The Light company Houston Lighting & Power P.O. Box 1700 Houston, Texas 77001 (713) 228-9211

August 30, 1982
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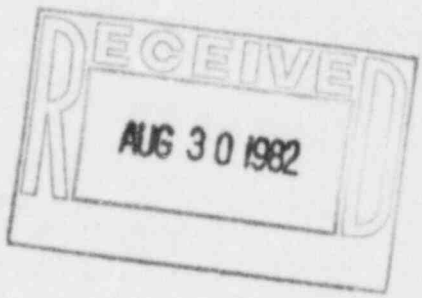


Mr. John T. Collins
Regional Administrator, Region IV
Nuclear Regulatory Commission
611 Ryan Plaza Dr., Suite 1000
Arlington, Texas 76012

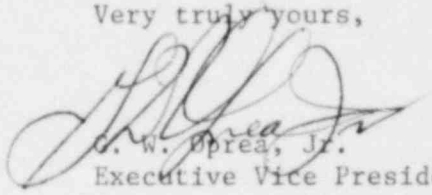
Dear Mr. Collins:

South Texas Project
Units 1 & 2
Docket Nos. STN 50-498, STN 50-499
Second Interim Report Concerning
the Design of the Residual Heat Removal System

On March 26, 1982, Houston Lighting & Power Company (HL&P), pursuant to 10CFR50.55(e), notified your office of an item concerning the design of the Residual Heat Removal (RHR) System. Attached is the Second Interim Report which provides several alternatives for corrective actions which are currently under review. The final report will be submitted to your office by January 21, 1983 and will describe the corrective action to be implemented.

If you should have any questions concerning this item, please contact Mr. Michael E. Powell at (713)877-3281.

Very truly yours,



O. W. Dprea, Jr.
Executive Vice President

MEP/mg

Attachment

IE 27

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Revision Date 08-23-82

Second Interim Report
Concerning the Design
of the Residual Heat Removal System

I. Summary

The elevation difference between the top of the Residual Heat Removal (RHR) heat exchanger tube bundle and the high water level in the Refueling Water Storage Tank (RWST) could result in leakage across the system check valves back to the RWST. This leakage could result in a voided volume in the heat exchanger tube bundle in which noncondensible gases could collect. The noncondensible gases could result in potential waterhammer and air entrapment concerns when the Low Head Safety Injection (LHSI) pumps are started.

This condition exists because of the low NPSH requirements of the LHSI pumps which allow the RWST to be located at a relatively low plant elevation. The RWST is normally at a higher elevation than the RHR heat exchanger.

Several alternatives for resolution of this item are outlined in Section III of this report.

II. Description of the Incident

On March 26, 1982, Houston Lighting & Power Company (HL&P), pursuant to 10CFR50.55(e), notified your office of an item concerning the design of the RHR System. The RHR heat exchangers are located at an elevation higher than the RWST, which is the source of borated water for safety injection. This configuration places the heat exchangers at the "high point" in the system, and therefore, subject to possible accumulation of noncondensible gases in the tube bundles when the system is not in operation. The accumulation of noncondensible gases in the tube bundles could lead to a potential for water hammer when the LHSI pumps are started.

Brown & Root, Inc. (B&R) notified the NRC - Region IV office on March 26, 1982 that this item was potentially reportable pursuant to 10CFR21. A copy of the B&R report concerning this item was provided as an attachment to our first interim report which was submitted to your office by letter dated April 21, 1982 (reference ST-HL-AE-818).

III. Corrective Action

The following alternatives regarding the modifications which may be required to preclude air entrapment in the RHR heat exchanger tube bundles are under consideration as resolutions to the problems identified herein.

a. The addition of a continuous or intermittent recirculation system to circulate fluid through the system to keep the piping full and to avoid stagnation which could lead to the separation of noncondensibles.

b. The addition of an elevated or pressurized tank to maintain a positive head on the system.

c. A flowpath currently exists which is used for flow verification testing of the LHSI pumps during normal plant operation. This flowpath could also be used to circulate fluid through the system to keep the piping full and to avoid stagnation which could lead to the separation of noncondensibles.

IV. Recurrence Control

Any recurrence control measures which may be deemed necessary will be identified in the final report concerning this item.

V. Safety Analysis

Pump startup with inadvertently voided discharge lines due to entrapped air or draining has been identified as a potential cause of water hammer by NUREG-0582-"Water Hammer in Nuclear Power Plants". Water hammer events, due to this mechanism, are more common in systems where the relative elevations of components allow drainage of lines due to normal system leakage, than in systems where the relative elevation of the water supply is such that the piping, after initial venting, tends to remain filled. The condition as described in this report falls under the first category since the low relative position of the RWST could allow drainage of the RHR heat exchanger tube bundles.

In water systems designed for operation with full pump discharge lines, inadvertent voiding of the lines due to air entrapment or drainage may result in excessive dynamic loads following pump startup. The air results in higher liquid velocities during the initial portion of the transient with attendant increased loads on the piping and possible higher pressures during the latter portion of the transient as the air is compressed.

For these reasons, we have assumed that a safety hazard could exist and the design will be corrected without further analysis of the existing condition.