APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-498/88-39
50-499/88-39

Operating License: NPF-76
Construction Permit: CPPR-129

Dockets: 50-498
50-499

Expiration Date: December 1989

Licensee: Houston Lighting & Power Company (HL&P)
P.O. Box 1700
Houston, Texas 77001

Facility Name: South Texas Project, Units 1 and 2 (STP)

Inspection At: STP, Matagorda County, Texas

Inspection Conducted: June 1-30, 1988

Inspectors: J. E. Bess
J. E. Bess, Resident Inspector, Project Section D
Division of Reactor Projects — 8/6/88 Date

D L Garrison
D. L. Garrison, Resident Inspector, Project
Section D, Division of Reactor Projects — 8-3-88 Date

H F Bundy
H. F. Bundy, Reactor Inspector, Test Programs
Section, Division of Reactor Safety — 8/3/88 Date

D M Hunnicutt
D. M. Hunnicutt, Senior Project Engineer, Project
Section D, Division of Reactor Projects — 8/3/88 Date

Approved: E. J. Holler
E. J. Holler, Chief, Project Section D, Division
of Reactor Projects — 8/5/88 Date

Inspection Summary

Inspection Conducted June 1-30, 1988 (Report 50-498/88-39)

Areas Inspected: Routine, unannounced inspection included licensee action on previous inspection findings, shutdown from outside the control room, monthly maintenance observation, monthly surveillance observation, operational safety verification, engineered safety feature (ESF) walkdown, and licensee action on reported events.

Results: Within the areas inspected, three violations were identified. The first violation involved failure to perform surveillances in accordance with Technical Specifications (paragraph 4.a). The second violation involved failure to meet Technical Specification requirements related to the release of liquid effluents (paragraph 4.b). The third violation involved the plant changing modes prior to the completion of required surveillances (paragraph 4.c).

Inspection Conducted June 1-30, 1988 (Report 50-499/88-39)

Areas Inspected: Routine, unannounced inspection included nonroutine event review, shutdown from outsided the control room, containment combustible gas control system (hydrogen recombiners), reactor pressure boundary piping, and safety-related components.

Results: Within the areas inspected, no violations or deviations were identified.

DETAILS

1. Persons Contacted

HL&P

*W. P. Evans, Licensing Engineer
*S. M. Dew, Manager, Operations Support
*A. R. Mikus, General Supervisor, Construction
*D. C. King, Construction Manager
*J. D. Green, Manager, Inspection and Surveillance
*M. A. McBurnett, Operations Support Licensing Manager
*S. M. Head, Supervising Licensing Engineer
*M. R. Wisenburg, Plant Superintendent, Unit 1
*J. N. Bailey, Manager, Licensing and Engineering, Unit 2
*J. T. Westermeier, General Manager
*G. L. Jarvela, HP Division Manager
*M. Polishak, Project Compliance
*M. Herman, Quality Assurance Engineer

Volt

*J. Guthrie, Startup Engineer

Ebasco

*M. A. Garcia, Senior Resident Engineer

In addition to the above, the NRC inspectors also held discussions with various licensee, architect engineer (AE), constructor and other contractor personnel during this inspection.

*Denotes those individuals attending the exit interview conducted on July 6, 1988.

2. Plant Status

South Texas Project (STP), Unit 1, went critical at 6:55 a.m. (CDT) on June 18, 1988, following an outage which began on May 25, 1988, because of the loss of No. 11 steam generator feed pump (SGFP). The No. 11 SGFP received extensive damage during the initiation of a Loss of Offsite Power (LOOP) test. An investigation into the cause of the SGFP turbine failure concluded that the apparent root causes were: less than adequate design to protect the SGFP, less than adequate design of the high pressure stop valve which lead to valve binding and inadequate isolation of steam admission to the turbine. The modifications listed below are being implemented by the licensee:

- Modifications to the high pressure stop valves and actuation linkage to ensure closure
- Addition of electrical overspeed trip function set at 105 percent of maximum rated turbine speed
- Addition of vital power to the Electro-Hydraulic Control System

On June 23, 1988, a shutdown from outside control room test was performed satisfactorily. The plant was shut down and maintained in a hot standby condition (Mode 3) for 45 minutes from the auxiliary shutdown panel (ASP). This was the last major test to be performed at the 30 percent reactor power plateau. During this brief shutdown, the licensee performed a hardness test on 23 flanges located throughout the component cooling water system (CCW) inside containment. The purpose of the test was to comply with NRC Bulletin 88-05 dated May 6, 1988. This bulletin identifies a potential safety concern with nonconforming materials supplied by Piping Supplies, Inc. (PSI) and West Jersey Manufacturing (WJM). The test (hardness) results on the 23 flanges indicated that 22 passed the test and one proved to be harder than the other flanges tested. Test data is still being evaluated. On June 27, 1988, at 6:43 a.m. (CDT) Unit 1 reached 48 percent reactor power.

STP, Unit 2, is 96 percent complete and preoperational testing is in progress. Hot functional testing is scheduled to begin in mid-July.

3. Licensee Action on Previous Inspection Findings (92701 and 92702)

a. (Closed) Violation (498/8808-01): Emergency Preparedness Procedure Changes - The licensee had not submitted changes made to its emergency preparedness procedures since Unit 1 was licensed (Operating License NPF-71 - later reissued as NPF-76) on August 21, 1987.

The root cause of this violation was identified by the licensee as a failure to be fully aware of NRC reporting requirements on the part of the Emergency Preparedness Manager, who failed to properly notify Operations Support Licensing of new or revised Emergency Plan Implementing Procedures (EPIPs). The following corrective actions have been taken by the licensee in response to this violation:

(1) HL&P has submitted copies of all new and revised EPIP issued since issuance of the OL on August 21, 1987, to the NRC.

