGNAL
 - NO CREDIT IN ANALYSIS GIVEN FOR STEAM LOADS; E.G., AIR EJECTORS, TDEFW EXHAUST TO ATMOSPHERE, HEATERS
 - DEDICATED SAFE SHUTDOWN FACILITY STILL AVAILABLE
 - INTERCONNECTION TO TDEFW OF SISTER UNITS AFTER MANUAL VALVE REALIGNMENT
- INTERIM MEASURES INCLUDE:
 - CROSS-TIE AUXILIARY STEAM LINES BETWEEN THREE UNITS BY LOCKING OPEN AS-5 AND 2AS-5
 - LOCKED CLOSED MS-126 AND MS-129 ON UNITS 1 AND 3; INSTALLING TRAVEL STOPS ON MS-129 ON UNIT 2

CONG-TERM CORRECTIVE MEASURE -- INCREASE RELIEF CAPACITY

- DUKE POWER COMPANY AND BECHTEL WERE THE ARCHITECT ENGINEERS
- ° DUKE IS RETRAINING STAFF DESIGN ENGINEERS

FOLLOW-UP:

- LICENSEE WILL PERFORM CORRECTIVE ACTIONS
- RESIDENT INSPECTOR WILL FOLLOW-UP ON CORRECTIVE ACTIONS



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OCONFE 1,2,3

3/10/87

PERRY 1 - REACTOR SCRAM AND HPCS INJECTION DUE TO LOSS OF FEEDWATER MARCH 2, 1987 - (P. LEECH, NRR)

PROBLEM:

OPERATOR ERROR-INDUCED REACTOR TRIP COMPLICATED BY RCIC MALFUNCTION
<u>CAUSE</u>:

OPERATOR ERROR

LEVEL SWITCH MALFUNCTION

SIGNIFICANCE:

 SCENARIO MAY BE INDICATIVE OF POOR TROUBLESHOOTING/ MAINTENANCE PRACTICE

DISCUSSION:

- EMERGENCY RELIEF FROM HAVING RCIC SYSTEM OPERABLE HAD BEEN GRANTED FOR 30 DAYS STARTING 2/24/87 DUE TO UNRELIABLE OPERATION OF THE INBOARD STEAM ISOLATION VALVE AND ERRATIC WATER LEVEL INDICATIONS DURING INJECTION TESTS
- RCIC AUTO INJECTION WAS DISABLED. RCIC MANUAL INJECTION WAS AVAILABLE.
- PLANT OPERATING AT 28% POWER OPERATORS INVESTIGATING A FAULTY LEVEL SWITCH ON HOT SURGE TANK, WHICH WAS CAUSING ERRONEOUS TANK LOW LEVEL SIGNALS, JARRED ANOTHER LEVEL SWITCH WHICH GENERATED A BOOSTER PUMP TRIP SIGNAL
- * TWO FEEDWATER BOOSTER PUMPS AND ONE TURBINE-DRIVEN FEEDWATER PUMP TRIPPED
- REACTOR TRIPPED AT LOW WATER LEVEL 3 AND HPCS AUTO-INITIATED AT LOW LEVEL 2. RCIC SYSTEM DID NOT START DUE TO FAILURE OF INBOARD STEAM ISOLATION VALVE TO OPEN. ALL EQUIPMENT EXCEPT RCIC FUNCTIONED PER DESIGN.
- BOOSTER PUMPS RESTARTED AUTOMATICALLY AND MOTOR-DRIVEN FEEDWATER PUMP WAS STARTED MANUALLY. WATER LEVEL WAS RESTORED AND HPCS WAS SECURED IN NEXT 4 MINUTES.
- * LICENSEE'S ENGINEERS ARE REVIEWING THE LOGIC FOR BOOSTER PUMP TRIP AND FEEDWATER PUMP TRIP

FOLLOW-UP:

REGION III AND PM ARE FOLLOWING CORRECTIVE MEASURES BY LICENSEE

REACTOR SCRAM SUMMARY WEEK ENDING 03/08/87

I. PLANT SPECIFIC DATA

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DATE	SITE	UNIT	POWER	RPS	CAUSE	COMPLI- CATIONS	YTD ABOVE 15%	YTD BELOW 15%	YTD TOTAL
03/02/87	PERRY	1	28	A	PERSONNEL	NO	1	1	2
03/03/87	SAINT LUCIE	2	100	A	EQUIPMENT	NO	1	Q.	1
03/03/87	COOK	2	0	A	EQUIPMENT	NO	Ó	1	1
03/05/87	SAINT LUCIE	2	40	A	UNKNOWN	NO	2	0	2
03/05/87	DIABLO CANYON	2	4	A	UNKNOWN	NO	0	1	1
03/06/87	TURKEY POINT	3	100	M	EQUIPMENT	NO	2	1	3
03/07/87	WATERFORD	3	56	A	EQUIPMENT	NO	1	Ó	1
03/07/87	MILLSTONE	3	100	A	EQUIPMENT	NO	2	1	3

