

444 South 16th Street Mall 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

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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 turbinedriven AFW pump (FW-10); one non-safety-related, diesel-driven AFW pump (FW-54); one non-safetyrelated 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.