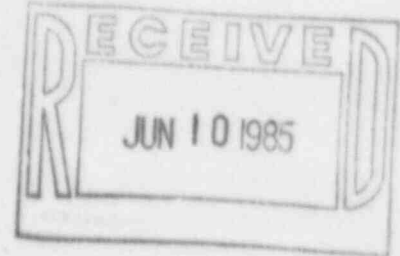


The Light company

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

June 5, 1985
ST-HL-AE-1264
File No.: G12.239

Mr. Robert D. Martin
Regional Administrator, Region IV
Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011



Dear Mr. Martin:

South Texas Project
Units 1 & 2
Docket Nos. STN 50-498, STN 50-499
First Interim Report Concerning
Core Exit Temperature Measurement System

On May 9, 1985, pursuant to 10CFR50.55(e), Houston Lighting & Power Company (HL&P) notified your office of a reportable item concerning the safety grade Westinghouse (W) core exit temperature measurement system. This item has been reported pursuant to 10CFR21 by W. Attached is the first interim report concerning this item. The next report will be submitted by September 20, 1985.

If you should have any questions on this matter, please contact Mr. Michael E. Powell at (713) 993-1328.

Very truly yours,

A handwritten signature in cursive script, appearing to read "J. H. Goldberg".

J. H. Goldberg
Group Vice President, Nuclear

CAA/yd

Attachment: First Interim Report Concerning
Core Exit Temperature Measurement System

85-442

W2/NRC3/c

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cc:

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Office of the Secretary
U.S. Nuclear Regulatory Commission
Washington, DC 20555

South Texas Project
Units 1 & 2
Docket Nos. STN 50-498, STN 50-499
First Interim Report Concerning
Core Exit Temperature Measurement System

I. Summary

Westinghouse (W) filed a 10CFR21 item on May 9, 1985 concerning the core exit temperature measurement system. Recent tests indicate that the potential total system error exceeds that which is assumed in the W Emergency Response Guidelines (ERG's) which are used as the basis for significant operations related to safety of the plant. The Reactor Coolant System (RCS) Subcooling Margin calculation and Inadequate Core Cooling Detection (ICC) are impacted. W has recommended interim corrective actions for their customers, however STP specific corrective actions are being investigated and pursued with W.

II. Description of Deficiency

During Westinghouse qualification testing of the safety grade core exit thermocouple system (consisting of thermocouples, connectors, potting adaptors, splices and the reference junction box), it was determined that the potential total system error of the system exceeds that which is assumed for certain functions in the Emergency Response Guidelines (ERG). The ERG's are the basis for plant specific Emergency Operating Procedures (EOP).

The safety grade core exit thermocouple system signals will be maintained although some errors could be experienced during or after a high energy line break event. These errors are postulated to be caused by moisture ingress and thermal expansion, but are not completely understood at this time.

According to 10CFR50.49, safety related equipment must be qualified to perform its intended safety function during and following design basis events.

The ERG's indicate that core exit thermocouple (T/C) information is used in determining RCS subcooling margin and inadequate core cooling (ICC).

RCS Subcooling Margin

The generic ERG's recommend the use of core exit T/C temperature in the calculation of RCS subcooling margin. Actions that are taken in the ERG's based wholly or in part on the RCS subcooling margin include safety injection (SI) termination, SI reinitiation, and manual reactor coolant pump (RCP) trip. Plant specific application of the generic ERG's requires each utility to determine the plant specific temperature uncertainty contribution to the RCS subcooling calculation based on that utility's system configuration. Information previously supplied to some utilities assumed less than a 30°F uncertainty allowance.

Potential consequences of exceeding the assumed temperature channel accuracy requirements include the following: (1) delay in terminating SI following a secondary high energy line rupture or small-break LOCA which could potentially result in water relief through the pressurizer safety and/or relief valves; (2) inappropriate SI termination following a small LOCA necessitating operator action to reinstate SI; and (3) failure of the operator to trip the RCP's following a small-break LOCA if subcooling margin is utilized as the criterion.

Occurrence of any of the above consequences due to increased temperature uncertainty in the RCS subcooling margin could result in consequences more severe than currently described in FSAR accident analyses.

W has determined that the RCS subcooling margin concern is the only 10CFR21 reportable concern for STP. Additional items not reportable in accordance with 10CFR21 are described below for information.

Inadequate Core Cooling Detection

The generic ERG's utilize core exit T/C temperature for the detection of the advent of ICC situations. In particular, for the Core Cooling Critical Safety Function Status Tree, the two decision points exhibited are core exit T/C temperature greater than 1200°F and core exit T/C temperature greater than 700°F in conjunction with a Reactor Vessel Level Indication System (RVLIS) indication below the core midplane.

An uncertainty of up to 200°F is acceptable in the 1200°F setpoint on the core cooling status tree, i.e., the actual core exit temperature could be between 1000°F and 1400°F. However, the 700°F setpoint only allocated a maximum core exit T/C temperature inaccuracy of approximately 30°F. Assuming the RCS pressure is at a maximum pressure corresponding to the relief setpoint of the pressurizer safety valves (approximately 2500 psia), the 700°F setpoint minus the temperature uncertainty ensures that the core exit temperature is indeed superheated prior to entering an ICC mitigating guideline.

III. Corrective Action

The generic Westinghouse interim recommendations which are applicable to operating utilities are provided in the Westinghouse 10CFR21 letter to the NRC.

STP specific corrective actions for RCS subcooling margin and inadequate core cooling are being investigated. Formal action is being taken with Westinghouse to pursue STP specific actions.

IV. Recurrence Control

No recurrence control is required. This deficiency was discovered during the equipment qualification process, which is in place specifically to identify and correct problems such as this.

V. Safety Analysis

Potential consequences of exceeding the assumed temperature channel accuracy requirements include several inappropriate operator actions, as discussed above, which could lead to events which are more severe than those analyzed in the FSAR.