



**Nebraska Public Power District**

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NLS2004003  
February 2, 2004

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

Subject: Licensee Event Report No. 2003-008  
Cooper Nuclear Station, NRC Docket 50-298, DPR-46

The subject Licensee Event Report is forwarded as an enclosure to this letter.

Sincerely,

  
John Christensen  
Plant Manager

/cb  
Enclosure

cc: Regional Administrator w/enclosure  
USNRC - Region IV

Senior Project Manager w/enclosure  
USNRC - NRR Project Directorate IV-1

Senior Resident Inspector w/enclosure  
USNRC

NPG Distribution w/enclosure

INPO Records Center w/enclosure

SORC Administrator w/enclosure

Records w/enclosure

*IE22*

<b>NRC FORM 366</b> (7-2001)	<b>U.S. NUCLEAR REGULATORY COMMISSION</b>	<b>APPROVED BY OMB NO. 3150-0104</b> Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC	<b>EXPIRES 7-31-2004</b>
<b>LICENSEE EVENT REPORT (LER)</b> (See reverse for required number of digits/characters for each block)			

<b>1. FACILITY NAME</b> Cooper Nuclear Station	<b>2. DOCKET NUMBER</b> 05000298	<b>3. PAGE</b> 1 OF 4
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**4. TITLE**  
Inadequate Evaluation Leads to Technical Specification Prohibited Operation

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
12	03	2003	2003	008	00	02	02	2004	FACILITY NAME	DOCKET NUMBER
										05000
										05000

<b>9. OPERATING MODE</b>	3	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)</b>									
<b>10. POWER LEVEL</b>	000	20.2201(b)			20.2203(a)(3)(ii)			50.73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)	
		20.2201(d)			20.2203(a)(4)			50.73(a)(2)(iii)		50.73(a)(2)(x)	
		20.2203(a)(1)			50.36(c)(1)(i)(A)			50.73(a)(2)(iv)(A)		73.71(a)(4)	
		20.2203(a)(2)(i)			50.36(c)(1)(ii)(A)			50.73(a)(2)(v)(A)		73.71(a)(5)	
		20.2203(a)(2)(ii)			50.36(c)(2)			50.73(a)(2)(v)(B)		OTHER Specify in Abstract below or in NRC Form 366A	
		20.2203(a)(2)(iii)			50.46(a)(3)(ii)			50.73(a)(2)(v)(C)			
		20.2203(a)(2)(iv)			50.73(a)(2)(i)(A)			50.73(a)(2)(v)(D)			
		20.2203(a)(2)(v)			x 50.73(a)(2)(i)(B)			50.73(a)(2)(vii)			
20.2203(a)(2)(vi)			50.73(a)(2)(i)(C)			50.73(a)(2)(viii)(A)					
20.2203(a)(3)(i)			50.73(a)(2)(ii)(A)			50.73(a)(2)(viii)(B)					

**12. LICENSEE CONTACT FOR THIS LER**

<b>NAME</b> Paul Fleming, Licensing and Regulatory Affairs Manager	<b>TELEPHONE NUMBER (Include Area Code)</b> (402) 825-2774
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**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

<b>14. SUPPLEMENTAL REPORT EXPECTED</b>				<b>15. EXPECTED SUBMISSION DATE</b>		
<b>YES (If yes, complete EXPECTED SUBMISSION DATE)</b>		<input checked="" type="checkbox"/>	<b>NO</b>		<input type="checkbox"/>	MONTH    DAY    YEAR

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

On December 3, 2003 after a reactor scram, operators exited a Limiting Condition for Operation (LCO) and entered Mode 2 for unit startup based on an inadequate engineering evaluation of the acceptability of the reactor coolant system for continued operations. This resulted in operations prohibited by Technical Specifications. Upon determination that the evaluation was inadequate unit was returned to a Mode 3 condition.

The root cause of the problem that resulted in the use of an inaccurate and incomplete engineering evaluation to support the decision to commence a reactor startup was individual human performance error.

Immediate actions were to return the plant to hot shutdown and correct the engineering evaluation to support a reactor startup.

Long term corrective actions include counseling of involved individuals, revised processes to improve controls when exiting LCO's based on engineering evaluations, and improvements to the post-event review and startup approval process.

**LICENSEE EVENT REPORT (LER)**

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Cooper Nuclear Station	05000298	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 4
		2003	-- 008	-- 00	

**17. NARRATIVE** (If more space is required, use additional copies of NRC Form 366A)

**PLANT STATUS**

Cooper Nuclear Station (CNS) was in Mode 3 (Hot Shutdown) at 000 percent (%) power at the time of the event.

**EVENT DESCRIPTION**

At 22:02 on November 28, 2003 during normal operation at 100% power, the reactor automatically scrammed on low water level due to a control system malfunction affecting Reactor Feed Pump B (LER 2003-007).

As a result of the scram and the vessel level shrink due to void collapse, both of the Reactor Recirculation pumps tripped, the Reactor Water Cleanup System (RWCU) isolated, and High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) initiated. HPCI and RCIC were manually tripped after reactor water level was restored to the normal level. At 22:10, Operators reset the scram and at approximately 23:08 RWCU Train A was placed back in service (LER 2003-007).

