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LIC-07-0120

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

- References:
1. Docket No. 50-285
 2. Letter from OPPD (J. A. Reinhardt) to NRC (Document Control Desk) dated April 17, 2007 (LIC-07-0027)
 3. Letter from NRC (A. T. Howell) to OPPD (R. T. Ridenoure) dated October 10, 2007 (NRC-07-0109)
 4. Letter from NRC (E. E. Collins) to OPPD (D. J. Bannister) dated December 7, 2007 (NRC-07-0130)

SUBJECT: NRC Inspection Report 05000285/2007011, Reply to a Notice of Violation (NOV) EA-07-194

In Reference 4, the NRC transmitted a Notice of Violation (NOV) to the Omaha Public Power District (OPPD). The NOV resulted from maintenance activities on train A emergency diesel generator that caused it to be inoperable. In the attachment to this letter, OPPD has provided a reply to the NOV.

This letter does contain regulatory commitments, summarized on the last page of the attachment. If you should have any questions, please contact me.

Sincerely,

D. J. Bannister
Site Director
Fort Calhoun Station

DJB/EPM

Attachment

- c: E. E. Collins, NRC Regional Administrator, Region IV
M. T. Markley, NRC Project Manager
J. Hanna, NRC Senior Resident Inspector

REPLY TO A NOTICE OF VIOLATION

**Omaha Public Power District
Fort Calhoun Station**

**Docket No. 50-285
License No. DPR-40
EA-07-194**

During an NRC inspection completed on September 17, 2007, two violations of NRC requirements were identified. In accordance with the NRC Enforcement Policy, the violations are listed below:

- A. 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," states, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition. A condition that would cause a failure of an emergency diesel generator is a Significant Condition Adverse to Quality (SCAQ).**

Contrary to the above, prior to February 14, 2007, the licensee failed to promptly identify and correct a significant condition adverse to quality involving high resistance across the field flash contacts of a relay in the Train A emergency diesel generator (EDG) voltage regulator circuit. Specifically, on September 16, 2006, the licensee had determined that operating experience (OE) associated with an EDG failure was applicable to Fort Calhoun, but the licensee failed to promptly identify and correct high electrical resistance on the field flash relay 2CR auxiliary contacts (the same issue that the OE addressed). On February 14, 2007, the EDG failed during a surveillance test because of high resistance across the field flash contacts. In a second example of this violation, as of April 30, 2007, the licensee failed to determine the cause of the February 14, 2007, Train A EDG failure (a significant condition adverse to quality) and to take corrective actions to preclude repetition.

- B. Fort Calhoun Technical Specification 5.8.1(a) states, in part, that written procedures shall be established, implemented and maintained covering the activities specified in Regulatory Guide 1.33, Revision 2, Appendix A, 1978. Section 9 of this guide states, in part, that maintenance that can affect the performance of safety-related equipment should be properly preplanned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances.**

Contrary to the above, as of February 16, 2007, the licensee failed to provide a written procedure for maintenance that could affect the performance of safety-related EDG voltage regulator relay auxiliary contacts. Specifically, the licensee failed to establish a written procedure for the proper lubrication of the safety-related auxiliary contact sliding mechanisms.

These violations are associated with a White SDP finding.

OPPD Response to Violation A.

1. Reason for the Violation

Cause analyses for the first example of the violation cited is not yet complete. The root cause analysis for violation 'B' identified the following contributing causes:

- *The FCS OE program does not facilitate adequate reviews of OE that spans multiple plant systems.*
- *Internal OE, such as work orders, is not consistently evaluated in the FCS OE Program, based on a review of similar root cause analyses.*

The analysis of the second example determined that Standing Order SO-R-2, "Condition Reporting and Corrective Action," did not adequately account for the functional importance of equipment.

2. Corrective Steps Taken and Results Achieved

Management briefing of system engineers was conducted on the DG failure of February 14, 2007. The briefing included a discussion of impact of operating experience on the event. This discussion also included reinforcing the importance of a broad review of operating experience including the impact on other systems that may use similar components.

SO-R-2 has been updated to account for the functional importance of equipment. The failure of equipment with a functional importance determination (FID) of nuclear critical 1, such as an emergency diesel generator, will be designated as a significant condition adverse to quality (SCAQ).

For each condition report written, the FID code of equipment is considered to ensure that SCAQ are correctly identified.

3. Corrective Steps That Will Be Taken To Avoid Further Violations

- a. A common cause analysis is being performed to ensure that the aspects of the issue with OE are adequately addressed. The analysis will be completed and corrective action identified by January 31, 2008.
- b. A root cause analysis is being performed to ensure that the problem is fully addressed. The analysis will be completed and corrective action identified by January 31, 2008.
- c. A supplement to this letter will be submitted by February 15, 2008, to document the results of a. and b. above.

4. The Date When Full Compliance Will Be Achieved

Fort Calhoun Station will complete the compliance analysis following the completion of the analyses listed in 3a. and 3b. above.

OPPD Response to Violation B.

1. Reason for the Violation

On Wednesday, February 14, 2007, at approximately 1058, during the monthly performance of OP-ST-DG-0001, "Diesel Generator 1 Check," speed was raised from 500 rpm to 900 rpm. At approximately 750 rpm, the diesel generator (DG) field is expected to "flash," a term used to describe the normal voltage buildup in the field of a generator. Field flashing did not occur. The DG was shut down and troubleshooting was performed on the field flashing circuit. DG-2 was started to ensure its operability. Condition Report (CR) 200700725 was written to document the failure of the field to flash and develop normal output voltage. This was a self-revealing event. The last successful operation of DG-1 prior to this event was on January 17, 2007.

