

February 28, 2000

Mr. Garry L. Randolph
Vice President and Chief Nuclear Officer
Union Electric Company
Post Office Box 620
Fulton, MO 65251

SUBJECT: CLOSEOUT OF RESPONSES TO GENERIC LETTER 96-06 FOR CALLAWAY
PLANT, UNIT 1 (TAC NO. M96791)

Dear Mr. Randolph:

The Nuclear Regulatory Commission (NRC) staff issued Generic Letter (GL) 96-06, "Assurance of Equipment Operability and Containment Integrity During Design-basis Accident Conditions," on September 30, 1996. In GL 96-06, the NRC staff requested that you determine, for postulated accident conditions at Callaway Plant, Unit 1 (Callaway), if (1) containment air cooler cooling water systems are susceptible to either water hammer or two-phase flow conditions, and (2) piping systems that penetrate containment are susceptible to thermal expansion of fluid so that overpressurization of piping could occur. You responded to GL 96-06 in letters of October 30, 1996 (ULNRC-3483), January 28, 1997 (ULNRC-3526), October 17, 1997 (ULNRC-3667), May 1, 1998 (ULNRC-3826), May 19, 1998 (ULNRC-3836), May 17, 1999 (ULNRC-4033), and October 29, 1999 (ULNRC-4141).

In addition to your letters, we issued requests for additional information (RAIs) in our letters of September 11, 1997, March 31, 1998, and May 10, 1999. Also, in our letters to you of December 12, 1996, and November 13, 1997, we acknowledged your letter of October 30, 1996, and stated that we expected that you would complete the actions requested in GL 96-06 and submit a report by January 28, 1997, as you did, and address corrective actions and the acceptance criteria for faulted conditions in Section III, Appendix F to the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), respectively.

In our letter of November 30, 1999, we addressed GL 96-06 item (1) above on waterhammer and two-phase flow concerns for containment air cooler cooling water systems and concluded that these concerns were addressed and closed out for Callaway. We also stated in the letter that there are shortcomings that have been identified in your analysis for Callaway that should be corrected. These shortcomings were addressed in the letter and discussed with your staff on November 18, 1999. Although the staff has disagreements with some of the assumptions made in your submittals, its conclusion remains for GL 96-06 that the allowable piping stress will not be exceeded by waterhammer for these cooling water systems at Callaway.

This letter documents the staff's review of your responses to GL 96-06 item (2) above on thermally induced overpressurization of piping systems that penetrate containment. In your submittal of January 28, 1997, you identified 23 penetrations with piping as potentially susceptible to thermal overpressurization, but stated that all the penetrations are operable based on piping plastic deformation and committed to perform further evaluations and possible

modifications during the then upcoming spring 1998 and fall 1999 refueling outages, both of which have been completed.

In your letter of May 19, 1998, following the spring 1998 outage, it was stated that 4 of the 23 penetrations are not susceptible to thermally-induced overpressurization and that a detailed evaluation of the remaining 19 penetrations had been performed using the ASME Code Section III, Appendix F criteria for faulted conditions, which is consistent with the commitments in the Callaway Final Safety Analysis Report. The detailed evaluation showed that the 19 penetrations met this criteria, although credit had to be taken for the piping insulation for 5 penetrations. Because the in-place insulation for these 5 penetrations was expected to have a degraded thermal performance when wet, the insulation was upgraded during the spring 1998 outage to ensure the assumed insulation properties were maintained during the postulated postaccident conditions.

In the telephone conference call of February 9, 1999, we discussed an error in the methodology for determining the temperature and pressure response that was used by your contractor, Altran Corporation, in the PIPEPRESS computer program. In the call, your staff committed to reevaluate and confirm the earlier calculations using PIPEPRESS after correcting the error. In the submittal of October 29, 1999, it was stated that, using the ANSYS computer program to determine the temperature and pressure response, the acceptability of the penetration evaluation provided in your letter of May 19, 1998, was confirmed.

Based on the above, the staff finds the evaluation for Callaway related to the thermally-induced overpressurization of piping systems that penetrate containment, which is documented in your submittals listed above, is acceptable. This includes the corrective actions discussed in these submittals. Therefore, the staff also concludes that your evaluation and corrective actions provide an acceptable resolution of these concerns in GL 96-06 for Callaway.

This closes out the staff's efforts on GL 96-06 for Callaway and TAC No. M96791. If you have any questions concerning this review, please contact me at 301-415-1307 or, through the internet, at jnd@nrc.gov.

Sincerely,

Jack Donohew, Senior Project Manager, Section 2
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-483

cc: See next page

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/RA/

Jack Donohew, Senior Project Manager, Section 2
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Division of Licensing Project Management
Office of Nuclear Reactor Regulation

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