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

7/31/84

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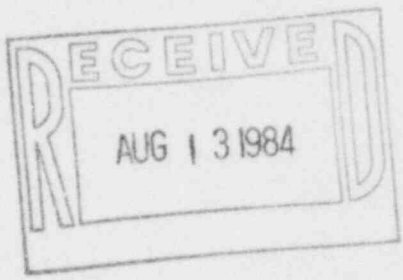
File Number: G12.168



Mr. John T. Collins
Director, Region IV
U. S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76102

Dear Mr. Collins:

South Texas Project
Units 1 & 2
Docket Nos. STN 50-498, STN 50-499
Third Interim Report Concerning Corrosion in a
Safety Injection System Weld

On October 20, 1983, pursuant to 10CFR50.55(e), Houston Lighting & Power Company (HL&P) notified your office of an item concerning corrosion in a pipe weld at the South Texas Project (STP). Attached is the third interim report concerning this item. The next report will be submitted to your office by November 16, 1984. As previously stated, the final report will address recurrence control and safety analysis aspects.

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

Very truly yours,

J. W. Goldberg for

G. W. Oprea, Jr.
Executive Vice President

MEP/mg
Attachment: 3rd Interim Report Concerning Corrosion
in a Safety Injection System Weld

W2/NRC2/d

IE-27

cc:

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Revised 07/31/84

South Texas Project
Units 1 and 2
Third Interim Report Concerning
Corrosion in a Safety Injection System Weld

I. Summary

Voids have been discovered in two welds in the portion of the Safety Injection System (SIS) piping between the Refueling Water Storage Tank (RWST) and the SI pumps located in the Fuel Handling Building (FHB). A portion of one weld was removed for analysis to determine the extent of the defects and the cause. Investigations of the defects showed through-wall penetration. Analysis of the physical appearance of the pipe section and microscopic analysis of samples taken from defects indicated the presence of microbiologically influenced corrosion (MIC).

Inspections and investigations have been initiated and completed as described below.

An expert in the field of microbiologically influenced corrosion has been retained to determine the source of the bacteria and assist in the formulation of a recurrence control program. A closed circuit television inspection program to investigate the interior of installed and laydown area piping has been completed for a sample population. The inspection/investigation concluded that the majority of the subject piping has not been affected by MIC; however, a few isolated areas did show evidence of potential MIC presence.

In addition, visual inspection of six (6) safety-related carbon steel tanks indicates no evidence of MIC. An inspection of stainless steel tanks has been initiated.

II. Description

On October 20, 1983, pursuant to 10CFR50.55(e), Houston Lighting & Power Company (HL&P) notified the NRC Region IV of an item concerning corrosion in an SIS weld. During a re-examination and repair program of ASME safety-related welding, certain field welds in the SI piping from the RWST were being repaired to eliminate defects identified in the radiographs taken by Brown & Root, Inc. (B&R). During examination of the weld metal in two welds, voids were found that exhibited signs of corrosion. From comparison of recent radiographs to the original radiographs, it is evident that the indications present in the new radiographs were not present in the original films. One weld was

sectioned and a sample sent for laboratory analysis. After metallographic examination and microscopic analysis of scrapings from the corrosion sites, MIC resulting from the action of bacteria (including Gallionella) was determined to be the probable cause of corrosion. This determination was further substantiated by the fact that the SI pipe had been observed to be partially filled with standing water, thus providing a suitable growth medium for bacteria.

III. Investigative Measures

An expert in the field of MIC has been retained to determine the source of the bacteria and assist in the formulation of a recurrence control program. The sampling program indicates corrosion causing bacteria are present in both the well water and soil at the plant site.

The low points of the buried 30" diameter aluminum-bronze essential cooling water system piping have been visually examined for MIC. Four small deposits have been discovered at one backing ring which had contained standing water for several months. The inspection of the deposits at the one backing ring in the essential cooling water piping has been completed. A portion of the backing ring adjacent to three of the four deposits was removed. This was accomplished without disturbing either the weld or pipe base material. The area underneath the backing ring as well as the backside of the backing ring was visually inspected, wire-brushed and probed with a sharp instrument for pitting. No significant pitting was observed. No other evidence of MIC was found in these ECW lines.

The MIC consultant has been attempting to grow bacteria nodules on test specimens of aluminum-bronze piping since January of this year. To date, the bacteria have developed only small deposits on the test specimens. These deposits were scraped away and no significant corrosion was found.

Based on the laboratory testing and the field investigation noted above, HL&P has determined that bacteria caused corrosion is not a significant concern for the essential cooling water aluminum-bronze components.

The inspection program using a closed circuit television and direct visual examination to investigate the interior of installed and laydown area piping has been completed. Approximately fifteen percent of laydown area piping with indications that dirt or water could have been introduced have been examined for indications of MIC. The laydown area stainless steel and aluminum-bronze piping examination has been completed and no indications of MIC have been found. Approximately fifteen percent of installed safety-related stainless steel piping low points have been examined. Stainless steel piping examination in the reactor containment building has been completed and no indications of MIC have been found. Stainless steel and carbon steel piping investigation in the mechanical auxiliary building has been completed

and no indications of MIC have been found in safety-related systems. Evidence of possible MIC in the nonsafety-related stainless steel equipment drain system has been discovered, and is mentioned here only for information completeness.

Stainless steel safety-related auxiliary feedwater system piping embedded in the slab of the isolation valve cubicle has also been found to contain indications of possible MIC in several welds. Two additional "suspect" welds have been identified in two Containment Spray System (CSS) lines, which are located in the same area in the Fuel Handling Building as the SIS line discussed in Section II above.

Visual inspection of the six (6) safety-related carbon steel standby diesel fuel oil storage tanks has been completed. No evidence of MIC was found. Some degree of MIC pitting has been identified in the field erected stainless steel tanks. Measures for detailed inspection of these tanks for location and disposition of MIC pitting are currently being developed, but have not yet been implemented.

In summary, the areas that show evidence of potential MIC are as follows:

1. Three stainless steel lines in the Safety Injection (SI) and Containment Spray (CS) systems, located in the lower elevations of the Unit 1 Fuel Handling Building (FHB).

2. Stainless steel lines in the Auxiliary Feed (AF) system, located in the lowest elevation of the Isolation Valve Cubicle (IVC) rooms in both Units 1 and 2.

3. Stainless steel lines in the nonsafety-related Equipment Drain (ED) system, located in the Mechanical Electrical Auxiliary Building (MEAB), Unit 1 that have been and are currently being used as construction drains.

4. One aluminum bronze ECW line located immedi tely east of the Unit 1 MEAB. The area of interest is the lo, point of the system.

5. Field erected stainless steel tanks.