AUG 23 1988

In Reply Refer To:
Docket: 50-285/88-22

Omaha Public Power District
ATTN: Kenneth J. Morris, Division Manager
Nuclear Operations
1623 Harney Street
Omaha, Nebraska 68102

Gentlemen:

This refers to the Enforcement Conference conducted in the NRC Region IV Office on August 11, 1988, with you and other members of your staff, and Region IV personnel. This conference was related to the findings of the NRC inspection conducted during the period June 29 through July 18, 1988, which were documented in our NRC Inspection Report 50-285/88-22 dated July 29, 1988.

The subjects discussed at this meeting are described in the enclosed Meeting Summary.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter will be placed in the NRC's Public Document Room.

Should you have any questions concerning this matter, we will be pleased to discuss them with you.

Sincerely,

Original Signed By
A. B. Beach

L. J. Callan, Director
Division of Reactor Projects

Enclosure:
Meeting Summary w/attachments (2)

cc w/enclosure:
Fort Calhour Station
ATTN: W. G Gates, Manager
P.O. Box 399
Fort Calhoun, Nebraska 68023

Harry H. Voigt, Esq.
LeBoeuf, Lamb, Leiby & MacRae
1333 New Hampshire Avenue, NW
Washington, D. C. 20036

Nebraska Radiation Control Program Director

RIV:PSB RPM	C:PSB	D:DRP
RPMullikin;df	TFWesterman	LJCallan
8/18/88	8/18/88	8/22/88

IE 1/1

bcc to DMB (IE45)

bcc distrib. by RIV:
R.D. Martin, RA
Section Chief (DRP/B)
RIV File
RSTS Operator
Lisa Shea, RM/ALF
DRS
RPB-DRSS
MIS System
DRP
Project Ergineer, DRP/B
P. Milano, NRR Project Manager
RRI

ENCLOSURE

OMAHA PUBLIC POWER DISTRICT

JUNE 8, 1988

MEETING SUMMARY

Licensee: Omaha Public Power District (OPPD)

Facility: Fort Calhoun Station (FCS)

License No.: DPR-40

Docket No.: 50-285

SUBJECT: ENFORCEMENT CONFERENCE CONCERNING NRC INSPECTION FINDINGS (INSPECTION REPORT 50-285/88-22)

On August 11, 1988, representatives of Omaha Public Power District, met in Arlington, Texas, with NRC Region IV and NRR personnel to discuss the findings documented in the NRC Inspection Report dated June 1, 1988. The attendance list and licensee presentations are attached. The meeting was held at the request of NRC, Region IV.

The intent of the enforcement conference was to discuss the Fuel Cycle 11 setpoint errors. This resulted in the limiting condition for operation for excore monitoring of linear heat rate and the thermal margin/low pressure trip setting of the reactor protection system being in error.

Attachment 1

Enforcement Conference Attendance List - Region IV

Omaha Public Power District

NRC Attendees:

A. B. Beach, Deputy Director, Division of Reactor Projects, RIV
J. L. Milhoan, Director, Division of Reactor Safety, RIV
G. F. Sanborn, Enforcement Officer, RIV
T. F. Westerman, Chief, Project Section B, RIV
R. P. Mullikin, Project Engineer, RIV
P. H. Harrell, Senior Resident Inspector, Fort Calhoun
T. Reis, Resident Inspector, Fort Calhoun

OPPD Attendees:

