Nebraska Public Power District
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NLS2011037
April 28, 2011

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

Subject: Licensee Event Report No. 2010-005-01
Cooper Nuclear Station, Docket No. 50-298, DPR-46

Dear Sir or Madam:

The purpose of this correspondence is to forward Licensee Event Report 2010-005-01.

Sincerely,

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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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)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Cooper Nuclear Station	05000298	1 of 6

4. TITLE

Steam Exclusion Barrier Door Blocked Open Results in Loss of Safety Function

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
11	09	2010	2010	- 005 -	01	04	28	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

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 November 9, 2010, a steam exclusion barrier (SEB) door in the control room corridor at Cooper Nuclear Station (CNS) was blocked open with a ladder to facilitate preventive maintenance. With this SEB door obstructed, steam from a postulated high energy line break could propagate into the control room and affect operability of systems, structures, or components necessary to safely shut down, cool down, and maintain cold shutdown conditions of the plant. During the time frame the door was blocked open for the work evolution, there were no Technical Specification required actions taken and no compensatory measures implemented.

The root cause of the event is a failure to implement a comprehensive barrier control process. To prevent recurrence, CNS will develop a hazard barrier control process using appropriate fleet engineering standards or other approved industry guidance.

This event was not risk significant.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REV NO.	
Cooper Nuclear Station	05000298	2010	- 005	- 01	2 of 6

17. NARRATIVE

PLANT STATUS

Cooper Nuclear Station (CNS) was in Mode 1, Power Operation, at 100 percent power at the time of the event.

BACKGROUND

A high energy line break (HELB) is a postulated design basis event outside of primary containment [EIIS: NH]. In the event of a postulated HELB, the plant is designed to ensure the capability to shut down the reactor and maintain it in a safe condition, and the capability to prevent or mitigate the consequences of accidents that could result in potential off-site exposures. Some boundary doors [EIIS: DR] at CNS are categorized, based on a HELB analysis, as providing a steam exclusion barrier (SEB). These doors are controlled to ensure safety-related equipment is protected from a harsh environment in the event of a postulated HELB.

SEB doors are designed and assumed to be closed to mitigate the effects of a postulated line break and provide a barrier function to prevent harsh environmental conditions from entering the adjacent area. With the exception of normal passage, SEB doors are maintained in a closed configuration during Modes 1, 2 and 3. These doors may be impaired in order to facilitate maintenance, system line-ups, system draining, etc., if the door is returned to its normal configuration when the activity is completed. Compensatory measures may be required in specific cases if a door is required to be left open or obstructed in support of maintenance.

Door H300 is located in the control room corridor at CNS. It is categorized as an SEB door, fire door, and control room envelope (CRE) boundary door.

EVENT DESCRIPTION

On November 9, 2010, CNS Door H300 was blocked open to facilitate preventive maintenance. A ladder was positioned in the travel path of the door to prevent it from closing. Door H300 is a fire door, CRE boundary, and SEB door. With Door H300 obstructed, steam from a postulated turbine building [EIIS: NM] HELB (i.e., main steam line rupture) could propagate into the control room and affect operability of systems, structures, or components necessary to safely shut down, cool down, and maintain cold shutdown conditions of the plant. Additionally, operability of the control room envelope filtration system [EIIS: JH] was affected. During the time the door was blocked open for the work evolution, there were no compensatory measures implemented to protect equipment credited for safe shutdown in the event of a postulated HELB and no Technical Specification required actions were taken.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REV NO.	
Cooper Nuclear Station	05000298	2010	-- 005	-- 01	3 of 6

17. NARRATIVE

On December 28, 2010, the Door H300 condition was identified by the Nuclear Regulatory Commission Senior Resident Inspector and discussed with CNS Operation's shift staff.

The following seven SEB doors at CNS protect the control building, control room, critical switchgear room, and the emergency diesel generator (EDG) [EIIS: DG] rooms.

Door Number	Description	Barrier Function
H105	Turbine Building to Control Building	SEB, Fire, Security
H202	Cable Spreading Room Southwest	SEB, CRE, Fire, Security
H300	Blast Doors in the Control Room Corridor	SEB, CRE, Fire
H307	Blast Doors Computer Room to I&C Shop	SEB, Fire, Security, Gaseous Fire Suppression System
N103	DG1 Room NW to Turbine Building	SEB, Fire, Security, Gaseous Fire Suppression System, Flooding Analysis
R208	Critical Switchgear 1F Room North	SEB, Fire, Security
R209	Between Critical Switchgear Rooms 1F and 1G	SEB, Fire

An extent of condition review was performed to identify whether similar conditions may have previously existed during maintenance and/or inspections of SEB doors. As part of the extent of condition, CNS reviewed corrective work orders, preventive work orders, and security compensatory posting logs for the three-year period beginning January 1, 2008, through January 1, 2011. Additionally, interviews were conducted with utility craft personnel who routinely perform door maintenance activities.

