Nebraska Public Power District

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10 CFR 50.73

NLS2021023
April 12, 2021

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

Subject: Licensee Event Report No. 2021-001-00
Cooper Nuclear Station, Docket No. 50-298, DPR-46

Dear Sir or Madam:

The purpose of this correspondence is to forward Licensee Event Report 2021-001-00.

There are no regulatory commitments contained in this request.

Sincerely,

John Dent, Jr.
Vice President and
Chief Nuclear Officer

/jo

Attachment: Licensee Event Report 2021-001-00

cc: Regional Administrator w/attachment
USNRC - Region IV

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

Senior Resident Inspector w/attachment
USNRC - CNS

SRAB Administrator w/attachment

NPG Distribution w/attachment

INPO Records Center w/attachment
via IRIS entry

SORC Chairman w/attachment

CNS Records w/attachment

NRC FORM 366 (08-2020) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 08/31/2023

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 http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

1. Facility Name	2. Docket Number	3. Page
Cooper Nuclear Station	05000 298	1 OF 4

4. Title

Secondary Containment Differential Pressure Perturbation Exceeds Technical Specifications

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Revision No.	Month	Day	Year	Facility Name	Docket Number
02	09	2021	2021	- 001 -	00	04	12	2021		05000
									Facility Name	Docket Number
										05000

9. Operating Mode	10. Power Level
1	100

11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: *(Check all that apply)*

10 CFR Part 20	☐ 20.2203(a)(2)(vi)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(A)	**10 CFR Part 73**
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.69(g)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(4)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(i)(A)	☑ 50.73(a)(2)(v)(C)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(i)	**10 CFR Part 21**	☐ 50.73(a)(2)(i)(B)	☑ 50.73(a)(2)(v)(D)	☐ 73.77(a)(1)(i)
☐ 20.2203(a)(2)(ii)	☐ 21.2(c)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(i)
☐ 20.2203(a)(2)(iii)	**10 CFR Part 50**	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)	☐ 73.77(a)(2)(ii)
☐ 20.2203(a)(2)(iv)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)	
☐ 20.2203(a)(2)(v)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)	

☐ **OTHER** (Specify here, in abstract, or NRC 366A).

12. Licensee Contact for this LER

Licensee Contact	Phone Number (Include area code)
Linda Dewhirst, Regulatory Affairs and Compliance Manager	(402) 825-5416

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	CDMP		Y						

14. Supplemental Report Expected		15. Expected Submission Date	Month	Day	Year
☑ No	☐ Yes (If yes, complete 15. Expected Submission Date)				

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

On February 9, 2021, Reactor Building differential pressure (d/p) became unstable and exceeded the Technical Specifications limit of -0.25 inches of water gauge (wg) resulting in Secondary Containment being declared inoperable.

Two causal factors were identified for this event. The first being that Reactor Building d/p controller 'A' has not been tuned to quickly respond to changing environmental conditions. The second factor is that there were no interim actions in place to bridge the gap identified in previous events.

Reactor Building d/p controller 'A' was optimally tuned. Follow up troubleshooting showed the as-left settings of the controller would be capable of maintaining Reactor Building d/p within limits when exposed to similar barometric pressure fluctuations.

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

Event Notification 55098 was submitted on February 9, 2021, due to the unplanned inoperability of Secondary Containment.

LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

(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/)

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Cooper Nuclear Station	05000- 298	2021	- 001	- 00

NARRATIVE

PLANT STATUS

Cooper Nuclear Station was in Mode 1, Power Operation, at 100 percent power at the time of the event on February 9, 2021.

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 and consists of four subsystems. One of the subsystems is the Reactor Building [EIIS: NG], which encloses the Reactor Pressure Vessel [EIIS: RPV] and Primary Containment [EIIS: 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 [EIIS: CDMP] 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 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 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 system will be automatically initiated.

EVENT DESCRIPTION

On February 9, 2021, at approximately 02:00 hours, control room operators noted that Reactor Building differential pressure (d/p) had exceeded -0.25 inches wg for less than 30 seconds. At the time, Reactor Building exhaust fan 'A' was in service maintaining Reactor Building d/p at a nominal -0.33 inches wg. The control room staff reviewed the meteorological conditions and decided to shift the Reactor Building exhaust fans. At 02:35 hours, Reactor Building exhaust fan 'B' was placed in service and maintained Reactor Building d/p less than -0.25 inches wg.

Engineering personnel reviewed the event and concluded that peaks in Reactor Building d/p and barometric pressure occurred coincident with each other. Technical Specifications (TS) Surveillance Requirement (SR) 3.6.4.1.1 was reviewed and it was noted that the TS basis specifically states that momentary transients on installed instrumentation caused by gusty wind conditions are considered acceptable and are not cause for failure to meet this SR. Meteorological data was reviewed and there was no evidence of gusty wind conditions observed.

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Cooper Nuclear Station	05000- 298	2021	- 001	- 00

NARRATIVE

The fluctuations in barometric pressure observed on February 9, 2021, have a similar impact as gusty wind conditions. These fluctuations changed the sensed d/p and the Reactor Building d/p controller 'A' responded to prevent a high d/p condition. As Reactor Building d/p lowered, the Reactor Building d/p controller 'A' could not increase exhaust fan flow quickly enough to prevent exceeding -0.25 inches wg.

The two Reactor Building d/p controllers average the signal from the four d/p transmitters. The controllers have a function block called a Dead Time monitor which performs a rolling average of these feedback signals. Reactor Building d/p controller 'A' had an 18 second moving average. This moving average delays the responsiveness of the controllers to transient conditions. This was identified in evaluations of previous similar conditions and corrective maintenance is scheduled; however, no interim actions were developed to prevent this event from recurring.

Troubleshooting confirmed that Reactor Building exhaust fan 'A' and its supporting equipment can control Reactor Building d/p with stable environmental conditions. However, the control system did not respond quickly enough to limit reactor building d/p with a transient condition present.

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 55098 was submitted on February 9, 2021, due to the unplanned inoperability of Secondary Containment.

An engineering review demonstrated that the perturbation on Secondary Containment pressure caused by the non-essential Reactor Building Heating Ventilation Air Conditioning (HVAC) system did not impact the integrity of Secondary Containment or the ability of Standby Gas Treatment to maintain Secondary Containment at a negative pressure.

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 Technical Specifications. This event resulted in four transient excursions, each less than one minute, of Reactor Building d/p above the TS limit of -0.25 inches wg until the non-essential Reactor Building HVAC controls restored the required d/p. These transients 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.

As such, 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.

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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Cooper Nuclear Station	05000- 298	2021	- 001	- 00

NARRATIVE

CAUSE

Two causal factors were identified for this event. The first being that Reactor Building d/p controller 'A' has not been tuned to quickly respond to changing environmental conditions. The second is there were no interim actions in place bridging the gap identified from previous events.

CORRECTIVE ACTIONS

Reactor Building d/p controller 'A' was optimally tuned. Follow up troubleshooting showed the as-left settings of the controller would be capable of maintaining Reactor Building d/p within limits when exposed to similar barometric pressure fluctuations.

PREVIOUS EVENTS

On November 11, 2020 - Secondary Containment declared inoperable due to a rise in differential pressure. 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 differential pressure. 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 differential pressure. 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.

On January 6, 2014 - Secondary Containment was declared inoperable due to a rise in differential pressure. This was reported under LER 2014-001-00 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.