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NLS2011089
August 19, 2011

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

Subject: Licensee Event Report No. 2011-005-00
Cooper Nuclear Station, Docket No. 50-298, DPR-46

Dear Sir or Madam:

The purpose of this correspondence is to forward Licensee Event Report 2011-005-00.

Sincerely,

for Demetrius L. Willis

Demetrius L. Willis
General Manager of Plant Operations

/bk

Attachment

cc: Regional Administrator w/attachment
USNRC - Region IV

Cooper Project Manager w/attachment
USNRC - NRR Project Directorate IV-1

Senior Resident Inspector w/attachment
USNRC - CNS

SRAB Administrator w/attachment

NPG Distribution w/attachment

INPO Records Center w/attachment

SORC Chairman w/attachment

CNS Records w/attachment

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IE22
NRR

NRC FORM 366 (10-2010) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 10/31/2013

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

LICENSEE EVENT REPORT (LER)

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

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4. TITLE
Technical Specification Prohibited Condition Due To Valve Test Failure

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
										05000
06	22	2011	2011	- 005 -	00	08	19	2011	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)*

☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
☐ 20.2203(a)(2)(vi)	☒ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER *(Include Area Code)*
David W. Van Der Kamp, Licensing Manager	(402) 825-2904

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
B	SB	RV	T020	N					

14. SUPPLEMENTAL REPORT EXPECTED
☐ **YES** *(If yes, complete 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 June 22, 2011, one of eight Target Rock safety relief valve (SRV) pilot valve assemblies, removed during Cooper Nuclear Station (CNS) refueling outage 26, failed to lift within Technical Specification (TS) lift setpoint requirements. Wyle Laboratories, Inc. performed this testing. The pressure setpoint of the failed pilot assembly is 1090 +/- 32.7 psig; the SRV pilot assembly lifted at 1199 psig. Two subsequent informational lifts were performed for the SRV pilot assembly and were within the TS pressure setpoint tolerances. The remaining seven SRV pilot valve assemblies tested satisfactory for TS lift setpoint requirements.

The mechanistic cause is the same as reported in previous licensee event reports, pilot disc-to-seat corrosion bonding. CNS submitted a license amendment request (LAR) on January 5, 2011, to the Nuclear Regulatory Commission (NRC) to revise the number of SRVs required to be operable. This LAR is pending NRC approval. As such, corrective actions to implement a license amendment, related to TS 3.4.3 and the number of SRVs required to be operable, were not completed prior to the SRV testing in June 2011.

This event is reportable as a condition prohibited by TS. The event has negligible safety significance.

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17. NARRATIVE

PLANT STATUS

Cooper Nuclear Station (CNS) was in Mode 1, Power Operation, at 100 percent power when the event was discovered; i.e., June 22, 2011. Additionally, CNS was in a Notice of Unusual Event due to Missouri River level above 899 feet.

BACKGROUND

The pressure relief system includes three American Society of Mechanical Engineers 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 safety valves 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 eight SRVs and three SVs to be operable. The nominal set pressure and 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.

During Refueling Outage 26 (RE26), three complete SRVs (pilot assemblies and main bodies) and five SRV pilot assemblies were removed from the plant and replaced with refurbished certified spares. The SRVs and pilot assemblies removed from service were shipped to Wyle Laboratories, Inc. for required surveillance testing.

EVENT DESCRIPTION

On June 20 through June 22, 2011, three complete SRVs and five SRV pilot assemblies, removed during RE26 in the Spring of 2011, were as-found tested at Wyle Laboratories, Inc. On June 22, 2011, as-found pressure setpoint testing for one SRV pilot assembly (serial number 1242) exceeded the TS limit. The SRV pilot assembly was installed during RE25 at functional location MS-RV-71HRV and operated through the entire cycle.

The pressure setpoint for SRV pilot assembly serial number 1242 is 1090 psig +/-3%. The TS SR 3.4.3.1 as-found limit of acceptance is 1090 +/- 32.7 psig (1057.3 psig to 1122.7 psig). The first actual lift pressure of this SRV pilot assembly was recorded as 1199 psig, 10% above the pressure setpoint. For informational purposes, the technicians performed a second and third lift. The results were 1095 psig and 1102 psig, both within 1.1% of the pressure setpoint. The lift patterns are characteristic of corrosion bonding.

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The remaining seven SRVs and SRV pilot assemblies tested satisfactory for TS lift setpoint requirements. The affected SRV pilot assembly is not currently installed in the plant. All eight SRV pilot assemblies installed during RE26 were refurbished and certified to lift within +/- 1% of as-left setpoint acceptance criteria prior to installation. Therefore, all currently installed SRVs are capable of performing their intended function of providing protection against over pressurization.

