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February 15, 2008
LIC-08-0009

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)
 5. Letter from OPPD (D.J. Bannister) to NRC (Document Control Desk) dated January 7, 2008

SUBJECT: NRC Inspection Report 05000285/2007011, Reply to a Notice of Violation (NOV) EA-07-194 (Revision 1)

In Reference 4, the NRC transmitted a Notice of Violation (NOV) to the Omaha Public Power District (OPPD). This NOV resulted from maintenance activities on train A emergency diesel generator which caused it to be inoperable. In the response to Reference 4, Violation A, OPPD committed to supplement the NOV response by February 15, 2008, after common and root cause evaluations on the Operating Experience program were completed. These evaluations have been completed and the results are described in the attachment to this letter. Revisions are noted by change bars in the margin.

This letter contains regulatory commitments that are 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/RMC

Attachment

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

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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****A.1 Operating Experience Program**

Operating Experience (OE) Report OE 22650, "Emergency Diesel Output Breaker did not Close Within the Required Time" was received by OPPD on May 19, 2006. The OE was evaluated via the OPPD OE evaluation process (NOD QP-21, "Operating Experience Program"). The review for applicability was completed on September 16, 2006. The review determined that the OE was applicable to OPPD and Corrective Actions in the form of testing/trending of the emergency diesel generator field flash circuit were recommended. The monthly diesel generator surveillance procedures were revised on September 27, 2007, to include the test changes necessary to track and trend the time response of the field flash circuit every six months. The OE reviewers indicated that the OE only suggested a means to enhance current testing processes for the field flash relay contacts and that immediate testing of the field flash circuit was not necessary.

An analysis has been performed that considered the programmatic and administrative aspects of the issue. The analysis concluded the reason the violation occurred was that a formalized process for evaluating the potential for an "applicable" OE to represent either a condition adverse to quality (CAQ) or a significant condition adverse to quality (SCAQ) was not contained in OPPD procedures. More specifically, once applicability is determined, a process was not in place to prompt further review under the Corrective Action Program (CAP) process where additional evaluations, such as operability determinations, may need to be performed. An additional contributor to this failure is the fact that risk-based guidance or expectations regarding the assignment and control of actions taken in response to applicable OE were not defined in a manner that reduces the exposure to a potentially preventable event already identified as an "applicable" OE item.

A.2 Failure to Determine Cause of the Field Flash Failure in a Timely Manner

The initial emergency diesel generator (EDG) field flash failure occurred during surveillance testing. The failure of the field flash relay was treated as a component level failure and not a failure of the EDG. Based on this determination, the field flash failure was classified as a CAQ that did not require the performance of an apparent cause evaluation. Since the field flash failure of the EDG occurred during surveillance testing and the failure had been traced to a faulty relay that was subsequently replaced, the consequences of the event did not represent a SCAQ as was defined in OPPD procedures at that time.

An analysis has been performed that considered the programmatic and administrative aspects of the issue. The analysis concluded that the reason the violation occurred was that the OPPD Corrective Action Process did not contain adequate criteria for determining the significance level of the field flash relay failure. 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.

2. Corrective Steps Taken and Results Achieved

A.1 Operating Experience Program

Procedure NOD-QP-21, "Operating Experience Program", has been revised to require a condition report be written if an OE notification is potentially applicable, or if a Functional Importance Determination (FID) 1 (the loss of a function of this component will cause the loss of a Maintenance Rule Risk Significant function) or FID 2 (the loss of this component will cause the loss of a Maintenance Rule In Scope function) component is affected, or if the OE notification identifies an operability concern.

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.

A Common Cause Analysis was performed on seven events that had causal factors associated with the ineffective use of OE. The analysis revealed that six of the seven past events exhibited common features associated with the failure to implement either internal or external OE. The analysis also provided suggested actions to correct the issue.

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

A.2 Failure to Determine Cause of the Field Flash Failure in a Timely Manner

Standing Order SO-R-2, "Condition Reporting and Corrective Action" has been updated to account for the functional importance of equipment. The failure of FID 1 equipment, such as an emergency diesel generator, will be designated as a SCAQ.

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

A review of past "broke/fix" condition reports involving FID 1 components issued since December 2006 was completed to determine if further causal analysis was required. The results indicated that one FID 1 condition report requires further causal analysis.

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

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

A.1 Operating Experience Program

A performance indicator that will track OE action timeliness expectations will be developed by April 11, 2008.

Open "applicable" OE issues will be reviewed to determine if they involve a FID 1 or FID 2 component. Each identified issue will be documented in a separate condition report. This will be completed by April 18, 2008.

An additional sample of open OE "applicable" reports will be reviewed to determine if they involve FID 1 or FID 2 components. Separate condition reports will be written to ensure that these OE items are properly dispositioned. This will be completed by October 31, 2008.

The OE programs from selected high performing commercial nuclear power plants will be benchmarked to determine if changes to the OPPD OE program are warranted. The benchmarking will be completed by March 14, 2008.

Management expectations on the use of OE will be provided to OPPD employees and contractors by March 31, 2008.

A.2 Failure to Determine Cause of the Field Flash Failure in a Timely Manner

A sample of level C and D condition reports written since July 31, 2007 will be reviewed to determine if any failure of FID 1 and FID 2 equipment were classified as level A or B condition reports in accordance with the requirements of SO-R-2. Any condition report not classified correctly will be reclassified and the appropriate causal analysis performed. This will be completed March 14, 2008.

SO-R-2 will be revised to specify that level A and B condition reports must be reviewed by the corrective action review board. This will be completed by April 11, 2008.

A benchmarking plan for the Corrective Action Group will be developed by May 2, 2008.

4. The Date When Full Compliance Will Be Achieved

Fort Calhoun Station is currently in full compliance.

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 field 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 contacts were replaced and DG-1 was restored to operability on February 17, 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 effectiveness 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.
(A FID 2 component is a component that its failure will cause the loss of a Maintenance Rule In Scope Function, and not a Maintenance Rule Risk Significant Function, this long term action is an enhancement to correct the extent of condition).
- 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
OE Evaluators will be provided risk based guidance or expectations regarding the assignment and control of actions taken in response to applicable OE in order to reduce the exposure to a potentially preventable event.	April 11, 2008	CR2007-5238
Open "as applicable" OE issues will be reviewed to determine if they involve a FID 1 or FID 2 component. Each identified issue will be documented in a separate condition report.	April 18, 2008	CR2007-5238
A sample of open OE "as applicable" reports will be reviewed to determine if they involve FID 1 or FID 2 components. Separate condition reports will be written to ensure that these OE items are properly dispositioned.	October 31, 2008	CR2007-5238
The OE programs from selected high performing commercial nuclear power plants will be benchmarked to determine if changes to the OPPD OE program are warranted.	March 14, 2008	CR2007-1704
Management expectations on the use of OE will be provided to OPPD employees and contractors.	March 31, 2008	CR2007-1704
A sample of level C and D condition reports written since July 31, 2007 will be reviewed to determine if any failure of FID 1 and FID 2 equipment were classified as level A or B condition reports in accordance with the requirements of SO-R-2. Any condition report not classified correctly will be reclassified and the appropriate causal analysis performed.	March 14, 2008	CR2007-5238
SO-R-2 will be revised to specify that level A and B condition reports must be reviewed by the corrective action review board.	April 11, 2008	CR 20075238
A benchmarking plan for the Corrective Action Group will be developed.	May 2, 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	June 15, 2008	CR200700725

plant is on-line, in plant systems are less than or equal to one ohm.		
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