The review revealed that previous to this event, utility personnel would normally utilize a ladder on Doors H105 and H300, which are large double doors, to inspect the upper portions of the door and seals. These doors were inspected on a monthly, quarterly, and annual basis. The review also revealed that some SEB doors were previously

blocked open with hoses and cables to support maintenance and also obstructed during material/equipment movements through the door.

Additionally, prior to determining the root cause for the November 2010 Door H300 condition, follow-up interviews with utility craft personnel revealed that during recent preventive maintenance inspections in January and February 2011 on Doors H105 and H300, the inactive leafs; i.e., the half of the doors with no auto-closure device, were manually held open during the inspection performance. The inactive leafs, however, were not blocked open to prevent closure.

Therefore, between January 2008 and February 2011, there were multiple occurrences during the times SEB doors were blocked open, obstructed, or held open where safety function of the doors could not be assured.

CNS has taken the following interim corrective actions:

- Blocked preventive maintenance and corrective maintenance work orders on SEB doors to prevent them from being performed during Modes 1, 2, and 3. Also, initiated a standing order.

- Secured and labelled four of five SEB door inactive leaf pins in the engaged position to prevent operation without Shift Manager approval. The inactive leaf of Door R209, door between the critical switchgear rooms, could not be secured because it does not have a pin; however, movement of equipment through the door would need to first go through Door R208 which is secured and labelled.

- Communicated expectations to Operations concerning control of SEB doors.

BASIS FOR REPORT

CNS determined the November 2010 event and other occurrences identified as part of the extent of condition review are reportable per the following 10 CFR 50.73 criteria:

50.73(a)(2)(i)(B) – An operation or condition prohibited by Technical Specifications.

50.73(a)(2)(ii)(B) – An unanalyzed condition that significantly degraded plant safety.

50.73(a)(2)(v) – An event or condition that could have prevented fulfillment of the safety function of structures or systems that are needed to: (A) shut down the reactor and maintain it in a safe shutdown condition; (B) remove residual heat; (C) control the release of radioactive material; or (D) mitigate the consequences of an accident.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REV NO.	
Cooper Nuclear Station	05000298	2010	- 005	- 01	5 of 6

17. NARRATIVE

50.73(a)(2)(vii) – An event where a single cause or condition caused at least one independent train or channel to become inoperable in multiple systems or two independent trains or channels to become inoperable in a single system designed to: (A) shut down the reactor and maintain it in a safe shutdown condition; (B) remove residual heat; (C) control the release of radioactive material; or (D) mitigate the consequences of an accident.

50.73(a)(2)(ix)(A) – Any event or condition that as a result of a single cause could have prevented the fulfillment of a safety function for two or more trains or channels in different systems that are needed to: (1) shut down the reactor and maintain it in a safe shutdown condition; (2) remove residual heat; (3) control the release of radioactive material; or (4) mitigate the consequences of an accident.

SAFETY SIGNIFICANCE

The safety significance associated with this condition is considered low due to the short duration the SEB doors were obstructed. The potential impact of this condition is limited to pipe breaks outside of primary containment. Therefore necessary equipment and personnel were available to respond to all other events during the short duration in which the SEB doors were obstructed. The likelihood of occurrence of pipe breaks outside of containment during the time the SEB doors were open resulted in a negligible increase to the core damage frequency reflected in the CNS probabilistic risk assessment model.

The November 2010 event and other occurrences identified in the extent of condition review are considered a safety system functional failure.

CAUSE

CNS determined the root cause to be a failure to implement a comprehensive barrier control process. There is a lack of barrier control guidance in the station procedure for control of doors and no developed compensatory measures are identified.

Barrier control was identified as a concern by Information Notice 2000-20, Potential Loss of Redundant Safety-Related Equipment Because of the Lack of High-Energy Line Break Barriers, and Regulatory Issue Summary 2001-009, Control of Hazard Barriers. Since that time, condition reports have identified the station procedure for control of doors was inadequate as a barrier control process.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REV NO.	
Cooper Nuclear Station	05000298	2010	-- 005	-- 01	6 of 6

17. NARRATIVE

CORRECTIVE ACTIONS

To prevent recurrence of SEB doors being blocked open, CNS will develop a hazard barrier control process using appropriate fleet engineering standards or other approved industry guidance.

PREVIOUS EVENTS

LER 2010-004 – On August 19, 2010, an SEB door was propped open during planned maintenance on EDG2. If a postulated HELB were to occur in the turbine building, steam could have entered the EDG1 room through the propped open door. The EDG rooms were not analyzed for a HELB environment; therefore, the plant was in an unanalyzed condition with the SEB door propped open. Additionally, having both EDGs inoperable created a condition that could have prevented the fulfillment of the safety function of the EDGs. The root cause of the event was that impairment of the door for maintenance activities was evaluated using procedural guidance based upon a probabilistic risk assessment rather than performing an operability evaluation.

ATTACHMENT 3 LIST OF REGULATORY COMMITMENTS©[4]

Correspondence Number: NLS2011037

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		