The failure mechanism is pilot disc-to-seat corrosion bonding. As reported in Licensee Event Reports (LER) 2008-002-00 and 2010-001-00, the performance of the two-stage Target Rock pilot-actuated valves in the current design application at CNS is unsuccessful in consistently meeting the as-found lift test requirements contained within the current TS due to corrosion bonding. SRV corrosion bonding is an industry-wide issue which has been evaluated within CNS' corrective action program. Past corrective actions taken by CNS have reduced the number of failures due to corrosion bonding. They include replacement of the SRV pilot valve assemblies with certified SRV pilot valve assemblies containing Stellite 21 pilot discs instead of platinum-impregnated Stellite 6B pilot discs; and installation of new Stellite 21 pilot discs during each refurbishment. This is the third set of SRVs tested with new Stellite 21 pilot discs.

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).

SAFETY SIGNIFICANCE

This event has negligible safety significance. One SRV opening at 1199 psig does not impact the ability to provide adequate overpressure protection for the reactor pressure vessel (RPV). Seven of the eight SRVs tested satisfactorily for as found set pressure. Analysis has shown that three SRVs could fail to lift completely and still meet RPV overpressure protection requirements. Therefore, this event does not create a core damage scenario. The change in core damage frequency or large early release frequency is insignificant. This event did not compromise overpressure protection for the RPV.

CAUSE

The mechanistic cause is pilot disc-to-seat corrosion bonding. The root cause of the event is corrective actions to implement a Licensing Amendment, related to TS 3.4.3 and the number of SRVs required to be operable, were not completed prior to SRV testing in June 2011.

CORRECTIVE ACTIONS

CNS submitted a license amendment request (LAR) to the Nuclear Regulatory Commission (NRC) on January 5, 2011, to revise the number of SRVs required to be operable. The station is engaged with the NRC and is working through the LAR review and approval process. Implementation of this LAR, if approved by the NRC, will reduce entries into TS LCO 3.4.3 and requisite LERs in the future.

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17. NARRATIVE

PREVIOUS EVENTS

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. Wyle Laboratories performed this testing. The pressure setpoint for the first pilot assembly is 1100 +/- 33.0 psig; the SRV pilot assembly lifted at 1166 psig. The pressure setpoint for the second pilot assembly is 1090 +/- 32.7 psig; it lifted at 1139 psig. Two subsequent informational lifts were performed for both SRV pilot assemblies and were within the TS pressure setpoint tolerances. The mechanistic cause was the same as reported in previous LERs, pilot disc-to-seat corrosion bonding.

LER 2008-002-00 – On July 7 through July 9, 2008, the results of Target Rock SRV test data performed at Wyle Laboratories identified that one of eight SRV pilot assemblies failed as-found pressure setpoint testing. The SRV pilot assembly lifted at 1165 psig, outside its TS setpoint tolerance of 1100 +/- 33.0 psig. The mechanistic cause was pilot disc-to-seat corrosion bonding between the Stellite 21 pilot disc and Stellite 6B pilot body seat to cause the SRV pilot assembly to lift outside its TS setpoint tolerance.

LER 2007-002-00 – On February 28 through March 2, 2007, the results of Target Rock SRV tests performed at Wyle Laboratories identified that one of eight SRV pilot valve assemblies failed to lift within its TS lift setpoint of 1090 +/- 32.7 psig. The failure was a result of sufficient corrosion bonding between the SRV pilot valve assembly Stellite 21 disc and the pilot valve Stellite 6B body seat to cause the SRV pilot valve to lift outside its TS setpoint tolerance.

LER 2005-002-00 – On May 16 and May 19, 2005, a review of Target Rock SRV test data, provided by Wyle Laboratories, determined that three of eight SRV pilot valve assemblies failed to lift within their TS lift setpoint. Examination determined that sufficient corrosion bonding existed between the SRV pilot valve assembly Stellite 21 disc and the pilot valve Stellite 6B in-body seat to cause the SRV pilot valves to lift outside TS setpoint tolerances.

LER 2003-002-00 – On May 19, 2003, a review of Target Rock SRV test data, provided by Wyle Laboratories, determined that four of eight SRV pilot valve assemblies failed to lift within their TS lift setpoint. Examination determined that sufficient corrosion bonding existed between the SRV pilot valve assembly Stellite 21 disc and the pilot valve Stellite 6B in-body seat to cause the SRV pilot valves to lift outside TS setpoint tolerances.

ATTACHMENT 3 LIST OF REGULATORY COMMITMENTS©[4]

Correspondence Number: NLS2011089

The following table identifies those actions committed to by Nebraska Public Power District (NPPD) in this document. Any other actions discussed in the submittal represent intended or planned actions by NPPD. They are described for information only and are not regulatory commitments. Please notify the Licensing Manager at Cooper Nuclear Station of any questions regarding this document or any associated regulatory commitments.

COMMITMENT	COMMITMENT NUMBER	COMMITTED DATE OR OUTAGE
None		