Nebraska Public Power District
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NLS2010021
March 5, 2010

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

Subject: Licensee Event Report No. 2010-001-00
Cooper Nuclear Station, Docket No. 50-298, DPR-46

Dear Sir or Madam:

The purpose of this correspondence is to forward Licensee Event Report 2010-001-00.

Sincerely,

FOR DEMETRIUS 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

COOPER NUCLEAR STATION
P.O. Box 98 / Brownville, NE 68321-0098
***Telephone:** (402) 825-3811 / **Fax:** (402) 825-5211*
www.nppd.com

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NRR

NRC FORM 366 (9-2007) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 08/31/2010

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. Forward comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@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 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)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
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4. TITLE
Technical Specification Prohibited Condition Due to Safety Relief Valve Test Failures

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
										05000
01	12	2010	2010	- 001 -	00	03	05	2010	FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE
1

10. POWER LEVEL
074

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)

- ☐ 20.2201(b)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☒ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☐ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER
  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	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES (If yes, complete EXPECTED SUBMISSION DATE). ☒ NO				

16. ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On January 12, 2010, two of eight Target Rock safety relief valve (SRV) pilot valve assemblies, removed during refueling outage 25, failed to lift within Technical Specification (TS) lift setpoint requirements. Wyle Laboratories, Inc. 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.

Cooper Nuclear Station (CNS) was in Mode 1, Power Operation, at approximately 74% power at the time of the discovery. The remaining SRV and SRV pilot valve assemblies tested satisfactory for TS lift setpoint requirements.

The cause is the same as previously reported in Licensee Event Report 2008-002-00, pilot disc-to-seat corrosion bonding. 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. CNS is pursuing corrective actions to evaluate and revise the as-found test requirements contained within TS.

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

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17. NARRATIVE *(If more space is required, use additional copies of Form 366A)*

PLANT STATUS

Cooper Nuclear Station (CNS) was in Mode 1, Power Operation, at approximately 74% power to perform condensate booster pump [EIIS:P] repairs at the time of safety relief valve (SRV) test failure discovery. Additionally, Division 2 of the residual heat removal system [EIIS: BO] was inoperable for planned maintenance.

BACKGROUND

The pressure relief system includes three American Society of Mechanical Engineers code safety valves [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 safety relief valves discharge to the suppression pool and provide three main functions: over pressure 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]. The nominal set pressure and tolerances for these valves are established in CNS Technical Specification (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 25 (RE25), 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 removed from service were shipped to Wyle Laboratories, Inc. for required surveillance testing.

EVENT DESCRIPTION

On January 11 through January 13, 2010, three complete SRVs and five SRV pilot assemblies, removed during RE25 in the fall of 2009, were as-found tested at Wyle Laboratories, Inc. On January 12, 2010, as-found pressure setpoint testing for two SRV pilot assemblies (serial numbers 376 and 383) exceeded the TS limit. The SRV pilot assemblies were formerly installed in functional locations MS-RV-71GRV and MS-RV-71HRV, respectively.

The pressure setpoint for SRV pilot assembly serial number 376 is 1100 psig. The TS SR 3.4.3.1 as-found limit of acceptance is 1100 +/- 33.0 psig (1067 psig to 1133 psig), a +/- 3% tolerance. The first actual lift pressure of this SRV pilot assembly was recorded as 1166 psig, 6% above the setpoint. For informational purposes, the technicians performed a second and third lift. The results were 1100 psig and 1096 psig, both within 1% of the pressure setpoint.

The pressure setpoint for SRV pilot assembly serial number 383 is 1090 psig. The TS SR 3.4.3.1 as-found limit of acceptance is 1090 +/- 32.7 psig (1057.3 psig to 1122.7 psig), also a

17. NARRATIVE *(If more space is required, use additional copies of Form 366A)*

+/- 3% tolerance. The first actual lift pressure of this SRV pilot assembly was recorded as 1139 psig, approximately 4.5% above the setpoint. The technicians again performed two subsequent informational lift tests. The results were 1111 psig and 1108 psig, both within 2% of the pressure setpoint. The remaining six SRVs and SRV pilot assemblies tested satisfactory for TS lift setpoint requirements. The affected SRV pilot assemblies are not currently installed in the plant.

All eight SRV pilot assemblies installed during RE25 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. CNS reported this same condition in November 2008 per Licensee Event Report (LER) 2008-002-00. SRV corrosion bonding is an industry-wide issue which has been evaluated within CNS' corrective action program. Past corrective actions 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 second set of SRVs tested with new Stellite 21 pilot discs. The first set of SRVs with new Stellite 21 pilot discs was tested in July 2008.

BASIS FOR REPORT

This event is being reported as an operation or condition prohibited by plant Technical Specifications per 10 CFR 50.73(a)(2)(i)(B).

SAFETY SIGNIFICANCE

This event has negligible safety significance. One SRV opening at 1166 psig and a second opening at 1139 psig are bounded by the assumed opening pressure of 1210 psig utilized in the reload licensing reports for Cooper Nuclear Station RE24 (cycle 25) and RE25 (cycle 26). This event does not create a core damage scenario. There is insignificant change in core damage frequency (CDF) or large early release frequency. This event did not compromise overpressure protection for the reactor pressure vessel. Even under postulated failure conditions (failure to open) of two safety relief valves, the CDF impact would be negligible.

CAUSE

The mechanistic failure was caused by corrosion bonding. The performance of the two-stage Target Rock pilot-actuated valves in the current design application is unsuccessful in consistently meeting the as-found lift test requirements contained within the current CNS TS.

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CORRECTIVE ACTIONS

CNS has not fully implemented the corrective actions reported in LER 2008-002-00. They are being tracked in the CNS corrective action program as follows:

1. Prepare a design document to determine how many of the eight SRVs must function to ensure plant safety.

2. Prepare and submit a TS license amendment request to allow one or two SRV failures during the SRV as-found TS lift testing as determined by the approved design document.

Based on the test evidence, past evaluations of the failure mechanism, and corrective actions currently in process, no additional corrective actions are required.

PREVIOUS EVENTS

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: NLS2010021

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		