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NLS2014013
March 6, 2014

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

Subject: Licensee Event Report No. 2014-001-00
Cooper Nuclear Station, Docket No. 50-298, DPR-46

Dear Sir or Madam:

The purpose of this correspondence is to forward Licensee Event Report 2014-001-00.

There are no new commitments contained in this letter.

Sincerely,

ACTING FOR

Oscar A. Limpias
Vice President Nuclear-
Chief Nuclear Officer

/jo

Attachment: Licensee Event Report 2014-001-00

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
via ICES entry

SORC Chairman w/attachment

CNS Records w/attachment

IE22
NRR

**COOPER NUCLEAR STATION**
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NRC FORM 366 (01-2014) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 01/31/2017

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections 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 Page 2 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** Secondary Containment Declared Inoperable due to Rise in Differential Pressure

| 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 |
| 01 | 06 | 2014 | 2014 | - 001 | - 00 | 03 | 06 | 2014 | FACILITY NAME | DOCKET NUMBER 05000 |

| 9. OPERATING MODE | 11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)* | | | |
|---|---|---|---|---|
| 1 | ☐ 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) |
| **10. POWER LEVEL** | ☐ 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) |
| 100 | ☐ 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 NUMER *(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 | MANU-FACTURER | REPORTABLE TO EPIX | CAUSE | SYSTEM | COMPONENT | MANU-FACTURER | REPORTABLE TO EPIX |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

| 14. SUPPLEMENTAL REPORT EXPECTED | 15. EXPECTED SUBMISSION DATE | MONTH | DAY | YEAR |
|---|---|---|---|---|
| ☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO | | | | |


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

On January 6, 2014, the differential pressure (DP) in the reactor building rose above the requirement of -0.25 inches of water column DP, causing entry into Limiting Condition of Operation (LCO) 3.6.4.1, Condition A. Secondary containment was declared inoperable at 02:45.

The DP transient occurred when a non-licensed plant operator (NLO) was hanging tags in support of maintenance work. During the process of hanging tags, the NLO inadvertently opened the wrong drain valve. When the wrong drain valve was open, the reactor recirculation motor generator (RRMG) exhaust fan discharge damper that was operating closed. The NLO felt the change in DP and closed the drain valve, which opened the RRMG exhaust fan discharge damper, restoring ventilation. DP was restored, secondary containment was declared operable at 03:02, and the LCO was exited. During this event, DP remained negative at all times.

The root cause is the organization was not fully aware of the effects of the cross-over leakage between the reactor building envelope and the RRMG exhaust system. To prevent recurrence of this event, procedures will be revised to ensure adequate precautions are taken to avoid exceeding the -0.25 inches of water column DP requirement, information about the effects of cross-over leakage will be incorporated into the appropriate training materials, and a procedure to directly measure air leakage will be developed.

**NARRATIVE**

## PLANT STATUS

Cooper Nuclear Station (CNS) was in Mode 1, Power Operation, at 100 percent power at the time of the event on January 6, 2014.

## BACKGROUND

Technical Specification (TS) Surveillance Requirement (SR) 3.6.4.1.1 verifies that secondary containment vacuum is greater than or equal to 0.25 inches of vacuum water gauge. Limiting Condition of Operation (LCO), 3.6.4.1, requires secondary containment to be operable.

The secondary containment system is designed with sufficient redundancy so that no single active system component failure can prevent the system from achieving its safety objectives, which includes preventing ground level releases of airborne radioactive materials to the environment. Secondary containment consists of four main subsystems, two of these are the reactor building [EIIS: NG] and standby gas treatment system [EIIS: BH]. The secondary containment system is designed to be sufficiently leak tight to allow the standby gas treatment system to reduce the reactor building pressure to a minimum of 0.25 inches of water column vacuum when neutral wind conditions exist when the standby gas treatment system fans are exhausting reactor building atmosphere at a rate of 100% per day of the reactor building free volume.

During normal operations, the reactor building ventilation system [EIIS: VA] is operated to produce a minimum of 0.25 inches of water column vacuum inside the reactor building as compared to the outside atmosphere.

The Reactor Recirculation [EIIS: AD] Motor Generator (RRMG) set consists of two, 100% capacity ventilation exhaust fans that draw cooling air from the outside environment, pass the air through the MG set drive motor and generator [EIIS: MG], and then exhaust the air to the outside environment. The air flow through the RRMG heating, ventilation, and air conditioning (HVAC) system is separate from the air flow needed to maintain a vacuum differential pressure within the reactor building envelope.

If the RRMG HVAC exhaust discharge closes, the reactor building HVAC system senses the change in pressure and automatically responds to compensate for the change in differential pressure (DP).

