your energy partner
OPPD
Omaha Public Power District
444 South 16th Street Mall
Omaha, NE 68102-2247

LIC-13-0009
January 31, 2013

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Reference: Docket No. 50-285

Subject: Licensee Event Report 2012-020, Revision 0, for the Fort Calhoun Station

Please find attached Licensee Event Report 2012-020, Revision 0, dated January 31, 2013. This report is being submitted pursuant to 10 CFR 50.73(a)(2)(i)(B).

There are no commitments being made in this letter. If you should have any questions, please contact Terrence W. Simpkin, Manager, Site Regulatory Assurance, at (402) 533-6263.

Sincerely,

Louis P. Cortopassi
Vice President and CNO

LPC/rjr

Attachment
c: E. E. Collins, Jr., NRC Regional Administrator, Region IV
L. E. Wilkins, NRC Project Manager
J. C. Kirkland, NRC Senior Resident Inspector

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 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 Section (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
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4. TITLE

Raw Water Pump Anchors

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
12	02	2012	2012	020 -	0	01	31	2013	FACILITY NAME	DOCKET NUMBER 05000

9. OPERATING MODE

5

10. POWER LEVEL

0

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)*
Erick Matzke	402-533-6855

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

☐ YES *(If yes, complete 15. 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 December 2, 2012, while in Mode 5 (De-fueled), Fort Calhoun Station (FCS) determined that raw water pumps (AC-10A/B/C/D) base plate support anchors were not to be in accordance with design requirements due to of inadequate embedment. This resulted in the inoperability of all four pumps and a violation of Technical Specification requirements during past operating cycles.

On January 9, 2013, FCS completed calculation FC08216, Rev 0, Raw Water Pump AC-10A/B/C/D Ultimate Failure. This calculation, without safety/reductions factors, resulted in lower tensile loading requirements during a seismic event and no failure of the anchors. To return the base plate support anchors to design requirements, raw water pumps AC-10A/B/C base plate support anchors have been replaced with maxi bolts. Pump AC-10D repairs are pending.

The cause has been determined to be FCS Engineering personnel failing to validate the actual plant configuration and the use of uncorroborated drawing information in completion of design basis calculations.

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NARRATIVE

BACKGROUND

Fort Calhoun Station (FCS) Technical Specification Limiting Conditions for Operation 2.4, Containment Cooling, states:

(1) Minimum Requirements

a. The reactor shall not be made critical, except for low-temperature physics tests, unless all the following are met:

i. The following equipment normally associated with diesel-generator DG-1 (4.16-kV bus 1A3 and associated non-automatically transferring 480-Volt bus sections) is operable, except as noted.(1)

Raw water pump AC-10A
Raw water pump AC-10C
Component cooling water pump AC-3A
Component cooling water pump AC-3C
Containment spray pump SI-3A
Containment air cooling and filtering unit VA-3A
Containment air cooling unit VA-7C

ii. The following equipment normally associated with diesel-generator DG-2 (4.16-kV 1A4 and associated non-automatically transferable 480 Volt bus sections) is operable, except as noted.(1)

Raw water pump AC-10B
Raw water pump AC-10D
Component cooling water pump AC-3B
Containment spray pump SI-3B
Containment air cooling and filtering unit VA-3B
Containment air cooling unit VA-7D

(1)Reactor may be made critical with one inoperable raw water pump. LCO action statements shall apply.

c. For cases involving raw water pump inoperability, if the river water temperature is below 60 degrees Fahrenheit, one raw water pump may be inoperable indefinitely without applying any LCO action statement. When the river water temperature is greater than 60 degrees Fahrenheit, an inoperable raw water pump shall be restored to operability within 7 days or the reactor shall be placed in a hot shutdown condition within 12 hours. If the inoperable raw water pump is not restored to operability within an additional 48 hours, the reactor shall be placed in a cold shutdown condition within 24 hours.

There is no Technical Specification Limiting Condition for Operation that addresses raw water pump availability in a shutdown condition.

EVENT DESCRIPTION

On December 2, 2012, while in Mode 5 (De-fueled), Fort Calhoun Station (FCS) determined that raw water pumps (AC-10A/B/C/D) base plate support anchors were not in accordance with design requirements due to inadequate embedment. This resulted in the inoperability of all four pumps and a violation of Technical Specification requirements during past operating cycles.

