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

LIC-12-0003
January 16, 2012

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

Reference: Docket No. 50-285

Subject: Licensee Event Report 2011-010, Revision 0, for the Fort Calhoun Station

Please find attached Licensee Event Report 2011-010, Revision 0, dated, January 16, 2012. This report is being submitted pursuant to 10 CFR 50.73(a)(2)(v)(A), (B), (C) and (D). If you should have any questions, please contact me.

Sincerely,

D. J. Bannister
Vice President and Chief Nuclear Officer
Fort Calhoun Station

DJB /epm

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

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
Fort Calhoun Station	05000285	1 OF 3

4. TITLE

Fire Causes a Circuit Breaker to Open Outside Design Assumptions

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
6	7	2011	2011	- 010 -	0	1	16	2012	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
6	29	2012

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On June 7, 2011, a bus fault in load center 1B4A initiated a switch gear fire that resulted in the opening of a circuit breaker which supplies power to load center 1B3A, associated with the opposite train. A fire in one fire area that resulted in a loss of power to a load center associated with the opposite train is not in compliance with 10 CFR 50, Appendix R. The analysis assumes that a fire in a fire area affecting one train of power will be isolated such that power associated with the redundant train will be maintained.

A root cause analysis is being performed to determine the cause of the failure.

The affected bus was de-energized and the Halon system extinguished the fire. The Halon system was recharged and restored to service. Inspections and testing of the unaffected 480 V buses, the supply circuit breakers to the 480 V buses, and the 480 V bus tie circuit breakers were performed. Appropriate 480 V supply circuit breakers and bus tie circuit breakers passed their inspections and testing. The fire damaged switchgear (1B4A), which contains two 480V supply circuit breakers, 1B4A and BT-1B4A (supply circuit breaker to the associated “island” bus), is being replaced. Additional corrective actions will be specified following the completion of the root cause analysis.

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Fort Calhoun Station	05000285	2011	- 010	- 0	2 OF 3

NARRATIVE

BACKGROUND

Fort Calhoun Station (FCS) is a two-loop reactor coolant system of Combustion Engineering (CE) design. The plant has six safety-related 480 VAC (V) buses and three 480 V safety related "island" cross-tie buses. The island buses are fed from one side or the other of the main 480 V buses. Load center 1B3A and 1B3C normally feed island buses in the east switchgear room, and 1B4C normally feeds an island bus in the west switchgear room. Non-segregated bus work connects each island bus to its alternate power supply on the opposite switchgear side. The 480 V bus feeder circuit breakers are NLI/Square D Masterpact circuit breakers with Micrologic trip units.

EVENT DESCRIPTION

On June 7, 2011, a bus fault in load center 1B4A initiated a switch gear fire that resulted in the opening of a circuit breaker which supplies power to load center 1B3A, associated with the opposite train. The fact that a fire in one fire area resulted in a loss of power to a load center associated with the opposite train is inconsistent with assumptions made in the 10 CFR 50, Appendix R Safe Shutdown analysis. This compliance analysis assumes that a fire in a fire area affecting one train of power will be isolated such that power associated with the redundant train will be maintained. Although there was local indication at the circuit breaker that the 1B3A main feeder circuit breaker opened due to an overcurrent condition, other available information does not conclusively indicate that a fault that should have opened the 1B3A main feeder circuit breaker actually occurred. Investigation is continuing into the cause of the trip of the 1B3A main feeder circuit breaker. On November 15, 2011, this event was determined to be reportable per 10 CFR 50.73(a)(2)(v). This event is being reported per 10 CFR 50.73(a)(2)(v)(A), (B), (C) and (D).

CONCLUSION

During normal plant operation, 480V load center and bus tie circuit breakers are expected to remain closed to provide 480V, three phase power to their associated buses. In the event of a fault on the associated bus, a load center circuit breaker or bus tie circuit breaker should open to isolate the fault without opening the next circuit breaker upstream, i.e., the circuit breakers should coordinate to isolate the fault by preserving power to loads not directly impacted by the fault. The FCS 10 CFR 50, Appendix R, Safe Shutdown Analysis credits coordination of the 480 V load center and bus tie circuit breakers for a fire in either switchgear room by assuming that a fault resulting from the fire damaged switchgear will be isolated by bus tie circuit breakers associated with the opposite train. Isolation of the fault by the bus tie circuit breakers will result in one train of AC power remaining in operation during a worst case fire event. The 10 CFR 50, Appendix R, Safe Shutdown Analysis demonstrates that the plant can be safely brought to hot shutdown from an operating mode and subsequently to cold shutdown with a worst case fire in any fire area in the plant. Coordination of plant circuit breakers is analyzed in the FCS, "Breaker/Fuse Coordination Study." The two analyses referenced in this discussion support the FCS Updated Safety Analysis Report (USAR) requirement that "Design provisions were made to limit fire damage to one train of the electrical systems…"

480 V load center and bus tie circuit breakers are expected to remain closed under normal conditions to provide power to buses to which they are aligned within the loading limitations as established in operating procedures. In the event of a fault on a main bus or island bus, the circuit breaker supplying

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NARRATIVE

that bus should open to isolate the fault without tripping upstream circuit breakers. Load center circuit breakers should not open due to a fault or fire in the opposite train.