## EVENT DESCRIPTION

On January 6, 2014, in support of maintenance work to refurbish actuator HV-AO-AD1009A, EF-R-1C discharge damper [EIIS: DMP] operator, a non-licensed plant operator (NLO) inadvertently opened drain valve HV-V-1009B, instead of the correct valve, HV-V-1009A. This caused the DP in the reactor building to rise above the TS requirement of -0.25 inches of water column DP. Consequently, LCO 3.6.4.1, Secondary Containment, Condition A, was entered and secondary containment was declared inoperable at 02:45.

| 1. FACILITY NAME | 2. DOCKET | 6. LER NUMBER | | | 3. PAGE |
|---|---|---|---|---|---|
| | | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | |
| Cooper Nuclear Station | 05000298 | 2014 | - 001 | - 00 | 3 OF 4 |

NARRATIVE

As a result of opening the wrong valve, the exhaust fan discharge damper of the RRMG that was operating closed. The NLO felt the change in DP and closed the drain valve, which opened the exhaust fan discharge damper of the RRMG, thus restoring ventilation. DP remained negative at all times. The NLO then checked the tag and realized he was on the wrong component.

Secondary containment DP was restored to within TS limits and was declared operable at 03:02 and LCO 3.6.4.1, Condition A, was exited.

Investigation of the event revealed that guidance documents did not contain information about the effects of cross-over leakage between the RRMG HVAC exhaust system and the reactor building envelope. No documented information was available that would have indicated that inadvertent operation of any valve in the RRMG HVAC exhaust ventilation room could cause a TS violation of secondary containment. The error of the NLO revealed that cross-over leakage between the reactor building envelope and the RRMG HVAC exhaust system existed such that the operation of one affects the other.

A Human Performance Error Review Board was conducted with the NLO. Several human error trap factors were identified which included poor-lighting conditions, danger tagged scaffolding, high noise, and that the individual was a newly qualified NLO. Also contributing to the error were loss of focus and lack of thorough verification of components to be manipulated.

Immediate actions included a stand down to review the event with operations personnel. For five weeks following the event, actions for the operator to call supervision or the job lead for verification was applied, and shiftly observations for qualified NLOs were implemented.

BASIS FOR REPORT

This event is reportable as a loss of safety function under 10 CFR 50.73(a)(2)(v)(C and D) – An event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to control the release of radioactive material or mitigate the consequences of an accident.

Event Notification 49694 was made to the Nuclear Regulatory Commission.

Secondary containment was declared inoperable due to failure to meet TS SR 3.6.4.1.1. An engineering analysis was performed and the results demonstrate that secondary containment integrity, isolation capability, and standby gas treatment capability to maintain secondary containment vacuum were not lost during the event. As such, this event will not be counted as a Safety System Functional Failure for the Nuclear Regulatory Commission performance indicator since no loss of safety function occurred.

SAFETY SIGNIFICANCE

No equipment was damaged, no one was hurt, and the safety of the public was not at risk. While the DP did rise above the TS limit of -0.25 inches of water column during the event, to -0.21 inches of water column, the reactor building envelope still maintained a negative DP throughout the two minute event period. During that two minute period, primary containment was intact and fully operable, no fuel was moved, shifted or transported, no unmonitored radiological release occurred, and all other safety systems were fully functional.

| 1. FACILITY NAME | 2. DOCKET | 6. LER NUMBER | | | 3. PAGE |
|---|---|---|---|---|---|
| | | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | |
| Cooper Nuclear Station | 05000298 | 2014 | - 001 | - 00 | 4 OF 4 |

NARRATIVE

CAUSE

CNS determined the root cause to be that the organization was not fully aware of the effects of the inter-relationship (cross-over leakage) between the reactor building envelope and the RRMG HVAC exhaust system since it was not captured in applicable plant documents (procedures and training), which affected the ability to identify the potential to impact secondary containment DP.

CORRECTIVE ACTION

To prevent recurrence, CNS will:

- Revise RRMG operational procedures to ensure that adequate precautions are taken to avoid exceeding the -0.25 inches of water column DP requirement if RRMG HVAC is to be secured while secondary containment requirements have to be maintained.
- Incorporate information about the effects of cross-over leakage between the reactor building envelope and the RRMG HVAC exhaust system into the appropriate operator training materials.
- Develop and establish a surveillance procedure to directly measure air leakage from the reactor building envelope into the RRMG HVAC exhaust system. The results shall be used to update the RRMG HVAC exhaust leakage numbers in the appropriate procedure used to estimate cross-over air leakage for radiological effluent calculations.

PREVIOUS EVENTS

On September 10, 2012, secondary containment was breached due to both airlock doors in the reactor building being inadvertently left open simultaneously. This was reported under LER 2012-003-00 as a loss of safety function under 10 CFR 50.73(a)(2)(v)(C and D) – An event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to control the release of radioactive material or mitigate the consequences of an accident.