



Nebraska Public Power District

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NLS2012129
December 12, 2012

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

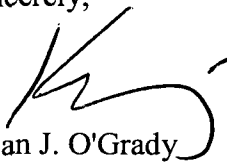
Subject: Licensee Event Report No. 2012-005-00
Cooper Nuclear Station, Docket No. 50-298, DPR-46

Dear Sir or Madam:

The purpose of this correspondence is to forward Licensee Event Report 2012-005-00.

There are no new commitments contained in this letter.

Sincerely,


for Brian J. O'Grady
Vice President Nuclear-
Chief Nuclear Officer

/jo

Attachment: Licensee Event Report 2012-005-00

cc: Regional Administrator w/attachment
USNRC - Region IV

NPG Distribution w/attachment

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

INPO Records Center w/attachment
via ICES entry

Senior Resident Inspector w/attachment
USNRC - CNS

SORC Chairman w/attachment

SRAB Administrator w/attachment

CNS Records w/attachment

IE22
NRR

LICENSEE EVENT REPORT (LER)(See reverse for required number of
digits/characters for each block)

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.

1. FACILITY NAME

Cooper Nuclear Station

2. DOCKET NUMBER

05000298

3. PAGE

1 of 4

4. TITLE

Prohibited Condition for Service Water Booster Pump Leak

5. EVENT DATE

| MONTH | DAY | YEAR |
|-------|-----|------|
| 10 | 17 | 2012 |

6. LER NUMBER

| YEAR | SEQUENTIAL NUMBER | REV NO. |
|------|-------------------|---------|
| 2012 | - 005 - | 00 |

7. REPORT DATE

| MONTH | DAY | YEAR |
|-------|-----|------|
| 12 | 12 | 2012 |

8. OTHER FACILITIES INVOLVED

| FACILITY NAME | DOCKET NUMBER |
|---------------|---------------|
| | 05000 |
| FACILITY NAME | DOCKET NUMBER |
| | 05000 |

9. OPERATING MODE

5

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

- | | | | |
|---|---|---|--|
| <input type="checkbox"/> 20.2201(b) | <input type="checkbox"/> 20.2203(a)(3)(i) | <input type="checkbox"/> 50.73(a)(2)(i)(C) | <input type="checkbox"/> 50.73(a)(2)(vii) |
| <input type="checkbox"/> 20.2201(d) | <input type="checkbox"/> 20.2203(a)(3)(ii) | <input type="checkbox"/> 50.73(a)(2)(ii)(A) | <input type="checkbox"/> 50.73(a)(2)(viii)(A) |
| <input type="checkbox"/> 20.2203(a)(1) | <input type="checkbox"/> 20.2203(a)(4) | <input type="checkbox"/> 50.73(a)(2)(ii)(B) | <input type="checkbox"/> 50.73(a)(2)(viii)(B) |
| <input type="checkbox"/> 20.2203(a)(2)(i) | <input type="checkbox"/> 50.36(c)(1)(i)(A) | <input type="checkbox"/> 50.73(a)(2)(iii) | <input type="checkbox"/> 50.73(a)(2)(ix)(A) |
| <input type="checkbox"/> 20.2203(a)(2)(ii) | <input type="checkbox"/> 50.36(c)(1)(ii)(A) | <input type="checkbox"/> 50.73(a)(2)(iv)(A) | <input type="checkbox"/> 50.73(a)(2)(x) |
| <input type="checkbox"/> 20.2203(a)(2)(iii) | <input type="checkbox"/> 50.36(c)(2) | <input type="checkbox"/> 50.73(a)(2)(v)(A) | <input type="checkbox"/> 73.71(a)(4) |
| <input type="checkbox"/> 20.2203(a)(2)(iv) | <input type="checkbox"/> 50.46(a)(3)(ii) | <input type="checkbox"/> 50.73(a)(2)(v)(B) | <input type="checkbox"/> 73.71(a)(5) |
| <input type="checkbox"/> 20.2203(a)(2)(v) | <input type="checkbox"/> 50.73(a)(2)(i)(A) | <input type="checkbox"/> 50.73(a)(2)(v)(C) | <input type="checkbox"/> OTHER |
| <input type="checkbox"/> 20.2203(a)(2)(vi) | <input checked="" type="checkbox"/> 50.73(a)(2)(i)(B) | <input type="checkbox"/> 50.73(a)(2)(v)(D) | Specify in Abstract below or in NRC Form 366A |