(2) The Emergency Preparedness Manager has been specifically included in the list of recipients of the Reporting Manual.

(3) Additional instructions have been issued to recipients of the Reporting Manual to ensure that responsible licensee groups are kept fully aware of reporting requirements.

(4) Copies of approved EPIPs are distributed to Operations Support Licensing for submittal to NRC.

(5) The EPIPs are distributed to Operations Support Licensing as part of the licensee's controlled document distribution program.

This violation is considered closed.

b. (Closed) Violation (498/8816-01): Failure to Follow Procedures - The NRC inspectors found five untagged electrical jumpers installed which required temporary alteration tags for status information.

The NRC inspector determined that the five jumpers identified had been installed for system testing within a scheduled work shift. Startup Administrative Instruction (SAI) 14, Revision 5, dated October 23, 1987, does not require the tagging and logging of temporary alterations made by startup engineers during a continuous scheduled work shift. However, the testing associated with the jumpers subsequently was rescheduled. The licensee removed three temporary jumpers, which had been placed in preparation for safety injection preoperational testing located in Solid State Protection System (SSPS) Cabinet ZRR002-1. The other two jumpers were located in the mechanical auxiliary building (MAB) HVAC system (SSPS Cabinet ZRR004-1) and were tagged and logged in accordance with SAI 14. Additionally, the licensee held group meetings with engineers and technicians to reiterate the requirements of SAI 14.

This violation is considered closed.

c. (Closed) Violation (498/8801-01): High Head Safety Injection Pump Controls System Lineup - The NRC inspector found that licensee Procedure 1POP02-SI-0002, "Safety Injection System Normal Lineup," Revision 6, dated December 30, 1987, was not adequate to control alignment of the high head safety injection pumps in Mode 4 in that following the alignment in Forms 3, 7, and 11 of the procedure would have made the pumps inoperable.

The NRC inspector found that the licensee had revised Forms 3, 7, and 11 in Procedure 1POP02-SI-0002 to indicate the proper handswitch alignments for all six modes. The licensee also revised Station Procedure OPGP03-ZA-0002, "Plant Procedures," Revision 11, dated February 29, 1988, to incorporate requirements for an independent technical review of new procedures. The licensee revised Station Procedure 1POP02-RH-0001, "Residual Heat Removal System Operation," Revision 8, dated January 22, 1988, and reviewed other system lineup procedures to assure that approved procedures were consistent with Technical Specifications (TS) requirements.

This violation is considered closed.

d. (Closed) Violation (498/8801-04): Containment Integrity - The ability to meet the 0.6 La criterion of Appendix J to 10 CFR Part 50 was not determined prior to entering Mode 4 on October 31 and November 1, 1987, in that a local leak rate test had not been performed on Containment Isolation Valve (CIV) BIRAMOV0003 after maintenance

The NRC inspector determined that the licensee subsequently performed a local leak rate test (LLRT) on this valve. A review of MWRs, LLRT data, and an HL&P office memorandum dated February 1, 1988, verified that proper testing has been completed by the licensee to assure containment integrity. The licensee reported this failure to test Valve CIV BIRAMOV0003 in LER 88-02, "Failure to Perform LLRT on CIV," dated February 4, 1988.

This violation is considered closed.

e. (Closed) Violation (498/8801-06): Implementation of Technical Specification Requirements - The NRC inspector found that the licensee had failed to provide test procedures, which completely implemented the final TS. Procedure 1PSP10-RC-0001, "Reactor Coolant System Flow Determination," Revision 0, contained acceptance criterion calling for a figure in the TS, which had been deleted when the final TS were issued. Procedure OPSP10-II-0003, "Determination of Limiting Hot Channel Factors and Axial Offset," Revision 2, dated February 8, 1988, contained an incorrect and nonconservative equation for adjusting the core radial peaking factor limit for fractional power levels.

The NRC inspector found that Procedure 1PEP04-ZG-0007, "Reactor Coolant System Flow Measurement At Power," Revision 2, dated January 21, 1988, was identified by the licensee as the proper procedure for use in reactor coolant system (RCS) surveillance in lieu of the previously referenced Procedure 1PSP10-RC-0001.

Procedure OPGP03-ZA-0002, Revision 11, dated February 2, 1988, requires an independent technical review of new procedures. The procedure includes requirements to perform a "walk through" of new surveillance procedures to confirm that the surveillance procedure requirements can be accomplished. An attribute check sheet has been added to confirm TS requirements.

The NRC inspector found that Procedure OPSP10-II-0003, "Determination of Limiting Hot Channel Factors and Axial Offset," Revision 2, dated February 8, 1988, has been corrected to be consistent with TS. The licensee completed a review of surveillance procedures to assure that Mode 1 TS requirements are incorporated.

This violation is considered closed.

f. (CLosed) Violation (498/8801-07): Overdue Station Problem Report Investigation - Sixty-eight of the 204 Station Problem Reports (SPRs) were overdue (past 17 days) for completion.

The NRC inspector found that Procedure IP-1.45Q, "Station Problem Reporting," Revision 1, dated February 22, 1988, increased licensee management's involvement in the SPR process. The Plant Manager establishes the priority and due date and SPRs are taken directly to the Shift Supervisor by the originator. The licensee also assigned additional licensing engineers to coordinate resolution of SPRs. The backlog of overdue SPRs was resolved.

This violation is considered closed.

g. (Closed) Open Item (498/8801-11): Signoff Requirements for Surveillance Tests - The NRC inspectors noted several cases where the Unit Supervisor signed for the Shift Supervisor either to authorize the start of testing or to signify the Operations Department's review of the test results. Plant Operations Standing Order PRO-23, Revision 2, allowed the Unit Supervisor to sign for the Shift Supervisor for a number of things, but the order did not address surveillance tests.

