



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION IV

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

APR - 8 1996

Nebraska Public Power District
ATTN: Guy R. Horn, Vice President - Nuclear
1414 15th Street
Columbus, Nebraska 68601

SUBJECT: PREDECISIONAL ENFORCEMENT CONFERENCE TO DISCUSS APPARENT VIOLATIONS

This refers to the predecisional enforcement conference conducted at NRC's request in the Region IV office on April 1, 1996. The conference was open to the public. Attendees are listed in Enclosure 1.

The purpose of this meeting was for you to present to the NRC the facts and circumstances pertaining to three apparent violations identified in NRC Inspection Reports 50-298/96-04 and 50-298/96-08, dated March 11 and 15, 1996, respectively. The subjects discussed at the meeting included a review of the root causes, your interim and long-term corrective actions, effectiveness of past corrective actions, and the safety significance of the issues. You did not dispute nor take issue with the apparent violations as described in the aforementioned inspection reports.

We found that the discussions provided us with a better understanding of the issues surrounding the apparent violations and your corrective actions. The information presented will be factored into our final decision regarding this enforcement matter. Briefing materials used in the conference are included in Enclosure 2.

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,

A handwritten signature in cursive script, appearing to read "J. E. Dyer".

J. E. Dyer, Director
Division of Reactor Projects

Enclosures:

1. Attendance List
2. Licensee Presentation

Docket: 50-298
License: DPR-46

9604110289 960408
PDR ADOCK 05000298
Q PDR

cc w/enclosures:

Nebraska Public Power District
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Nebraska Public Power District
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Brownville, Nebraska 68321

Nebraska Public Power District
ATTN: Robert C. Godley, Nuclear
Licensing & Safety Manager
P.O. Box 98
Brownville, Nebraska 68321

Midwest Power
ATTN: R. J. Singer, Manager-Nuclear
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Des Moines, Iowa 50303

Lincoln Electric System
ATTN: Mr. Ron Stoddard
11th and O Streets
Lincoln, Nebraska 68508

Nebraska Department of Environmental
Quality
ATTN: Randolph Wood, Director
P.O. Box 98922
Lincoln, Nebraska 68509-8922

Nemaha County Board of Commissioners
ATTN: Chairman
Nemaha County Courthouse
1824 N Street
Auburn, Nebraska 68305

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 Public Power District

-3-

Nebraska Department of Health
ATTN: Dr. Mark B. Horton, M.S.P.H.
Director
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Lincoln, Nebraska 68509-5007

Department of Natural Resources
ATTN: R. A. Kucera, Department Director
of Intergovernmental Cooperation
P.O. Box 176
Jefferson City, Missouri 65102

Kansas Radiation Control Program Director

bcc to DMB (IE45)

bcc distrib. by RIV:

L. J. Callan
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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4/5/96	4/5/96	4/6/96				

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APR - 8 1996

bcc to DMB (IE45)

bcc distrib. by RIV:

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DRP Director
Branch Chief (DRP/C)
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PREDECISIONAL CONFERENCE

LICENSEE/FACILITY	Nebraska Public Power District Cooper Nuclear Station (CNS)	
DATE/TIME	April 1, 1996, 9 a.m. CST	
MEETING LOCATION	Region IV Office, Training Conference Room	
EA NUMBER	EA 96-062	
NAME (PLEASE PRINT)	ORGANIZATION	TITLE
LICENSEE ATTENDEES		
Philip D Graham	NPPD	Senior Engineering Manager
RAYMOND A. REXROAD	NPPD	SENIOR ELECT. ENGR.
Guy R. Nix	NPPD	Vice President Nuclear
John H. Mueller	NPPD	Site Manager
RICHARD A. SESSONS	NPPD	Div MGR - Quality Assurance
DAW Berman	NPPD	Design Engineering Manager
KENNETH NESS	ES&W - PULVERHOFF	VP - MANAGER OF PROJECTS
WILLIAM F. ANG	NRC REGION IV	ACTING ENGR BRANCH CHIEF
Philip Qualls	NRC RIV/ORS/ER	Reactor Inspector
Mary M. ...	NRC (ERI COOPER)	Reactor Inspector
DAVID W. WIGGINTON	NRC - NRR PD-1	SR PROJECT MANAGER LICENSING
Terry Reis	NRC RIV	Acting Branch Chief
Chris A. Van Landuyck	NRC RIV	Engineering Branch Chief
Ken C. ...	NRC, RIV	Executive Director, Div. of Re Safety