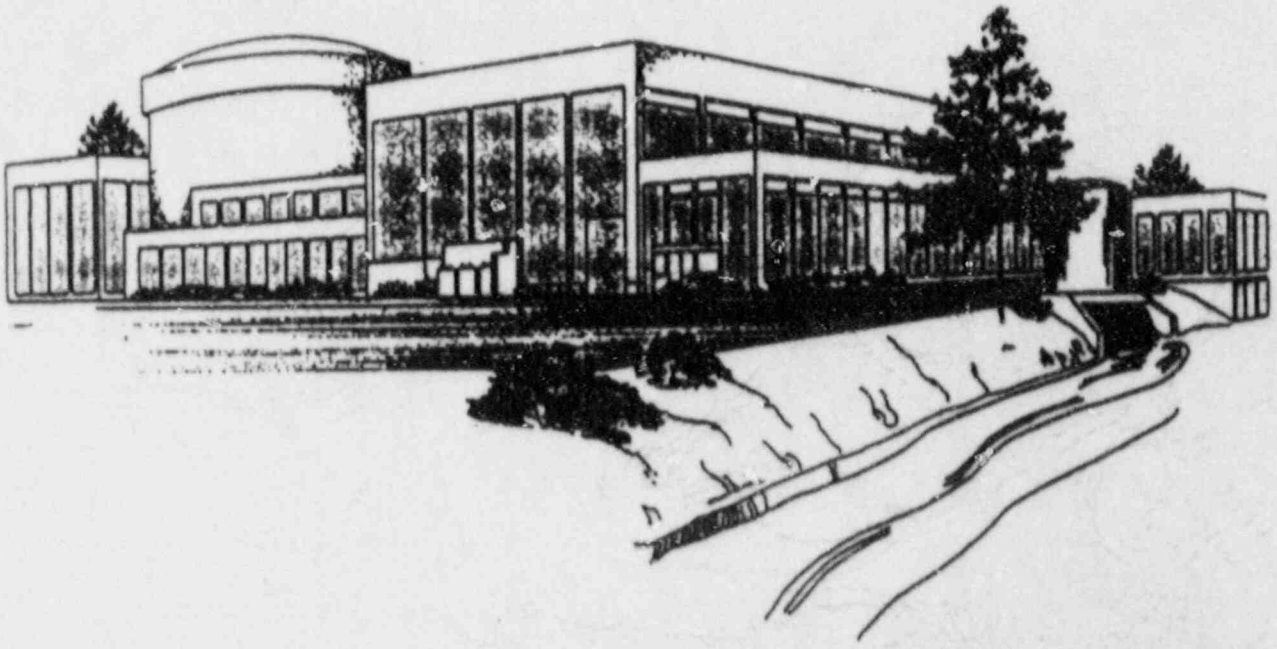
K. J. Morris, Division Manager
J. F. Fisicaro, Supervisor, Nuclear Regulatory and Industry Affairs
S. Gambhir, Section Manager, Generating Station Engineering

Combustion Engineering (CE) Attendees:

H. Fields, Supervisor, Analog Transients and Setpoint Analysis
T. G. Ober, Project Manager

ATTACHMENT 2

FORT CALHOUN STATION



NRC / OPPD MEETING

AUGUST 11, 1988

TM/LP SETPOINT ERROR MEETING AGENDA

August 11, 1988
Inspection Report 50-285/88-22

I.	Opening Remarks/Introduction	K. J. Morris S. K. Gambhir
II.	Overview of Meeting	J. J. Fisicaro
III.	Potential Violation - Operated Cycle 11 with Nonconservative Technical Specification Setpoints (285/8822-01)	K. C. Holthaus

- Background
- Statement of Problem
- TM/LP Logic
- Sequence of Events and Immediate Corrective Actions/Results Achieved
- Root Cause
- Completed Corrective Actions
- Safety Significance
- Summary/Closure

IV.	Potential Violation - Inaccurate Information Provided to NRC (285/8822-02)	J. D. Kecy

- Statement of Problem
- Sequence
- Intent of Statement
- Cause
- Future Corrective Actions Planned

V.	Closing Statement and Conclusions	K. J. Morris S. K. Gambhir

AGENDA

- BACKGROUND
- STATEMENT OF PROBLEM
- TM/LP LOGIC
- SEQUENCE OF EVENTS AND IMMEDIATE CORRECTIVE ACTIONS
- ROOT CAUSES
- COMPLETED CORRECTIVE ACTIONS
- SAFETY SIGNIFICANCE
- SUMMARY/CLOSING

BACKGROUND

- OPPD PERFORMING CYCLE 12 RELOAD ANALYSIS
- REVIEW OF CYCLE 11 SETPOINT ANALYSIS RESULTED IN FINDING TWO NONCONSERVATISMS
- IMMEDIATE CORRECTIVE ACTIONS IMPLEMENTED