The NRC inspector determined that Plant Operations Standing Order, "PRO-23 Unit 1," Revision 4, dated March 15, 1988, paragraph 4.6 states, "The Unit Supervisor has signature authority for the Shift Supervisor for surveillance tests. In these instances the Unit Supervisor shall ensure the Shift Supervisor is kept informed of ongoing surveillances."

This item is closed.

h. (Closed) Violation (498/8817-01): Failure to Follow Procedures: The NRC inspector found that the unit supervisor log and the reactor operator log for the period February 29 through March 3, 1988, noted several entries into LCO conditions which had been logged into one of the two logs, but not in both logs.

The NRC inspector found that Procedure OPOP01-ZQ-0030, "Maintenance of Plant Operations Logbooks," was revised on June 4, 1988, to eliminate the use of dual logbooks. The Unit Supervisor and Reactor Operator Logbooks have been combined into the "Control Room Logbook." The control room logbook is maintained by the Reactor Operator.

This violation is considered is closed.

4. Onsite Followup of Events (93702)

a. Failure to Meet Surveillance Requirements

On February 11, 1988, the Component Cooling Water (CCW) Train 1B quarterly valve operability test was performed. Review by the test coordinator and the shift supervisor for valve stroke time limits showed acceptable results, and the package was forwarded for review. Procedure OPGP03-ZE-0021, Revision 3, "Inservice Testing Program for Valves," requires the System Engineer to review the completed surveillance package and perform a stroke time change evaluation. The required review and evaluation for this test package was not performed until mid May by the System Engineer.

On May 18, 1988, the Systems Engineer's stroke time change evaluation for Valve FV-4548 (the Residual Heat Removal Heat Exchange Outlet Valve) indicated an increase in stroke time greater than 25 percent of its previous stroke time. In accordance with OPGP03-ZE-0021, paragraph 7.3.1, the referenced valve surveillance frequency should have been increased to monthly. However, because of the lack of timely review and evaluation of the test package, two required surveillances were missed. The licensee intends to identify the causes and corrective activities in LER 88-035. This is an apparent violation (498/8839-01).

b. Failure to Comply With Technical Specifications Related to Unmonitored Release of Radioactive Effluent

On June 4, 1988, at approximately 6:30 p.m. with the plant in cold shutdown (Mode 5), approximately 1500 gallons of unanalyzed water was discharged from Waste Monitor Tank (WMT) 1D to the Main Cooling Reservoir. WMTs 1D, 1E, and 1F were in recirculation prior to the discharge. The licensee's investigation of the incident, as to causes and corrective actions, indicates that two independent surveillance data packages were received by the Radwaste Control Room Operator to make the release from WMT 1E as required by the licensee's Liquid Waste Effluent Release procedures. Liquid Waste Effluent Radiation Monitor RT-8038 was not operable at this time. In accordance with TS 3.3.3.10 effluent releases may continue with Liquid Waste Effluent Radiation Monitor RT-8038 inoperable provided at least two independent samples are analyzed in accordance with TS 4.11.1.1.1 and at least two qualified members of the facility staff independently verify the release rate calculations and discharge line valving. At approximately 6:24 p.m., on June 7, 1988, the MAB Roving Operator opened the manual isolation valves on the common discharge line. The Radwaste Control Room Operator (RWO) mistakenly placed the WMT 1D Pump Discharge Valve handswitch in the discharge position. The RWO should have placed WMT 1E Pump Discharge handswitch in the discharge position. At approximately 6:30 p.m., on June 7, 1988, the RWO placed the discharge header three-way valve handswitch in the discharge position, which resulted in a discharge

from WMT 1D. After discovering that the wrong tank was lined up and discharging, the RWO terminated flow at approximately 6:35 p.m., on June 7, 1988. A total of approximately 1500 gallons of unanalyzed water from WMT 1D was discharged to the Main Cooling Reservoir. The licensee intends to identify the causes and corrective action in LER 88-036. This is an apparent violation (498/8839-02).

c. Failure to Meet Technical Specifications Surveillance Requirements

On June 13, 1988, at approximately 6:50 a.m., Unit 1 entered Mode 2. At approximately 11 a.m., on June 13, 1988, the licensee discovered that the Intermediate Range Nuclear Instruments had not had an Analog Channel Operational Test performed in the previous 31 days as required by TS 4.3.1.1. On June 12, 1988, prior to changing from Mode 3 to Mode 2, the shift supervisor attempted to obtain various department managers' signatures to verify that a review of their work activities, including surveillance tests, supported a mode change in accordance with the Plant Operation procedure. The Maintenance Manager erroneously informed the shift supervisor that there were no mode change restraints. After the plant entered Mode 2, the I&C Divisional Surveillance Coordinator informed the shift supervisor that the Intermediate Range Nuclear Instrumentation Analog Channel Operational Test had not been performed. On June 13, 1988, at approximately 10:30 a.m., the tests were satisfactorily performed. Since this surveillance test was required prior to entering Mode 2, the licensee was not in compliance with TS 4.0.4 from 6:55 a.m. on June 13, 1988, to 10:35 a.m. on June 13, 1988. The licensee intends to identify the causes and corrective actions in LER 88-038. This is an apparent violation (498/8839-03).

5. Shutdown from Outside the Control Room - Unit 1 (72583B)

The purpose of this inspection was to determine whether the test was consistent with regulatory requirements, guidance, licensee commitments, and TS.

