



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION IV

611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011 8064

DEC 23 1995

Omaha Public Power District
ATTN: T. L. Patterson, Division Manager
Nuclear Operations
Fort Calhoun Station FC-2-4 Adm.
P.O. Box 399, Hwy. 75 - North of Fort Calhoun
Fort Calhoun, Nebraska 68023-0399

SUBJECT: MANAGEMENT MEETING REGARDING EMERGENCY DIESEL GENERATOR OPERABILITY

This refers to the meeting conducted in the Region IV office on December 21, 1995. This meeting related to the circumstances surrounding the acceleration of Emergency Diesel Generator 1 to 900 rpm rather than 500 rpm immediately following a reactor trip that occurred on August 24, 1995. The meeting agenda included a discussion of the event, root cause and engineering evaluation of the event, and corrective actions taken and lessons learned from the event.

Based on your presentation at the meeting, we believe your root cause and engineering evaluation of the event were comprehensive. Your corrective actions described in the meeting appeared appropriate and thorough.

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,

J. E. Dyer, Director
Division of Reactor Projects

Docket: 50-285
License: DPR-40

Enclosures:
1. Attendance List
2. Meeting Presentation

cc w/enclosures:
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Washington County Board
of Supervisors
ATTN: Jack Jensen, Chairman
Blair, Nebraska 68008

Nebraska Department of Health
ATTN: Cheryl Rogers, LLRW Program Manager
Environmental Protection Section
301 Centennial Mall, South
P.O. Box 95007
Lincoln, Nebraska 68509-5007

Nebraska Department of Health
ATTN: Dr. Mark B. Horton, M.S.P.H.
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Fort Calhoun Station
ATTN: James W. Chase, Manager
P.O. Box 399
Fort Calhoun, Nebraska 68023

DEC 28 1995

bcc to DMB (IE45)

bcc distrib. by RIV:

L. J. Callan

DRS-PSB

Branch Chief (DRP/A)

RIV File

Senior Resident Inspector - Cooper

Resident Inspector

MIS System

Project Engineer (DRP/A)

Branch Chief (DRP/TSS)

Leah Tremper (OC/LFDCB, MS: TWFN 9E10)

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ENCLOSURE 1

LIST OF ATTENDEES

December 21, 1995, Meeting

OPPD

- T. Patterson, Division Manager, Nuclear Operations
- G. Gates, Vice President, Nuclear
- S. Gambhir, Division Manager, Production Engineering Division
- D. Trausch, Manager - Nuclear Licensing and Industry Affairs
- J. Chase, Manager, Fort Calhoun Station

NRC

- A. Howell, Acting Deputy Director, Division of Reactor Projects (DRP)
- K. Brockman, Deputy Director, Division of Reactor Safety
- J. Pellet, Acting Chief, Project Branch A, DRP
- R. Kopriva, Project Engineer, Project Branch A, DRP

ENCLOSURE 2

FORT CALHOUN STATION



**OMAHA PUBLIC POWER DISTRICT
NRC/OPPD MANAGEMENT
MEETING
DECEMBER 21, 1995**

NRC DIESEL GENERATOR OPERABILITY MANAGEMENT MEETING AGENDA

- I. OPENING REMARKS Gary Gates

- II. EVENT DISCUSSION Jim Chase

- III. ROOT CAUSE ANALYSIS Terry Patterson

- IV. ENGINEERING EVALUATION Sudesh Gambhir

- V. CORRECTIVE ACTIONS/ LESSONS LEARNED Terry Patterson

- VI. MANAGEMENT ISSUES/ CLOSING REMARKS Gary Gates

EVENT DISCUSSION

■ **NORMAL OPERATION**

- Standby in Low Speed Start 500 RPM

■ **WILL AUTO START IN FAST SPEED IF:**

- Actuation of OPLS
- Low Bus Voltage on 1A3 or 1A4
- Test Switch Selected to Full Speed

EVENT DISCUSSION (CONT.)

■ EVENT

- Apparently Adjusted the Voltage Regulator Switch
- Event of 3/27/95 Refueling Outage

■ PRC DISCUSSION OF APRIL 5, 1995

- Engineering Findings
- Administrative Controls Appeared Adequate
- Reportability Discussions
- Operator Issues
 - Procedures
 - Indication
 - Past Practice

EVENT DISCUSSION (CONT.)

- PRC DISCUSSION OF JUNE 1995

- AUGUST 24, 1995 REACTOR TRIP

- AUGUST 28, 1995 PRC MEETING

EVENT DISCUSSION (CONT.)

