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Omaha, NE 68102-2247

LIC-11-0082
July 28, 2011

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. Reinhart) to NRC (Document Control Desk), "Licensee Event Report 2011-004, Revision 0, for the Fort Calhoun Station" (LIC-11-0024)

Subject: Licensee Event Report 2011-004, Revision 1, for the Fort Calhoun Station

Please find attached Licensee Event Report 2011-004, Revision 1, dated, July 28, 2011. This report is being submitted pursuant to 10CFR50.73(a)(2)(v)(B). If you should have any questions, please contact me.

Sincerely,

Jeffrey Reinhart
Site Vice President

JAR/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 205 55-0001, 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 4

4. TITLE

Isolation of Both Trains of Safety Related Auxiliary Feedwater

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
2	5	2011	2011	- 004 -	1	7	28	2011	FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE

2

10. POWER LEVEL

1

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 February 5, 2011, during plant startup activities, operations personnel initiated a transition from auxiliary feedwater (AFW) to main feedwater (MFW) while in Mode 2 (Hot Standby Condition). During the transition, AFW was being supplied by a safety-related motor-driven AFW pump (FW-6) through the AFW nozzles (HCV-1107A/B and HCV-1108A/B). With MFW aligned and feeding both steam generators, the control room operator was directed to shut down FW-6 and return the system to its normal alignment. During this activity the control room operator placed both inboard isolation valves, as directed by procedure, HCV-1107A and HCV-1108A, into their closed position. This action defeated automatic initiation via an auxiliary feedwater actuation signal to open the valves, rendering both trains of AFW inoperable. The condition lasted approximately three minutes.

The root cause analysis for this event determined that technical reviews performed on the operating instruction for AFW were incomplete in their consideration of how plant mode changes affected auxiliary feedwater safety system status.

The condition was recognized and the control switches were placed in "Auto" restoring both trains to operable. The affected procedure will be revised to correct the problem prior to plant startup following the 2011 refueling outage.

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NARRATIVE

BACKGROUND

Fort Calhoun Station (FCS) is a two-loop Combustion Engineering (CE) design reactor coolant system (RCS). Each loop has one steam generator (SG) and two reactor coolant pumps (RCPs). Each SG has one main feedwater (MFW) nozzle and one auxiliary feedwater (AFW) nozzle. The MFW nozzle is the normal path for feeding the SGs.

The AFW system is provided for storage, pumping and delivery of makeup water to the SGs in order to remove decay heat if the MFW system is not available. The AFW system consists of one emergency feedwater storage tank; one safety-related motor-driven AFW pump (FW-6), one safety-related turbine-driven AFW pump (FW-10); one non-safety-related, diesel-driven AFW pump (FW-54); one non-safety-related diesel fuel oil transfer pump with a day tank; non-safety-related fuel oil piping and valves; remotely operated flow control valves; interconnecting piping to the MFW system and piping to the AFW nozzles on the SGs.

The AFW line to each SG has an isolation valve on the inside of containment (the 'A' valves) and one on the outside of containment (the 'B' valves). The HCV-1107A/B valves are the isolation valves for the 'A' SG. The HCV-1108A/B valves are the isolation valves for the 'B' SG. The AFW isolation valves are 3-inch, pneumatically operated globe valves. These valves are air to close and spring to open.

FW-54 is the startup AFW pump. FW-54 takes its suction from the condensate storage tank and discharges to the normal feedwater header. FW-54 and its associated equipment are not safety-related.

The AFW system provides a redundant means of supplying one or both SGs with feedwater. Operation of the safety-related portion of the AFW system is automatically initiated on a low SG water level or manually initiated as follows:

- Automatic initiation via an auxiliary feedwater actuation signal (AFAS).
- Automatic start signals to the safety-related pumps (FW-6 and FW-10).
- Manual initiation from the control room.
- Manual initiation from alternate shutdown panel for FW-10 and the AFW injection valves and locally for FW-6.

