



**Nebraska Public Power District**

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NLS2014058

June 26, 2014

U.S. Nuclear Regulatory Commission

Attention: Document Control Desk

Washington, D.C. 20555-0001

Subject: Licensee Event Report No. 2014-003-00  
Cooper Nuclear Station, Docket No. 50-298, DPR-46

Dear Sir or Madam:

The purpose of this correspondence is to forward Licensee Event Report 2014-003-00.

There are no new commitments contained in this letter.

Sincerely,



FOR OSCAR LIMPIAS

Oscar A. Limpas  
Vice President Nuclear-  
Chief Nuclear Officer

/bk

Attachment: Licensee Event Report 2014-003-00

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  
via ICES entry

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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www.nppd.com

IE22  
NRR



## LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of  
digits/characters for each block)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollections.Resource@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 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

Valve Linkage Pin Out of Position Causes Condition Prohibited by Technical Specifications

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
02	25	2014	2014	- 003	- 00	06	26	2014	FACILITY NAME	DOCKET NUMBER
										05000
									FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING  
MODE

1

## 10. POWER LEVEL

100

## 11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)

<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)	Specify in Abstract below or in NRC Form 366A

## 12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME

David W. Van Der Kamp

TELEPHONE NUMBER (Include Area Code)

(402) 825-2904

## 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

## 14. SUPPLEMENTAL REPORT EXPECTED

☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE)☒ NO15. EXPECTED  
SUBMISSION  
DATE

MONTH	DAY	YEAR

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

On February 25, 2014, during planned Reactor Core Isolation Cooling (RCIC) system maintenance activities, a linkage pin in the RCIC trip and throttle valve, RCIC-MOV-MO14, was found out of position and not properly retained. The pin is part of the linkage assembly that ensures a successful valve reset following normal RCIC turbine trip situations. With the linkage pin in the as-found condition, it may have become disengaged during future RCIC system operation and prevented RCIC-MOV-MO14 to automatically reset, thus causing a system failure. Investigation found the set screws loose with no thread locker applied.

The cause of the linkage pin being out of position is inadequate work instructions during the valve overhaul in September 2010. The inadequate work instructions led to the set screws being out of position, which eventually let the linkage pin move out of position.

Immediate corrective action was taken to properly reinstall the pin and operation of RCIC-MOV-MO14 was tested satisfactorily on February 25, 2014. An additional corrective action was completed to revise the associated maintenance plan for RCIC-MOV-MO14 to include guidance for installation of the linkage pin and set screws.

**LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET**

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections 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, NEOB-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	2. DOCKET	6. LER NUMBER			3. PAGE
Cooper Nuclear Station	05000298	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 of 4
		2014	- 003	- 00	

**NARRATIVE****PLANT STATUS**

Cooper Nuclear Station (CNS) was in Mode 1 (Power Operation) at 100 percent power, at the time of the event.

**BACKGROUND**

The Reactor Core Isolation Cooling (RCIC) [EIS: BN] system provides makeup water to the reactor pressure vessel (RPV) [EIS: RPV] following an RPV isolation in order to prevent the release of radioactive materials to the environs as a result of inadequate core cooling.

The RCIC system consists of a steam driven turbine-pump unit [EIS: TRB, P], piping, and valves [EIS: V] to provide steam to the turbine, as well as piping and valves to transfer water from the suction source to the core via the Feedwater [EIS: SJ] system line, where the coolant is distributed within the RPV. The RCIC system pump supply is normally aligned to the Emergency Condensate Storage Tanks. The pump discharge is normally isolated and valve operation is required to align in either RPV injection mode or test return mode. Upon receipt of an initiation signal, the RCIC turbine accelerates to provide a specified pump flow. As the RCIC flow increases, the turbine control valve [EIS: FCV] is automatically adjusted to maintain the required design flow.

RCIC is required to be operable during Modes 1, 2 and 3 with reactor steam dome pressure > 150 psig, since RCIC is the primary non-emergency core cooling system water source for core cooling when the RPV is isolated and pressurized.

