Nebraska Public Power District

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10 CFR 50.73

NLS2023023
May 08, 2023

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

Subject: Licensee Event Report No. 2023-001-00
Cooper Nuclear Station, Docket No. 50-298, DPR-46

Dear Sir or Madam:

The purpose of this correspondence is to forward Licensee Event Report 2023-001-00.

This letter does not contain regulatory commitments.

Sincerely,

Khalil Dia
Site Vice President

/jo

Attachment: Licensee Event Report 2023-001-00

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 U.S. NUCLEAR REGULATORY COMMISSION
(03-14-2023)

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

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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/)

1. Facility Name		2. Docket Number	3. Page
Cooper Nuclear Station	☒ 050 ☐ 052	00298	1 of 3

4. Title
Valve Test Failures Result in Condition Prohibited by 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	050	Docket Number
03	08	2023	2023	- 001 -	00	05	08	2023	Facility Name	052	Docket Number

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)	**10 CFR Part 50**	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)	☐ 73.1200(a)
☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)	☐ 73.1200(b)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)	☐ 73.1200(c)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)	☐ 73.1200(d)
☐ 20.2203(a)(2)(i)	**10 CFR Part 21**	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(A)	**10 CFR Part 73**	☐ 73.1200(e)
☐ 20.2203(a)(2)(ii)	☐ 21.2(c)	☐ 50.69(g)	☐ 50.73(a)(2)(v)(B)	☐ 73.77(a)(1)	☐ 73.1200(f)
☐ 20.2203(a)(2)(iii)		☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(2)(i)	☐ 73.1200(g)
☐ 20.2203(a)(2)(iv)		☒ 50.73(a)(2)(i)(B)	☒ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(ii)	☐ 73.1200(h)
☐ 20.2203(a)(2)(v)		☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)		

☐ **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
B	SB	RV	T020	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 1326 spaces, i.e., approximately 13 single-spaced typewritten lines)

On March 7 and March 8, 2023, two Target Rock safety relief valve (SRV) pilot assemblies, removed during Refueling Outage 32, failed to lift within Technical Specifications (TS) lift setpoint requirements. The pressure setpoint of the first failed pilot assembly was 1080 psig; the SRV pilot assembly lifted at 1166.4 psig. The pressure setpoint of the second failed pilot assembly was 1100 psig; the SRV pilot assembly lifted at 1186.1 psig. Three subsequent lifts were performed for the failed SRV pilot assemblies and the results were within the TS pressure setpoint tolerance.

The cause of the failure was determined to be corrosion bonding.

Although the setpoint lift pressures of the SRV pilot valve assemblies exceeded TS requirements, an analysis of the event concluded the thermal limits, and American Society of Mechanical Engineers overpressure transients, did not exceed allowable limits. Public safety was not at risk. Safety of plant personnel, and plant equipment, was not at risk. A TS Amendment to TS 3.4.3 will be submitted that will address the failure to meet the TS criteria for the Target Rock two-stage SRVs.

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/)

FACILITY NAME		2. DOCKET NUMBER	3. LER NUMBER		
	X 050		YEAR	SEQUENTIAL NUMBER	REV NO.
Cooper Nuclear Station	052	00298	2023	- 001	- 00

NARRATIVE

PLANT STATUS

Cooper Nuclear Station was in Mode 1, Power Operation, at 100 percent power, when the event was discovered, i.e., March 8, 2023.

BACKGROUND

The pressure relief system includes three American Society of Mechanical Engineers (ASME) code safety valves (SV) [EIIS: SB] and eight safety relief valves (SRV) [EIIS: RV], all of which are located on the main steam lines [EIIS: SB] within the drywell [EIIS: NH], between the reactor vessel [EIIS: RPV] and the first main steam isolation valve [EIIS: ISV]. The SVs provide protection against over pressurization of the nuclear system and discharge directly into the interior space of the drywell. The SRVs discharge to the suppression pool and provide three main functions: overpressure relief operation to limit the pressure rise and prevent safety valve opening, overpressure safety operation to prevent nuclear system over pressurization, and depressurization operation (opened automatically or manually) as part of the emergency core cooling system [EIIS: BJ, BM, BO].

Technical Specification (TS) Limiting Condition for Operation (LCO) 3.4.3 requires the safety function of seven SRVs and three SVs to be operable. The nominal set pressure tolerances for these valves are established in CNS TS Surveillance Requirement (SR) 3.4.3.1.

The SRVs installed at CNS are Target Rock Model 7567F, two-stage, pilot-actuated valves with pilot assemblies comprised of Stellite 21 pilot discs and Stellite 6B pilot body seats. The pilot assemblies had been in continuous service since installation in Refueling Outage (RE) 31, (Fall of 2020).