The NRC inspector reviewed Procedures 1FEP04-ZY-0035, "Shutdown From Outside The Control Room," and 1TOP04-ZO-0001, "Temporary Control Room Evacuation For Power Ascension Testing." The review determined that the procedures contained acceptance criteria requiring that the reactor and turbine must trip and stable hot standby conditions be established and maintained by manipulation of controls at the Auxiliary Shutdown Panel (ASP) for at least 45 minutes, with no intervention required from the Main Control Room. The procedure also required operating crew to be positioned to monitor plant parameters in the Main Control Room.

The NRC inspector attended a pretest briefing for all personnel involved in the testing. The test started on June 23, 1988, at 4:15 p.m. (CDT). The reactor was tripped using the reactor trip switch gear and the turbine tripped because of the reactor trip. Control of the plant was transferred to the ASP from the Main Control Room. The plant was declared stable

approximately 12 minutes after the reactor tripped. The plant was maintained in a stable, hot standby condition for 45 minutes from the ASP. After notifying the control room Shift Supervisor, control of the plant was returned to the Main Control Room. All switches on the ASP were restored and independently verified and data was collected in accordance with procedures. There were some equipment problems encountered during the initiation and restoration phases of the test. The equipment problems are listed below:

- When control of the Letdown Orifice Isolation Valves was transferred to the ASP, the 150 gpm orifice isolation valve (ACV-0012) closed. This caused a loss of letdown flow. The 100 gpm orifice isolation valve was then opened from the ASP to restore letdown flow. When control was transferred back to the control room after completion of the test, the 100 gmp orifice isolation valve remained open. The licensee wrote Maintenance Work Request (MWR) CV-59309 to investigate and repair the problem.

- The Emergency Response Facilities Data Acquisition and Display System Computer (ERFDAD) digital point for Turbine Trip did not toggle from N/Trip to Trip on the ERFDAD terminal at the ASP. MWR-EN-10738 was initiated to investigated and correct this problem.

- The A, C, and D Main Steam Isolation Valves (MSIV) above seat drain valves could not be opened from the ASP and the Train "C" valve had no indication. After the completion of the test and transfer of control back to the Main Control Room, the valves still could not be opened. This inability to open the valves did not hinder the ability of the operators to maintain the plant in a stable, hot standby condition. Following the competion of the test, the transfer switch for the Train "C" valve was manipulated several times, and indication and control of the valve was restored at the ASP.

  Nonconformance Report (NCR) 88-011 had previously been written identifying this problem.

None of the problems encountered affected the test results. The acceptance criteria for the test were met.

No violations or deviations were identified.

6. Monthly Maintenance Observation - Unit 1 (62703)

The station maintenance activities listed below were observed and documentation was reviewed to ascertain that the activities were conducted in accordance with approved procedures.

On June 9, 1988, MWRs FW-59253 and FW-59254 were initiated to perform one of the six modifications recommended by licensee engineers to prevent recurrence of damages received by the No. 11 Steam Generator Feed Pump (SGFP) on May 25, 1988. This modification (Modification

Package-88098) entailed the addition of a low net positive suction pressure trip to three SGFPs and the Startup Steam Generator Feed Pump (S/U SGFP). The NRC inspector observed the operation of the S/U SGFP following the modifications. A review of Modification Package-88098 by the NRC inspector concluded that the work was performed in compliance with established procedures. Instructions provided to maintenance personnel in the MWRs appeared to be adequate for the circumstances. The S/U SGFP operability test run was within the acceptance criteria. All systems functioned satisfactorily.

No violations or deviations were identified.

7. Monthly Surveillance Observation - Unit 1 (61726)

The NRC inspector observed selected portions of the surveillances listed below to verify that the activities were being performed in accordance with the TS and surveillance procedures. The applicable procedures were reviewed for adequacy, test instrumentation was verified to be in calibration, and test data was reviewed for accuracy and completeness. Identified deficiencies were properly reviewed and resolved.

a. Procedure 1PSP02-SI-0952, Revision 0, "Accumulator 1B Level Group 4 Calibration." The NRC inspector witnessed the data acquisition, and the verification of accuracies for channel sensor, alarm, associated signal processing equipment, and remote displays as required by TS 4.5.1.2.b. The NRC inspector noted that the results were within the TS limits.

b. Procedure 1PSP02-SI-0955, Revision 0, "Accumulator 1C Level Group 4 Calibration." The NRC inspector observed portions of the verification test which checked the accuracy of Channel L-0955 Hi/Lo alarms. A review of the completed data package by the NRC inspector confirmed that the results were within TS limits.

c. Procedure 1PSP06-PK-0006, Revision 0, "4.16KV Class 1E Tolerable Degraded Voltage Coincident With SI and Sustained Degraded Voltage Relay Channel Calibration." The NRC inspector observed a portion of the performance of 1PSP06-PK-0006 and verified that the test met the requirements of TS 3/4.3.2, paragraph 4.3.2.1. The NRC inspector verified that the data acquired was accurate and complete and that affected systems were restored to normal. No discrepancies were identified.

d. Procedure 1PSP03-CS-0003, Revision 2, "Containment Spray Pump 1C Inservice Test." The NRC inspector observed the performance of 1PSP03-CS-0003 on Containment Spray Pump 1C and verified that the pump was operating in compliance with the ASME Boiler and Pressure Vessel Code, Section XI. Additionally, compliance with TS 4.0.5 and 4.6.2.1.b was verified.

No violations or deviations were identified.

8. Operational Safety Verification - Unit 1 (71707)

The objectives of this portion of the inspection were to verify that the facility is being operated safely and in conformance with regulatory requirements, that management controls are effective, that selected activities of the licensee's radiological protection programs are implemented in conformance with plant policies and procedures and in compliance with regulatory requirements, and to inspect the licensee compliance with the approved physical security plan.

