

The Light company

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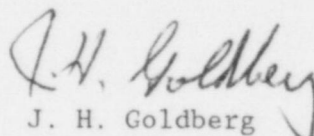
U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

South Texas Project
Units 1 and 2
Docket Nos. STN 50-498, STN 50-499
Final Report Concerning
Small Break LOCA - Shutdown Modes 3 & 4

On September 29, 1986, Houston Lighting & Power Company, (HL&P) notified the NRC, pursuant to 10CFR50.55(e), of an item concerning small break loss of coolant accident (LOCA) mitigation during plant shutdown. Attached is our Final Report on this issue.

As the report states, this issue is generic to Westinghouse plants. HL&P is participating in the Westinghouse Owners Group (WOG) resolution of this issue. In the interim, HL&P has estimated that sufficient time (10 minutes) is available for operator actions from the control room to terminate this event. Therefore, for small breaks in Modes 3 and 4 this deficiency is not reportable pursuant to 10CFR50.55(e).

If you should have any questions on this matter, please contact Mr. C. A. Ayala at (512) 972-8628.



J. H. Goldberg
Group Vice President, Nuclear

LRS/yd

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I. Summary

On September 29, 1986, Houston Lighting & Power Company (HL&P) notified the NRC of an item concerning small break LOCA mitigation during plant shutdown Modes 3 and 4 (hot standby and hot shutdown). Since specific analysis did not exist for STP which demonstrated the ability to detect and mitigate a small break LOCA during Modes 3 and 4, this was considered to be a potentially reportable item.

As stated in HL&P correspondence to the NRC staff (ST-HL-AE-2017 and ST-HL-AE-2159, dated 4/20/87 and 5/8/87 respectively), Westinghouse estimates for STP that approximately 10 minutes are available for operator action following an 8 inch or smaller line break in Modes 3 and 4. The bases for this estimate are TREAT and SATAN analyses performed for similar Westinghouse plants. The Westinghouse Owners Group (WOG) has initiated a program to formally resolve this issue and it is expected that the results of this program will confirm the aforementioned estimate. Furthermore, STP's design includes separate residual heat removal (RHR) system pumps and low head safety injection (LHSI) pumps, and thus no RHR to LHSI realignment is required.

Since sufficient time exists for operator action to secure the plant from an 8 inch or smaller break in Modes 3 and 4, we have determined that this deficiency is not reportable pursuant to 10CFR50.55(e).

II. Description of Deficiency

During an update of the response to FSAR question 211.32, a concern was raised by the NRC with respect to the operator action time assumed for the small break LOCA case in Modes 3 and 4. The response indicated that the operator was assumed to manually initiate Safety Injection (SI) within 10 minutes upon detection of a LOCA in Modes 3 and 4. This assumption had been considered conservative based on a calculated containment pressure Hi-1 signal causing an automatic SI signal within 2-5 minutes. The Hi-1 signal was expected to occur based on previous Westinghouse analyses for 6 and 8 inch breaks. Westinghouse analyses now show that a Hi-1 signal will probably not be generated by these small breaks and that the operator may be required to initiate SI.

Since a specific analysis was not available for STP it could not be assured that sufficient time would be available for the operator to analyze the event and take corrective action.

III. Corrective Action

Westinghouse notified the NRC of the generic implications of this issue on June 24, 1986 via letter NS-NRC-86-3114. A Westinghouse Owners Group (WOG) program has been initiated and will provide for analysis on a generic basis of the available time for operator action to mitigate the consequences of the LOCA for WOG plants. In the interim, HL&P and Westinghouse have estimated for STP that approximately 10 minutes are available for operator actions following an 8 inch or smaller break in Modes 3 and 4. This estimate is based on TREAT analyses that were performed for two and three inch LOCAs at 1000 psig and 425 F and on a SATAN analysis for a standard four loop Westinghouse plant that was performed for a double-ended rupture of a reactor coolant inlet pipe with the RCS at 750 psig and 350 F at 4 hours after reactor shutdown.

A LOCA in Modes 3 and 4 can be identified by abnormal containment conditions, abnormal auxiliary building radiation, low pressurizer level alarms, loss of RCS pressure, loss of RCS subcooling without loss of heat sink, and level sensors and alarms associated with the RCS pressure boundary leak detection. Upon identification of the aforementioned conditions, operator actions would be to ensure adequate water is provided to the RCS to keep the core covered, and to remove decay heat. Since the STP design includes separate residual heat removal (RHR) pumps and low head safety injection (LHSI) pumps, no RHR to LHSI realignment is necessary.

Subsequent operator actions would be to isolate letdown, verify satisfactory RCS pressurizer level and satisfactory upperhead level, verify RCS subcooling, isolation of the containment, and protection of the reactor coolant pumps. These actions would be from the control room.

In keeping with our commitments in other correspondence with the NRC (letters ST-HL-AE-2017 and ST-HL-AE-2159), HL&P will incorporate WOG interim guidance into STP's off-normal procedures for identification and termination of a LOCA in Modes 3 and 4. This will be completed approximately two months after receipt of the finalized WOG interim guidance. HL&P will continue to participate in WOG activities concerning this issue and will take additional corrective actions, if required, according to the results of the final WOG analysis.

IV. Recurrence Control

Recurrence control measures are not necessary since this deficiency is an isolated occurrence (limited to Modes 3 and 4).

V. Safety Analysis

For 8-inch and smaller breaks, automatic SI initiation may not occur when the reactor coolant temperatures are in the lower range of Mode 3 (350 F) or when in Mode 4 (200-350 F) because of the reduced energy release to the containment. Since automatic SI initiation may not occur, operator action will be required to initiate SI for breaks in this range.

Westinghouse estimates that approximately 10 minutes are available for operator actions to initiate SI and decay heat removal following a 8 inch or smaller size LOCA during Modes 3 or 4.

The STP design requires that at least one (1) high head safety injection (HHSI) pump and two (2) LHSI pumps be available during operation in Modes 3 and 4. The STP design also includes separate RHR and LHSI pumps with no RHR to LHSI realignment necessary.

Therefore, based on sufficient time available (approximately 10 minutes) for operator actions from the control room following an 8 inch or smaller LOCA in Modes 3 or 4, we have determined that this deficiency is not reportable pursuant to 10CFR50.55(e).