10. POWER LEVEL

000

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME

David W. Van Der Kamp, Licensing Manager

TELEPHONE NUMBER (Include Area Code)

(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 | MANUFACTURER | REPORTABLE TO EPIX |
|-------|--------|-----------|--------------|--------------------|-------|--------|-----------|--------------|--------------------|
| E | BO | P | B580 | YES | | | | | |

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 October 17, 2012, Cooper Nuclear Station personnel discovered that a Service Water Booster Pump (SWBP) was leaking. The pump was secured and the leak stopped. Investigation revealed that the flushing port of the pump was only partially filled with plug material.

The root cause was corrective actions put in place to preclude the purchase of SWBPs with high pressure volute area flushing ports were not effectively implemented.

To prevent recurrence of this event, the SWBP Vendor Manual will be revised to include references to correspondence regarding providing SWBPs without high pressure flushing holes; and the purchase order and SWBP drawing will be revised to include the following statement: Pump shall not have side flushing holes in the high pressure volute area of the pump case. The only hole in the high pressure volute area of the pump case should be the top vent hole located at the top of the pump case. In addition, a Change Evaluation Document will be developed to change the design of the SWBPs to remove the high pressure volute area flushing water ports and accept as permanent.

LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

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| Cooper Nuclear Station | 05000298 | YEAR | SEQUENTIAL NUMBER | REV NO. | 2 of 4 |
| | | 2012 | -- 005 | -- 00 | |

17. NARRATIVE**PLANT STATUS**

Cooper Nuclear Station (CNS) was in Mode 5, Refueling, 0 percent power, at the time of the event.

BACKGROUND

The Residual Heat Removal [EIS:BO] Service Water Booster (RHRSWB) System is designed to provide cooling water for the Residual Heat Removal System heat exchangers [EIS:HX], required for a safe reactor shutdown following a Design Basis Accident or transient. The RHRSWB System is operated whenever the RHR heat exchangers are required to operate in the shutdown cooling or suppression pool cooling mode.

The system is initiated manually from the Control Room. If operating during a loss of coolant accident (LOCA), the system is automatically tripped to allow the diesel generators [EIS:DG] to automatically power only that equipment necessary to reflood the core. The system is assumed in the analysis to be manually started 10 minutes after the LOCA.

The RHRSWB System removes heat from the suppression pool via the RHR System to limit the suppression pool temperature and primary containment [EIS:NH] pressure following a LOCA. This ensures that the primary containment can perform its function of limiting the release of radioactive materials to the environment following a LOCA.

The analyses assume that the RHRSWB System will provide adequate cooling support to the equipment required for safe shutdown. These analyses include the evaluation of the long term primary containment response after a design basis LOCA.

The RHRSWB Pumps [EIS:P] supply the cooling service water, pumped from the Missouri River at a higher pressure, to the RHR System heat exchangers. A total of four RHRSWBPs, divided into two pairs, take suction from the Service Water Reactor Building Supply Headers and discharge to the RHR heat exchangers.

EVENT DESCRIPTION

On October 17, 2012, the CNS Control Room was notified that Service Water Booster Pump (SWBP) D had developed a leak. Consequently, the pump was secured and isolated, which stopped the leak. The pump was declared inoperable at 02:09.

Investigation of the leak determined the flushing port of the pump was only partially filled with plug material. The upper case of the SWBPs has two flushing ports located in the high pressure volute area of the pump. The original intent of these ports was to allow injection of water into the pump casing, in the high pressure volute area, in order to flush out silt that may accumulate inside of the pump without having to remove the top casing. However, due to the design of the service water system at CNS, the upper case of the SWBP does not need to be flushed.

