



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION IV  
611 RYAN PLAZA DRIVE, SUITE 400  
ARLINGTON, TEXAS 76011-8064

**AUG 29 1996**

PREDECISIONAL ENFORCEMENT CONFERENCE SUMMARY

Licensee: Nebraska Public Power District

Facility: Cooper Nuclear Station

License No.: DPR-46

Docket No.: 50-298

EA Number: 96-226

On August 27, 1996, representatives of the Nebraska Public Power District met with NRC personnel in the Region IV office located in Arlington, Texas, to discuss the apparent violation identified in NRC Inspection Report 50-298/96-10. The conference was held at the request of Region IV.

The violation concerned the past inoperability of core spray injection valve CS-12A with respect to its operation during a postulated pressure locking scenario. The licensee presented a summary of the causes for the apparent violation and the corrective actions they had taken. The licensee admitted that the violation had occurred, but opined that the errors contributing to the violation had occurred predominantly in the past and prior to improvements that had been made to the corrective action process. The NRC's decisions concerning the significance of this occurrence and the regulatory response will be addressed in a separate correspondence.

The attendance list and the licensee's presentation are enclosures to this summary.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this summary and its enclosures will be placed in the NRC Public Document Room.

Enclosures:

1. Attendance List
2. Licensee Presentation

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PDR ADOCK 05000298  
G PDR

cc w/o Enclosure 2:  
Guy R. Horn, Vice President - Nuclear  
Nebraska Public Power District  
1414 15th Street  
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John R. McPhail, General Counsel  
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John Mueller, Site Manager  
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Robert C. Godley, Nuclear Licensing  
& Safety Manager  
Nebraska Public Power District  
P.O. Box 98  
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R. J. Singer, Manager-Nuclear  
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907 Walnut Street  
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Chairman  
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Cheryl Rogers, LLRW Program Manager  
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Nebraska Department of Health  
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Dr. Mark B. Horton, M.S.P.H.  
Director  
Nebraska Department of Health  
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Lincoln, Nebraska 68509-5007

R. A. Kucera, Department Director  
of Intergovernmental Cooperation  
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Kansas Radiation Control Program Director

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DRP Director  
Branch Chief (DRP/C)  
Branch Chief (DRP/TSS)  
Project Engineer (DRP/C)

Resident Inspector  
DRS-PSB  
MIS System  
RIV File  
Leah Tremper (OC/LFDCB, MS: TWFN 9E10)

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08/1/96	08/1/96	08/1/96	08/1/96

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MFRunyan/lmb	CAVanDerburgh	ECollins	KEBrockman
08/1/96	08/1/96	08/1/96	08/1/96

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ENCLOSURE 1

LIST OF PERSONNEL ATTENDING EA 96-226 ENFORCEMENT CONFERENCE AUGUST 27,  
1996

Nebraska Public Power District

M. Boyce, Acting Senior Engineering Manager  
S. Freborg, Maintenance Engineering Supervisor  
J. Gausman, Plant Engineering Manager  
R. Godley, Licensing Manager  
P. Graham, Site Manager  
G. Horn, Vice President, Energy  
C. Moeller, Licensing Engineer  
R. Thacker, MOV Program Engineer

Mid American Energy

W. Turnbull, Senior Nuclear Engineer

Lincoln Electric System

R. Stoddard, Chief Plant Engineer

Nuclear Regulatory Commission

W. Beckner, Project Manager  
E. Collins, Chief, Reactor Projects Branch C  
J. Dyer, Director, Division of Reactor Projects  
T. Gwynn, Acting Deputy Regional Administrator  
C. Myers, Reactor Inspector  
M. Runyan, Reactor Inspector  
G. Tracy, Acting Deputy Director, Division of Reactor Safety  
C. VanDenburgh, Chief, Engineering Branch  
G. Vasquez, Enforcement Specialist

Nuclear Regulatory Commission- participating via telephone

P. Campbell, Mechanical Engineering Branch, NRR  
S. Tingen, NRR  
J. Wiedenhamer, RES

ENCLOSURE 2

COPY OF SLIDES PRESENTED BY NEBRASKA PUBLIC POWER DISTRICT DURING  
PREDECISIONAL ENFORCEMENT CONFERENCE EA 96-226, AUGUST 27, 1996