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JIM DYER	USNRC, RIV	Dir. Div. of R & Proj
L. JOE CALKAN	USNRC, RIV	REGIONAL ADMINISTRATOR
William Turnbull	MidAmerican Energy CO	Sr Nuclear Eng
RONALD D. STODDARD	LANIER ELECTRIC SYSTEM	CHIEF ENGINEER
M. Vasquez	NRC, RIV	Environ. Specialist
Breck Henderson	NRC, RIV	Public Affairs
WILLIAM L. BROWN	NRC, RIV	REGIONAL COORDINATOR BRANCH
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Mark Unruh	NPPD	ITC Design Supervisor
FADI DIYA	NPPD/CNS	INSTRUMENTATION ENGINEERING SR
RICHARD M. WACHOWIAK	NPPD	Reliability Engineering SUPERVISOR
Robert G. ...	NPPD	Licensing Manager

NEBRASKA PUBLIC POWER DISTRICT
NUCLEAR REGULATORY COMMISSION - REGION IV

PREDECISIONAL ENFORCEMENT CONFERENCE

APRIL 1, 1996

AGENDA
PREDECISIONAL ENFORCEMENT CONFERENCE

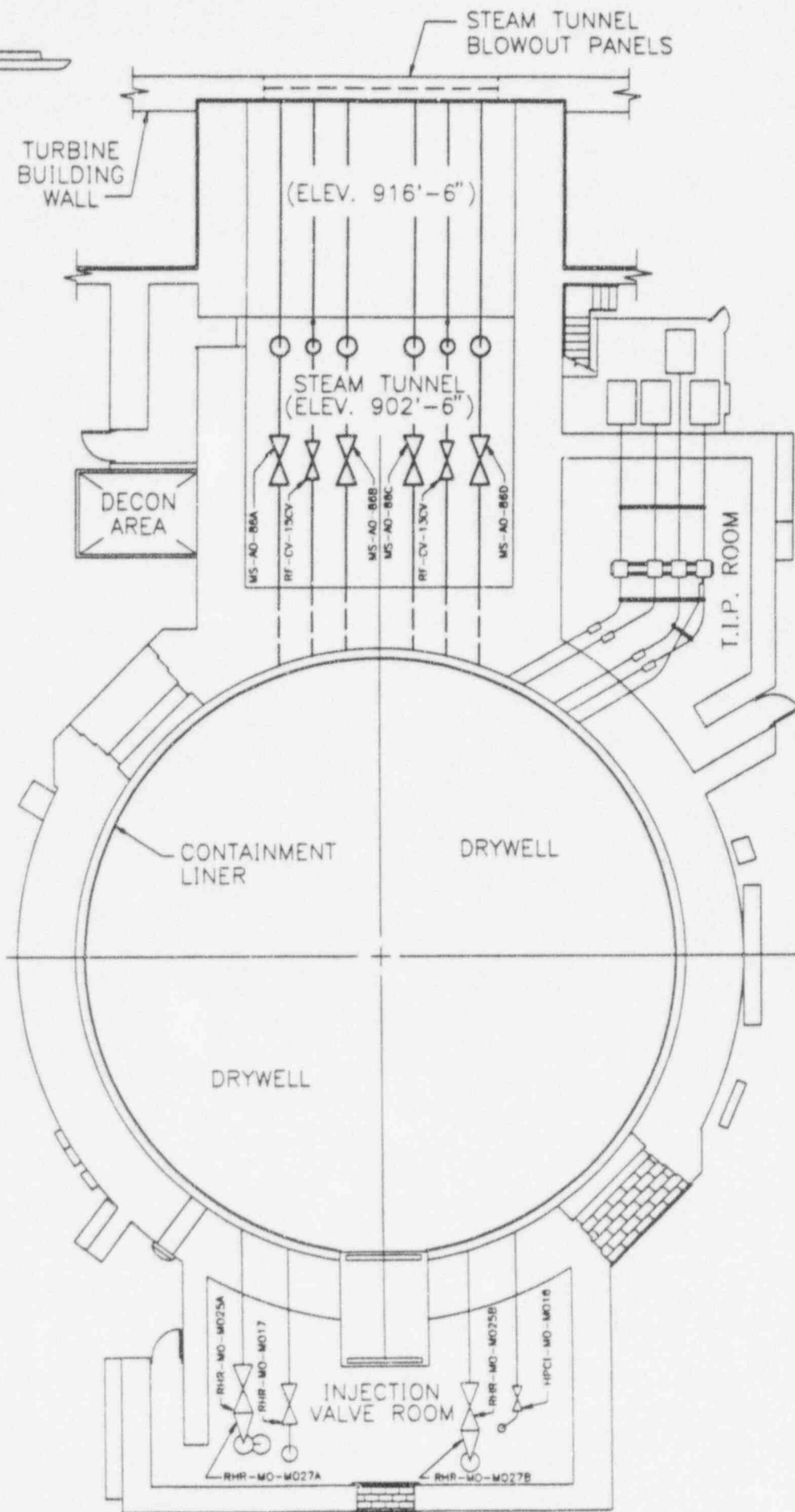
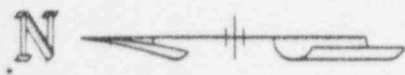
APRIL 1, 1996