**EVENT DESCRIPTION**

At 14:44 on February 25, 2014, a linkage pin in the RCIC trip and throttle valve, RCIC-MOV-MO14, was found out of position and not properly retained. At the time of the event, the RCIC system was already inoperable for system maintenance activities. The pin is part of the linkage assembly that ensures a successful valve reset following normal RCIC turbine trip situations. For RCIC to automatically maintain RPV level, the valve must reset following turbine trips to allow the turbine to restart.

Maintenance personnel investigated the condition and found both set screws loose with no thread locker applied. Although a component failure was not experienced, the linkage pin, in the as-found condition, may have become disengaged during future RCIC system operation and prevented RCIC-MOV-MO14 to automatically reset, thus causing a system failure. Later in the shift on February 25, 2014, maintenance personnel re-installed the pin and applied thread locker to both set screws. Operation of RCIC-MOV-MO14 was tested satisfactorily at 21:41. Additionally, inspection was performed on all RCIC-MOV-MO14 linkages, pins, and set screws. All were found in the correct position.

Previous maintenance history of RCIC-MOV-MO14 was reviewed. In September 2010, preventive maintenance was performed that would have removed and re-installed the linkage pin and setscrews. At that time, maintenance personnel did not identify any adverse as-found conditions with either the linkage pin or set screws during disassembly of the valve.

(01-2014)

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## **NARRATIVE**

A photograph taken of the linkage assembly in August 2012 was compared against a photograph taken following the repair of the linkage assembly on February 25, 2014. The photographic evidence showed that although the linkage pin was in the proper location in August of 2012, the set screws were not sufficiently engaged to properly retain it in the correct position. The linkage pin has flats ground for the set screws to contact. This should lock the pin in place and prevent rotation. It is unknown if the pin was installed with the flats rotated slightly during the September 2010 preventive maintenance or if the set screws were simply improperly tightened.

CNS has a unique configuration of RCIC-MOV-MO14 in that it has an oil trip relay. This feature is not covered in vendor manual instructions. As such, in September 2010, personnel would have relied on skill-of-the-craft and standard mechanical practices for removal and re-installation of the linkage pin and set screws.

## **BASIS FOR REPORT**

The cause evaluation performed for the event was completed on April 28, 2014, and established firm evidence that the condition that caused the out-of-position linkage pin existed since August 2012. Therefore, the event is being reported as a condition prohibited by Technical Specifications (TS) per 10 CFR 50.73(a)(2)(i)(B) in that the condition existed for a period of time longer than permitted by TS. This report is due 60 days from the date of discovery, i.e., June 27, 2014.

## **SAFETY SIGNIFICANCE**

The safety significance associated with the discovery of an out-of-position linkage pin for the RCIC turbine trip automatic reset function is very low based on the following:

- RCIC's ability to provide reactor inventory control immediately following plant events was not impacted.
- Other high pressure reactor inventory make up systems (e.g., High Pressure Coolant Injection, Control Rod Drive, Reactor Feedwater) were not impacted.
- The as-found condition of the out-of-position linkage pin would have guaranteed the ability to automatically reset and use RCIC following at least one RCIC turbine trip.
- Continued RCIC operation following initial initiation of RCIC as an RPV injection source would have been achieved through procedural directed operator actions that do not result in RCIC turbine trips, and the need for automatic resets following multiple RCIC turbine trips would not be required.

Based on the above, this event resulted in a negligible increase to the core damage probability reflected in the internal events base model of the CNS Probabilistic Risk Assessment.

## **CAUSE**

The cause of the linkage pin being out of position is inadequate work instructions during the valve overhaul in September 2010. The inadequate work instructions led to the set screws being out of position, which eventually let the linkage pin move out of position.

(01-2014)

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**NARRATIVE****CORRECTIVE ACTION**

As noted above, immediate corrective action was taken to properly re-install the linkage pin.

An additional corrective action was completed to revise the associated maintenance plan for RCIC-MOV-MO14 to include guidance for installation of the linkage pin and set screws.

**PREVIOUS EVENTS**

There have been no events reported in the last three years related to RCIC.