Omaha Public Power District
1946 - 2006

Fort Calhoun Station
P.O. Box 550
Fort Calhoun, NE 68023

LIC-08-0011
May 21, 2008

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station P1-137
Washington, DC 20555

References: 1) Docket No. 50-285
2) Letter from OPPD (J. A. Reinhart to Document Control Desk) dated April 17, 2007, LER 2007-003 (LIC-07-0027)

Subject: Licensee Event Report 2007-003 Revision 1 for the Fort Calhoun Station

In accordance with 10CFR50.73(a)(2)(i)(B) and 10CFR50.73(a)(2)(v)(D), enclosed is a revision to the Reference 2 report concerning the inoperability of a diesel generator with an inoperable containment cooling fan. This revision updates the reference 2 title, and the identified root cause and corrective actions.

This letter contains no commitments to the NRC. If you should have any questions, please contact me.

Sincerely,

T. R. Nellenbach
Division Manager – Nuclear Operations

TRN/RMC/rmc

Attachment

cc: E.E. Collins, NRC Regional Administrator, Region IV
M.T Markley, NRC Project Manager
J. D. Hanna, NRC Senior Resident Inspector
INPO Records Center

NRC FORM 366 (6-2004) U.S. NUCLEAR REGULATORY COMM

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 06/30/2007

Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@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
Fort Calhoun Station	05000285	1 OF 3

4. TITLE Inoperability of a Diesel Generator with an Inoperable Containment Cooling Fan from the Opposite Bus

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
02	16	2007	2007	- 003 -	01	05	21	2008	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)
- ☐ 20.2201(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)
Donna Guinn, Compliance Engineer	402-533-7337

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 February 16, 2007, during the monthly surveillance testing of diesel generator (DG) 1, field flashing of the diesel did not occur. The diesel was shutdown and declared inoperable. Investigation determined that DG-1 had been inoperable since February 14, 2007. This is due to the field flash auxiliary contacts which were observed to be stuck open when they should have been closed. The containment cooling fan powered from DG-2 was declared inoperable for approximately 2.5 hours on February 15, 2007 to perform surveillance testing. Since DG-1 was inoperable during the time the containment cooling fan was inoperable, there was only the one small containment cooler operable for approximately 2.5 hours.

The root cause analysis determined that this event was caused by a post-maintenance testing (PMT) process that did not follow industry standards. This process was over-reliant on the knowledge base in work management and engineering. Corrective actions included replacing the field flash auxiliary contacts. Procedural guidance for PMT has been enhanced to improve the quality of PMT to ensure additional problems are not created by the work activities.

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NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

BACKGROUND

The Fort Calhoun Station (FCS) has two emergency diesel generators (DG-1 and DG-2). They are designed to furnish a reliable source of 4160 volt AC power for safe plant shutdown and operation of engineered safeguards when the normal sources of power are lost. The diesel generators are normally aligned in a standby mode ready to automatically start, come up to rated speed and voltage, and energize the engineered safeguard buses when an undervoltage condition is sensed on the bus. The two diesel generators will supply the two vital buses. The non-vital busses are normally fed from either the main generator or off-site power.

Component Cooling Water is supplied to the two containment air cooling and filtering units. The function of the containment air cooling and filtering fans is to circulate air throughout the containment to equalize the temperature and prevent the formation of hydrogen pockets.

Technical Specification (TS) 2.4(1)(a) provides the containment cooling minimum requirements to assure operability of equipment required to remove heat from the containment during normal operation. There is one containment air cooling and filtering unit associated with each of the diesel generators.

TS 2.4(1)(b) reads as follows:

"During power operation one of the components listed in (1)a.i. and ii. may be inoperable. If the inoperable component is not restored to operability within seven days, the reactor shall be placed in hot shutdown condition within 12 hours."

