



Nebraska Public Power District

COOPER NUCLEAR STATION  
P.O. BOX 98, BROWNVILLE, NEBRASKA 68521  
TELEPHONE (402) 225-3811

CNSS923695

July 10, 1992

U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, D.C. 20555

Dear Sir:

Cooper Nuclear Station Licensee Event Report 92-009, Revision 0, is being forwarded as an attachment to this letter.

Sincerely,

R. L. Gardner  
Acting Division Manager  
of Nuclear Operations  
Cooper Nuclear Station

RLG/bjs

Attachment

cc: R. D. Martin  
G. R. Horn  
J. M. Meacham  
R. E. Wilbur  
V. L. Wolstenholm  
D. A. Whitman  
INPO Records Center  
NRC Resident Inspector  
R. J. Singer  
CNS Training  
CNS Quality Assurance

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### LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) <b>Cooper Nuclear Station</b>	DOCKET NUMBER (2) <b>0 5 0 0 0 2 9 8</b>	PAGE (3) <b>1 OF 0 4</b>
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TITLE (4)  
**Noncompliance With 10CFR50 Appendix R, Failure of Post Fire Safe Shutdown Equipment**

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)																																				
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES		DOCKET NUMBER(S)																																		
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<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:15%;">OPERATING MODE (9) <b>N</b></td> <td colspan="11">THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)</td> </tr> <tr> <td rowspan="6">POWER LEVEL (10) <b>1 0 0</b></td> <td><input type="checkbox"/> 20.402(b)</td> <td><input type="checkbox"/> 20.405(c)</td> <td><input type="checkbox"/> 50.73(a)(2)(iv)</td> <td><input type="checkbox"/> 73.71(b)</td> </tr> <tr> <td><input type="checkbox"/> 20.405(a)(1)(i)</td> <td><input type="checkbox"/> 50.36(a)(1)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)</td> <td><input type="checkbox"/> 73.71(c)</td> </tr> <tr> <td><input type="checkbox"/> 20.405(a)(1)(ii)</td> <td><input type="checkbox"/> 50.36(a)(2)</td> <td><input type="checkbox"/> 50.73(a)(2)(vi)</td> <td rowspan="4">OTHER (Specify in Abstract below and in Text, NRC Form 366A)</td> </tr> <tr> <td><input type="checkbox"/> 20.405(a)(1)(iii)</td> <td><input checked="" type="checkbox"/> 50.73(a)(2)(i)</td> <td><input type="checkbox"/> 50.73(a)(2)(vii)(A)</td> </tr> <tr> <td><input type="checkbox"/> 20.405(a)(1)(iv)</td> <td><input checked="" type="checkbox"/> 50.73(a)(2)(ii)</td> <td><input type="checkbox"/> 50.73(a)(2)(vii)(B)</td> </tr> <tr> <td><input type="checkbox"/> 20.405(a)(1)(v)</td> <td><input type="checkbox"/> 50.73(a)(2)(iii)</td> <td><input type="checkbox"/> 50.73(a)(2)(ix)</td> </tr> </table>												OPERATING MODE (9) <b>N</b>	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)											POWER LEVEL (10) <b>1 0 0</b>	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)	<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.36(a)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.36(a)(2)	<input type="checkbox"/> 50.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)	<input type="checkbox"/> 20.405(a)(1)(iii)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(vii)(A)	<input type="checkbox"/> 20.405(a)(1)(iv)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(vii)(B)	<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)
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LICENSEE CONTACT FOR THIS LER (12)

NAME <b>John R. Myers</b>	TELEPHONE NUMBER
	AREA CODE: <b>4 0 2</b> NUMBER: <b>8 2 5 - 3 8 1 1</b>

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS

SUPPLEMENTAL REPORT EXPECTED (14)

<input checked="" type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
			<b>1 0</b>	<b>1 0</b>	<b>9 2</b>

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

Following receipt of NRC Information Notice 92-18, engineering review of the Alternate Shutdown (ASD) capability revealed that an electrical "hot short" caused by a fire affecting the control circuits of motor operated valves could bypass the torque and limit switches, resulting in full travel of the valves (open or closed). The loss of protection provided by the torque and limit switches could result in permanent damage prior to the control circuit being isolated from the fire by repositioning the transfer switch at the ASD panel. This would prevent remote operation of the valves. This condition was determined reportable at 11:40 a.m. on June 11, 1992.

The root cause of this event was the failure of the ASD design to consider this potential failure mechanism. Immediate corrective actions were taken to incorporate mitigating actions in procedures and brief the Shift Supervisors and appropriate plant personnel. Further corrective actions will entail circuit modifications or revisions to ASD procedures, and a review of the ASD design.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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		YEAR 9   2	SEQUENTIAL NUMBER —   0   0   9	REVISION NUMBER —   0   0	0   2	OF 0   4

TEXT (If more space is required, use additional NRC Form 305A's) (17)

A. Event Description

Upon receipt of NRC Information Notice 92-18, "Potential for Loss of Remote Shutdown Capability During a Control Room Fire," a review of the control wiring schematics for motor operated valves associated with Alternate Shutdown (ASD) capability was performed. The ASD capability is comprised of alternative control panels for selected High Pressure Coolant Injection (HPCI), Automatic Depressurization System (ADS), Residual Heat Removal (RHR), and Diesel Generator components, along with local manual operation of specific components. The review investigated post fire operability, given the occurrence of "hot shorts" in the control circuits prior to transfer of control to the alternate shutdown panel. 10CFR50 Appendix R Section III.L.7 requires "The safe shutdown equipment and systems for each fire area shall be known to be isolated from associated non-safety circuits in the fire area such that hot shorts, open circuits, or shorts to ground in the associated circuits will not prevent operation of the safe shutdown equipment." The regulatory position on "hot shorts" was further developed in NRC Generic Letter 86-10 which stated that "...a hot short condition exists until action has been taken to isolate the given circuit from the fire area, or other actions as appropriate have been taken to negate the effects of the spurious actuation. We do not postulate that the fire would eventually clear the hot short."