Corrosion bonding is an industry known problem with Target Rock Model 7567F two-stage relief valves in which the pilot valve bonds/sticks to the in-body seat, resulting in an increased pressure needed to lift the valve. After the corrosion bonding is "broken" following the initial lift, the subsequent lifts are within tolerance.

EVENT DESCRIPTION

In the Fall of 2022, three main SRV body/pilot assemblies and five SRV pilot assemblies were removed during RE32. In March 2023, the eight SRV pilot assemblies were as-found tested at National Technical Systems Laboratories.

The pressure setpoint for SRV pilot assembly serial number 387 is 1080 psig. The TS SR 3.4.3.1 as-found limit acceptance is 1080 +/- 3%. The first actual lift pressure of this SRV pilot assembly was recorded at 1166.4 psig, 8.0% above the pressure setpoint. A second, third, and fourth lift was performed, and the results were 1088 psig, 1084 psig, and 1084 psig, all three within 3% of the pressure setpoint.

The pressure setpoint for SRV pilot assembly serial number 386 is 1100 psig. The TS SR 3.4.3.1 as-found limit acceptance is 1100 +/- 3%. The first actual lift pressure of this SRV pilot assembly was recorded at 1186.1 psig, 7.8% above the pressure setpoint. A second, third, and fourth lift was performed, and the results were 1111 psig, 1110 psig, and 1109 psig, all three within 3% of the pressure setpoint.

BASIS FOR REPORT

CNS is reporting this event as an operation or condition prohibited by plant TS per 10 CFR 50.73(a)(2)(i)(B), and also 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 as defined under 10 CFR 50.73(a)(2)(v)(D).

SAFETY SIGNIFICANCE

CNS performed an Engineering Report (ER) documenting the impact of the RE32 SRV setpoint failures. The ER determined the ASME overpressure protection and core thermal limits would not have been exceeded. Public safety was not at risk. Safety to plant personnel and plant equipment was not at risk.

Based on the results of the ER, this event is not considered a Safety System Functional Failure nor a loss of safety function and will not be counted as a Safety System Functional Failure to the Nuclear Regulatory Commission (NRC) perform indicator since no loss of safety function occurred.

CAUSE

Corrosion bonding between the pilot disc and the in-body seat.

CORRECTIVE ACTIONS

The Boiling Water Reactor Owners Group (BWROG) Licensing Committee is actively developing a TS change via a Technical Specification Task Force (TSTF) Traveler such that the LCO and associated SR will be met if the safety function is met. CNS is following this BWROG initiative and utilizing the corrective action program to track the following actions:

1. Track to completion the BWROG industry initiative to develop a TSTF Traveler for TS 3.4.3, including NRC approval, that would address the failure to meet TS criteria for the Target Rock two-stage SRVs.

2. Submit a TS Amendment to TS 3.4.3 that would address the failure to meet TS criteria for the Target Rock two-stage SRVs. Following submittal, initiate a new CA for TS Change approval that also ensures a follow-on corrective action to implement the TS change.

PREVIOUS EVENTS

Licensee Event Report (LER) 2021-002-00 – On March 18 and March 20, 2021, two Target Rock SRV pilot assemblies failed to lift within TS lift setpoint requirements. The cause was corrosion bonding.

LER 2019-001-00 and LER 2019-001-01 – On March 4, March 5, and March 6, 2019, three of eight Target Rock SRV pilot assemblies failed to lift within TS lift setpoint requirements. The cause was corrosion bonding.

LER 2017-002-00 – In February and March, 2017, one Target Rock SRV pilot assembly failed to lift within TS lift setpoint requirements and another SRV pilot assembly was conservatively considered a failure due to lack of as-found lift pressure test data since it was inadvertently disassembled prior to performing the as-found lift pressure test. There were two causes for the failures; one of the SRV pilot assemblies failed due to corrosion bonding; the other SRV pilot assembly failed due to a lack of a barrier to prevent inadvertent disassembly of the SRV pilot prior to testing.

LER 2015-001-00 and LER 2015-001-01 – On January 26 and February 11, 2015, five of eight Target Rock SRV pilot valve assemblies failed to lift within TS lift setpoint requirements. The cause was corrosion bonding.

LER 2011-005-00 – On June 22, 2011, one of eight Target Rock SRV pilot valve assemblies failed to lift within TS lift setpoint requirements. The cause was corrosion bonding.

LER 2010-001-00 – On January 12, 2010, two of eight Target Rock SRV pilot valve assemblies failed to lift within TS lift setpoint requirements. The cause was corrosion bonding.