



**Nebraska Public Power District**

*Always there when you need us*

NLS2011024  
March 14, 2011

U.S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, D.C. 20555-0001

Subject: Licensee Event Report No. 2011-001-00  
Cooper Nuclear Station, Docket No. 50-298, DPR-46

Dear Sir or Madam:

The purpose of this correspondence is to forward Licensee Event Report 2011-001-00.

Sincerely,

Demetrius L. Willis  
General Manager of Plant Operations

/jo

Attachment

cc: Regional Administrator w/attachment  
USNRC - Region IV

NPG Distribution w/attachment

Cooper Project Manager w/attachment  
USNRC - NRR Project Directorate IV-1

INPO Records Center w/attachment

Senior Resident Inspector w/attachment  
USNRC - CNS

SORC Chairman w/attachment

SRAB Administrator w/attachment

CNS Records w/attachment

**COOPER NUCLEAR STATION**

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Telephone: (402) 825-3811 / Fax: (402) 825-5211

www.nppd.com

*JE22  
HRR*

**LICENSEE EVENT REPORT (LER)**(See reverse for required number of  
digits/characters for each block)

Estimated burden per response to comply with this mandatory information collection request: 80 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA/Privacy Service Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to [infocollects.resource@nrc.gov](mailto:infocollects.resource@nrc.gov), and to the Desk Officer, Office of Information and Regulatory Affairs NEOF-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

**1. FACILITY NAME**

Cooper Nuclear Station

**2. DOCKET NUMBER**

05000298

**3. PAGE**

1 of 4

**4. TITLE**

Both Loops of Residual Heat Removal Inoperable Results in Loss of Safety Function

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED																																					
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10. POWER LEVEL																																														
100																																														

**12. LICENSEE CONTACT FOR THIS LER**

FACILITY NAME

David W. Van Der Kamp, Licensing Manager

TELEPHONE NUMBER (Include Area Code)

(402) 825-2904

**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
B	AD	IL	G080	Y					

**14. SUPPLEMENTAL REPORT EXPECTED**☐ YES (If yes, complete EXPECTED SUBMISSION DATE) ☒ NO**15. EXPECTED SUBMISSION DATE**

MONTH DAY YEAR

**ABSTRACT** (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On January 18, 2011, the open position indication light for Reactor Recirculation Pump "A" Discharge valve (RR-MO-53A) was discovered de-energized. Investigation found a damaged socket resistor for the bulb, causing fuses to the control power circuit for the valve to be open-circuited, preventing RR-MO-53A from closing to support the Residual Heat Removal (RHR) "A" Low Pressure Coolant Injection (LPCI) safety function, if needed. At the time of discovery, the RHR Loop "B" of LPCI was inoperable for planned maintenance. This condition resulted in a loss of safety function for the Emergency Core Cooling System.

The fuses were replaced and the RR-MO-53A indication changed state from "closed" to "open" on the Plant Monitoring Information System (PMIS). After satisfactory completion of Post Maintenance Testing, RHR Loop "A" was declared operable.

The root cause of this event is that there were no significant barriers in existence that could have provided prompt indication that the starter circuit had become inoperable. To prevent recurrence, the station procedure was revised to include shiftly verification of this valve position and the PMIS will be upgraded to indicate power loss to the starter circuit for RR-MO-53A and RR-MO-53B.

CNS reported this event per Event Notification 46563. This event was not risk significant.

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**17. NARRATIVE****PLANT STATUS**

Cooper Nuclear Station (CNS) was in Mode 1, Power Operations, at 100% power at the time of discovery.

**BACKGROUND**

Emergency Core Cooling Systems (ECCS) [EIS: BJ, BM, BO] are designed to limit fuel clad temperature over the complete spectrum of possible break sizes in the reactor coolant pressure boundary including the design basis break which is defined as the complete and instantaneous circumferential rupture of the largest pipe connected to the reactor vessel with displacement of the ends so that blowdown occurs from both ends.

The Low Pressure Coolant Injection (LPCI) [EIS: BO] system is one of four systems that make up the ECCS. LPCI provides protection to the core for the case of a large break in the reactor coolant pressure boundary when level cannot be maintained and reactor vessel rapidly depressurizes. Protection extends to a small break in which the High Pressure Coolant Injection [EIS: BJ] system is unable to maintain reactor water level and the Automatic Depressurization System [EIS: RV] has operated to lower reactor vessel pressure. LPCI is one operational mode of the Residual Heat Removal (RHR) [EIS: BO] system.

The RHR system provides core cooling, in conjunction with other ECCS sub-systems and also provides containment cooling as required during abnormal operational transients and postulated accidents.