Utilizing the above regulatory guidance and NRC Information Notice 92-18, the engineering review determined that the wiring for the 19 valves controlled from the ASD panel, identified in Technical Specification Table 3.2.1-2, and 30 other valves associated with the ASD capability were arranged in a configuration where a postulated fire in one of the Alternate Shutdown areas could create a "hot short" which would bypass the valve position limit and torque switches. This could result in a "hot short" energizing the open or close contactors, bypassing the torque and position limit switches, driving a valve to the full open or closed position. Permanent damage to the valve or operator could occur if the motor remained energized for an appreciable amount of time before the control circuit was isolated by transferring control to the ASD panel.

Upon review of the results of the engineering evaluation by station management, this condition was determined to be reportable at 11:40 a.m. on June 11, 1992.

B. Plant Status

The plant was operating at approximately full power on June 11, 1992, when the design deficiency was discovered. The deficient condition has existed since the ASD panel was declared operational in July, 1987.

C. Basis for Report

This condition was determined to be reportable per the requirements of 10CFR50.73(a)(2)(i), a condition prohibited by Technical Specifications, and 10CFR50.73(a)(2)(ii), a condition outside the design basis.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

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TEXT (If more space is required, use additional NRC Form 306A's) (17)

D. Cause

The cause of this event was the failure to adequately address the "hot short" failure mechanism in the design criteria for the ASD capability. The criteria for this design did not take into consideration the interim time period from the occurrence of the "hot short" until the transfer switches would be operated, and the resulting potential for valve or operator damage.

E. Safety Significance

The ASD capability is provided to mitigate the effects of a special event (i.e., fire). In the event of a fire of extreme magnitude in one of the Alternate Shutdown areas, motor operated valves could potentially be rendered inoperable prior to remote/local control being established. Due to the valve inaccessibility, insufficient time available, and the assumption that all other systems are rendered inoperable, the ability to reach a safe shutdown condition could be jeopardized.

The safety significance of this deficiency is minimized by the very low probability of the "hot short" circuit failure mode occurring for the duration necessary to cause valve damage with no other interrupting circuit failures, such as shorts to ground or open circuits, occurring. In addition, the likelihood of a fire in one of the alternate shutdown areas of sufficient magnitude to cause such cable damage is extremely unlikely. This is based on the defense in depth strategy employed at Cooper Nuclear Station.

Stringent controls are placed on combustible materials and ignition sources in the Alternate Shutdown areas. Fire detection and suppression is provided as listed below:

Fire Area	Fire Area Description	Fire Detection	Fire Suppression
I/2A	Reactor Building 903'6" North	Smoke	Wet Pipe Sprinkler
VII/8A	Auxiliary Relay Room	Smoke	Manual
VII/9A	Cable Spreading Room	Smoke and Heat Activated	Pre-action Sprinkler
VII/9B	Cable Expansion Room	Smoke	Wet Pipe Sprinkler
VII/10A	Computer Room	Smoke	Automatic Halon
VII/10B	Control Room	Smoke	Manual

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

E. Safety Significance (Continued)

The fire detection and associated automatic fire suppression systems along with the manual fire fighting capability available in these areas is designed to prevent the fire damage thresholds required to create a "hot short."

F. Safety Implications

The effect of a fire is most significant to Alternate Shutdown capability during power operation. As such, there are no safety implications beyond those discussed in Paragraph E above.

G. Corrective Action

Immediate corrective actions were taken to issue temporary procedure changes to the Annunciator Response and ASD procedures. The procedure changes inform the operator of the concern for motor operated valve damage and prompts immediate transfer of control to the ASD panel during a fire if the potential for a "hot short" exists. On-shift Shift Supervisors and appropriate plant personnel were also briefed on these procedure changes.

Nebraska Public Power District (NPPD) is monitoring/participating in Industry activities associated with the "hot short" issue and a detailed engineering review of the ASD design is being performed to determine the best resolution. Corrective actions being evaluated are modification of motor operated valve circuits, installation of motor overloads, or revisions to ASD procedures. Corrective actions for those valves controlled from the ASD panel will be completed by the end of the Spring 1993 Refueling Outage. The remaining valves are either "support" valves for hot shutdown (i.e., Service Water, Reactor Equipment Cooling, Suppression Pool Cooling), or used to attain cold shutdown. The impact of the potential loss of these valves is being evaluated and may not require modifications. NPPD will provide within 90 days the schedule for completing any necessary modifications to the remaining valves via a supplement to this LER.

In addition, a comprehensive review of the ASD design is planned as a part of the Design Basis Reconstitution effort.

H. Similar Events

None.