The system is designed to add feedwater to either or both SGs under any condition, including the loss of all electrical power along with the loss of the MFW system and the loss of the main steam piping downstream of the main steam isolation valves. The AFW system fulfills both safety-related and non-safety-related functions.

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NARRATIVE

Technical Specification (TS) 2.5, “Steam and Feedwater Systems,” states, in part:

(1) Two AFW trains shall be OPERABLE when Tcold is above 300°F.

A. With one steam supply to the turbine driven AFW pump inoperable, restore the steam supply to OPERABLE status within 7 days and within 8 days from discovery of failure to meet the LCO.

B. With one AFW train inoperable for reasons other than condition A, restore the AFW train to OPERABLE status within 24 hours.

C. If the required action and associated completion times of condition A or B are not met, then the unit shall be placed in MODE 2 in 6 hours, in MODE 3 in the next 6 hours, and less than 300°F without reliance on the steam generators for decay heat removal within the next 18 hours.

D. With both AFW trains inoperable, then initiate actions to restore one AFW train to OPERABLE status immediately. Technical Specification (TS) 2.0.1 and all TS actions requiring MODE changes are suspended until one AFW train is restored to OPERABLE status.

EVENT DESCRIPTION

On February 5, 2011, during plant startup activities, operations personnel initiated a transition from AFW to MFW while in Mode 2, power operations. During the transition, AFW was being supplied by FW-6 through the AFW nozzles via HCV-1107A/B and HCV-1108A/B. With MFW aligned and feeding both steam generators, the control room operator was directed to shut down FW-6 and return the system to its normal alignment. During this activity, the control room operator, as directed by procedure, placed both HCV-1107A and HCV-1108A into their closed position. This action defeated the AFAS ability to open the valves, rendering both trains of AFW inoperable. The condition was subsequently recognized as inappropriate for the current plant mode and the control switches for HCV-1107A and HCV-1108A were placed in “Auto” restoring both trains to operable status. The condition represented a violation of Technical Specification 2.5(1)D. This condition existed for approximately three minutes. On February 6, 2011, an eight (8) hour report was made under 10 CFR 50.72 (b)(3)(v)(B) to the NRC Headquarters Operation Office (HOO) at 0237 CST. This report is being made per 10 CFR 50.73(a)(2)(v)(B).

CONCLUSION

The root cause analysis for this event determined that technical reviews performed on the operating instruction for AFW were incomplete in their consideration of how plant mode changes affected auxiliary feedwater safety system status.

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NARRATIVE

CORRECTIVE ACTIONS

Immediate corrective actions:

As previously noted, the condition was recognized and the control switches were placed in "Auto" restoring both trains to operable.

Long term corrective actions:

1. The affected procedure (Operating Instruction, OI-AFW-4, Auxiliary Feedwater Startup and System Operation) will be revised to correct the problem prior to startup following the 2011 refueling outage.
2. Operating Instructions were reviewed to determine if similar issues exist elsewhere. Corrections to identified deficiencies will be controlled by the corrective action program.
3. The station process for periodic reviews of procedures is being strengthened. These process changes will be controlled by the corrective action program.

SAFETY SIGNIFICANCE

As previously discussed, during the plant startup while in transitioning from the startup feedwater alignment used during low power operation to the MFW system the operators momentarily isolated AFW. The operators quickly realized the plant's incorrect configuration and restored the AFW system to its correct alignment. The incorrect alignment lasted for approximately three minutes. During the time the AFW system was in an incorrect alignment the operators would have been able to restore the system to automatic operation by turning the control switches to "AUTO" or by taking manual control of the AFW system. The plant had been shut down since February 4, 2011, at 2212 CST, reducing the effect of decay heat on transients to the plant. The AFW system was fully capable of performing its design function other than the mispositioning of the valve control switches. Therefore, this event had little effect 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 EVENTS

LERs 2010-003, 2008-003 and 2006-002 report similar events.