**APPARENT VIOLATION OF CRITERION XVI**

**CS-MOV-MO12A**

**NEBRASKA PUBLIC POWER DISTRICT  
ENFORCEMENT CONFERENCE  
AUGUST 27, 1996**



## APPARENT VIOLATION OF CRITERION XVI

### AGENDA

- OPENING REMARKS P. GRAHAM
- APPARENT VIOLATION 298/9610-02 S. FREBORG
- SYSTEM DESCRIPTION S. FREBORG
- TIMELINE OF KEY EVENTS S. FREBORG
- CAUSE OF VIOLATION S. FREBORG
- CORRECTIVE ACTIONS S. FREBORG
- SAFETY SIGNIFICANCE R. GODLEY
- MITIGATION CONSIDERATIONS R. GODLEY
- SUMMARY M. BOYCE
- CONCLUDING REMARKS P. GRAHAM

## APPARENT VIOLATION OF CRITERION XVI

### APPARENT VIOLATION 298/9610-02

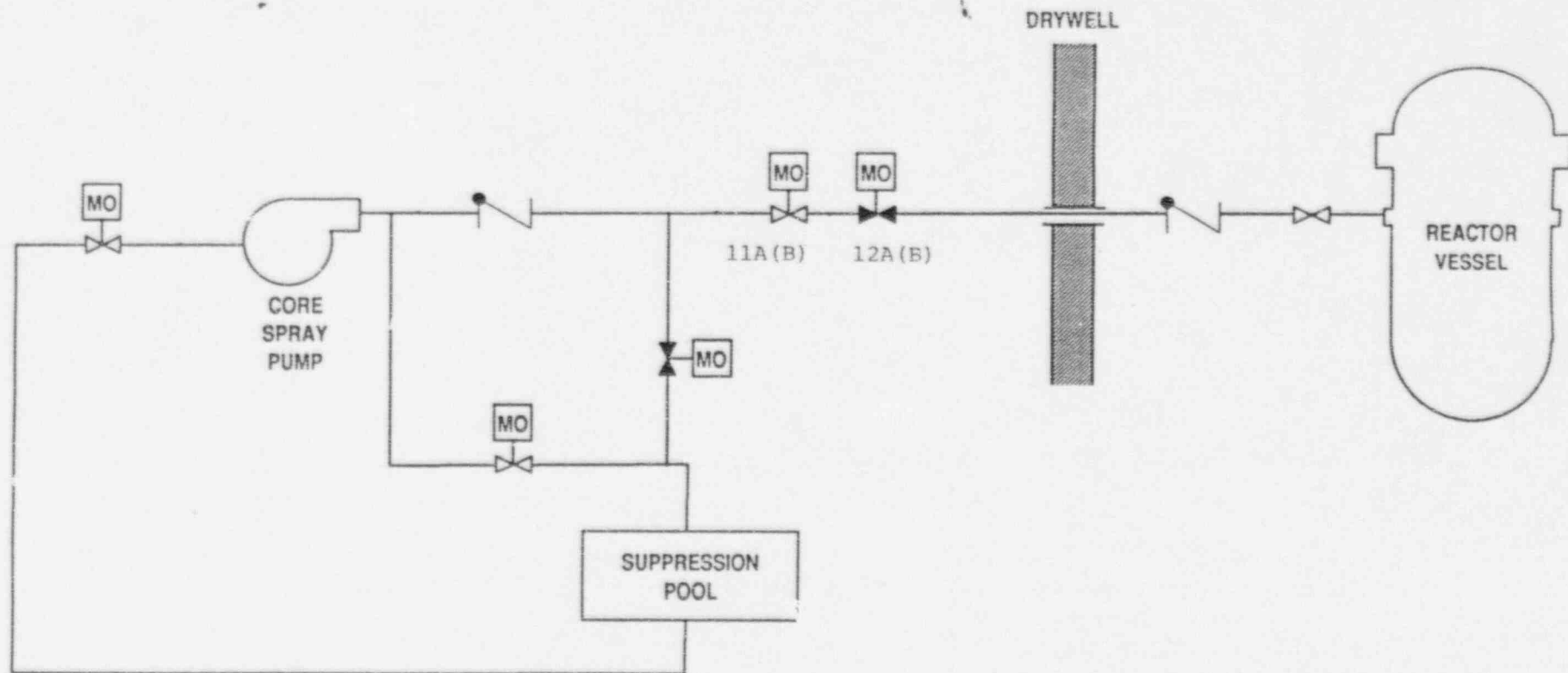
"The licensee may have operated Cooper Nuclear Station for an extended period of time with Valve CS-MO12A in an inoperable condition. This time period extended from April 1993 when the torque switch setting of this valve was likely raised to meet the demands of the Generic Letter 89-10 program, thereby increasing the static pullout thrust to 23,500 pounds. The licensee had an opportunity to identify the inoperable condition following the November 1994 contractor report and in conjunction with the NRC inspection of September 1995. However, the fact that the licensee had misinterpreted the previous static diagnostic trace of CS-MO12A (erroneously measuring a static pullout thrust of 5500 pounds) led to a missed opportunity to identify the inoperable condition.