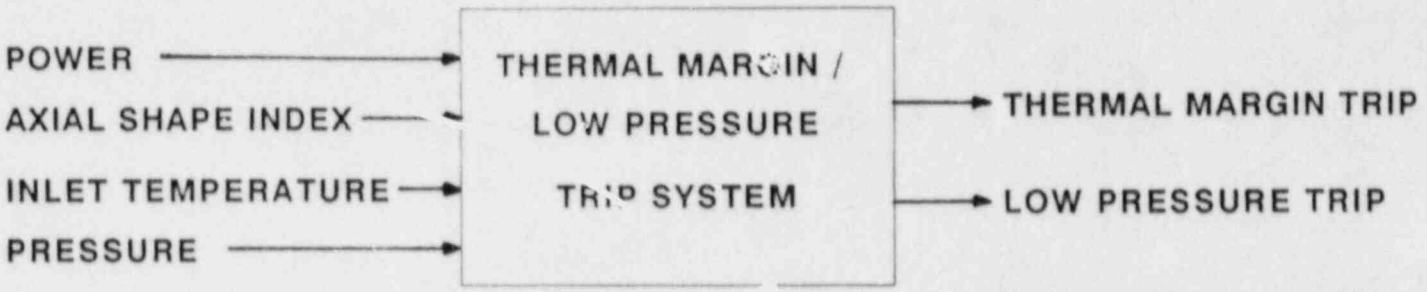
STATEMENT OF PROBLEM

APPARENT VIOLATION 285/8822-01:

- SUMMARY:
  - TM/LP TRIP FUNCTION SET IN A NONCONSERVATIVE DIRECTION BY 79 PSIA
  - ALL FOUR TM/LP CHANNELS INOPERABLE
  - APPARENT VIOLATION OF TECH. SPEC. 2.15

- OPPD ADMITS TO VIOLATION AS STATED

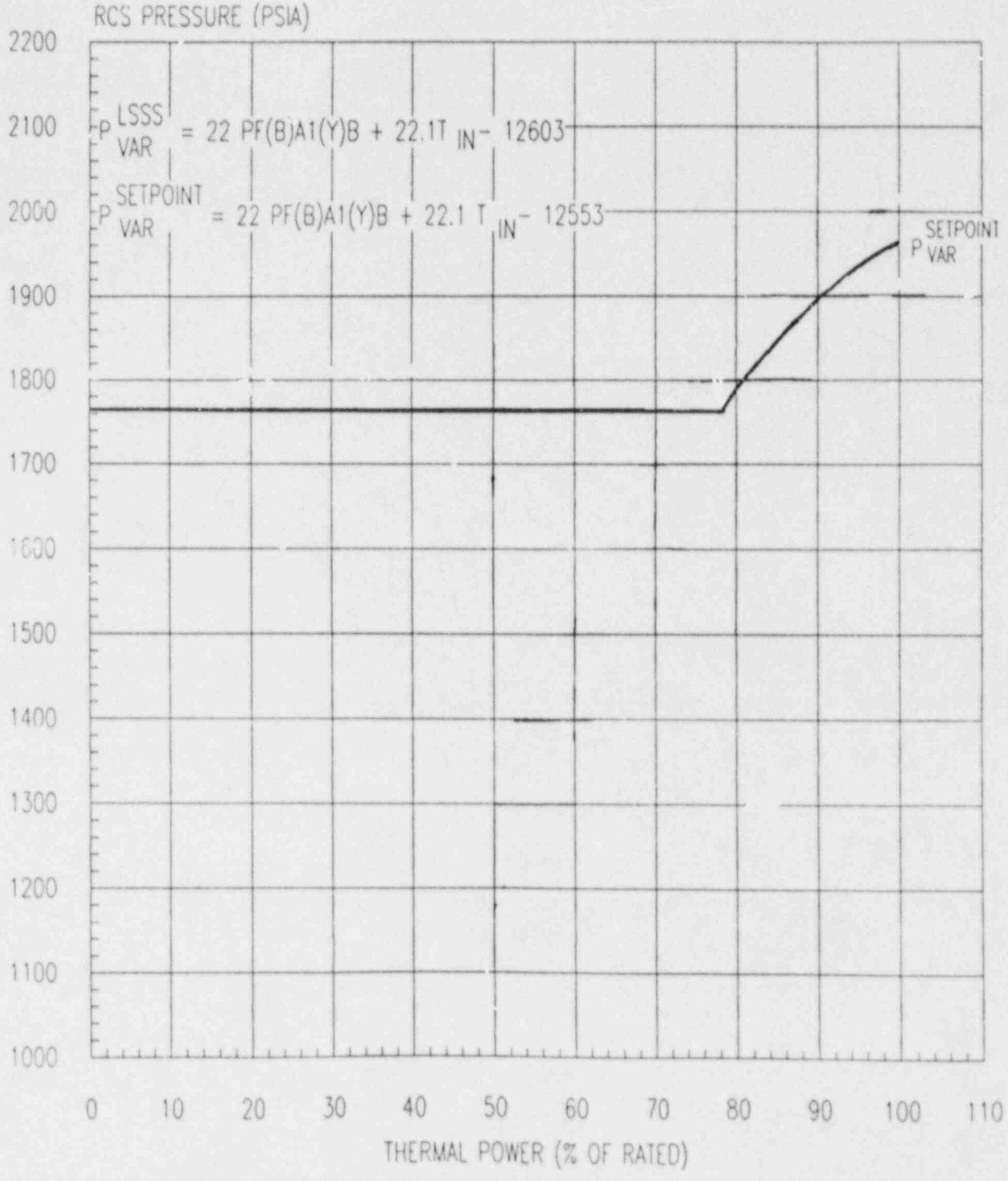
DNBR SAFDL PROTECTION
BY THE TM/LP TRIP SYSTEM



