Nebraska Public Power District
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NLS2010002
January 4, 2010

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

Subject: Licensee Event Report No. 2009-003-00
Cooper Nuclear Station, Docket No. 50-298, DPR-46

Dear Sir or Madam:

The purpose of this correspondence is to forward Licensee Event Report 2009-003-00.

Sincerely,

Demetrius L. Willis
General Manager of Plant Operations

/jo

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 Administrator w/attachment

CNS Records w/attachment

IE22
NRR

NRC FORM 366 (9-2007)	U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB NO. 3150-0104 EXPIRES 08/31/2010

LICENSEE EVENT REPORT (LER)

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

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Cooper Nuclear Station	05000298	1 of 4

4. TITLE
Isolation of Residual Heat Removal Shutdown Cooling

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
11	07	2009	2009	- 003 -	00	01	04	2010	FACILITY NAME	DOCKET NUMBER 05000

9. OPERATING MODE: 4

10. POWER LEVEL: 000

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
N/A	N/A	N/A	N/A	N/A					

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)*

At approximately 21:08, Central Standard Time, on November 7, 2009, isolation signals from pressure switches in the Recirculation System caused Shutdown Cooling suction isolation valves to close, which initiated a trip of the operating Residual Heat Removal (RHR) Pump D. Cooper Nuclear Station was in Mode 4, Cold Shutdown, with reactor temperature at 167 degrees Fahrenheit.

The closure of RHR suction isolation valves was a result of deficient operational procedures. The procedures do not contain statements to ensure mechanical vacuum pumps are secured, with steam lines open to the condenser and reactor pressure near or below 0 psig with RHR suction isolation valves open. The operating crew did not demonstrate sufficient control of reactor pressure while Shutdown Cooling was in operation. Reactor pressure decreased to a negative value resulting in flashing of water to steam while in Shutdown Cooling.

This event is not risk significant.

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

PLANT STATUS

Cooper Nuclear Station (CNS) was at 0% Power in Mode 4, Cold Shutdown, at the time of the event.

BACKGROUND

The safety objective of the Residual Heat Removal (RHR) system [EIIS:BO] is to provide core cooling, in conjunction with other Emergency Core Cooling Systems (ECCS), and to provide containment cooling as required during abnormal operational transients and postulated accidents. The RHR system consists of two heat exchangers [EIIS:HX], four main system pumps [EIIS:P], and associated piping, valves, controls and instrumentation. Irradiated fuel in the shutdown reactor core generates heat during the decay of fission products and increases the temperature of the reactor coolant. This decay heat must be removed to maintain the temperature of the reactor coolant ≤ 212 degrees Fahrenheit (°F) in preparation for performing Refueling operations, or the decay heat must be removed for maintaining the reactor in Cold Shutdown condition.

EVENT DESCRIPTION

On November 7, 2009, at approximately 19:29, the B loop of RHR was placed in the Shutdown Cooling (SDC) mode of operations. At 20:26 hours, the plant entered Mode 4 due to reactor coolant temperature of less than 212°F. At approximately 21:08, isolation signals from pressure switches (RR-PS-128A and RR-PS-128B) caused SDC suction isolation valves RHR-MO-17 and RHR-MO-18 [EIIS:ISV] to close. At the time of the event, reactor temperature was approximately 167°F in the A Reactor Recirculation (RR) loop (operating) and 234°F in the B RR loop (idle). The closure of RHR suction isolation valves resulted from an improper configuration during low pressure SDC operation. This configuration entailed alignment of the reactor through steam line drains to the condenser with mechanical vacuum pumps running. This configuration, though proper for decay heat removal at higher pressure, should have been secured prior to reactor pressure reaching near 0 psig while in SDC. The slight negative pressure at reactor temperatures near saturation caused steam flashing and void collapse which resulted in a pressure spike, causing the RHR suction line overpressure protection pressure switches to actuate and close the SDC suction valves. This isolation caused the operating RHR pump to trip. Coincident with the isolation, loud noise and vibration were witnessed in proximity to RHR piping near the Drywell.

Operations personnel opened Reactor Head Vents, removed Mechanical Vacuum Pumps from service, and reviewed pressure and temperature data to confirm the cause of the event. Engineering personnel conducted a systematic walkdown of affected RHR system piping and components and determined that no structural damage had occurred.

SDC was restored at 23:02 on November 7, 2009, with temperature at 174°F in A RR loop (operating) and 188°F in B RR loop (idle).

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

BASIS FOR REPORT

This event is reportable under 10 CFR 50.73(a)(2)(v)(B) due 60 days from date of discovery, i.e., by 01/06/2010. This was a condition which could have prevented the fulfillment of the safety function of structures or systems that are needed to remove residual heat.

SAFETY SIGNIFICANCE

This is a Safety System Functional Failure. Although it is recognized that loss of decay heat removal is potentially a significant contributor to nuclear safety risk, this particular event is not considered risk significant. A human error induced pressure perturbation caused closure of SDC suction isolation valves and subsequent trip of the operating RHR Pump D.

This isolation of SDC is not considered risk significant based on the following:

- Decay heat levels were low. Based on temperature monitoring data, the time to boil was greater than four hours.
- All RHR pumps and associated equipment required for SDC operation remained available for restoration.
- All low pressure ECCS system trains were available for inventory control if necessary.
- Reactor coolant temperature increased 10°F in the approximate 120 minutes before SDC restored.
- The extended time for SDC restoration was not due to equipment problems or complications, but due to the relatively low heat-up rate. Precautionary RHR system inspections were performed to address perceived water hammer potential impacts.
- SDC was restored within less than ½ the time to boil.

The event did not challenge fuel, reactor coolant pressure boundary, primary containment, or secondary containment. Timely restoration was assured given the adequate response time available to mitigate continued heat-up. Reactor coolant temperature did not approach unacceptable limits prior to restoration of SDC. Therefore, the incurred risk due to this event is not risk significant.

CAUSE

The closure of SDC suction isolation valves, which caused RHR Pump D to trip, was a result of deficient operational procedures. The procedures do not contain action steps to ensure mechanical vacuum pumps are secured (or steps that otherwise break vacuum), with steam lines open to the condenser and reactor pressure near or below 0 psig, and with SDC suction isolation valves open.

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

The operating crew did not demonstrate sufficient control of reactor pressure while SDC was in operation. Reactor pressure decreased to a negative value resulting in flashing of water to steam while in SDC.

CORRECTIVE ACTION

The following actions are being tracked in the CNS corrective action program:

1. Develop and administer tailgate to all operating crews on this event, its causal factors, and associated corrective actions.

2. Revise procedures to include action steps to secure (or ensure secured) mechanical vacuum pumps (or otherwise break vacuum) or isolate the reactor from the condenser when reactor pressure is no less than 5 psig (or an alternate pressure determined through benchmarking) with SDC suction isolation valves open.

3. Revise applicable Training lessons to include a discussion of the causal factors and corrective actions associated with the site-specific operating experience from this event. This discussion is to include the importance of operator control of reactor pressure during cooldown operations, to prevent flashing from Psat/Tsat conditions.

PREVIOUS EVENTS

There have been no reportable events in the last three years related to SDC.

ATTACHMENT 3 LIST OF REGULATORY COMMITMENTS©[4]

Correspondence Number: NLS2010002

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		