



Nebraska Public Power District

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10 CFR 50.73

NLS2022027

July 20, 2022

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

Subject: Licensee Event Report No. 2022-001-00
Cooper Nuclear Station, Docket No. 50-298, DPR-46

Dear Sir or Madam:

The purpose of this correspondence is to forward Licensee Event Report 2022-001-00.

There are no regulatory commitments contained in this letter.

Sincerely,

John Dent, Jr.
Vice President and
Chief Nuclear Officer

/jo

Attachment: Licensee Event Report 2022-001-00

cc: Regional Administrator w/attachment
USNRC - Region IV

NPG Distribution w/attachment

Cooper Project Manager w/attachment
USNRC - NRR Plant Licensing Branch IV

INPO Records Center w/attachment
via IRIS entry

Senior Resident Inspector w/attachment
USNRC - CNS

SORC Chairman w/attachment

SRAB Administrator w/attachment

CNS Records w/attachment



LICENSEE EVENT REPORT (LER)

(See Page 3 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form
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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, Library, and Information Collection Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; e-mail: oir_submission@omb.eop.gov. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

1. Facility Name Cooper Nuclear Station	2. Docket Number 05000 298	3. Page 1 OF 4
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4. Title Secondary Containment Differential Pressure Perturbation Exceeds Technical Specifications Limit

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
05	23	2022	2022	- 001	00	07	20	2022	Facility Name	05000
									Facility Name	05000

9. Operating Mode 1	10. Power Level 95
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11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)

10 CFR Part 20	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	10 CFR Part 73
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.69(g)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(4)
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.71(a)(5)
<input type="checkbox"/> 20.2203(a)(2)(i)	10 CFR Part 21	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(1)(i)
<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 21.2(c)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(i)
<input type="checkbox"/> 20.2203(a)(2)(iii)	10 CFR Part 50	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 73.77(a)(2)(ii)
<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<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)(v)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)	
<input type="checkbox"/> Other (Specify here, in Abstract, or in NRC 366A).				

12. Licensee Contact for this LER

Licensee Contact Linda Dewhirst, Regulatory Affairs and Compliance Manager	Phone Number (Include Area Code) (402) 825-5416
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13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable To IRIS	Cause	System	Component	Manufacturer	Reportable To IRIS
D	NG	DMP	H260	Y					

14. Supplemental Report Expected☒ No ☐ Yes (If yes, complete 15. Expected Submission Date)**15. Expected Submission Date**

Month	Day	Year

16. Abstract (Limit to 1560 spaces, i.e., approximately 15 single-spaced typewritten lines)

On May 23, 2022, Reactor Building differential pressure (d/p) became unstable and exceeded the Technical Specifications limit of -0.25 inches of water gauge resulting in Secondary Containment being declared inoperable.

The direct cause of the d/p perturbation was determined to be a failure of the valve stem O-ring in the Reactor Building 'A' Exhaust Fan vortex damper actuator. The d/p controller responded to the condition and restored Secondary Containment pressure without Operator action. The O-ring and case gaskets were replaced and 'A' Exhaust Fan was returned to service.

There was no impact on nuclear safety, plant reliability, radiological safety, or industrial safety.

Event Notification 55907 was submitted on May 23, 2022, due to the unplanned inoperability of Secondary Containment.

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

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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Cooper Nuclear Station	05000- 298	2022	- 001	- 00

NARRATIVE**PLANT STATUS**

Cooper Nuclear Station was in Mode 1, Power Operation, at 95 percent power at the time of the event on May 23, 2022.

BACKGROUND

Secondary Containment serves as a barrier to confine and monitor potential releases during fuel handling operations and is a system that limits the release of radioactive materials to the environment. Secondary Containment consists of four subsystems. One of the subsystems is the Reactor Building [EIS: NG], which encloses the Reactor Pressure Vessel [EIS: RPV] and Primary Containment [EIS: NH].

The Secondary Containment area (most of the Reactor Building) has supply and exhaust ventilating systems. The supply system furnishes filtered 100% outdoor air to all floors of the building through ductwork. The supply unit has an operating and standby (100% capacity) fan with vortex dampers [EIS: CDMF] to provide regulation of air capacity. The fans will deenergize in the event of loss of offsite power. The exhaust air is induced from the ventilated areas to a common plenum connected to the two exhaust fans, each of 100% capacity. The air is then exhausted to the atmosphere.

During normal plant operation, a minimum average negative pressure of 0.25 inches of water gauge (wg) is maintained by differential pressure controllers [EIS: PDC] which receive signals proportional to the pressure difference between outside air and the Secondary Containment atmosphere, and control the position of the exhaust fan vortex dampers. The differential pressure (d/p) is detected by four separate probes, with one on each side of the Reactor Building. Control action is initiated from the average value of the four sensor probes.

If a Loss of Coolant Accident should occur, all ventilation systems of the Primary Containment area and Secondary Containment area will be isolated automatically, and the Standby Gas Treatment (SGT) [EIS: BH] system will be automatically initiated.