EVENT DESCRIPTION

On February 16, 2007 at approximately 1010, during the monthly surveillance testing of Diesel Generator (DG) 1 speed was increased from approximately 500 RPM to 900 RPM. At approximately 750 RPM the generator field is expected to self-flash. Field flashing of the diesel generator did not occur. The diesel was shutdown and declared inoperable. Investigation determined that the DG-1 had been inoperable since February 14, 2007 when a problem with a relay was repaired.

During the time DG-1 was inoperable, the larger containment cooling fan (VA-3B) powered from DG-2 was made inoperable for approximately 2.5 hours on February 15, 2007 to perform routine surveillance testing. Since DG-1 was inoperable during the time the containment cooling fan was inoperable, only the smaller containment cooler (VA-7D) was operable. This event is reportable per 10CFR50.73(a)(2)(i)(B) and 10 CFR 50.73(a)(2)(v)(D).

CONCLUSION

Work Order 263153 was written to disassemble, clean and repair the GE 2CR relay and replace the auxiliary contacts. Troubleshooting determined that the GE 2CR relay auxiliary contact over travel stop tang was hung up on the main relay phenolic base, preventing the auxiliary contacts from returning to their normally closed position. Binding appears to have resulted from a slight misalignment of the relative positions of the auxiliary contact bracket and the main relay phenolic base. Due to the design of the GE 2CR relay, the relative positions need only change by as little as approximately 1/64 of an inch to result in binding due to the over travel tang bypassing the stop. The resulting misalignment causes the normally closed auxiliary contacts to stick in the open state when the GE 2CR relay energizes.

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NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

The auxiliary contacts were replaced with new contacts from the warehouse. The GE 2CR contactor was tested 12 times by energizing the main contactor coil using an external power supply. Resistance readings were taken on the contacts during the testing to ensure good contact. The diesel was started and flashed twice to ensure proper operation of the field flashing circuit. The monthly performance of the DG-1 surveillance test was completed satisfactorily on Saturday, February 17, 2007.

The root cause for this event was determined to be a PMT process that did not follow industry standards. This process was over-reliant on the knowledge base in work management and engineering. Specifically, this involved failure to verify that the normally closed auxiliary contacts had returned to the closed state following the surveillance test of the diesel.

The field flash circuitry is common to both emergency DG-1 and DG-2. During follow up to the DG-1 failure, the identical GE 2CR relay auxiliary contacts in DG-2 were replaced and successfully tested.

In addition, auxiliary contacts are utilized on other relays in the plant. Routine surveillance testing of associated equipment provides assurance that the safety function will be met, as evidenced by identification of misoperation of the contacts associated with DG-1 on February 16, 2007. However, actions are planned to address weaknesses in post maintenance testing practices as a result of this event.

CORRECTIVE ACTIONS

As previously indicated, the auxiliary contacts associated with DG-1 and DG-2 were replaced with new contacts.

Procedural guidance for post maintenance testing has been enhanced to improve the quality of PMT to ensure no additional problems are created by the work activities.

Training has been provided on this event and on the changes to procedural guidance. This training was provided to personnel who specify PMT as well as to personnel reviewing PMT requirements.

SAFETY SIGNIFICANCE

At the time of discovery, both trains of the containment spray system were available from its normal power supply to provide cooling to the containment should it be required.

The amount of time that the VA-3B containment cooling fan was inoperable was a short, approximately 2.5 hours to perform surveillance testing. The amount of time required to restore the system to operability when being tested is short. Although the system was inoperable due to the surveillance testing, it was quickly restorable if needed. The probability of an accident occurring during the time of inoperability is very low. The DG-1 was inoperable for approximately 3 days.

Due to the short amount of time of inoperability of VA-3B, the ability to quickly restore VA-3B, and the low probability of an accident during that time, there was very small impact on the health and safety of the public.

SAFETY SYSTEM FUNCTIONAL FAILURE

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

PREVIOUS SIMILAR EVENTS

There have not been any other instances of a similar nature resulting in the diesels not being able to field flash due to post maintenance testing at FCS in the last three years.