The Reactor Recirculation system [EIS: AD] provides a variable coolant flow to the reactor core for adjusting reactor power level.

**EVENT DESCRIPTION**

On January 17, 2011, at 11:37 Central Standard Time (CST), Plant Management Information System (PMIS) data point N829 indicated that Reactor Recirculation Pump "A" Discharge valve (RR-MO-53A) had closed. This data point indicates valve "closed" if the electrical control power circuit were open-circuited, or if the valve were actually less than full open.

On January 18, 2011, at 00:16 CST, RHR Loop "B" of LPCI was declared inoperable for planned maintenance.

On January 18, 2011, at approximately 16:40 CST, during a panel walk down, an operator discovered the open position indication light for RR-MO-53A was de-energized. Investigation found the socket resistor for the bulb damaged, and the bulb had blown with signs of overheating. Further investigation found the fuses for the 250 VDC control power circuit for RR-MO-53A open-circuited, which prevents RR-MO-53A from closing if needed to support RHR "A" LPCI injection. Upon determination that control power for RR-MO-53A had been lost, RHR "A" was declared inoperable for the LPCI function at 17:31 CST.

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**17. NARRATIVE**

As specified by Required Action for Technical Specification Limiting Condition of Operation (LCO) 3.5.1, Condition H, two or more low pressure ECCS injection/spray subsystems inoperable for reasons other than Condition A, LCO 3.0.3 must be immediately entered. LCO 3.0.3, was entered immediately and CNS Procedure 2.1.4.1 was entered at 18:25 CST to initiate a plant shutdown.

Troubleshooting found a failed light socket which apparently caused the fuses to open. At 18:38 CST, the electricians replaced the control power fuses and RR-MO-53A indication on PMIS changed state from indicating "closed" to "open."

The indicator bulb was removed for examination and evidence preservation. The damaged resistor and socket were left in place pending eventual repair and replacement. The socket was inspected and the bulb was not replaced due to the potential damage that exists on either the socket or the resistor. There is no bulb in the socket at this time and Operations is monitoring an alternate indication.

On January 18, 2011, at 19:15 CST, RHR Loop "A" of LPCI was declared operable due to the replacement of fuses and satisfactory completion of Post Maintenance Testing and LCO 3.0.3, along with CNS Procedure 2.1.4.1, was exited. No power reduction occurred.

**BASIS FOR REPORT**

This event is being reported as an event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to remove residual heat per 10 CFR 50.73(a)(2)(v)(B). CNS also reported this event per Event Notification (EN) 46563, as an eight-hour report. The EN described the blown control power fuse as a 125 VDC fuse. The blown control power fuse is actually a 250 VDC fuse.

**SAFETY SIGNIFICANCE**

The design interlock to automatically close RR-MO-53A on a LPCI injection signal is intended to ensure LPCI flow to the Reactor Pressure Vessel in the event of a pipe break located in the suction line of the Reactor Recirculation pump. The potential safety consequences are low, due to the low likelihood of occurrence of a Reactor Recirculation suction line break during the time the condition existed and the ECCS defense in-depth designed to respond to such design basis pipe breaks. RHR Loop "A" of LPCI remained able to provide injection flow for all other pipe break and accident/transient scenarios. This event resulted in a negligible increase to the core damage frequency reflected in the base model of the CNS Probabilistic Risk Assessment.

**CAUSE**

The root cause of this event was that no significant barriers existed when the event occurred in the RR-MO-53A power control power circuitry that could have provided prompt indication to operators that the starter circuit had become inoperable.

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**17. NARRATIVE**

With barriers in place to indicate that the starter circuit had become inoperable, then the planned maintenance on RHR Loop "B" would have been postponed and RHR Loop "B" would have been operable.

**CORRECTIVE ACTION**

Checks of N829 for RR-MO-53A open indication were conducted twice per shift until the procedure was revised to include the shiftly verification.

The following remaining corrective action to prevent recurrence is being tracked in the Corrective Action Program:

- Upgrade PMIS program so that there is a third line alarm for the RR-MO-53A and B valves to indicate power loss to the starter circuit.

**PREVIOUS EVENTS**

There have been no events reported in the last three years related to a failed indicator light socket.

Correspondence Number: NLS2011024

The following table identifies those actions committed to by Nebraska Public Power District (NPPD) in this document. Any other actions discussed in the submittal represent intended or planned actions by NPPD. They are described for information only and are not regulatory commitments. Please notify the Licensing Manager at Cooper Nuclear Station of any questions regarding this document or any associated regulatory commitments.

COMMITMENT	COMMITMENT NUMBER	COMMITTED DATE OR OUTAGE
None		