EVENT DESCRIPTION

On May 23, 2022, at 0400, Reactor Building Exhaust Fan 'A' was placed in service to maintain Reactor Building d/p while Exhaust Fan 'B' was secured for planned maintenance. After Exhaust Fan 'A' was placed in service, Reactor Building d/p controller output trended down for 40 minutes to adjust d/p to match the setpoint. Reactor Building effluent flow was unchanged during this timeframe. The continuous downward trend in pressure with no change in effluent flow indicated that the fan vortex damper actuator was not responding to the changes in demand from the d/p controller.

The fan vortex damper actuator responded causing a sudden reduction in exhaust flow which caused a pressure spike in the Reactor Building at 0455 to -0.20 inches wg. This exceeded the Technical Specification (TS) Surveillance Requirement 3.6.4.1.1 limit of -0.25 inches wg for Secondary Containment. The d/p

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controller immediately responded to this pressure rise and restored Reactor Building pressure to within TS limits. Secondary Containment was Operable at 0457 with no operator actions required. Reactor Building Exhaust Fan 'A' was removed from service.

Troubleshooting was performed and found that when the vortex damper for Reactor Building Exhaust Fan 'A' was cycled, the under diaphragm area of the damper actuator would not hold pressure and the valve stem O-ring appeared to not seal. The vortex damper actuator was refurbished including replacement of the stem O-ring. The condition of the stem O-ring was brittle and fell apart during removal. This prevented the under-diaphragm area from being pressurized. The stem O-ring and case gaskets were replaced, and the 'A' Exhaust Fan was returned to service.

A review of maintenance plan history revealed that the diaphragm required routine replacement to prevent failure. However, the maintenance plan did not contain direction on replacing the valve stem O-ring, or that a failure of the O-ring would cause a pressure transient.

BASIS FOR REPORT

This event is reportable under 10 CFR 50.73(a)(2)(v)(C and D) – An event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to control the release of radioactive material or mitigate the consequences of an accident. Event Notification 55907 was submitted on May 23, 2022, due to the unplanned inoperability of Secondary Containment.

An engineering review was performed for Loss of Safety Function and it documented that the SGT system remained capable of drawing the Reactor Building to vacuum conditions within a period of time sufficient to ensure acceptance criteria would not be exceeded.

Based on the engineering review, this event will not be counted as a Safety System Functional Failure for the Nuclear Regulatory Commission performance indicator since no loss of safety function occurred.

SAFETY SIGNIFICANCE

This condition is non-consequential. The pressure excursion in the Reactor Building resulted in an unexpected plant condition and met the entry condition for required action pursuant to TS. This event resulted in a minor excursion of Reactor Building d/p above the TS limit of -0.25 inches wg for several minutes until the non-essential Reactor Building HVAC controls restored the required d/p. This event did not negate the ability of the Standby Gas Treatment system to maintain Secondary Containment d/p if required. There was no impact on nuclear safety, plant reliability, radiological safety, or industrial safety.

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CAUSE

The causal factor for this event was failure to previously identify all potential failure modes for the Exhaust Fan vortex damper actuator.

CORRECTIVE ACTIONS

The stem O-ring and case gaskets for the Reactor Building Exhaust Fans have been replaced, and the 'A' Exhaust Fan was returned to service.

The maintenance plan has been revised to include replacing the valve stem O-ring during routine maintenance.

PREVIOUS EVENTS

On February 9, 2021 – Secondary Containment declared inoperable due to a rise in d/p. This was reported under LER 2021-001-00 as a loss of safety function under 10 CFR 50.73(a)(2)(v)(C and D) – An event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to control the release of radioactive material or mitigate the consequences of an accident.

On November 11, 2020 – Secondary Containment declared inoperable due to a rise in d/p. This was reported under LER 2020-004-00 as a loss of safety function under 10 CFR 50.73(a)(2)(v)(C and D) – An event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to control the release of radioactive material or mitigate the consequences of an accident.

On August 6, 2020, Secondary Containment was declared inoperable due to a rise in d/p. This was reported under LER 2020-002-00 as a loss of safety function under 10 CFR 50.73(a)(2)(v)(C and D) – An event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to control the release of radioactive material or mitigate the consequences of an accident.

On May 1, 2020, Secondary Containment was breached due to both airlock doors in the Reactor Building being inadvertently opened simultaneously. This was reported under LER 2020-001-00 as a loss of safety function under 10 CFR 50.73(a)(2)(v)(C and D) - An event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to control the release of radioactive material or mitigate the consequences of an accident.

On August 8, 2019, Secondary Containment was declared inoperable due to a rise in d/p. This was reported under LER 2019-002-00 as a loss of safety function under 10 CFR 50.73(a)(2)(v)(C and D) - An event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to control the release of radioactive material or mitigate the consequences of an accident.