Opening Remarks	John Mueller
Introduction/Engineering Overview	Phil Graham
Enforcement Issues	
Steam Tunnel Blowout Panels	Fadi Diya
Muffler Bypass Valve Solenoid	Mark Unruh
Appendix R Fuse	Ray Rexroad
Summary	Phil Graham
Closing Remarks	John Mueller

Cooper Nuclear Station Steam Tunnel Blowout Panels

Issue:

- **A modification was performed in 1985 without an evaluation to determine if it constituted a change to the facility or the technical specifications or constituted an unreviewed safety question**
- **Fiberglass applied to panels prevented blowout at the required pressure and raised the steam tunnel peak pressure**



PLAN VIEW

Cooper Nuclear Station Steam Tunnel Blowout Panels

Background:

- Panels are secondary containment boundary
 - Made of 3-inch thick cellular concrete
 - Designed to mitigate effects of a HELB in steam tunnel
 - Panels sealed with fiberglass material in 1985 to prevent secondary containment leakage - MWR used - no 50.59 evaluation
- Fiberglass material strengthened panels - elevated rupture pressure

Cooper Nuclear Station Steam Tunnel Blowout Panels

Timeline:

- | | |
|-------------------------------|--|
| 10-14-95 | Start of refueling outage RE16 |
| 10-30-95
(approx.) | NRC Senior Resident Inspector inquiry on panel design basis |
| 11-9-95 | Design basis research/walkdown completed |
| 11-9-95 | Discovered violation issue - condition report for design basis calculation prepared |
| 11-10-95 | Condition report for fiberglass material prepared |
| 11-17-95 | Fiberglass material documentation research completed |

**Cooper Nuclear Station
Steam Tunnel Blowout Panels**

Timeline: (cont'd)

- | | |
|-----------------|---|
| 11-17-95 | Initiated finite element analysis |
| 11-21-95 | Finite element analysis concluded increase in minimum blowout panel pressure |
| 11-21-95 | 10CFR50.72 notification (4 hour ENS notification report) |
| 11-30-95 | Minor Modification Package issued to remove fiberglass |
| 12-17-95 | Panels restored to perform design basis function |
| 12-21-95 | LER 95-018 submitted to NRC |
| 12-30-95 | End of refueling outage RE16 |

Cooper Nuclear Station Steam Tunnel Blowout Panels

Apparent Cause:

- A Plant Engineer did not do necessary design basis investigation prior to initiating MWR

1985 Contributors:

- Panels not described on drawings
- Panels only referred in calculations and USAR (not detailed)
- Work was performed under MWR - no 50.59 was performed
- Design Engineering not involved

Cooper Nuclear Station Steam Tunnel Blowout Panels

No Opportunities to Identify:

- **No routine access to steam tunnel during operation**
- **East end of steam tunnel infrequently accessed during outages**
 - **Little equipment requiring maintenance**
 - **Path to panels blocked by pipes and HVAC ducts**
- **Personnel considered fiberglass material as blowout panels**

Cooper Nuclear Station Steam Tunnel Blowout Panels

No Opportunities to Identify: (cont'd)

- **1993 Secondary Containment Integrity Walkdown:**
 - Walkdown focused on secondary containment leakage integrity
 - Walkdown not intended to validate HELB design basis
- **1994 System Readiness Review:**
 - Secondary containment not in scope
 - Secondary containment leakage integrity corrective actions in 1993

Cooper Nuclear Station Steam Tunnel Blowout Panels

No Opportunities to Identify: (cont'd)

- **PM 7022:**

- **PM focused on panel degradation and leakage integrity**

- **PRA Study:**

- **PRA study considered existing configuration and design basis calculation valid**

Cooper Nuclear Station Steam Tunnel Blowout Panels

Immediate Corrective Actions:

- **Restored design basis function of panels**
- **Inspected other blowout panels - minor discrepancy found**
- **Performed safety consequences evaluation**
- **Determined unreviewed safety question existed prior to restoring design basis function of panels**

Cooper Nuclear Station Steam Tunnel Blowout Panels

Long Term Corrective Actions:

- Reviewed a random sample of past maintenance work for unreviewed safety questions and unauthorized modifications
 - Population = 9117 MWRs
 - Sample = 91 MWRs
 - No unreviewed safety questions - two unauthorized modifications identified
 - Expanding sample - will take appropriate actions accordingly

**Cooper Nuclear Station
Steam Tunnel Blowout Panels**

Long Term Corrective Actions: (cont'd)

- **Development of HELB Design Criteria Document in progress**
- **Improve description of panels in USAR**
- **Add panel details to design drawings**

Cooper Nuclear Station Steam Tunnel Blowout Panels

Actual Safety Consequences:

- **No challenges to safety function of panels**

Cooper Nuclear Station Steam Tunnel Blowout Panels

Potential Safety Consequences:

- **HELB analysis re-performed using GOTHIC**
 - **Panels and fiberglass rupture pressures calculated and used in analysis**
 - **Steam tunnel peak pressure increased to 19.9 psig**
 - **Peak pressure in the primary containment annular gap was 1.2 psig (less than 2 psig - design)**

Cooper Nuclear Station Steam Tunnel Blowout Panels

Potential Safety Consequences: (cont'd)

- **Steam tunnel structure within code allowable stress limits**
- **Primary containment structure (including shell) within code allowable stress limits**
- **Containment penetrations within code allowable stress limits**
- **None of the EQ envelopes were exceeded**

Conclusion:

- **No adverse impact on Part 100 offsite dose**
- **Minimal safety consequences**

Cooper Nuclear Station Steam Tunnel Blowout Panels

Regulatory Significance:

- Regulatory significant
 - Introduced unreviewed safety question

Cooper Nuclear Station Steam Tunnel Blowout Panels

Summary:

- NRC Senior Resident Inspector asked initial question
- CNS Engineering took ownership, kept Senior Resident Inspector informed, fully developed issue, and identified violation issue
 - Restored design basis function of panels
 - Ensured other panel design basis function not altered
 - Implementing corrective actions

Cooper Nuclear Station Steam Tunnel Blowout Panels

Summary: (cont'd)

- Introduced unreviewed safety question
- No actual safety consequences
- Minimal potential safety consequences

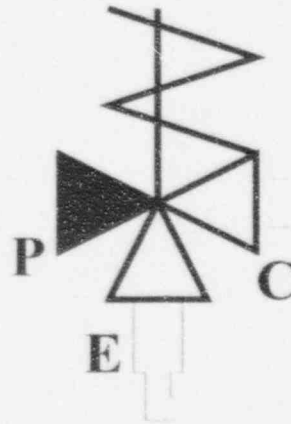
**Cooper Nuclear Station
Diesel Generator Unauthorized Modification**

Statement of Issue:

Contrary to 10 CFR Part 50, Appendix B, Criterion III, an unauthorized modification was installed on both Diesel Generator muffler bypass systems.