The NRC inspector visited the control room on a daily basis and verified that control room staffing, operator behavior, shift turnover, adherence to TS Limiting Condition for Operation (LCOs), and overall control room decorum were consistent with NRC requirements.

The NRC inspector observed the following annunciators illuminated during each visit to the control room:

- Lampbox-3M03, Window D-4-D.G. - Fuel Oil Storage Tank 11 Level Hi.
- Lampbox-2M02, Window C-2 - Containment Elec. Pen. El' 60 Leak Hi.
- Lampbox-2M02, Window D-2 - Containment Elec. Pen. El' 35 Leak Hi.
- Lampbox-2M02, Window E-2 - Containment Elec. Pen. El' 10 Leak Hi.

After discussing this concern with licensee management, the NRC inspector was informed that an annunciator task force had been organized to investigate all annunciator alarms. Futher discussions with a member of the annunciator task force indicated that Change Authorization Request (CAR) 88D04 had been initiated to identify and correct problems associated with Lampbox-3M03. Also, Configuration Control Package (CCP) 1E-FST-0885 had been issued to identify and correct problems associated with Lampbox-2M02-C-2, D-2, and E-2. The NRC inspector will monitor licensee actions regarding this concern.

Tours were conducted in various locations of the plant to observe work and operations in progress. A review of Radiation Work Permit (RWP) 88-1-0651 was made regarding information required by licensee procedures relating to the performance of work in a safe manner and under controlled conditions. The NRC inspector verified that the referenced RWP contained information which referenced: job description, radiation levels, contamination levels, respiratory protective equipment, dosimetry, and expiration dates. The NRC inspector noted that RWPs were prominently posted.

On a sampling basis, the NRC inspector verified that the security force was functioning in accordance with the approved security plan. During entrance and exits from the protected area (PA), the NRC inspector verified that search equipment such as X-ray machines, metal detectors,

and explosive detectors were operational. The NRC inspector noted during tours of the vital areas that barriers were well maintained and observed no weakness or obvious breaches.

No violations or deviations were identified.

9. Engineered Safety Feature (ESF) System Walkdown - Unit 1 (71710)

The NRC inspector walked down accessible portions of the main feedwater and main steam systems for Steam Generator 1C to verify system operability. A review was performed to confirm that the licensee's system operating procedures matched plant drawings and the as-built configuration. Equipment condition, valve position, housekeeping, labeling, and support subsystems essential to actuation of the systems were noted. The systems were walked down using the drawings and procedures as follows:

- Main Feedwater System for "Steam Generator 1C," Procedure 1POP02-FW-0001, Revision 3, Drawing 5S139F00063, Revision 11A.

- Main Steam System "Steam Generator 1C," Procedure 1POP02-MS-0001, Revision 4, Drawing 5S109F0016, Revision 6.

No violations or deviations were identified.

10. Licensee Action on Reported Events - Unit 1 (92700)

The NRC inspector performed onsite followup on the following licensee event reports (LERs) to determine whether the licensee had taken corrective actions as stated in the LERs and whether responses to the events were adequate and met regulatory requirements, license conditions, and commitments.

a. (Open) LER 87-03, "Actuator Motor Shaft-to-Pinion Keys Sheared Due to Incorrect and Defective Material"

This LER reported failure of the shaft-to-pinion keys in the Limitorque SMB-0-25 motor operators for all three Unit 1 essential cooling water (ECW) pumps discharge valves. The licensee also reported these failures under 10 CFR 21 and 10 CFR 50.55(e). The failures apparently resulted from use of incorrect material for fabrication of the keys. Licensee corrective actions included replacing all keys in SMB-0-25 operators with keys fabricated from the specified AISI 1018 material. This replacement was completed only for operators installed in Unit 1. Also, the licensee inspected a sample of six Limitorque actuator models having less than 25 foot-pounds starting torque and found no deficiencies. The results of this inspection were documented in Revision 6 to NCR 87-121, which was not included in the closeout package originally

presented to the NRC inspector. The NRC inspector questioned whether the licensee personnel who recommended closure of this LER were aware of the results of the sample inspection.

This LER will remain open pending replacement of the keys in the Unit 2 SMB-0-25 actuators.

b. (Closed) LER 87-05, "Personnel Error and Incorrect Operator Response Causes Auto-Actuation to Recirculation Mode for Control Room Ventilation"

This event resulted from incorrect operator response to an annunciator actuated when a cleaning person inadvertently tripped a breaker supplying backup power to an inverter. In the restoration attempt the inverter was deenergized. This resulted in loss of control power to the toxic gas monitor, which caused auto actuation of control room ventilation to the recirculation mode. The licensee's corrective actions included posting of signs and appropriate retraining.

This LER is considered closed.

c. (Closed) LER 87-12, "Safety Injection (SI) Cold Leg Injection Valves Found Closed When Required Open"

This event involved having the SI system inoperable for 51 hours with the plant in Mode 4. The NRC inspector reviewed procedure and turnover log changes, which should be helpful in precluding occurrence of this event and similar events. Also, appropriate remedial training was conducted for licensed operators.

This LER is considered closed.

d. (Closed) LER 87-14, "Control Room Ventilation Actuation to Recirculation Mode Due to a Toxic Gas Monitor Detecting Paint Fumes"

This event resulted from inadequate administrative controls for preventing toxic gas monitors from being exposed to paint fumes. Contributing factors were two open pipe penetrations between Room 501B and the air inlet chase for the control room. The licensee posted warning signs concerning use of solvents and paints on the air intake room doors. Procedure OPGP03-ZF-0007, Revision 2, incorporates requirements which should prevent inadvertent auto-actuation of control room ventilation to the recirculation mode because of painting. Also, installation of air tight seals in Room 501B was accomplished per Contractor Work Request 2348.

