



**Nebraska Public Power District**

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NLS2006100  
December 15, 2006

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

Subject: Licensee Event Report No. 2006-005-00  
Cooper Nuclear Station, NRC Docket 50-298, DPR-46

The purpose of this correspondence is to forward a Licensee Event Report.

Sincerely,

Stewart B. Minahan  
General Manager of Plant Operations

/dm

Enclosure

cc: Regional Administrator w/enclosure  
USNRC - Region IV

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

Senior Resident Inspector w/enclosure  
USNRC - CNS

NPG Distribution w/enclosure

INPO Records Center w/enclosure

SORC Administrator w/enclosure

SRAB Administrator w/enclosure

CNS Records w/enclosure

*IE22*

<b>NRC FORM 366</b> (6-2004)		<b>U.S. NUCLEAR REGULATORY COMMISSION</b>			APPROVED BY OMB NO. 3150-0104    EXPIRES 06/30/2007								
<h2 style="margin: 0;">LICENSEE EVENT REPORT (LER)</h2> <p style="margin: 0;">(See reverse for required number of digits/characters for each block)</p>							Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@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 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.						
<b>1. FACILITY NAME</b> <b>Cooper Nuclear Station</b>				<b>2. DOCKET NUMBER</b> <b>05000298</b>		<b>3. PAGE</b> <b>1 of 4</b>							
<b>4. TITLE</b> <b>Residual Heat Removal Loop B Injection Valve Failure due to Incorrect Pinion Gear Installation in Motor Operator</b>													
<b>5. EVENT DATE</b>		<b>6. LER NUMBER</b>			<b>7. REPORT DATE</b>			<b>8. OTHER FACILITIES INVOLVED</b>					
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER			
10	17	2006	2006	- 005 -	00	12	15	2006					
<b>9. OPERATING MODE</b> <div style="text-align: center; font-size: 2em;">1</div>		<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5:</b> (Check all that apply)											
<b>10. POWER LEVEL</b> <div style="text-align: center; font-size: 2em;">92</div>		<input type="checkbox"/> 20.2201(b) <input type="checkbox"/> 20.2203(a)(3)(i) <input type="checkbox"/> 50.73(a)(2)(i)(C) <input type="checkbox"/> 50.73(a)(2)(vii) <input type="checkbox"/> 20.2201(d) <input type="checkbox"/> 20.2203(a)(3)(ii) <input type="checkbox"/> 50.73(a)(2)(ii)(A) <input type="checkbox"/> 50.73(a)(2)(viii)(A) <input type="checkbox"/> 20.2203(a)(1) <input type="checkbox"/> 20.2203(a)(4) <input type="checkbox"/> 50.73(a)(2)(ii)(B) <input type="checkbox"/> 50.73(a)(2)(viii)(B) <input type="checkbox"/> 20.2203(a)(2)(i) <input type="checkbox"/> 50.36(c)(1)(i)(A) <input type="checkbox"/> 50.73(a)(2)(iii) <input type="checkbox"/> 50.73(a)(2)(ix)(A) <input type="checkbox"/> 20.2203(a)(2)(ii) <input type="checkbox"/> 50.36(c)(1)(ii)(A) <input type="checkbox"/> 50.73(a)(2)(iv)(A) <input type="checkbox"/> 50.73(a)(2)(x) <input type="checkbox"/> 20.2203(a)(2)(iii) <input type="checkbox"/> 50.36(c)(2) <input type="checkbox"/> 50.73(a)(2)(v)(A) <input type="checkbox"/> 73.71(a)(4) <input type="checkbox"/> 20.2203(a)(2)(iv) <input type="checkbox"/> 50.46(a)(3)(ii) <input type="checkbox"/> 50.73(a)(2)(v)(B) <input type="checkbox"/> 73.71(a)(5) <input type="checkbox"/> 20.2203(a)(2)(v) <input type="checkbox"/> 50.73(a)(2)(i)(A) <input type="checkbox"/> 50.73(a)(2)(v)(C) <input type="checkbox"/> OTHER <input type="checkbox"/> 20.2203(a)(2)(vi) <input checked="" type="checkbox"/> 50.73(a)(2)(i)(B) <input type="checkbox"/> 50.73(a)(2)(v)(D)											
<b>12. LICENSEE CONTACT FOR THIS LER</b>													
FACILITY NAME						TELEPHONE NUMBER (Include Area Code)							
Paul V. Fleming, Licensing Manager						(402) 825-2774							
<b>13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT</b>													
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX				
D	BO	INV	L200	Y									
<b>14. SUPPLEMENTAL REPORT EXPECTED</b> <input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE). <input checked="" type="checkbox"/> NO						<b>15. EXPECTED SUBMISSION DATE</b>		MONTH	DAY	YEAR			
<b>16. ABSTRACT</b> (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) <p style="margin-top: 20px;">           At 04:05 CST on October 17, 2006, during surveillance testing, the Residual Heat Removal (RHR) Motor Operated Valve (MOV) Loop B injection valve (RHR-MOV-25B) failed to open when the associated switch was placed to open. Immediate action consisted of exiting the surveillance procedure and declaring the subject valve inoperable. The failure was a result of a dislocated motor pinion gear in the associated Limatorque motor operator. The MOV was incapable of opening for a period of approximately three months, which is a condition prohibited by Technical Specification 3.5.1 where one Emergency Core Cooling System train was inoperable for a period greater than seven days. The cause of the MOV failure was determined to be an improper pinion gear installation resulting from non-specific procedural guidance. This event was not risk significant.         </p>													