■ PRC REFUELING ISSUES

- Members Not Part of Outage Management
- PRC Maintains Independent Oversight of Refueling
- Handle Significant Issues Separate From Outage Management
- Independent Review of Refueling Outage
 - Startup Issues Addressed
- Special Work Assignment Team (SWAT) Issues Handled

ROOT CAUSE ANALYSIS

■ CAUSES

- Incorrect Control Switch Manipulated
 - Governor and Voltage Regulator Switches Identical
- Training/Documentation
 - Importance of Governor in Idle Speed Position not Fully Understood
- Failure to Implement PRC Meeting (April 5, 1995) Actions in a Timely Manner
- No Positive Position Indication
- Inadequate Administrative Controls
 - No Independent Position Verification

ENGINEERING EVALUATION OF MARCH 27, 1995 EVENT

- Engineering Assistance Request (EAR) Initiated by System Engineering on March 27, 1995

- EAR Response Completed by Design Engineering on April 4, 1995

■ **SIGNIFICANT EAR CONCLUSIONS**

- No Design Calculation/Analysis was Available to Justify D/G Operability with the Governor Left in Full Speed Position.
- The Problem would not be Expected During Normal Operation because D/G Surveillance Test Procedures and OIs Contain Direction to Run Back the Governor

ENGINEERING EVALUATION OF MARCH 27, 1995 EVENT (CONT.)

■ CORRECTIVE ACTIONS

- Procedure Review to Verify Administrative Controls
- PRC Request to Evaluate Possibility of Adding D/G Governor Switch Position Indication

■ MANAGEMENT ISSUES

- Engineering Should have been more Aggressive in Conveying the Importance of Running Back the Governor
- Engineering Should have Recommended Independent Verification of Governor Position
- PRC Action Item Dealing with Addition of Governor Position Indication Should have been Assigned Higher Priority

ENGINEERING EVALUATION OF AUGUST 24, 1995 EVENT

- INITIAL EVALUATION

- FINAL EVALUATION

- OBJECTIVE
 - Determine the Performance of D/G No. 1 for an Offnormal Loading Sequence

- SCENARIO ANALYZED
 - D/G No. 1 Starts to Full Speed Instead of Idle Speed

 - Loss of Offsite Power

 - The D/G Attempts to Start all 480V Loads Operating Before the Loss of Offsite Power.

ENGINEERING EVALUATION OF AUGUST 24, 1995 EVENT (CONT.)

■ **RESULTS OF ANALYSIS**

- 480V Load Center Load Shed Successful
- The ESF Loads Sequence on the D/G as Designed
- Time Delay Uncertainties do not Impact Analysis Results
- Analysis Representative of Bounding Conditions

■ **OTHER AREAS REVIEWED FOR ADVERSE IMPACT**

- Effect on ESF Motor Acceleration Time
- Motor Current Transients

ENGINEERING EVALUATION OF AUGUST 24, 1995 EVENT (CONT.)

- Motor Starts - Thermal Damage
- Affects on the Diesel Generator Exciter
- Diesel Engine Mechanical Loading

- **NO ADVERSE IMPACTS FOUND**

- **ELECTRICAL TRANSIENT ANALYSIS
PROGRAM (ETAP) COMPUTER PROGRAM**
 - Validated Against Test Data
 - EPRI Independent Validation
 - Results Independently Reviewed by
Stone and Webster

- **THE ANALYSIS IS CONSIDERED TO BE
BOUNDING**

CORRECTIVE ACTIONS

■ COMPLETED

3/95 IR and EAR Request Written

4/95 IR Discussed in PRC

- System Engineering CID (assigned to Verify Controls in Place to Control the D/G Governor Setting)
- DEN Assigned to Perform an Evaluation to Assess whether a Supervisory Circuit is needed for the Lower Position of the D/G Governor
- System Engineering Confirmed that Procedures Addressed Online Operation

6/95 SE Informs PRC that DG Procedures Reviewed and Refueling Test OP-FT-DG-0001, "183 Master Electrical Switch (183/MES) Functional Test", is Only Procedure without Rundown Step.

CORRECTIVE ACTIONS (CONT.)

8/95 One Hour Notification made.

9/95 Operator Training

- Events Reviewed
- Emphasized Importance of D/G Governor being Run Back to Idle Speed
- PRC Action Item Issued on Operability Evaluation
- D/G Procedures Revised
 - Require Local, Independent Verification of Governor Run Back
 - Caution added on D/G Operability Involving Governor Position
 - Step in Surveillance Test to Run Down Governor prior to Starting Test Removed from Procedures

CORRECTIVE ACTIONS (CONT.)

- Implemented Peer Verification
- 10/95 D/G Loading Capability Analysis
- Generic Implications Review completed for Inclusion in revision 1 to LER 95-006
- 12/95 Governor Position Indication Modification
- Different Governor and Voltage Regulator Control Switches

■ IN PROGRESS

- Update Applicable Design Basis Documents (December 31, 1995)
- Self-Checking and Peer Verification Training (February 29, 1996)
 - All Licensed and Non-Licensed Operators

CORRECTIVE ACTIONS (CONT.)

- PRC Member Case Study (February 29, 1996)
 - Will be Included as Initial Training for new PRC Members

- NSRG Independent Review of Other Equipment For Potential Similar Problems (August 31, 1996)

MANAGEMENT ISSUES

- **FAILURE TO COMMUNICATE D/G IDLE SPEED CONCERNS TO OPERATIONS PERSONNEL UNTIL AUGUST 24, 1995 EVENT**

- **FAILURE TO IMPLEMENT TIMELY CORRECTIVE ACTIONS**
 - New Condition Reporting System Implemented In September 1995
 - Broader Review Of Issues/Problems

 - Daily Tracking Of Outstanding Operability Evaluations (NOD-QP-31)