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

LIC-13-0184
December 18, 2013

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

Reference: Docket No. 50-285

Subject: Licensee Event Report 2013-008, Revision 1, for the Fort Calhoun Station

Please find attached Licensee Event Report 2013-008, Revision 1. This report is being submitted pursuant to 10 CFR 50.73(a)(2)(V), 10 CFR 50.73(a)(2)(i)(B), 10 CFR 50.73(a)(2)(vii), and 10 CFR 50.73(a)(2)(ix)(A).

There are no new 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: M. L. Dapas, NRC Regional Administrator, Region IV
J. M. Sebrosky, NRC Senior Project Manager
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

Previously Installed GE IVA Relays Failed Seismic Testing

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
4	11	2013	2013	008 -	1	12	18	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)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☒ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☐ 50.73(a)(2)(iv)(A)
- ☒ 50.73(a)(2)(v)(A)
- ☒ 50.73(a)(2)(v)(B)
- ☒ 50.73(a)(2)(v)(C)
- ☒ 50.73(a)(2)(v)(D)
- ☒ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☒ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER

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 April 11, 2013, the test results of seven General Electric (GE) IVA relays, indicated that three safety-related, seismically qualified, relays did not pass seismic testing. The condition was entered in to the Station's corrective action program. A causal analysis determined that the failure was caused by the control spring in the relay contacting either the disk or the drag magnet during seismic testing resulting in a short. A wire used to support the spring was not installed in the relays that failed the testing allowing the control spring to sag and make electrical contact.

There are a total of 45 GE IAV relays identified in the plant, of which 32 are safety-related. Twenty-seven of the relays required replacement due to missing the support wire.

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NARRATIVE

BACKGROUND

Fort Calhoun Station (FCS) is a two-loop reactor coolant system of Combustion Engineering (CE) design.

EVENT DESCRIPTION

On April 11, 2013, the test results of seven General Electric (GE) IVA relays, indicated that three safety-related, seismically qualified, relays did not pass IEEE 344, IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations, testing. The condition was entered in to the Station's corrective action program.

These relays we originally purchased seismically qualified and installed in 1978. From inspecting the failed relays, it was noted that they were missing a control spring support wire although the relays did contain the mounting screws for the support wire. The support wire has been part of the standard IAV relay design for over 30 years. The support wire prevents the control spring from sagging.

The station reviewed the procedures used to calibrate the relays, reviewed the original procurement specifications, and reviewed historical modifications to determine if the station did anything that would have removed the support wire. After the review, the station concluded that the relays were most likely purchased without the support wire during the original construction of the plant.

This report is being submitted in accordance with 10 CFR 50.73(a)(2)(v); any event or condition that could have prevented the 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, 10 CFR 50.73(a)(2)(i)(B) any operation or condition which was prohibited by the plant's Technical Specifications, 10 CFR 50.73(a)(2)(vii) any 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, and 10 CFR 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.

CONCLUSION

A causal analysis determined that the failure was caused by a control spring in the relay contacting either the disk or the drag magnet during seismic testing resulting in a short. A wire used to support the control spring was not installed in the relays that failed the testing allowing the spring to sag and make electrical contact.

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NARRATIVE

CORRECTIVE ACTIONS

There are a total of 45 GE IAV relays identified in the plant, of which 32 are safety-related. Twenty-seven of the relays required replacement due to missing the support wire. See Table 1 for a list of relays.

SAFETY SIGNIFICANCE

The safety significance of the three failed relays can be characterized as follows:

In the case of relay 27-1/1A3, a ground alarm would be received and the under voltage circuit would be inoperable. This would have prevented the load shedding of safeguard loads and non-safeguards loads. Diesel generator (DG) 1 would not have started. As part of the follow-up replacement activity, relay 27-2/1A3 was required to be replaced. This would have prevented DG 2 from starting.

In the case of relay 27-1/1A3-13, a ground alarm would be received and under voltage circuit would be inoperable. This would cause relays 27T1X/1A3-13 and 27T2X/1A3-13 not to energize to perform their tripping functions.

In the case of relay 27-1/1B4B, an internal short in the relay causes a ground condition. The 125VDC circuit is an ungrounded system, the ground will cause an alarm but the fuse FU/10 should not open. A ground alarm would be received on the 125VDC system. This impacts vacuum deaerator circulating pump, DW-46B and indication. The 1B4B circuit would be inoperable and breaker 1B4B-8 for DW-46B would be prevented from tripping on a low voltage condition.

Cumulatively, the seismic event would have impacted relays on both the 1A3 and 1A4 buses preventing load shedding functions as well as the starting of diesel generators DG-1 and DG-2.

SAFETY SYSTEM FUNCTIONAL FAILURE

This event does result in a safety system functional failure in accordance with NEI-99-02.

PREVIOUS EVENTS

None

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NARRATIVE

Table 1 Replaced Relays

Equipment Tag	Equipment Name
27-2/1B3C-4C	UNDERVOLTAGE RELAY BUS 1B3C-4C
27-2/1B4B	UNDERVOLTAGE RELAY BUS 1B4B
27-2/1B4C	UNDERVOLTAGE RELAY BUS 1B4C
64/1B3A	GROUND PROTECTIVE RELAY T1B-3A SECONDARY
64/1B4B	GROUND PROTECTIVE RELAY BUS 1B4B
64/1B4C	GROUND PROTECTIVE RELAY BUS 1B4C
27-1/1B3C-4C	UNDERVOLTAGE RELAY BUS 1B3C-4C
27-1/1B4B	UNDERVOLTAGE RELAY BUS 1B4B
27-1/1B4C	UNDERVOLTAGE RELAY BUS 1B4C
27-1/1A3	UNDERVOLTAGE RELAY BUS 1A3 LOSS OF VOLTAGE
27-1/1A3-13	UNDERVOLTAGE RELAY TRANSFORMER T1A-3 LOSS OF VOLTAGE
27-1/1A4-24	UNDERVOLTAGE RELAY TRANSFORMER T1A-4 LOSS OF VOLTAGE
27-1/1B3A	UNDERVOLTAGE RELAY BUS 1B3A
27-1/1B3A-4A	UNDERVOLTAGE RELAY BUS 1B3A-4A
27-1/1B3B-4B	UNDERVOLTAGE RELAY BUS 1B3B-4B
27-2/1A3-13	UNDERVOLTAGE RELAY TRANSFORMER T1A-3 LOSS OF VOLTAGE
27-1/1A4	UNDERVOLTAGE RELAY BUS 1A4 LOSS OF VOLTAGE
27-1/1B3B	UNDERVOLTAGE RELAY BUS 1B3B
27-1/1B3C	UNDERVOLTAGE RELAY BUS 1B3C
27-2/1A3	UNDERVOLTAGE RELAY BUS 1A3 LOSS OF VOLTAGE
27-2/1A4	UNDERVOLTAGE RELAY BUS 1A4 LOSS OF VOLTAGE
27-2/1A4-24	UNDERVOLTAGE RELAY TRANSFORMER T1A-4 LOSS OF VOLTAGE
27-2/1B3A	UNDERVOLTAGE RELAY BUS 1B3A
27-2/1B3A-4A	UNDERVOLTAGE RELAY BUS 1B3A-4A
27-2/1B3C	UNDERVOLTAGE RELAY BUS 1B3C
27-2/1B3B	UNDERVOLTAGE RELAY BUS 1B3B-4B
27-2/1B3B-4B	UNDERVOLTAGE RELAY BUS 1B3B