This LER is considered closed.

e. (Closed) LER 88-17, "Pressurizer Low Pressure Safety Injection Setpoint Too Low Due to Procedural Error"

This event involved incorrect and nonconservative translation of a TS setpoint required for Safety Injection (SI) to surveillance procedures, which resulted in operation with a setpoint in violation of TS. In following up on this error, the licensee discovered the TS setpoint for power range flux high positive rate was not covered by surveillance procedures. The NRC inspector reviewed procedure changes, which corrected both these errors, and audit reports stating that no further TS translations errors exist. The licensee changed its program, subsequent to this event, to require verification of implementation of TS changes by the Nuclear Assurance Department.

This LER is considered closed.

f. (Closed) LER 87-19, "Slave Relay Surveillance Deficiency Due to Personnel Error"

This event occurred as a result of incorrectly deleting a surveillance procedure field change, which would have tested a slave relay contact necessary for containment spray actuation. The licensee's corrective actions included counselling instrumentation and control group technical supervisors regarding the necessity of independent review of field changes to surveillance procedures prior to performing the affected procedures. Also, similar procedures were reviewed to ensure that identical errors had not been made.

This LER is considered closed.

g. (Closed) LER 87-21, "Inadvertent Actuation of Engineered Safety Features (ESF) Load Sequencer and Standby Diesel Generator"

This event involved ESF Train "B" standby diesel start and load shedding when the load sequencer was partially deenergized for troubleshooting. Load sequencing then began when the load sequencer was reenergized a few minutes later. The licensee determined that the load shedding and sequencing would not have occurred if the load sequencer had been deenergized by opening the main circuit breaker. The licensee's corrective actions included the following:

- Revision of the vendor manual to clarify the proper method for deenergizing the ESF sequencer
- Conducting training for instrumentation and control technicians on the proper method of deenergizing the ESF sequencer

- Placing caution signs on the ESF sequencer to warn technicians and operators to use the main circuit breaker for deenergizing the sequencer

This LER is considered closed.

h. LER 87-24, "Control Room Ventilation Actuation to Recirculation Mode Due to Inadvertent Operation of Pushbutton By Technician"

This event occurred during performance of a modification to disable the pushbutton which was inadvertently pushed to cause actuation of the control room ventilation system to the recirculation mode. The technician had just disabled a similar pushbutton for the fuel handling building radiation monitoring system (RMS) and intended to push that pushbutton. The involved pushbutton subsequently was disabled as planned. Also, a meeting was held for RMS technicians to reinforce the need for attention to detail in performance of work.

This LER is considered closed.

i. (Closed) LER 88-04, "Loose or Corroded Toxic Gas Monitor Computer Board Electrical Connection Results in ESF Actuation"

A failed computer chip in the toxic gas monitor caused an ESF actuation of control room ventilation to the recirculation mode. The licensee inspected and cleaned the monitor card cages and boards and adjusted the card frame assembly covers. No apparent reason for the failure was discovered; however, the licensee believes the most probable cause was a loose connection on an integrated circuit board. Licensee engineering determined that vibration of the circuit board frame should not have contributed to the loosening of connections. The licensee does not expect further similar failures. A licensee task force is studying a design modification to reduce the number of unnecessary ESF actuations and challenges to the system resulting from toxic gas monitoring malfunctions.

This LER is considered closed.

j. (Closed) LER 88-09, "Unanticipated Safety Injection Signal From SSPS Resulting From Procedural Deficiency"

An unanticipated ESF Train "A" SI actuation occurred during a surveillance test of Master Relay K-736R. This was being performed in accordance with a field changed procedure, which failed to require placing the Master Relay Selector-S switch to off prior to placing the Mode Selector to operate. This event was similar to LER 87-019 discussed above and, therefore, indicated a need for more rigorous reviews of procedure field changes. A similar procedure had previously been completed successfully for Train "B" because the

technician performed the step without pointing out the procedure deficiency. The licensee's corrective actions included:

- Training to emphasize the importance of procedure reviews, procedure compliance, initial performance of revised procedures, and reporting of procedure deficiencies

- Requiring a second, independent technical review of procedure revisions and new procedures

This LER is considered closed.

k. (Closed) LER 88-11, "Non Performance of a Scheduled Test for Essential Chilled Water Pump as a Result of a Lost Test Package"

This event occurred as a result of apparent loss of a surveillance test package during routing between the surveillance program scheduler and the main control room. A contributor to the event was the failure of the missed surveillance to be properly flagged by the overdue report feature of the program. Also, a mode change report had the wrong due date for the surveillance. The frequency of this test had recently been shortened because of previous test results in the alert range. The licensee's corrective actions included:

- Verifying that tests were not missed in other instances when the test frequency had been changed

- Adding a requirement in Procedure OPGO3-ZE-0004 for divisional surveillance coordinators to periodically review upcoming tests to ensure that test packages are received by the start date

- Documenting the method of changing the test frequency based on previous test results in Procedure OPGP03-ZA-0055

This LER is considered closed.

l. (Closed) LER 88-19, "Prematurely Terminating a TS Limiting Condition for Operation (LCO) Requirement Due to Personnel Error"

This event resulted from the failure of shift operators to properly log the inoperability of SI and containment spray when Train "A" essential chiller became inoperable. This error ultimately resulted in improperly exiting an LCO with both Train "A" and "C" low head SI inoperable. Licensee corrective action included:

- Revision of Procedure OPOP01-ZQ-0030 to provide a more structured review for impact of inoperable equipment on other systems, including independent evaluations

- Training for operations personnel on determining impact inoperable components may have on other systems

This LER is considered closed.