$$P_{VAR} = \alpha * PF(B) * A1(Y) * B + \beta * T_{in} + \gamma$$

THERMAL MARGIN/LOW PRESSURE CALC OF PVAR

AT Tc = 545 ASI = 0.0



SEQUENCE OF EVENTS

IMMEDIATE CORRECTIVE ACTIONS/RESULTS ACHIEVED

- JUNE 28, 1988: POSITIVE IDENTIFICATION OF ERRORS IN CYCLE 11 SETPOINT ANALYSIS (1700)
  - RADIAL PEAKING FACTOR SCALING FACTOR NOT INCLUDED - TECH. SPEC. FIG. 1-3
  - LOCA ROPM NOT UTILIZED - TECH. SPEC. FIG. 2-6
- REANALYSIS OF CYCLE 11 SETPOINTS INITIATED (1700)
- REACTOR ENGINEER NOTIFIES SHIFT SUPERVISORS AND PLANT MANAGER. INTERIM INSTRUCTIONS
- JUNE 29, 1988: PRELIMINARY ANALYSIS RESULTS (0730)
- ALL FOUR RPS TM/LP TRIP MODULES DECLARED INOPERABLE (0920)
- BEGAN RECALIBRATION WITH FOUR HOUR TIME LIMIT FOR SIGNIFICANT PROGRESS OR SHUTDOWN TO BE INITIATED (~0930)
- COMPLETION OF SETPOINT REANALYSIS
- NRC NOTIFICATION PER 10CFR50.72 (1230)
- RECALIBRATION AND SURVEILLANCE TESTING COMPLETED (1730)

ROOT CAUSES

- SETPOINT UTILITY MANUAL DID NOT ADEQUATELY DESCRIBE APPLICATION OF RADIAL PEAKING SCALING FACTOR

- TRAINING PROGRAM
  - NOT PERFORMANCE BASED
  - TRAINING WAS FRAGMENTED
  - TRAINING REQUIREMENTS NOT PROPERLY DEFINED

- INEXPERIENCED ANALYST AND REVIEWER

COMPLETED CORRECTIVE ACTIONS

- REVIEW OF CYCLE 10 SETPOINT ANALYSIS
- REVIEW OF CYCLE 11 RELOAD ANALYSES
- EXPERIENCE REQUIREMENT ON ANALYSIS VERIFICATION/INDEPENDENT REVIEW
- PERFORMANCE BASED TRAINING

FUTURE ACTIONS:

- SETPOINT UTILITY CODE MANUAL CORRECTION UNDERWAY
- EXPERIENCE REVIEW REQUIREMENT TO BE INCORPORATED INTO PROCEDURE
- INDEPENDENT REVIEW OF ALL CYCLE 12 ANALYSES TO BE DONE BY CE. FUTURE ANALYSES TO BE REVIEWED BY INDEPENDENT NON-OPPD ORGANIZATION

SAFETY SIGNIFICANCE

NO DESIGN LIMITS WERE OR WOULD HAVE BEEN VIOLATED UNDER TRANSIENT OR STEADY STATE CONDITIONS WITH RESPECT TO TECH. SPEC. FIGS. 1-3 AND 2-6

- SAFETY MARGINS EXISTED FOR PVAR EQUATION IN TECH. SPEC. FIG. 1-3 AS A RESULT OF CONSERVATIVE OPERATION BELOW TECH. SPEC. LIMITS:

    - F_R^T MARGIN OF 6.67 PERCENT (200 PSIA)

    - T_C MARGIN OF 4°F (88 PSIA)

    - THERMAL MARGIN TRIP ONLY CREDITED IN SAFETY ANALYSIS FOR TWO EVENTS; RCS DEPRESSURIZATION AND EXCESS LOAD

SUMMARY/CLOSING

- PAST EXPERIENCE (CORE FOLLOW REPORT)
- SETPOINT ERROR DETECTED BY UPGRADED OPPD RELOAD ANALYSIS PROGRAM
- CONSERVATISMS IN ANALYSIS ENSURED THAT NO VIOLATION OF DNB DESIGN LIMITS WOULD HAVE OCCURRED
- IMMEDIATE AND PROMPT CORRECTIVE ACTIONS TAKEN
- REVIEW OF PREVIOUS ANALYSIS (CYCLE 10 SETPOINTS) AND WORK UNDERWAY (CYCLE 12)
- CHANGES IN RELOAD ANALYSIS TRAINING AND REVIEWER REQUIREMENTS WILL PREVENT FUTURE OCCURRENCES OF SIMILAR PROBLEMS

APPENDIX A

DETAILED SEQUENCE OF EVENTS

- CE CONTRACTED TO ASSIST IN CYCLE 12 SETPOINT ANALYSIS

- PARTIAL REVIEW OF THE CYCLE 11 ANALYSIS BY CE ANALYST UNDER OPPD DIRECTION RAISED QUESTIONS AS TO WHETHER CERTAIN FACTORS WERE INCORPORATED INTO THIS ANALYSIS

- ON JUNE 28, 1988, TWO POTENTIAL NONCONSERVATISMS IN THE CYCLE 11 SETPOINT ANALYSIS WERE IDENTIFIED. MEETING HELD BETWEEN OPPD STAFF, REACTOR ENGINEER AND CE WHICH CONCLUDED THAT:

  1) A TEMPERATURE DEPENDENT RADIAL PEAKING FACTOR PENALTY FACTOR WAS NOT APPLIED TO DNB LSSS ANALYSIS. THIS WOULD RESULT IN A POTENTIALLY NONCONSERVATIVE PVAR EQUATION IN TECH. SPEC. FIG. 1-3.

  2) LOCA ROPM FACTOR SHOULD HAVE BEEN USED IN GENERATING TECH. SPEC. FIG. 2-6. COMPARISON TO PREVIOUS CYCLE'S MAXIMUM PERMISSIBLE POWER FOR EXCORE LHR LOC MONITORING INDICATED THIS POWER SHOULD BE APPROXIMATELY 85 PERCENT.

  3) SIGNIFICANT MARGINS EXISTED BETWEEN THE OPERATING VALUES OF F_{XY}^T, F_R^T AND T_C AND THEIR RESPECTIVE TECH. SPEC. LIMITS. IF NONCONSERVATISM EXISTED IN 1 AND 2 ABOVE, THESE MARGINS SHOULD BE SUFFICIENT TO PREVENT VIOLATION OF ANY SAFDL.

- REVIEW OF CYCLE 10 SETPOINT ANALYSIS TO ENSURE CORRECT APPLICATION OF METHODOLOGY.