(10-2010)

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17. NARRATIVE

Investigation found that leaks from the high pressure volute area flushing ports have occurred twice previously; once in 1973, during preoperational testing, on the original pumps and again in 1993, on the pumps that replaced the original pumps. In 1973, a minor design change was implemented to fill the flushing ports of the original SWBPs with steel plugs and welds.

In 1993, the leak on the replacement pumps was addressed with a dual focused approach. The high pressure volute area flushing ports on all of the in-service pumps, and all spare replacement casings, were plugged with a full length plug that was welded in place. This was effective in precluding repetition of leaks from the high pressure volute area flushing ports on these pumps. In addition, corrective actions were developed to ensure that all new pumps would be purchased without the flushing ports; however, these corrective actions were poorly implemented and ineffective.

In 2008, a new pump was purchased from the manufacturer. Upon installation in April of 2012, it was noticed that the ports were plugged differently than the ports on the existing installed pumps. The ports on the new pumps were each three inches deep and plugged from the external side of the pump with 3/4 inch carbon steel pipe plugs, leaving a 2-1/4 inch deep hole on the interior side of the pump volute.

After 157 hours of total operating time and after 75 hours of continuous operation in the shutdown cooling mode, SWBP D developed the leak. A work order was generated to add sealant to the threads of the plug to repair the leak. However, when the plug was removed from the pump casing, damage to the plug was evident as a large portion of the plug material had been removed. Investigation determined that this damage was caused by high velocity, sand laden water from the Missouri River that flows along the high pressure volute entering the open flushing port, causing a sandblasting effect that had removed enough material from the pump casing and plug to open a small hole to the outside, thus causing the leak.

Maintenance personnel removed the existing pipe plugs and welded in stainless steel plugs. SWBP D was declared operable on October 19, 2012, at 15:05.

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), because SWBP D was determined to be inoperable since April 2012, when it was installed.

SAFETY SIGNIFICANCE

The safety significance of the SWBP D leak from a flushing port on the upper casing of the pump is low. This is of low safety significance due to the fact that three other SWBPs were unaffected by the condition and SWBP D would have operated for an extended period of time without any adverse impact. This condition resulted in a negligible increase to the core damage frequency reflected in the base model of the CNS Probabilistic Risk Assessment.

(10-2010)

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17. NARRATIVE**CAUSE**

CNS determined the root cause is corrective actions put in place in 1993 to preclude the purchase of SWBPs with high pressure volute area flushing ports were not effectively implemented.

CORRECTIVE ACTION

To prevent recurrence of this event, CNS will:

- Revise the SWBP Vendor Manual to include references to correspondence regarding providing SWBPs without high pressure flushing holes.
- Revise the current SWBP purchase order to include the following statement: Pump shall not have side flushing holes in the high pressure volute area of the pump case. The only hole in the high pressure volute area of the pump case should be the top vent hole located at the top of the pump case.
- Revise the SWBP drawing to include the following statement: Pump shall not have side flushing holes in the high pressure volute area of the pump case. The only hole in the high pressure volute area of the pump case should be the top vent hole located at the top of the pump case.
- Develop a Change Evaluation Document to change the design of the SWBPs to remove the high pressure volute area flushing water ports and accept as permanent the Temporary Change Configuration for installation of plugs in the high pressure volute area flushing ports installed in SWBP D in October 2012.

PREVIOUS EVENTS

On April 17, 2011, the outboard oiler reservoir for SWBP B motor was low and oil sheen was on the motor and the floor. On April 27, 2011, the same outboard oiler reservoir was discovered empty. The root cause of the event was the lack of inspection protocol for large electric motors. The event was reported under Licensee Event Report 2011-002-01, Technical Specification Prohibited Condition for Service Water Booster Pump, dated July 26, 2011.