



Nebraska Public Power District

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NLS2016074
December 19, 2016

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

Subject: Licensee Event Report No. 2016-006-00
Cooper Nuclear Station, Docket No. 50-298, DPR-46

Dear Sir or Madam:

The purpose of this correspondence is to forward Licensee Event Report 2016-006-00.

There are no new commitments contained in this letter.

Sincerely,

Oscar A. Limpias
Vice President Nuclear-
Chief Nuclear Officer

/jo

Attachment: Licensee Event Report 2016-006-00

cc: Regional Administrator w/attachment USNRC - Region IV	NPG Distribution w/attachment
Cooper Project Manager w/attachment USNRC - NRR Plant Licensing Branch IV-2	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

IEZZ
NRR



LICENSEE EVENT REPORT (LER)
(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R 3 for instruction and guidance for completing this form
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

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 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
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4. TITLE
High Vibration on Control Room Emergency Filter System Fan Results in Inoperability and Loss of Safety Function

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
10	23	2016	2016	006	00	12	19	2016	FACILITY NAME	DOCKET
										05000
										05000

9. OPERATING MODE 5

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)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(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)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
10. POWER LEVEL 000	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(B)
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(C)
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(D)
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(vii)
		<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> OTHER Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT Jim Shaw, Licensing Manager	TELEPHONE NUMBER (Include Area Code) (402) 825-2788
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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	TO EPIX
D	JH	FAN	C147	Y					

14. SUPPLEMENTAL REPORT EXPECTED

YES (If yes, complete 15. 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 October 23, 2016, while conducting refueling and Operations with a Potential for Draining the Reactor Vessel activities, Control Room Emergency Filter System (CREFS) Supply Fan A (SF-C-1A) experienced high vibration. A vibration analysis was performed and results indicated that vibration readings were elevated across all points for the motor and fan. Consequently, Operations declared CREFS inoperable at 19:08 hours. At 19:53 hours, SF-C-1B was started, CREFS was transferred to the alternate supply, and SF-C-1A was secured. At 23:41, Event Notification 52315 was made to the Nuclear Regulatory Commission Operations Center.

The fan was repaired on October 24 and 25, 2016, and a vibration analysis was performed on October 26, 2016, with satisfactory results. Operations declared CREFS operable at 13:41 on October 27, 2016.

The root cause was the preventive maintenance strategy for the fan was ineffective to ensure shaft to bearing engagement is maintained. To prevent recurrence, the applicable maintenance plan will be revised to include verification that the bearings are adequately engaged to the fan shaft.

This is a Safety System Functional Failure.

NRC FORM 366
(11-2015)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104

EXPIRES: 10/31/2018

**LICENSEE EVENT REPORT (LER)**

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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Cooper Nuclear Station	05000- 298	2016	- 006	- 00

NARRATIVE**PLANT STATUS**

Cooper Nuclear Station was in MODE 5, Refueling, at 0 percent power, at the time of the event. Diesel Generator (DG) 2 was inoperable for maintenance.

BACKGROUND

The Control Room Emergency Filter System (CREFS) [EIS:JH] is designed to provide a radiologically controlled environment to ensure the habitability of the control room for the safety of control room operators under all plant conditions. The CREFS is a standby system. The instrumentation and controls for the CREFS automatically isolate the normal ventilation intake and initiate action to pressurize the main control room and filter incoming air to minimize the infiltration of radioactive material into the control room environment.

The safety related function of CREFS includes a single high efficiency air filtration system for emergency treatment of outside supply air and a Control Room Envelope boundary that limits the inleakage of unfiltered air. The system consists of a prefilter, a high efficiency air particulate air filter [EIS:FLT], an activated charcoal adsorber [EIS:ADS] section, a supply fan [EIS:FAN], and emergency booster fan, an exhaust booster fan, and the associated ductwork [EIS:DUCT], valves [EIS:V] or dampers [EIS:DMP], doors [EIS:DR], barriers, and instrumentation.

Technical Specifications (TS) 3.7.4 requires one supply fan to be Operable to support CREFS Operability.

In MODES 4 and 5, maintaining CREFS operable is not required except during Operations with a Potential for Draining the Reactor Vessel (OPDRV); and during movement of lately irradiated fuel assemblies in the secondary containment. Due to radioactive decay, CREFS is only required to be OPERABLE during fuel handling involving handling of lately irradiated fuel.

Power supply for Supply Fan SF-C-1A is MCC LX (Division 1). Power supply for SF-C-1B is MCC-TX (Division 2).

EVENT DESCRIPTION

On October 21, 2016, Operations declared Diesel Generator 2 Inoperable in preparation for performing planned maintenance. Therefore, only SF-C-1A had essential power available.

On October 23, 2016, at 11:54 hours, Operations entered an OPDRV condition for Control Rod Drive maintenance using a freeze seal. The OPDRV condition required CREFS to be operable.

On October 23, 2016, at 13:56 hours, it was observed that control room supply fans were shaking while SF-C-1A was running, and it was noticed that a belt guard bracket had broken off.

NRC FORM 366
(11-2015)

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Cooper Nuclear Station	05000- 298	2016	- 006	- 00

NARRATIVE

A vibration analysis was performed and results indicated that vibration readings were elevated across all points for the motor and fan. It was recommended that SF-C-1A be removed from service. Operations declared CREFS inoperable at 19:08 hours, entering TS Limiting Condition for Operation 3.7.4, Condition A. At 19:53 hours, SF-C-1B was started and SF-C-1A was secured.

The fan was repaired on October 24 and 25, 2016. A vibration analysis was performed on October 26, 2016, with satisfactory results and Operations declared CREFS operable at 13:41 on October 27, 2016.

During investigation it was found that the drive end bearing locking collar was loose from the bearing and the shaft. This allowed the shaft to turn within the bearing inner race, causing damage to the shaft and resulting in high vibration levels. Preventive Maintenance (PM) on the Control Room supply fans are lubricated every 26 weeks, but the PM does not verify that bearing setscrews or locking collars are tight.

BASIS FOR REPORT

This event is reportable in accordance with 10 CFR 50.73(a)(2)(v)(D) as a condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident. Event Notification 52315 was made to the Nuclear Regulatory Commission Operations Center.

SAFETY SIGNIFICANCE

This is a Safety System Functional Failure because of the loss of a single train safety-related system. The plant was in MODE 5 performing refueling activities and conducting an OPDRV activity. CREFS was required to be operable in case of a drain down event resulting in uncovering fuel. The CREF system was fully functional with the exception of the SF-C-1A fan and the DG2 emergency electrical power supply to SF-C-1B. In the case of a drain down event, SF-C-1B was capable of being manually started and still had electrical power available from the Normal Station Service Transformer back feed and the Emergency Station Service Transformer. There were no actual safety consequences associated with this event. The potential safety consequences of this event were minimal due to the limited duration the condition existed and the redundant safety equipment which remained operable.

CAUSE

The root cause is the preventive maintenance strategy for the fan was ineffective to ensure shaft to bearing engagement is maintained.

NRC FORM 366
(11-2015)

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Cooper Nuclear Station	05000- 298	2016	-006	-00

NARRATIVE

CORRECTIVE ACTIONS

To prevent recurrence of this event, the Maintenance Plan will be revised to include verification that the bearings are adequately engaged to the fan shaft.

PREVIOUS EVENTS

There have been no events reported in the past three years related to CREFS being declared inoperable.