II. COMPARISON OF WEEKLY STATISTICS WITH INDUSTRY AVERAGES

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SCRAMS FOR WEEK ENDING 03/08/87

SCRAM CAUSE	POWER	NUMBER OF SCRAMS (5)	1987 WEEKLY AVERAGE YTD	1986 WEEKLY AVERAGE (3)(4)	1985 WEEKLY AVERAGE (8)(9)
** POWER >15%					
EQUIP. RELATED	>15%	4	3.9	4.3	5.4
FERS. RELATED(6)	>15%	1	1.5	1.8	2.0
OTHER (7)	>15%	1	0.6	0.4	0.6
** Subtotal **					
		6	6.0	6.5	8.0
** POWER <15%					
EQUIP. RELATED	<15%	1	1.0	1.4	1.3
PERS. RELATED	<15%	0	0.8	0.8	0.9
OTHER	<15%	1	0.1	0.2	0.2
** Subtotal **					
		2	1.9	2.4	2.4
*** Total ***					
		8	7.9	8.9	10.4

MANUAL VS AUTO SCRAMS

TYPE	NUMBER OF SCRAMS	1987 WEEKLY AVERAGE YTD	1986 WEEKLY AVERAGE	1965 WEEKLY AVERAGE
MANUAL SCRAMS Automatic Scrams	1 7	1.2	1.0	1.0 9.4

- 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.
- RECOVERY <u>COMPLICATED</u> BY EQUIPMENT FAILURES OR PERSONNEL ERRORS UNRELATED TO CAUSE OF SCRAM.
- 3. 1986 INFORMATION DERIVED FROM ORAS STUDY OF UNPLANNED REACTOR TRIPS IN 1986. WEEKLY DATA DETERMINED BY TAKING TOTAL TRIPS IN A GIVEN CATEGORY AND DIVIDING BY 52 WEEKS/YEAR.
- 4. IN 1986, THERE WERE AN ESTIMATED TOTAL OF 461 AUTOMATIC AND MANUAL UNPLANNED REACTOR TRIPS AT 104 REACTORS (HOLDING OPERATING LICENSES). THIS YIELDS AN AVERAGE RATE OF 4.4 TRIPS PER REACTOR PER YEAR AND AN AVERAGE RATE OF 8.8 TRIPS PER WEEK FOR ALL REACTORS.
- 5. BASED ON 104 REACTORS HOLDING AN OPERATING LICENSE.
- PERSONNEL RELATED PROBLEMS INCLUDE HUMAN ERROR, PROCEDURAL DEFICIENCIES, AND MANUAL STEAM GENERATOR LEVEL CONTROL PROBLEMS.
- "OTHER" INCLUDES AUTOMATIC SCRAMS ATTRIBUTED TO ENVIRONMENTAL CAUSES (LIGHTNING), SYSTEM DESIGN, OR UNKNOWN CAUSE.
- 8. 1985 INFORMATION DERIVED FROM AN ORAS STUDY OF UNPLANNED REACTOR TRIPS IN 1985. WEEKLY DATA DETERMINED BY TAKING TOTAL TRIPS IN A GIVEN CATEGORY AND DIVIDING BY 52 WEEKS/YEAR.
- 9. IN 1985, THERE WERE AN ESTIMATED TOTAL OF 541 AUTOMATIC AND MANUAL UNPLANNED REACTOR TRIPS AT 93 REACTORS (HOLDING FULL POWER LICENSES). THIS YIELDS AN AVERAGE RATE OF 5.8 TRIPS PER REACTOR YEAR AND AN AVERAGE RATE OF 10.4 TRIPS PER WEEK FOR ALL REACTORS.

NOTES

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SIGNIFICANT EVENTS FREQUENCY PERFORMANCE INDICATOR No. 3

PLANT NAME	EVENT	EVENT DESCRIPTION	CAUSE	19

PERRY 1

03/02/87 OPERATOR ERROR INDUCED REACTOR TRIP COMPLICATED BY RCIC PERSONNEL ERROR MALFUNCTION

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