Criterion XVI of 10 CFR Part 50, Appendix B, requires that significant conditions adverse to quality be promptly identified and corrected. The licensee's failure to promptly identify and correct this significant condition adverse to quality is an apparent violation (298/9610-02)."

**APPARENT VIOLATION OF CRITERION XVI**

**NPPD POSITION**

- **NPPD AGREES WITH VIOLATION OF CRITERION XVI**
- **OPPORTUNITIES TO IDENTIFY INOPERABLE CONDITION MISSED**



**CORE SPRAY SYSTEM**

## **APPARENT VIOLATION OF CRITERION XVI**

### **TIMELINE OF KEY EVENTS**

#### **10/21/91    STATIC TEST OF CS-MOV-MO12A**

- Static pullout thrust of 20,512 lbs recorded

#### **09/17/92    SCREENING EVALUATION FOR IN 92-026**

- CS-MOV-12A/B potentially susceptible to pressure locking
- Engineering study (Study 92-144) commissioned

#### **03/15/93    RESULTS OF BONNET DECAY CALCULATION (STUDY 92-144)**

- Indicate CS-MOV-MO12A/B would not pressure lock
- Assumed 5762 lbs (80 % of minimum required closing thrust); not 10/21/91 test data
- Nonconservative assumption not detected during review and approval

## **APPARENT VIOLATION OF CRITERION XVI**

### **TIMELINE OF KEY EVENTS (Cont.)**

#### **04/26/93    STATIC TEST ON CS-MOV-MO12A**

- Sensor thrust reversal anomaly not identified
- Converted to VOTES MOV diagnostic system during 1993 outage
- Incorrect interpretation: pullout thrust of 5483 lbs recorded
- Pullout thrust not compared to 10/21/91 test

#### **05/05/93    RESULTS OF SUSCEPTIBILITY EVALUATION FOR GL 89-10 VALVES RECEIVED**

#### **06/16/93    ENGINEERING WORK REQUEST (EWR) WRITTEN**

- Would modify CS-MOV-12A/B to preclude pressure locking
- EWR later combined with additional work involving CS-MOV-MO12A/B (LLRT test connections) and scheduled for 1995 outage

## **APPARENT VIOLATION OF CRITERION XVI**

### **TIMELINE OF KEY EVENTS (Cont.)**

**10/08/93 INSPECTION 93-08**

- Violation for potentially malfunctioning valve CS-MOV-MO5A
- Subsequent review of test data, traces for anomalies reveals no additional MOV operability concerns

**11/14/94 DRAFT REVISION 1 OF SUSCEPTIBILITY EVALUATION**

- No basis to question existing calculation
- Valves already scheduled for modification

**12/01/94 IR 93-08, ITEM 93-08-16 (Pressure Locking and Thermal Binding Methodology)  
SCREENED**

- Not a restart item
- Based upon 1993 calculation

## **APPARENT VIOLATION OF CRITERION XVI**

### **TIMELINE OF KEY EVENTS (Cont.)**

**06/01/95    FORMATION OF NEW CNS GL 89-10 MOV TEAM**

**09/25/95    NRC REGION IV INSPECTION (IR 95-13)**

- **Challenged 1993 calculation methodology**
- **Alternate Capability Methodology (Entergy) subsequently used to demonstrate capability of CS-MOV-MO12A/B**
- **Used pullout thrust from 04/26/93 test (5483 lbs)**

**10/19/95    AS-FOUND TESTING OF CS-MOV-MO12A**

- **Conducted as part of MOV test program prior to valve modification**
- **Recorded pullout thrust of 23,572 lbs**