During the recovery from the transient it was noted that the cooldown rate in the bottom head of the reactor had exceeded the 100 degree (°)F per hour Technical Specification limit. This is a known phenomenon that can occur when forced core circulation is lost, while cold water is injected into the bottom of the vessel through the Control Rod Drive system. Exceeding the Technical Specification limit on plant cooldown required entry into the Limiting Condition for Operation (LCO) Condition that governs Reactor Coolant System (RCS) heat-up and cooldown rates. To exit this LCO it is necessary to determine that the RCS is acceptable for continued operation.

While taking action to reduce reactor vessel stratification Operators raised Reactor Pressure Vessel level to establish natural circulation flow. The establishment of natural circulation flow resulted in the heat-up rate in the bottom head of the vessel exceeding the 100 °F per hour Technical Specification limit. The heat-up rate was restored to within limits and operators commenced depressurization of the reactor vessel to promote natural circulation flow. Heat-up rate in the bottom head drain exceeded the 100 °F per hour Technical Specification limit following the depressurization.

Engineering was engaged to evaluate the cooldown and first heat-up rate transients. A consultant was retained to assist with the evaluation and was provided with the transient information and vessel parameters (e.g., vessel temperatures and pressures). This evaluation reviewed the vessel parameters from just prior to the reactor scram through the first heat-up transient. The initial evaluation results were based on an incorrect assumption about plant conditions and inappropriately concluded that the second heat-up transient was bounded by the vessel design cycle analysis. The engineering evaluation was revised twice in an attempt to resolve operator verbal comments. Revision 2 was accepted as justification for exiting the LCO, whereupon the LCO was exited and plant Mode was changed from hot shutdown to startup. Further review of the engineering evaluation determined that bottom head heat-up effects resulting from the second heat-up transient had not been properly addressed and the LCO should not have been exited. The unit was returned to hot shutdown until the RCS evaluation was properly completed to permit exiting the LCO and conducting a plant startup. Subsequent analysis determined that the RCS was acceptable for continued operation.

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		2003	-- 008	-- 00	

17. NARRATIVE (If more space is required, use additional copies of NRC Form 366A)

**BASIS FOR REPORT**

This event is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B) for any operation or condition which was prohibited by the plant's Technical Specifications.

**CAUSE**

There were two causes to this event, first, human performance errors by several involved individuals and second, a lack of formality in the post-event review and startup approval process.

1. Individual actions by the preparer, independent verifier, supervisor and Shift Technical Engineer were flawed resulting in an inaccurate and incomplete Engineering Evaluation.
2. The post event review and startup approval process lacks the formality and structure necessary to ensure identification and resolution of all startup issues in a rigorous manner.

**SAFETY SIGNIFICANCE**

The final RCS condition analysis ultimately demonstrated that the stresses induced by the transients remained within the design stress and fatigue limits for the vessel and components. Therefore, there was no actual safety significance for this event. Worst case potential consequences could have been a stress induced fatigue flaw in the nozzle welds, shroud support welds, or bottom head welds leading to an unisolable leak in the Reactor Coolant Pressure Boundary. There were no actual consequences to the vessel due to the failure to complete the analysis prior to entry into Mode 2, and the likelihood of a worse case outcome was very low.

**CORRECTIVE ACTIONS**

**Immediate Actions:**

The unit was returned to Mode 3.

The Engineering Evaluation was revised to accurately address stress effects in the bottom head due to heat-up.

**Long Term Actions:**

Individuals involved in this event have been counseled in the need for formality, rigor, procedure adherence, communications and follow-up.

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		2003	-- 008	-- 00	

17. NARRATIVE (If more space is required, use additional copies of NRC Form 366A)

Revise the Post-Event Review and Startup Approval process to make the process more comprehensive. (Due May 28, 2004)

Produce a formal document delineating the standards for preparing, reviewing and approving engineering documents, including handling of formal comments and resolutions. Communicate this to the engineering staff. (Due May 31, 2004)

Develop a formal process for exiting LCO action statements based on engineering evaluation. (Due April 30, 2004)

Prepare and present training to the engineering staff of events associated with the engineering evaluation of the heat-up and cool-down transients that occurred after the automatic reactor scram on November 28, 2003. (Due June 30, 2004)

PREVIOUS EVENTS

None

**ATTACHMENT 3 LIST OF REGULATORY COMMITMENTS©**

Correspondence Number: NLS2004003

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 & Regulatory Affairs Manager at Cooper Nuclear Station of any questions regarding this document or any associated regulatory commitments.

COMMITMENT	COMMITTED DATE OR OUTAGE
Revise the Post-Event Review and Startup Approval process to make the process more comprehensive.	May 28, 2004
Produce a formal document delineating the standards for preparing, reviewing and approving engineering documents, including handling of formal comments and resolutions. Communicate this to the engineering staff.	May 31, 2004
Develop a formal process for exiting LCO action statements based on engineering evaluation.	April 30, 2004
Prepare and present training to the engineering staff of events associated with the engineering evaluation of the heat-up and cool-down transients that occurred after the automatic reactor scram on November 28, 2003.	June 30, 2004