10 CFR 50, Appendix R design assumptions are that a fire in either the east or west switchgear room will result in the loss of switchgear in the affected room, but will not impact the operability of the switchgear in the opposite room. During the fire in 1B4A, the formation of fire residue (soot) on the non-segregated bus stabs within 1B4A switchgear bus tie circuit breaker cubicle created fault currents that were sensed by circuit breaker 1B3A. At the time of the event, circuit breaker BT-1B4A was open and circuit breaker BT-1B3A was closed supplying island bus 1B3A-4A.

An NRC Part 21 (2005-039) addressed spurious tripping of the Micrologic trip devices, and the supplier Nuclear Logistics Incorporated (NLI) added a filter capacitor to the trip module. Additionally, a subsequent industry spurious trip of NLI/Square D Masterpact circuit breakers in 2008 (OE 21873) resulted in a design change to the trip module. The NLI/Square D Masterpact circuit breakers replaced in 2009, contained the industry operating experience of the Micrologic trip units, and the vendor confirmed the FCS trip units contained the upgrades driven by the NRC Part 21 (2005-039).

CORRECTIVE ACTIONS

As documented in LER 2011-008 (Fire in Bus 1B4A) the following actions have been or are being taken:

The affected bus was de-energized and the Halon system extinguished the fire. The Halon system was recharged and restored to service.

FCS conducted inspections and testing of the unaffected 480 V buses, the supply circuit breakers to the 480 V buses, and the 480 V bus tie circuit breakers. The tested 480 V supply circuit breakers and bus tie circuit breakers passed their inspections and testing.

FCS is replacing the affected bus (1B4A), which contains two 480 V supply circuit breakers, 1B4A and BT-1B4A (supply circuit breaker to the associated “island” bus).

Additional corrective actions will be determined following completion of the root cause for this event.

SAFETY SIGNIFICANCE

The safety significance will be fully evaluated following completion of the root cause analysis for this event.

SAFETY SYSTEM FUNCTIONAL FAILURE

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

PREVIOUS EVENTS

LER 2011-008 documents the fire associate with this event.

LICENSING CORRESPONDENCE REVIEW FORM

LIC-12-0003

Date Issued: 1/6/12 **Requested Return Date: 1/11/12**

Review/Approval		Information	
Dave Bannister		Brad Blome	
John Herman		Woody Goodell	
Steve Miller		Tim Nellenbach	
Susan Baughn			
Chris Sterba			
Dave Digiacinto			
John Adams			
Fred Fork			
C. Cameron			
Mike Cooper			

Subject: LER 2011-010 "Fire Creates Fault Currents Outside Design Assumptions."

Please review and approve the attached draft correspondence (referenced above). In order to document your review for our records, please sign this form and return it to the Licensing Coordinator. If no notification is received by the requested return date, your concurrence with no comment will be assumed.

_____ E. Matzke 6855
Technical Coordinator (Ext.) Licensing Coordinator (Ext.)

[ ] Approved with no comment. [ ] Approved pending resolution of comments as noted.

Comments: _____

_____ _____
Reviewer's Signature Date

LICENSING CORRESPONDENCE REVIEW FORM SUMMARY

LIC-12-0003

Date Issued: 1/6/12 Requested Return Date: 1/11/12

Name	Date Comments Received	No Comments[1]	Comments - How Resolved[2]
Dave Bannister	1/7/*12		Corrected
J. Herman	none		
Woody Goodell	none		
Tim Nellenbach	none		
Susan Baughn	1/11/12		Corrected
Mike Cooper	1/11/12		Corrected
Steve Miller	none		
Chris Sterba	none		
Brad Blome	1/10/12	X	
Dave Digiacinto	none		
John Adams	1/9/12		Corrected
Fred Fork	none		
C. Cameron	none		

Subject: ___LER 2011-010 “Fire Creates Fault Currents Outside Design Assumptions.”

NOTE – This submittal does ____ does not __X__ include documents/files on CD-ROM.[3]

NL Comment Coordinator Signature E. Matzke	Date 1/16/12
Responsible Dept. Manager (if required)	Date
Review by Nuclear Licensing Supervisor	Date 1/16/12

[1] Attach only signed Licensing Correspondence Review Form.
[2] Attach necessary documentation.
[3] Ensure that the CD-ROM files are formatted properly for electronic information exchange (EIE) to the NRC. (Reference NL-17)