- CE WAS DIRECTED TO REANALYZE THE CYCLE 11 SETPOINTS AND PROVIDE:

  1) A QUANTIFICATION OF NONCONSERVATISMS IN TECH. SPEC. FIGS. 1-3 AND 2-6, IF THEY WERE NONCONSERVATIVE

  2) A DETERMINATION OF ANY OTHER CYCLE 11 SETPOINT NONCONSERVATISMS, IF THEY EXISTED

- REANALYSIS INITIATED AT APPROXIMATELY 1700 JUNE 28, 1988

- REACTOR ENGINEER NOTIFIED ON DUTY P.M. SHIFT SUPERVISOR OF ERROR IN TECH. SPEC. FIG. 2-6 AND POTENTIAL TECH. SPEC. FIG. 1-3 NONCONSERVATISM. CONSERVATIVE INSTRUCTIONS PROVIDED TO SHIFT SUPERVISOR INCLUDED:

  1) BRING REACTOR TO 80 PERCENT INSTEAD OF 90 PERCENT IF TECH. SPEC. FIG. 2-6 REQUIRED TO BE ENTERED. 80 PERCENT PREVIOUSLY DETERMINED TO BE CONSERVATIVE

  2) REACTOR ENGINEER TO BE NOTIFIED IN EVENT OF ITEM 1 ABOVE

  3) UNIT TO BE MAINTAINED AT 90 PERCENT POWER AND T_C AT 541°F TO GAIN ADDITIONAL THERMAL MARGIN AND PREVENT ANY POTENTIAL REACTIVITY CHALLENGE RESULTING FROM CHANGING CURRENT OPERATING PARAMETERS

- REACTOR ENGINEER CALLED PLANT MANAGER AND APPRISED HIM OF ABOVE EVENTS. LCO NOT ENTERED BECAUSE QUANTIFICATION OF FIGURE 1-3 HAD NOT BEEN COMPLETED. REACTOR ENGINEER INSTRUCTED TO CALL MANAGER - ADMINISTRATIVE AND TRAINING SERVICES

- PLANT MANAGER CALLED SHIFT SUPERVISOR TO CONFIRM THAT UPON ENTRY INTO TECH. SPEC. FIG. 2-6 AN IMMEDIATE POWER REDUCTION TO 80 PERCENT WOULD OCCUR

- MANAGER - ADMINISTRATIVE AND TRAINING SERVICES COMMUNICATED WITH OTHER MANAGEMENT PERSONNEL

- REACTOR ENGINEER AGAIN CALLED PM SHIFT SUPERVISOR. GUIDANCE PROVIDED THAT VHPT NOT TO BE RESET - LIMITS POWER INCREASES TO 10 PERCENT BEFORE TRIP RESULT

- TECHNICAL DATA BOOK UPDATE FIGURES FOR EXCORE MONITORING OF LHR LCO AND TM/LP TRIP/PRE-TRIP WERE APPROVED BY THE PRC ON JULY 1, 1988

- OPS MEMO 88-05 (JULY 1, 1988) INSTRUCTED OPERATIONS PERSONNEL TO UTILIZE THE ABOVE TDB FIGURES IN LIEU OF CORRESPONDING TECHNICAL SPECIFICATIONS

- OPTIMIZED SETPOINT ANALYSIS COMPLETED BY CE CONFIRMED THAT THE REQUIRED TM/LP ADJUSTMENT WAS 47 PSIA AS OPPOSED TO THE EARLIER CONSERVATIVE CALCULATION OF 79 PSIA

APPENDIX B

SAFETY SIGNIFICANCE

NO SAFETY LIMITS WERE OR WOULD HAVE BEEN VIOLATED UNDER TRANSIENT OR STEADY STATE CONDITIONS WITH RESPECT TO TECH. SPEC. FIGS. 1-3 AND 2-6

- SAFETY MARGINS EXISTED FOR PVAR EQUATION IN TECHNICAL SPECIFICATION FIGURE 1-3:

  - MAX. F_R^T DURING CYCLE WAS 1.68 VS. TECH. SPEC. LIMIT OF 1.80. RESULT IS 6.67 PERCENT MARGIN IN F_R^T OR APPROXIMATELY 200 PSIA IN PVAR. OFFSETS NONCONSERVATISM OF 79 PSIA (2.63 PERCENT F_R^T) AND STILL MAINTAINS MARGINS OF 121 PSIA OR 4.04 PERCENT F_R^T

  - OPTIMIZED ANALYSIS SHOWS REQUIRED PVAR ADJUSTMENT OF 47 PSIA WHICH RESULTS IN EVEN GREATER MARGIN OF 153 PSIA OR 5.11 PERCENT IN F_R^T

  - OPERATION AT A CORE INLET TEMPERATURE (T_C) OF 541°F RESULTS IN AN ADDITIONAL MARGIN GAIN OF APPROXIMATELY 88 PSIA WHICH IS SUFFICENT TO OFFSET THE 47 PSIA NONCONSERVATISM

  - THERMAL MARGIN TRIP ONLY CREDITED IN SAFETY ANALYSIS FOR TWO EVENTS; RCS DEPRESSURIZATION AND EXCESS LOAD

  - THERMAL MARGIN TRIP REACHES LOW PRESSURE TRIP FLOOR AT APPROXIMATELY 72 PERCENT POWER. BELOW THIS POWER LEVEL, A LOW PRESSURE TRIP WILL OCCUR

- SAFETY MARGIN EXISTED IN TECH. SPEC. FIG. 2-6:

  - MAXIMUM F_{XY}^T DURING CYCLE WAS 1.72 VS. TECH. SPEC. LIMIT OF 1.85. RESULT IS A 7.03 PERCENT MARGIN IN F_{XY}^T. SUFFICIENT TO OFFSET 4 PERCENT POWER NONCONSERVATISM IN FIG. 2-6 AND STILL MAINTAIN A MARGIN OF 3.03 PERCENT

  - TECH. SPEC. FIG. 2-6 HAS NOT BEEN ENTERED SINCE THE VERY EARLY FUEL CYCLES FOR FORT CALHOUN. SHOULD LOSS OF THE INCORE MONITORING SYSTEM HAVE OCCURRED ON JUNE 28, 1988, ENTRY INTO TECH. SPEC. FIG. 2-6 WOULD NOT HAVE BEEN REQUIRED UNTIL JULY 1, 1988 WHEN THE LAST VALID INCORE POWER DISTRIBUTION WOULD EXPIRE

- STATEMENT OF PROBLEM

- CAUSE

- CORRECTIVE ACTION

SEQUENCE

- JUNE 28
  - ANALYTICAL ERRORS IDENTIFIED
  - INFORMED EVENING SS
  - INFORMED PLANT MANAGER
  - INFORMED NIGHT SS
- JUNE 29
  - IMPACT OF ERRORS
  - NRC BRIEFING
  - PRC-LOC CONDITION
  - NRC FOUR HOUR REPORT
  - RECALIBRATION OF RPS
  - NIGHT NOTES
- JUNE 30
  - TELEPHONE DISCUSSION WITH NRC (OPPD INITIATED)
- JULY 1
  - TECH. DATA BOOK FIGURES
  - OPS MEMO
  - TRANSMITTAL TO NRC

- INTENT OF STATEMENT

- SS'S WERE ALL KEPT CURRENT ON THE SITUATIONS

- SS'S WERE APPRISED OF ALL APPROPRIATE ACTIONS

- PLANT IN SAFE CONDITION AT ALL TIMES

- SS WAS DIRECTED TO RECORD CONVERSATION IN SS LOG

- ACTUAL STATEMENT JULY 1, 1988 LETTER TO NRC

SS PLACED IN HIS LOG INSTRUCTIONS THAT IF ANY SITUATION AROSE, THE UNIT WOULD BE BROUGHT TO 80 PERCENT, NOT THE 90 PERCENT STATED IN TECH. SPEC. FIG. 2.6

CORRECTIVE ACTION

- CORRECTED LETTER (COMPLETE)

- ADDITIONAL EMPHASIS ON
  ADEQUACY OF REVIEW (ON-GOING)

- PERSONAL ACCOUNTABILITY (ON-GOING)