11. Nonroutine Event Review - Unit 2 (90711)

The NRC inspector reviewed Interdepartmental Procedure IP-1.45Q, Revision 1, dated February 22, 1988, "Station Problem Reporting," and completed discussions with licensee personnel to ascertain whether the licensee had assigned responsibilities for the review of off-normal operating events on planned and unplanned maintenance activities. The inspection verified the following:

- The licensee had assigned responsibilities for a timely review and evaluation of off-normal operating events to assure identification of safety-related events. The requirements for the plant manager, Station Problem Report (SPR) coordinator, nuclear assurance, Nuclear Safety Review Board (NSRB), Plant Operating Review Committee (PORC), classification and control officer, security force supervisor, and administrative controls are addressed in Procedure IP-1.45Q.

- The licensee had delegated the responsibilities for the timely review of planned and unplanned maintenance and testing activities to assure identification of violations or potential violations or problem areas for proposed TS Limiting Conditions for Operations (LCOs). (NOTE: all requirements shall be fully applicable when the station TS are issued in conjunction with the Operating License.) Procedure IP-1.45Q addressed these delegations of responsibilities.

- The licensee had delegated responsibilities for assuring completion of corrective actions relating to safety-related events. The delegation of responsibilities addressed in Procedure IP-1.45Q included the originator, first-line supervision, management, SPR coordinator, and other appropriate personnel.

- The licensee had delegated responsibilities for assuring completion of corrective actions relating to safety-related operating events. Procedure IP-1.45Q discussed the responsibilities for corrective actions in detail, provided guidelines for immediate investigations, and discussed types of data which should be included in establishing the root causes, generic implications, and the corrective actions.

12. Shutdown From Outside The Control Room - Unit 2 (70352)

The NRC inspector reviewed Procedure 1TOP04-ZO-0001, "Temporary Control Room Evacauation For Power Ascension Testing," Revision 0, and Procedure 1PEP04-ZY-0035, "Shutdown From Outside The Control Room," Revision 2.

These procedures describe the methods to shutdown the reactor, maintain the reactor subcritical, maintain reactor coolant inventory, and achieve and maintain the reactor in hot standby (Mode 3) from outside the main control room using the minimum number of shift operating personnel. These procedures meet the NRC requirements, and licensee commitments stated in the TS (proposed); FSAR Chapter 14.2.12.3, Test Description 25, Amendment 53; and Regulatory Guide 1.68, "Initial Test Programs for Water-Cooled Nuclear Power Plants," Revision 2, paragraph 5, "Power Ascension Tests," Test d.d (page 1.68-18).

13. Containment Combustible Gas Control System (Hydrogen Recombiners) - Unit 2 (70342)

a. Description

The Electric Hydrogen Recombiners (EHR) are natural convection, flameless, thermal reactor-type hydrogen/oxygen recombiners. The EHR consist of two independent recombination units. Each unit contains electric heater banks, a power supply panel, and a power control panel. The EHRS are permanently installed inside the Reactor Containment Building (RCB). The power supplies and control panels are located outside the RCB.

b. Documentation and Procedure Review

The NRC inspector reviewed the following documentation and procedures related to operation and testing of the EHR:

- 0917-00001-BWN, Revision B, "Electric Hydrogen Recombiner," Model B, FCR BN-00256, DE-1802, Technical Manual, South Texas Nuclear Generating Station, Units 1 and 2
- NSD-TO-E-74-20, "Hydrogen Recombiner Temperature Instrumentation Checkout, Calibration & Test Procedure," Revision 1, dated December 4, 1974
- NSD-ELEC-2, "Storage of Electrical Instrumentation and Control Equipment," Revision 2, dated August 1973
- 2-CG-P-01, "Electric Recombiner," Revision 0, dated September 15, 1987
- Regulatory Guide 1.68, "Initial Test Programs for Water-Cooled Nuclear Power Plants, Revision 2, dated August 1978 and Appendix A, "Initial Test Program," paragraph 1.h.(4)
- FSAR, Amendment 61, Section 6.2.5, "Combustible Gas Control in Containment" and Section 14.2.12.2 (103), "Combustible Gas Control System Preoperational Test Summary"
- Applicable Drawings are listed below:

Vendor Dwg. No. Sht/Rev	Controlled Drawing No.
9553 D 97/1/5	N159 X 3153 - WN
9553 D 97/2/3	N159 X 3154 - WN
9553 D 97/3/1	N159 X 3155 - WN
9553 D 97/4/3	N159 X 3156 - WN
9553 D 97/5/2	N159 X 3157 - WN

c. Review of Preoperation Test Procedure

The NRC inspector reviewed Preoperational Test Procedure 2-CG-P-01, "Electric Recombiner," Revision 0, dated September 15, 1987. This procedure requires testing that will demonstrate the minimum air flow (EHR design minimum air flow capacity is 100 scfm) through each EHR is adequate, and each EHR will have sufficient electrical power (EHR electrical requirements are: 4-wire, 3-phase, 60 Hz. 480 VAC, 75 KW maximum power output) to achieve recombination temperature (1225 + or - 10°F).

The preoperational test acceptance criteria and requirements and the EHR design characteristics are addressed for normal operating conditions and postulated LOCA operating conditions. The test procedure adequately addressed NRC requirements and licensee commitments related to testing and verification of operating requirements for the two EHRs. Preoperational testing of the two EHRs are scheduled for November 1988. The NRC inspector will observe the preoperational testing of the EHRs at Unit 2.

No violations or deviations were identified.

