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10CFR50.55(e)

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
Second Interim Report Concerning
Main Steam Power Operated Relief Valves

On March 23, 1987 Houston Lighting & Power Company notified your office, pursuant to 10CFR50.55(e), of an item concerning the main steam power operated relief valves at the South Texas Project. Enclosed is the Second Interim Report on this item. Our next report will be submitted by June 3, 1987.

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

J. T. Weissman for
J. H. Goldberg
Group Vice President, Nuclear

CAA/hg

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South Texas Project
Units 1 and 2
Docket Nos. STN 50-498, STN 50-499
Second Interim Report Concerning
Main Steam Power Operated Relief Valves

I. Summary

During hot functional testing of Unit 1, main steam power operated relief valve (PORV) actuator hydraulic pressure switches were found to be leaking hydraulic fluid. Failures of other PORV hydraulic components and valve body-to-bonnet leakage were also found. The Unit 1 PORV actuators and valve internals were returned to the suppliers for additional evaluation and repair.

II. Description of Deficiency

On March 23, 1987, HL&P notified the NRC of a potentially reportable item concerning main steam PORV actuator hydraulic pressure switch failures. During hot functional testing of Unit 1 PORVs, hydraulic fluid was found to be leaking from electrical conduit for six of eight hydraulic actuator pressure switches. An on-site bench test was performed by the actuator supplier's service representative on one of the affected pressure switches. The pressurized fluid was observed to leak around the pressure switch stem inside the contact enclosure. An evaluation by the vendor showed that the pressure switches failed due to hydraulic fluid contamination in the valve operator assembly causing puncture of the sealing diaphragm of the units tested. The vendor requires that the hydraulic actuators be cycled periodically to prevent degradation of the hydraulic components. This was not done at STP because the vendor information was not transferred to the Maintenance Action Card (MAC). The formation of corrosion products and subsequent hydraulic fluid contamination resulted in the puncture of the pressure switch sealing diaphragm when the valves were cycled during hot functional testing.

In addition to the pressure switch deficiencies, other PORV actuator component deficiencies were identified. Two of the four (one per PORV) potentiometers (valve position transducers), which provide valve position feedback, were found to be defective. Open resistor circuits within the potentiometers resulted in incomplete output signals. These potentiometers were found by the vendor to have bent shafts and dried lubricant due to improper storage, maintenance and handling at STP. Three of the four servo amplifiers (one per PORV), which compare the valve position feedback signal with the incoming command signal, were also found to be defective. The vendor's evaluation concluded that inability to meet calibration requirements was also due to oil and grease contamination as well as a blown fuse.

Additionally, PORV body-to-bonnet seal leakage was detected on each of the four PORVs. This leakage resulted from improper installation caused by failure to follow vendor's instructions regarding valve disassembly or valve position during welding.

III. Corrective Action

The affected Unit 1 pressure switches, potentiometers, servo amplifiers, and solenoid valves were replaced with corresponding Unit 2 PORV components which did not exhibit the same failures. Each of the repaired valve actuators satisfied preoperational test acceptance criteria during hot functional testing. Subsequent to the preoperational test, additional failures of hydraulic components occurred. Consequently, the four Unit 1 actuators were shipped to Paul-Munroe for additional evaluation and overhaul. The actuators for Unit 1 are due back from the supplier in mid-June. The Unit 2 PORV actuators were also shipped back to the supplier for overhaul and are due back in August, 1987.

A representative from Control Components Inc. (CCI) assisted in an on-site valve internals inspection during which it was established that the internal valve body-to-bonnet surface on each Unit 1 valve was out-of-round and scratched. We have concluded that this resulted from failure to follow vendor's instructions regarding valve disassembly or valve position during welding. The body-to-bonnet bore diameter has been increased on-site to correct the condition and remove the scratches. Additionally, the Unit 1 valve internal components were reworked by CCI and are currently being reinstalled. Since the Unit 2 valve installation was in progress at the time of identification of this deficiency, the Unit 2 valve bodies will be inspected for out-of-roundness. Similar corrective actions will be taken, if necessary, following inspection.

Following reinstallation, the valves and actuators will be retested prior to initial criticality.

IV. Recurrence Control

An STP Standard Deficiency Report (SDR) was written to evaluate and correct the failure of the maintenance program to incorporate vendor maintenance requirements. This revealed that the PORV hydraulic unit maintenance requirements were not transferred to the MAC system and, as such, were not implemented. The vendor requirements for cycling of the PORV and other hydraulic units have been incorporated into the MAC system. The responsible engineering group has been directed to insure that a complete review of vendor manuals is conducted when establishing maintenance requirements. Also, the appropriate personnel in Startup and NPOD Maintenance have been redirected to insure that the requirements for fluid cleanliness and storage for the electrical components in hydraulic actuators are met.

A clarification to the vendor manual on installation of the valve body has been issued to require that valve internals be removed prior to valve body installation welding.

Additional investigation is required to determine if the failure to follow vendor instructions during valve installation was an isolated case and to determine whether additional corrective measures are required. The results of this evaluation will be given in the next report.

V. Safety Analysis

The leaking of the PORV pressure switches could result in loss of hydraulic fluid pressure and the resultant inability to stroke the PORV to the open or closed position. Main steam PORVs are required for safety grade cold shutdown as a part of the STP licensing basis. Therefore, HL&P considers this condition to be reportable pursuant to 10CFR50.55(e).