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NARRATIVE

At the time of discovery, FCS was performing work to chase new threads on the southwest 1-1/4 inch stud of the AC-10A RW pump base anchor. When this work failed visual inspection (VT-1) for thread depth and minimum diameter, replacement of the bolt was required. In the process of determining interference (such as rebar) buried in the concrete, the following discrepancy between construction and design drawings identified:

> Venetian Drawing 154 (shop drawing) lists the studs for the raw water pump base as Type I and the detail of this shows a J-bolt. This was unexpected, as it was assumed from the Design Drawing 11405-S-312 (used during the 1993 Seismic Qualification Utility Group walkdown) that a typical sleeve and anchor bolt with Hexnut and washer meant that it was a Type II, cast in place, "Headed Stud." Repair work was performed to 1) determine the field installation and 2) replace the installed anchors. This work confirmed that J-bolts were installed. This resulted in the inoperability of all four pumps and a violation of Technical Specification requirements during past operating cycles.

To be qualified, the anchors must be able to withstand a load of 24.89 Kips in tension. On January 9, 2013, FCS completed calculation FC08216, Rev 0, Raw Water Pump AC-10A/B/C/D Ultimate Failure. This calculation determined the worst case scenario of forces on the Raw Water Pump which included seismic, flood, and barge impact. This calculation results in a J-bolt capacity, without safety/reductions factors, of 26.83 Kips in tension. On that basis the J-bolts were found to be acceptable. However, with safety/reductions factors included, the results are below design requirements requiring the anchors to be replacement.

FCS remains in Mode 5. Raw water pumps AC-10B and AC-10D are in service providing cooling to the component cooling water system. The core is offloaded and the component cooling water system is maintaining spent fuel pool temperature.

This condition is being submitted pursuant to 10 CFR 50.73(a)(2)(i)(B): Any operation or condition which was prohibited by the plant's Technical Specifications. This condition was initially reported on December 2, 2012, under 10 CFR 50.72(b)(3)(v)(B): Any event or condition that at the time of discovery could have prevented the fulfillment of the safety function of structures or systems that are needed to remove residual heat, Event Notification 48551. However, additional analysis shows that the anchors remained functional in a seismic event, but do not meet the design basis.

CONCLUSION

This condition was self-identified during the conduct of work to chase new threads on the southwest 1-1/4 inch stud of raw water pump AC-10A. The cause has been determined to be FCS Engineering personnel failing to validate the actual plant configuration and the use of uncorroborated drawing information in completion of design basis calculations.

CORRECTIVE ACTIONS

RW pumps AC-10A/B/C base plate support anchors have been replaced with maxi bolts. Pump AC-10D repairs are pending.

Corrective actions being taken as a result of this condition are:

- Conduct a focused self-assessment to determine if the validations of assumptions of Design Engineering work products are being successfully conducted. Due October 25, 2013.

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NARRATIVE

- Edit Typical Sleeve and Anchor Bolt Details on design drawings to add a note to specify the anchor type. Due June 28, 2013.
- Add the lessons learned from this event to the initial class for Print Reading for Engineers. Due April 15, 2013.
- Cover details of this event as the Lessons Learned in Engineering Continuing Training. Due June 28, 2013.
- Revise Design Engineering procedures to validate assumptions in calculations, engineering analysis, and configuration control procedures to review all available references. Due March 29, 2013.

Additionally, a Fundamental Performance Deficiency in engineering design and configuration control processes has been identified in Condition Report 2012-08125. Corrective actions from that condition report, which are applicable to this condition, are:

- The development of a "Conduct of Engineering – Principles and Expectations" procedure,
- Update/revise various engineering procedures based on a gap analysis of PED-HU-1, "Engineering Human Performance Program", and
- Develop and issue Engineering review guidance for Vendor/Contractor design changes to ensure thorough and rigorous reviews by design engineering.

SAFETY SIGNIFICANCE

The results of the calculation completed on January 9, 2013, shows that during a seismic or barge impact event the raw water pump anchor bolts would remain functional. Therefore, there would be no loss of a safety function and no impact to safety.

SAFETY SYSTEM FUNCTIONAL FAILURE

This event does not result in a safety system functional failure in accordance with Nuclear Energy institute, NEI-99-02.

PREVIOUS EVENTS

No previous LERs concerning inadequate embedment of safety related anchors have been noted.