14. Reactor Pressure Boundary Piping - Unit 2 (49053 and 49055)

The NRC inspector performed an inspection of selected systems in the reactor pressure boundary piping, and the related records to determine whether licensee activities associated with the fabrication of the reactor pressure boundary piping system and documentation of these activities had been completed in accordance with the specifications, drawings, and procedures. The NRC inspector selected the High Head Safety Injection System (HHSI), Low Head Safety Injection System (LHSI), and the Containment Spray System (CS) in the Train "B" for this inspection. These three systems are located between columns 28 and 30 and on both sides of the pump centerline from elevations -29 feet to -10 feet in the fuel handling building.

a. Work Observation

The NRC inspector verified that the as-built piping systems were constructed in accordance with the drawings. The welding, nondestructive examinations (NDE), and installation of piping hangers were not included in the inspection. This inspection verification started at the suction header at column line 28 and proceeded through

the bay and back through the discharge and selected auxiliary lines to the column 28 line. The piping was inspected for dimensional conformance to the piping isometric drawings. The systems were also inspected for nonconforming conditions, including visible or surface damage, proper pipe sizes, fabrication errors, and related construction and installation items. The following isometric drawings were referenced and used for comparison during the inspection activities:

- 5F-369P-SI-572, Sheet 1, Revision 7, LHSI Discharge
- 2F-362P-SI-572, Sheet 5, Revision 0, HHSI Discharge
- 2F-369P-SI-572, Sheet 4, Revision 9, LHSI & HHSI Suction
- 5F-369P-SI-572, Sheet A01, Revision 10, Auxiliary Systems
- 2F-369P-SI-572, Sheet A09, Revision 9, Auxiliary Systems
- 5F-369P-SI-572, Sheet A02, Revision 7, Auxiliary Systems
- 5F-369P-SI-572, Sheet A04, Revision 5, Auxiliary Systems
- 5N-129 F05014, No. 2, Revision 9, Safety Injection and Piping Diagram
- 2F-369P-SI-572, Sheet 01, Revision 7, CS Suction, Discharge, and Auxiliary Systems
- 4F-369P-CS-515, Sheet A04, Revision 6, Auxiliary Systems
- 5F-369P-CS-515, Sheet 04, Revision 2, Auxiliary Systems
- 5N-109F 05037, No. 2, Revision 9, CS Piping Diagram

The NRC inspector noted that the licensee had identified a problem area in flange connections. A licensee procedure, "Site Specific Procedure - 10" (SSP-10), required bolt tightening as "snug." The NRC inspector determined that this requirement does not have a functional meaning. The licensee is revising the applicable procedures to include torque values and/or definitions to the assembly process. The NRC inspector will reinspect the flange connections subsequent to completion of the licensee's rework.

b. Records

The NRC inspector reviewed records packages for selected portions of the systems inspected to assess conformance and verify that:

- The records were properly identified and retrievable within a reasonable time.

- The records confirmed that the components were installed and inspected as required.

- The records reflected that the materials installed were the materials specified.

- The records were complete and provided a traceable path for the construction process. The following records were reviewed:

  - High head and low head safety injection suction line flange bolt-up, including Flanges S-1 and N-1.

  - High head and low head safety injection pumps to flange connections. These components are detailed on Piping Isometric Drawing F-369P-SI-572, Sheet 4, Revision 9, and the welds were designated as M21-MBFC-SI-2201-01, -02, -03, and -04. The NRC inspector reviewed the piping fabrication checklists, bills of material, bolted connections, inspection reports, and the mechanical equipment/mechanical supports checklist.

  - Spool piece data packages for HHSI, the 6-inch discharge line, SI-2206-DB2, which included Spool Pieces SI-2206-A, -B, and -C are shown on Drawing 2F362P-SI-572, Sheet 5, Revision 0. The records are filed in a file designated as 505-SI-2206-A, -B, and -AB.

- The contents of the ASME Code data packages were reviewed for the required drawings, Material Test Reports (MTRs), and NDE reports.

The NRC inspector determined that the records were adequate and contained the required information to complete the package and document the related activities.

No violations or deviations were identified.

15. Safety-Related Components - Unit 2 (50073 and 50075)

The NRC inspector performed an inspection of safety-related components to evaluate the fabrication and installation process and to determine whether the installation was in accordance with the applicable drawings.

a. Spray Additive Tank

1. Work

The Train "B" spray additive tank as shown on Drawing 5N-129P-05014, Sheet 2, Revision 9; and Westinghouse Drawing 1212E61, Revision 2, was inspected in detail by the NRC

inspector. The inspection included weld quality, detail of parts, fabrication, damage, and dimensions. The manhole covers were inspected for cladding, bolting, and functional ability.

2. Records

The vendor data package was easily retrieved from the records vault by licensee personnel. The NRC inspector reviewed the records for required ASME Code required forms, materials test reports for the shell, welding consumables (electrodes), bill of materials, drawings, and NDE records. The records were reviewed for correctness, completeness, legibility, and identification.

No descrepancies were identified.

b. Components

The NRC inspector also inspected the following components during the inspection of the spray additive tank. These items were inspected for attributes that could be identified by visual inspection.

Equipment/Components	Inspected for:
Area radiation monitors	Damage, cables, installation and status
Emergency lighting	Test function and loss of power
Valve remote control disassembled reach rod assemblies	These units were being cleaned by licensee personnel at the time the inspection was being performed
HHSI, LHSI, and CS pump motors	Grounding, instrumentation, oil, level, damage, bolting, and general appearance

No violations or deviations were identified during the inspection.

16. Exit Interview

The NRC inspectors met with licensee representatives (denoted in paragraph 1) on July 6, 1988, and summarized the scope and findings of the inspection. Other meetings between NRC inspectors and licensee management were held periodically during the inspection to discuss identified concerns. The licensee did not identify as proprietary any of the information provided to or reviewed by the inspectors during this inspection.