## APPARENT VIOLATION OF CRITERION XVI

### TIMELINE OF KEY EVENTS (Cont.)

- 10-12/95    MODIFIED CS-MOV-MO12A/B -- Precludes pressure locking
- 01/04/96    COMPARISON OF AS-FOUND CS-MOV-MO12A/B TEST DATA TO ENTERGY  
METHODOLOGY CALCULATION
- Subsequent review of previous test (04/26/93) reveals undetected sensor thrust reversal anomaly
  - Assessments of past operability begin

## **APPARENT VIOLATION OF CRITERION XVI**

### **CAUSE OF VIOLATION**

- **ROOT CAUSE -- MANAGEMENT INATTENTION TO THE GL 89-10 MOV PROGRAM -- PROGRAM WAS BELOW STANDARDS**
  - **WEAK CALCULATION DESIGN INPUT VERIFICATION/VALIDATION PROCESS, PARTICULARLY WITH VENDOR PREPARED CALCULATIONS**
    - **Inadequate Review of Vendor Prepared Bonnet Pressure Decay Calculation**
  - **FAILURE TO PROPERLY EVALUATE TEST TRACE ANOMALIES**
    - **Failure to Detect Sensor Thrust Reversal Anomaly**
    - **Ineffective Review of Test Data Following 1993 CS-MOV-MO5A Violation**
  - **INADEQUATE TRENDING SYSTEM FOR MOV TEST RESULTS**
    - **Failure to Detect Disparity Between 10/21/91 Data (20,512 Lbs) and the 04/26/93 Test Data (5483 Lbs)**

## **APPARENT VIOLATION OF CRITERION XVI**

### **CORRECTIVE ACTIONS**

- **ACTIONS TO ASSURE OPERABILITY**
  - **CS-MOV-MO12A/B MODIFIED DURING 1995 REFUELING OUTAGE TO PRECLUDE PRESSURE LOCKING**
  - **TEST TRACES FOR MOV5 NOT TESTED DURING RE-16 REVIEWED FOR ANOMALIES**
  - **COMMISSIONED GENERAL ELECTRIC EVALUATION OF ONE CORE SPRAY AVAILABLE SCENARIO**

## **APPARENT VIOLATION OF CRITERION XVI**

### **CORRECTIVE ACTIONS (Cont.)**

- **HIGH LEVEL MANAGEMENT ATTENTION FOCUSED ON MOV PROGRAM**
  - **DELAYED FORCED OUTAGE RESTART TO TEST VALVES, REVIEW PROGRAM**
    - **Major Effort to Evaluate Valve Capability by Reviewing Design Setups and Test Outputs**
    - **Retained Industry Experts in Program Management, Engineering**
    - **Significant Management Commitment and Support**
    - **Increased Expectations and Standards for MOV Program**
    - **Embarked on Significant Technical Upgrade**
  - **NEW MOV TEAM FORMED AT CNS JUNE 1995**
    - **Ownership and Accountability Emphasized**

## **APPARENT VIOLATION OF CRITERION XVI**

### **CORRECTIVE ACTIONS (Cont.)**

- **DESIGN INPUT VERIFICATION/VALIDATION PROCESS STRENGTHENED**
  - **ENGINEERING PROCEDURE 3.4.7, "DESIGN CALCULATIONS"**
  - **ENGINEERING PROCEDURE 3.4.8, "DESIGN VERIFICATION"**
  
- **MOV PROJECT PROCEDURES AND RELATED MAINTENANCE PROCEDURES REVISED TO PRECLUDE MISINTERPRETATION OF TEST DATA**
  - **ENGINEERING PROCEDURE 3.33, "MOTOR OPERATED VALVE PROGRAM"**
  - **MAINTENANCE PROCEDURE 7.5.2, "VOTES TESTING OF RISING STEM MOTOR OPERATED VALVES"**
  - **MAINTENANCE PROCEDURE 7.5.7, "VOTES TEST ANALYSIS OF RISING STEM MOTOR OPERATED VALVES"**