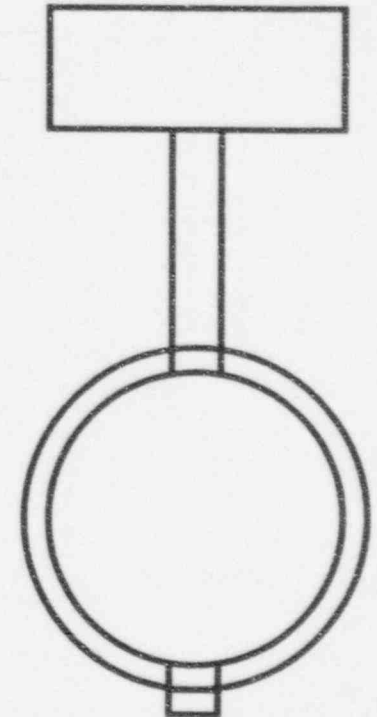
Muffler Bypass Controls

DGSA



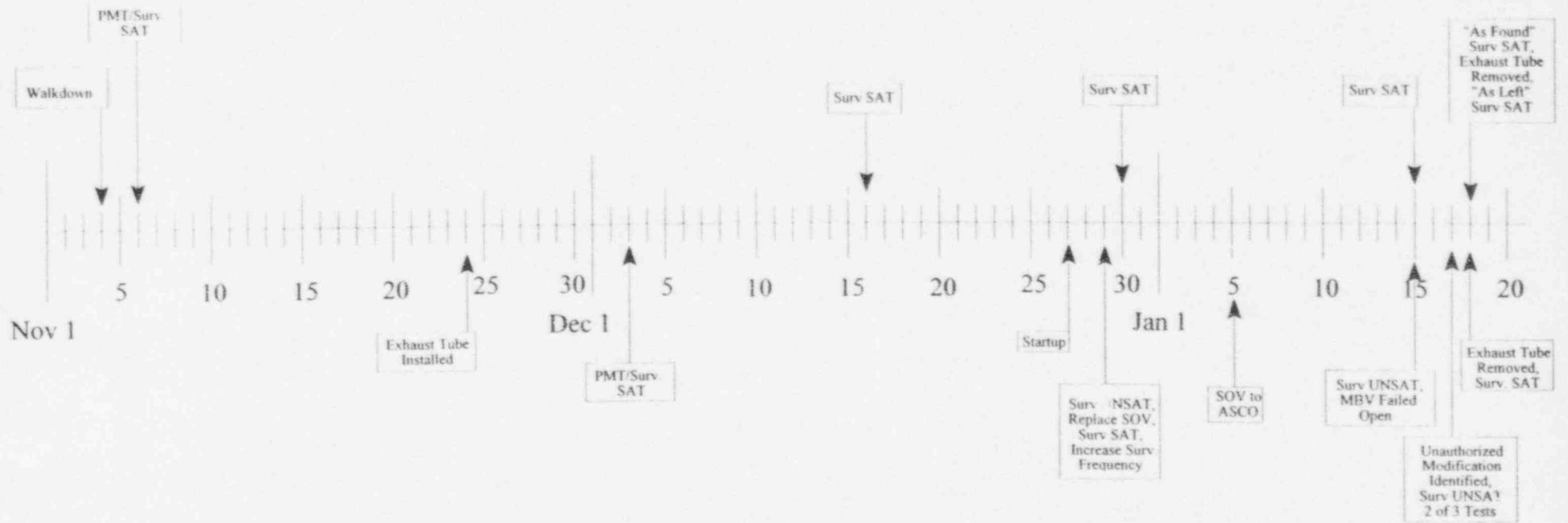
DG-SOV-DG2(20EBB)

DG-AO-MB2



Pneumatic Line

Diesel Generator #1 Timeline



Diesel Generator #2 Timeline

**Cooper Nuclear Station
Diesel Generator Unauthorized Modification**

Root Cause:

- **Failure to communicate what constitutes a change to the Plant**
 - **Installation of Exhaust Tube not recognized as an Unauthorized Modification**
 - **Inadequate training of Craft and Field Engineer**

**Cooper Nuclear Station
Diesel Generator Unauthorized Modification**

Immediate Corrective Actions:

- **Replaced DG-SOV-DG2(20EBB)**
- **Increased testing frequency to semi-monthly**
- **Sent SOV to ASCO for Failure Analysis**
- **Tested DG #1 MBV upon failure of DG #2 MBV**
- **Failed DG #2 MBV to safe position**
- **Removed Exhaust Tubes**

**Cooper Nuclear Station
Diesel Generator Unauthorized Modification**

Interim Corrective Actions:

- **Walked down accessible Pilot Operated SOVs in plant for exhaust tubes**

- **Management communication of expectations**
 - **Tailgate sessions with Maintenance, Operations, Radiation Protection, and Engineering**

 - **Article on expectation in “Current Events” paper**

- **Walkdown selected 1995 modifications**

**Cooper Nuclear Station
Diesel Generator Unauthorized Modification**

Long Term Corrective Actions:

- **Strengthen Post-Modification walkdown criteria**
- **Training enhancements to reinforce management expectations**
 - **Craft responsibility during implementation of work instructions**
 - **Field engineer functional qualification**

**Cooper Nuclear Station
Diesel Generator Unauthorized Modification**

Actual Safety Consequences:

- **DG #1 Operable with exhaust tube installed**
- **Additionally**
 - **No Start/Load demands**
 - **No Design Basis Events Occurred**
- **No Actual Safety Consequences**

**Cooper Nuclear Station
Diesel Generator Unauthorized Modification**

Potential Safety Consequences:

- **Loss of Offsite Power with blockage of Exhaust Stack**

- **Missile - N/A**
 - **Over 30 ft off ground (1975 NRC Standard Review Plan)**

- **High Wind - N/A**
 - **Exhaust stack designed for 100 mph wind**
 - **87 mph 100 yr high (NUREG CR 4767)**

**Cooper Nuclear Station
Diesel Generator Unauthorized Modification**

Potential Safety Consequences: (con't)

- **Tornado - Core Damage Frequency increase $\sim 1 \times 10^{-6}$**
- **Seismic Event - Core Damage Frequency increase
 $\sim 1 \times 10^{-6}$**
- **Increase within the CNS non-risk significant permanent
change envelope**

**Cooper Nuclear Station
Diesel Generator Unauthorized Modification**

Potential Safety Consequences: (con't)

- **No damage to Diesel Generator due to backpressure**
- **MBV failure easily identified and corrected**
- **Minimal Potential Safety Consequences**

**Cooper Nuclear Station
Diesel Generator Unauthorized Modification**

Regulatory Significance:

- **Introduced a Potential Common Mode Failure**
 - **No actual Common Mode Failure occurred**
- **Not a programmatic breakdown**

**Cooper Nuclear Station
Diesel Generator Unauthorized Modification**

Summary:

- **DG #1 operable for all Design Basis Events**
- **DG #2 operable except for specific low probability scenario**
- **No Actual Safety Consequences**
- **Appropriate and timely Corrective Actions**

**Cooper Nuclear Station
Diesel Generator Appendix R Fuse Isolation**

Issue:

NPPD failed to electrically isolate Diesel Generator 2 control circuitry from the effects of a fire induced cable fault created by a fire in the control room or cable spreading room in violation of 10 C. F. R. Part 50, Appendix R, Section III.G

**Cooper Nuclear Station
Diesel Generator Appendix R Fuse Isolation**

Timeline:

July 1994

CNS Engineering identified DG Appendix R susceptibility

August 1994

Modification implemented which corrected Appendix R problem

December 1994

DG HVAC modification implemented which altered Appendix R design

**Cooper Nuclear Station
Diesel Generator Appendix R Fuse Isolation**

Timeline: (cont'd)

- November 1995** **CNS Engineering identified DG wiring discrepancies**
- **125 VDC +/- power daisy chain in panel of DG2 verified**
 - **Results evaluated**
 - **Identified DG2 not Appendix R compliant - CR/LER initiated**
- December 1995** **Modification implemented to correct Appendix R problem**
- Demonstrated DG2 operation with fuses removed**

**Cooper Nuclear Station
Diesel Generator Appendix R Fuse Isolation**

Root Cause:

- **Process inadequacy allowed the use of drawings which did not have all pending changes identified.**

**Cooper Nuclear Station
Diesel Generator Appendix R Fuse Isolation**

Immediate Corrective Actions:

- **Investigated existing Drawing Control Program process**
 - **Since June 1995, process identifies pending changes**

- **Evaluated which disciplines affected by root cause**
 - **Electrical and I&C most susceptible - Mechanical and Civil rarely susceptible**

- **Evaluated sample of panel drawings to identify adverse modification inter-relationships (5 of 24 panels reviewed) - None found**

**Cooper Nuclear Station
Diesel Generator Appendix R Fuse Isolation**

Long Term Corrective Actions:

- **Review remaining population of panels (19) for adverse modification inter-relationships**

- **Training**
 - **Training will be provided for changed processes**

- **Other**
 - **QA performing independent evaluation of drawing control program**

**Cooper Nuclear Station
Diesel Generator Appendix R Fuse Isolation**

Long Term Corrective Actions: (cont'd)

● **Process improvements**

- **Drawing control process changes**
- **Require electronic data sources be promptly updated**
- **Modification process changes**
 - **Identify pending changes earlier**
 - **Require applicable portions of drawings be as-built prior to work initiation**

**Cooper Nuclear Station
Diesel Generator Appendix R Fuse Isolation**

Appendix R Initiatives:

- **Performed a self assessment of the Appendix R program**
- **Safe and Alternate Shutdown Analysis methodology independently reviewed - no functional/compliance issues identified**
- **Enhancement of Safe and Alternate Shutdown Analysis in progress**

**Cooper Nuclear Station
Diesel Generator Appendix R Fuse Isolation**

Actual Safety Consequences:

- **No control room/cable spreading room fires**

**Cooper Nuclear Station
Diesel Generator Appendix R Fuse Isolation**

Potential Safety Consequences:

- **Frequency of initiator (fires challenging DG Appendix R isolation fuse) ~ 10^{-7} /year**
- **Below screening cutoff for evaluation of Core Damage Frequency increase**

**Cooper Nuclear Station
Diesel Generator Appendix R Fuse Isolation**

Potential Safety Consequences: (cont'd)

- **Control Room defense-in-depth fire protection strategy:**
 - **Stringent controls for combustible materials and ignition sources**
 - **Control Room continually manned by fire brigade personnel**
 - **Area wide fire detection**
 - **Readily available fire suppression equipment**
 - **IEEE 383-equivalent cables used**

**Cooper Nuclear Station
Diesel Generator Appendix R Fuse Isolation**

Potential Safety Consequences: (cont'd)

- **Cable Spreading Room defense-in-depth fire protection strategy:**
 - **Stringent controls for combustible materials and ignition sources**
 - **Fire brigade personnel from control room are close in proximity and in same HVAC envelope**
 - **Area wide fire detection**
 - **Direct suppression equipment**
 - **IEEE 383-equivalent cables used**

**Cooper Nuclear Station
Diesel Generator Appendix R Fuse Isolation**

Regulatory Significance:

- **DG circuitry was not Appendix R compliant for control room/cable spreading room fires**

**Cooper Nuclear Station
Diesel Generator Appendix R Fuse Isolation**

Enforcement Policy Perspectives:

- **Ability to achieve safe shutdown still existed**
- **Scenario which affects ability to maintain safe shutdown not credible event (E-7/year)**

**Cooper Nuclear Station
Diesel Generator Appendix R Fuse Isolation**

Enforcement Policy Perspectives: (cont'd)

- **Capabilities at CNS increase probability that safe shutdown would be maintained**
 - **Redundancy in switchyard components/off-site power sources**
 - **The inability to power the station from offsite has not occurred at CNS**
 - **Procedures and training would result in quick response if power from offsite is lost/interim coping instructions provided**

- **No programmatic breakdown**

Cooper Nuclear Station Diesel Generator Appendix R Fuse Isolation

Summary:

- CNS Engineering self identified wiring discrepancy
- CNS Engineering evaluated impact of discrepancy
- CNS Engineering promptly corrected problem
- Root Causes identified
 - Inadequate process
- Implementing appropriate corrective actions