



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001**

May 1, 2000

Mr. Harold B. Ray
Executive Vice President
Southern California Edison Company
San Onofre Nuclear Generating Station
P.O. Box 128
San Clemente, CA 92674-0128

**SUBJECT: SAN ONOFRE NUCLEAR GENERATING STATION, UNITS 2, AND 3 -
EVALUATION OF RESPONSES TO GENERIC LETTER 96-06, "ASSURANCE
OF EQUIPMENT OPERABILITY AND CONTAINMENT INTEGRITY DURING
DESIGN-BASIS ACCIDENT CONDITIONS" (TAC NOS. M96862 AND M96863)**

Dear Mr. Ray:

On September 30, 1996, the U.S. Nuclear Regulatory Commission (NRC) staff issued Generic Letter (GL) 96-06, Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions, to all holders of operating licenses for nuclear power reactors to address the following concerns:

1. Cooling water systems serving the containment air coolers may be exposed to the hydrodynamic effects of waterhammer during either a loss-of-coolant accident (LOCA) or a main steam line break (MSLB). These cooling water systems were not designed to withstand the hydrodynamic effects of waterhammer and actions may be needed to satisfy system design and operability requirements.
2. Cooling water systems serving the containment air coolers may experience two-phase flow conditions during postulated LOCA and MSLB scenarios. The heat removal assumptions for design-basis accident scenarios are based on single-phase flow conditions and actions may be needed to satisfy system design and operability requirements.
3. Thermally induced overpressurization of isolated water-filled piping sections in containment could jeopardize the ability of accident-mitigating systems to perform their safety functions and could lead to a breach of containment integrity through bypass leakage. Actions may be needed to satisfy system operability requirements.

If systems are found to be susceptible to the conditions discussed in the GL, licensees were expected to assess the operability of affected systems and take corrective action as appropriate in accordance with the requirements stated in 10 CFR Part 50 Appendix B and as required by the plant technical specifications.

The GL requested that licensees submit a written summary report stating actions taken in response to the GL, conclusions that were reached relative to these issues, the basis for continued operability of affected systems and components as applicable, and corrective actions that were implemented or plan to be implemented.

On November 13, 1997, the NRC staff issued a supplement to the GL, and provided additional guidance to licensees for resolving the GL issues.

By letters dated January 28, 1997, February 3, 1997, July 10, 1998, October 30, 1998, and July 2, 1999, you provided responses to GL 96-06 for San Onofre Nuclear Generating Station (SONGS), Units 2 and 3. The NRC staff has evaluated your responses, and finds them acceptable as discussed below.

You identified (see your letter dated February 3, 1997) 26 penetrations as potentially vulnerable to a water solid volume that may be subjected to an increase in pressure due to heating of trapped fluid. You determined that all affected penetrations are operable based on the potential leakage through packing, bonnet gaskets, and/or valve seating surfaces. Your detailed evaluation determined that:

- (1) 9 penetrations are qualified by analysis and no further action is necessary,
- (2) 2 penetrations are associated with spring-loaded diaphragm actuated isolation valves that are inherently not susceptible to thermally induced overpressurization,
- (3) 5 penetrations would require modification, and
- (4) 10 penetrations would require administrative control

For the two penetrations associated with spring-loaded diaphragm actuated isolation valves, you determined that the valves' design provides inherent relief to prevent thermally induced overpressurization. In response to the staff's request for additional information of May 6, 1998, by letter dated July 10, 1998, you provided applicable design criteria for the piping and valves, the load combinations, and the maximum calculated temperature and pressure for the pipe run. For the spring-loaded diaphragm actuated isolation valves associated with these two penetrations, you provided (1) the pressure at which the valve was determined to lift off its seat or leak, (2) the method used to estimate the pressure including any source of uncertainty associated with the estimate, and (3) the maximum calculated stress in the piping run based on the estimated lift off or leakage pressure. Also, by letter dated July 2, 1999, you provided a sample calculation to demonstrate the application of the criteria in Appendix F to Section III of the ASME Code for the evaluation of thermally induced overpressurization loads with Level D service limits. You determined that the calculated pipe stresses meet the design-basis allowable stress limits. The staff finds your evaluation and corrective action reasonable and acceptable.

You determined that five penetrations would require modification to meet the design-basis stress criteria. The modification consisted of adding or modifying thermal insulation on four penetrations and adding a relief valve on piping for one penetration. By letter dated April 19, 2000, you confirmed that these modifications were completed in both SONGS, Units 2 and 3 during their respective Cycle 9 refueling outages.

For the remaining 10 penetrations, you stated that you administratively control them to ensure that all intervening valves are open to provide a relief path throughout Modes 1 through 4, or that compensatory measures are taken to provide overpressure protection in the event of their closure.

Based on its review and the above discussion, the staff concludes that your corrective action and evaluation provide an acceptable resolution for the issue of thermally induced pressurization of piping runs penetrating the containment. This completes our effort relating to GL 96-06 under our Technical Assignment Control (TAC) Numbers M96862 and M96863 and the TACs are closed.

If you have any questions regarding this matter, please write or call me at 301-415-1471.

Sincerely,

/RA/

L. Raghavan, Senior Project Manager, Section 2
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-361, and 50-362

cc: See next page

Based on its review and the above discussion, the staff concludes that your corrective action and evaluation provide an acceptable resolution for the issue of thermally induced pressurization of piping runs penetrating the containment. This completes our effort relating to GL 96-06 under our Technical Assignment Control (TAC) numbers M96862 and M96863 and the TACs are closed.

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L. Raghavan, Senior Project Manager, Section 2
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Docket Nos. 50-361, and 50-362

cc: See next page

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*No major changes to input.

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