## **APPARENT VIOLATION OF CRITERION XVI**

### **CORRECTIVE ACTIONS (Cont.)**

- **TRENDING PROGRAM IMPLEMENTED**
  - **ESTABLISHED PROJECT PROCEDURE IN MARCH 1994**
    - **Now included in Engineering Procedure 3.33**
  - **ELECTRONIC MOV PARAMETER TRENDING PLANNED**
- **MOV DATABASE IMPROVED**
  - **MOV DESIGN BASIS CALCULATIONS BEING PLACED ON ELECTRONIC MEDIUM**
  - **CONFIGURATION DATABASE DEVELOPED**

APPARENT VIOLATION OF CRITERION XVI

SAFETY SIGNIFICANCE

- ACTUAL CONSEQUENCES -- NONE

## APPARENT VIOLATION OF CRITERION XVI

### SAFETY SIGNIFICANCE (Cont.)

- POTENTIAL CONSEQUENCES -- MINIMAL
  - CS-MOV-MO12B OPERABLE
  - CS-MOV-MO12A INOPERABLE ONLY ASSUMING WORST CASE DEGRADED VOLTAGE CONDITIONS DURING LOSS OF OFFSITE POWER SCENARIO (LER 96-002)
    - Current CNS Accident Analysis Does Not Evaluate Scenario with Only One Core Spray Subsystem
    - Subsequent General Electric Evaluation Indicates 10CFR50.46 ECCS Limits Met
    - Risk Studies Confirm Minimal Impact



## **APPARENT VIOLATION OF CRITERION XVI**

### **SAFETY SIGNIFICANCE (Cent.)**

- **REGULATORY SIGNIFICANCE -- FAILURE TO PROMPTLY IDENTIFY AND RESOLVE MOV ISSUE**
  - **SPECIFIC MISTAKES IN 1993 CAUSED INCORRECT CONCLUSIONS IN 1994/1995**
    - **Nonconservative Assumption in Bonnet Pressure Decay Calculation in 3/93**
    - **Failure to Recognize Sensor Reversal on 4/26/93**
    - **4/26/93 Data Utilized in Entergy Methodology Calculation**
    - **Ineffective Review of Test Data Following 1993 CS-MOV-MO5A Violation**
  - **PAST EVENTS NOT INDICATIVE OF CURRENT PERFORMANCE**

## APPARENT VIOLATION OF CRITERION XVI

### MITIGATION CONSIDERATIONS

- IDENTIFICATION FACTOR -- OPPORTUNITIES WERE MISSED TO ADDRESS THE MOV ISSUE
  - PROPOSED VIOLATION ADDRESSES TIMELINESS
  - ENFORCEMENT POLICY (SECTION VI.B.2.b) DISCOURAGES "DOUBLE COUNTING"
- CORRECTIVE ACTIONS FACTOR -- LASTING CORRECTIVE ACTIONS HAVE BEEN TAKEN
  - VALVES WERE MODIFIED TO PRECLUDE PRESSURE LOCKING
  - MOV PROGRAM HAS BEEN SIGNIFICANTLY IMPROVED

## **APPARENT VIOLATION OF CRITERION XVI**

### **MITIGATION CONSIDERATIONS (Cont.)**

- **CNS GL 89-10 MOV PROGRAM HAVE BEEN SIGNIFICANTLY IMPROVED, AS RECOGNIZED DURING CLOSURE INSPECTION (IR 96-10)**
  - **IMPLEMENTED STRONG, REORGANIZED PROGRAM IN JUNE 1995**
  - **MOV STAFF IS CAPABLE AND COMMITTED**
  - **PERFORMANCE SIGNIFICANTLY IMPROVED SINCE PRIOR INSPECTIONS**
  - **IR 96-10 RECOGNIZED QUALITY OF MOV FAILURE ASSESSMENTS**
  - **MOV PROGRAM PERFORMING COMPREHENSIVE ENGINEERING EFFORTS TO EVALUATE DESIGN BASIS CAPABILITY OF PROGRAM VALVES**
  - **ESTABLISHED WELL-SPECIFIED PROGRAM FOR POST-MODIFICATION AND POST-MAINTENANCE TESTING**

## **APPARENT VIOLATION OF CRITERION XVI**

### **SUMMARY**

- **NPPD AGREES WITH CRITERION XVI VIOLATION**
- **MINIMAL SAFETY SIGNIFICANCE**
- **LASTING CORRECTIVE ACTIONS TAKEN**
- **MOV PROGRAM HAS DEMONSTRATED SIGNIFICANT IMPROVEMENT**