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

**SAFETY SIGNIFICANCE**

This condition is not risk significant. The failure of RHR-MOV-25B impacted RHR Loop B ability to provide LPCI and SDC injection to the RPV. The increase in core damage probability resulting from failure of RHR-MOV-25B is 1.5E-07. This increase is characterized as not risk-significant. Qualitatively, the minimal risk increase is justified by the fact that multiple redundant low pressure injection systems and containment heat removal systems were available and not impacted by the RHR-MOV-25B failure.

The failure had no impact to the primary containment isolation function since RHR-MOV-25B failed in a closed position. Therefore, the large early release frequency calculated for CNS was not impacted directly by the failure.

**CAUSE**

The failure of RHR-MOV-25B was a result of a dislocation of the motor pinion gear in the associated Limatorque motor operator. The pinion gear had moved both radially and axially on the motor shaft, resulting in insufficient gear engagement. The set screw was not holding the pinion gear to prevent axial movement. The failure was attributed to improper pinion gear installation.

The improper pinion gear installation was determined to be a result of non-specific procedural guidance governing the pinion gear installation. There was a mismatch between the criticality of the task to install MOV motor pinion gears and the level of detail in the maintenance procedures.

**CORRECTIVE ACTION**

The following immediate actions were completed.

1. CNS MOV maintenance procedures required for Refueling Outage 23 (RFO-23) governing Limatorque operators prone to pinion gear displacement were revised to include improved directions for securing the motor pinion gear during reassembly. Procedures that have not incorporated the improved motor pinion gear reassembly instructions were placed on administrative hold. Final changes to the procedures within the scope of this action are not yet completed and are being tracked in the CNS corrective action program.
2. The condition associated with the Limatorque operator for RHR-MOV-25B has been corrected.

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

**PLANT STATUS**

Cooper Nuclear Station (CNS) was at 92% power in Mode 1 at the time of the event.

**BACKGROUND**

The safety objective of the Residual Heat Removal (RHR) system [EIS:BO] is to provide core cooling, in conjunction with other Emergency Core Cooling Systems (ECCS), and to provide containment cooling as required during abnormal operational transients and postulated accidents. The RHR system consists of two heat exchangers [EIS:HX], four main system pumps [EIS:P] in two divisions, and associated piping, valves, controls and instrumentation. Upon opening the RHR Loop B injection valve (RHR-MOV-25B) [EIS:INV,ISV] a path is provided for low pressure coolant injection (LPCI)[EIS:BO] and shutdown cooling (SDC) to the reactor pressure vessel (RPV)[EIS:RPV]. In the normally closed position, this valve provides a primary containment isolation function for the associated line.

**EVENT DESCRIPTION**

On October 17, 2006 the plant was in Mode 1, in preparation for a refueling outage. At 04:05 CST, during surveillance testing, motor operated valve (MOV) RHR-MOV-25B failed to open when the associated switch [EIS:HS] was placed to open. Immediate action consisted of exiting the surveillance procedure and declaring the subject valve inoperable. The MOV was repaired, tested, and returned to OPERABLE status on October 18, 2006 at 05:18 CST.

**BASIS FOR REPORT**

This event is reportable under 10CFR50.73(a)(2)(i)(B) as a condition prohibited by Technical Specifications (TS). This is based on determining that injection valve RHR-MOV-25B was incapable of opening for a period of approximately three months. This was a condition prohibited by Technical Specification 3.5.1 where one ECCS train was inoperable for a period greater than seven days. Although other MOV actuators were identified with varying degrees of degradation, only RHR-MOV-25B was determined to be incapable of performing its safety function during the period required by TS. This was not a loss of core cooling or containment safety function because the redundant RHR Loop A remained operable.

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

3. MOVs determined to be "high risk" were inspected during RFO-23 for similar problems. Individual corrective actions to ensure continued operability have been completed.

The following actions are being tracked in the CNS corrective action program.

1. Revise CNS procedures associated with Limitorque motor pinion gear inspection and assembly.
2. Perform inspections and repairs (as necessary) of remaining extent-of-condition MOV actuators during Cycle 24 and RFO-24.
3. Establish appropriate Preventive Maintenance Plans to periodically inspect Limitorque motor shaft & pinion gear interface.

**PREVIOUS EVENTS**

There have been no recent reportable events related to MOV failures related to maintenance.

Correspondence Number: NLS2006100

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
<b>None</b>		