Step 7.15.3 of EM-PM-EX-1100, "480 Volt Motor Control Center (MCC) Maintenance," allowed lubrication of the starter contactor slider with a light film of DOW Corning Molykote 55M. Use of the lubricant was in direct conflict with vendor guidance and was based on historical use of lubricants at OPPD's plants. The use of lubricants on the 2CR contactor and specifically the auxiliary contacts is not authorized by any plant procedures or the maintenance work document.

An analysis was performed that considered the programmatic and administrative aspects of the event. The analysis concluded that the lack of a preventive maintenance strategy for the 2CR auxiliary contacts in the field flashing circuit was the root cause of the event. Contributing causes identified in the analysis are documented in the corrective action system. Actions to address the contributing causes are being managed by the station's corrective action program.

Both of the DG flashing circuits use General Electric National Electrical Manufacturers Association (NEMA) size 3 model CR 105MOOOADA contactors with associated CR 105X 300 auxiliary contacts and 55-501336G26 115/125 volts direct current (VDC) coils.

2. Corrective Steps Taken and Results Achieved

The following corrective actions have been completed:

- a. The defective relay was replaced and DG-1 was restored to operability on February 16, 2007 (Reference 2).
- b. The 2CR relay auxiliary contacts in the DG-1 and DG-2 field flash circuits have been replaced.
- c. The 3CR auxiliary contacts in the DG-1 and DG-2 field flash current forcing circuits have been replaced. These two relays are the same make and model relays as the 2CR relays. Contact resistances on these 3CR auxiliary contacts have been verified to be less than one ohm.
- d. Procedure EM-PM-EX-1100 has been revised to add guidance to remove wet lubricant from the sliding surfaces of CR105 relays and auxiliary contacts in MCC draw-out units. This procedure has also been revised to add a requirement to check contact resistance of CR105 auxiliary contacts in MCC draw-out units.

- e. An interim test program has been implemented to measure contact resistance once per operating cycle and to verify less than one ohm for CR105 auxiliary contacts in DG-1 and DG-2 control circuits. This monitors the relays for degrading contact resistance.
- f. FID nuclear critical 1, CR105 auxiliary contacts, have been identified in plant systems. The contact resistance of on-line accessible FID nuclear critical 1 CR105 auxiliary contacts in plant systems have been verified to be less than or equal to one ohm.
- g. A preventive maintenance strategy for the 2CR auxiliary contacts of DG-1 and 2 has been implemented.
- h. Training material has been incorporated into the electrical maintenance apprenticeship training program stating that lubricants shall not be used on plant equipment unless specifically directed by procedure.

Insufficient time has elapsed to determine the results of the corrective actions taken to date.

3. Corrective Steps That Will Be Taken To Avoid Further Violations

- a. Comprehensive testing to verify proper functioning per design requirements, including coil and contact resistances, will be completed for the following components in the DG-1 and DG-2 field flash circuits:
 - 103C speed sensing relay and associated contacts,
 - 105X engine shutdown relay and associated contacts,
 - 41C field contactor control relay and associated contacts,
 - GFB generator field breaker relay, resistor, and associated contacts,
 - 94 voltage latching relay and associated contacts,
 - 13R, 14R, 15R, and 16R resistors,
 - 1CR field flash relay and associated contacts, and
 - associated field flash circuit terminal connections.This testing will be completed by February 29, 2008.
- b. Verify that the contact resistance of FID nuclear critical 1 CR105 auxiliary contacts, that are not accessible while the plant is on-line, in plant systems are less than or equal to one ohm. This will be completed by June 15, 2008.
- c. Identify critical relays (FID nuclear critical 1) and associated contacts. This will be completed by August 15, 2008.
- d. Implement a preventive maintenance strategy for FID nuclear critical 1 relays and associated contacts based on industry best practices. This will be completed by December 31, 2008.
- e. Identify FID critical 2 relays. This will be completed by September 30, 2009.
- f. Implement a preventive maintenance strategy for FID critical 2 contacts based on industry best practices. This will be completed by December 31, 2009.

4. The Date When Full Compliance Will Be Achieved

Fort Calhoun Station is currently in full compliance.

Regulatory Commitments

Commitment	Due Date	CR Number
A common cause analysis is being performed to ensure that the aspects of the issue with OE are adequately addressed. The analysis will be completed and corrective action identified.	January 31, 2008	CR2007-5238
A root cause analysis is being performed to ensure that the problem is fully addressed. The analysis will be completed and corrective action identified.	January 31, 2008	CR2007-5238
A supplement to this letter will be submitted to document the results of a. and b. above.	February 15, 2008	CR2007-5238
Comprehensive testing to verify proper functioning per design requirements, including coil and contact resistances, will be completed for the following components in the DG-1 and DG-2 field flash circuits: <ul style="list-style-type: none"> • 103C speed sensing relay and associated contacts, • 105X engine shutdown relay and associated contacts, • 41C field contactor control relay and associated contacts, • GFB generator field breaker relay, resistor, and associated contacts, • 94 voltage latching relay and associated contacts, • 13R, 14R, 15R, and 16R resistors, • 1CR field flash relay and associated contacts, and • associated field flash circuit terminal connections. 	February 29, 2008	CR200700725
Verify that the contact resistance of FID nuclear critical 1 CR105 auxiliary contacts, that are not accessible while the plant is on-line, in plant systems are less than or equal to one ohm.	June 15, 2008	CR200700725
Identify critical relays (FID nuclear critical 1) and associated contacts.	August 15, 2008	CR200700725
Implement a preventive maintenance strategy for FID nuclear critical 1 relays and associated contacts based on industry best practices.	December 31, 2008	CR200700725
Identify FID critical 2 relays.	September 30, 2009	CR200700725
Implement a preventive maintenance strategy for FID critical 2 contacts based on industry best practices.	December 31, 2009	CR200700725