U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket Nos:	50-498, 50-499
License Nos:	NPF-76, NPF-80
Report No:	50-498/96-07, 50-499/96-07
Licensee:	Houston Lighting & Power Company
Facility:	South Texas Project Electric Generating Station, Units 1 and 2
Location:	8 Miles West of Wadsworth on FM 521 Wadsworth, Texas 77483
Dates:	September 8 through October 19, 1996
Inspectors:	D. P. Loveless, Senior Resident Inspector
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Approved by:	J. I. Tapia, Chief, Project Branch A Division of Reactor Projects

EXECUTIVE SUMMARY

South Texas Project, Units 1 and 2
NRC Inspection Report 50-498/96-07; 50-499/95-07

This resident inspection included aspects of licensee operations, engineering, maintenance, and plant support. The report covers a 6-week period of resident inspection.

Operations

- Operators continued to perform professionally with an appropriate focus on reactor safety (Section O1.1).

- Shift turnover activities were attended by managers on a routine basis. Turnover information continued to be detailed, clear, and concise (Section O1.1).

- Material condition of the equipment and cleanliness of plant spaces were considered to be excellent with two isolated examples where housekeeping could have been better (Section O2.1, R1.1, P2).

- A decision to abandon the use of dial indicators for MOV position indication in 1989 was not captured in the training program for nonlicensed reactor operators (Section O2.1).

- Licensed operators and the system engineer failed to identify the significance of leakage from the emergency core cooling system into the fuel handling building (Section O2.2).

Maintenance

- Maintenance and surveillance activities were professionally performed by knowledgeable mechanics and technicians (Sections M1.1 and M1.2).

Engineering

- The design change and associated calculations performed in support of a piping support anomaly in the emergency core cooling system were determined to be acceptable following a detailed review (Section E1.1).

Plant Support

- Radiological controls in the Unit 1 reactor containment building were good and housekeeping was considered excellent (Section R1.1).

Report Details

Summary of Plant Status

Units 1 and 2 operated at essentially 100 percent reactor power throughout this inspection period.

I. Operations

O1 Conduct of Operations

O1.1 Control Room Observations (Units 1 and 2)

a. Inspection Scope (71707)

Using Inspection Procedure 71707, the inspectors routinely observed conduct of operations in the Units 1 and 2 control rooms. Daily control board walkdowns, attendance at shift turnover meetings, observations of operator performance, and reviews of control room logs and documentation, were performed.

b. Observations and Findings

During routine observations and interviews, the inspectors determined that the control room operators were continually aware of existing plant conditions. Operators responded to annunciator alarms in accordance with approved procedures. Annunciator alarms were promptly announced to the control room staff who, in turn, acknowledged with repeat backs. The unit supervisors remained cognizant of ongoing activities.

The inspectors routinely attended shift turnovers. The on-shift operators provided clear and concise information to the oncoming operators. Oncoming operators routinely reviewed the control room logs. Plant mangers and operations managers were often observed attending shift turnover meetings.

On September 21, during the night shift, the inspector observed an operations staff meeting in the Unit 1 control room conducted by the shift supervisor. The meeting provided a good forum for exchange of information about ongoing activities with good feedback from the reactor plant operators. The site was under a tornado watch and, as a result, the awareness of the condition of equipment within the protected area was emphasized.

On September 23, the inspector observed the Unit 1 unit supervisor conducting a prejob briefing for a containment entry in accordance with Plant Surveillance Procedure 0PSP03-XC-0002, Revision 10, "Containment Inspection." The briefing

was thorough, with emphasis on the control of debris and the identification and reporting of abnormal conditions inside containment.

c. Conclusions

The inspectors concluded that the operators were performing professionally with an appropriate focus on safety. Shift turnover meetings were thorough and routinely attended by management.

O2 Operational Status of Facilities and Equipment

O2.1 Plant Tours (Units 1 and 2)

a. Inspection Scope (71707)

The inspectors toured portions of the accessible plant areas in Units 1 and 2 on a daily basis. Areas of special attention during this inspection period included:

- Turbine generator building in Unit 2.
- Essential cooling water building for Unit 2.
- Fuel handling building emergency core cooling pump rooms in Units 1 and 2.
- Fuel handling building spent fuel pool cooling and cleanup system pump and valve rooms in Unit 2.
- Protected area yard.

b. Observations and Findings

On September 17, 1996, the inspector performed a detailed walkdown of the emergency core cooling water system suction piping and the associated supports and structural members. The system alignment matched the valve positions indicated on Piping and Instrumentation Diagram 5N129F05013, Sheet 1, "Safety Injection System." Hangers and supports were properly aligned, and piping components were in good condition. In general, system components were in excellent material condition. One piping support anomaly was identified and reviewed as documented in Section E1.1.b of this inspection report.

The inspector also noted during the walkdown that the local position indicator for several safety-related motor-operated valves (MOVs), including Safety Injection Minimum Flow Recirculation Line Isolation Valves 1-MOV-SI0013A, 1-MOV-SI0013B, 1-MOV-SI0013C, 1-MOV-SI0014A, 1-MOV-SI0014B, and 1-MOV-SI0014C, did not accurately reflect the position of the valves. The position indicator consisted of a small dial on the side of the MOV housing. The system

engineer stated that they had previously evaluated the inaccurate position indicators in 1989 and determined that they would not be used. He also stated that operators had been trained to know that these MOV position indicators were inaccurate and should not be relied upon.

Two reactor plant operators were interviewed to determine what indication would be used to determine the position of a valve. In both cases, the reactor plant operators stated that, if the valve had a dial indicator, they would refer to that indication. The inspectors also interviewed current control room operators and verified that they were aware that the dial indicators were not to be used. The inspectors verified that operators were informed in 1989 of the decision to abandon the use of the dial indicators. However, this information was not captured in the training program for the nonlicensed reactor plant operators. The inspectors could find no evidence that the training program had advised against using these indicators for valve position determination. Discussions with the lead trainer for reactor plant operators disclosed that neither the training plans nor the qualification cards contained information which would alert the reactor plant operators of the inoperable local indicator dials. The inspector informed the shift supervisor that a discrepancy existed between the decision to not use the dial indicators and the knowledge that the reactor plant operators expressed regarding the use of the dial indicators. He acknowledged the concern and ensured that other shift supervisors communicated this to each operating crew. The training department was also informed.

The inspectors also verified that the lack of knowledge concerning the use of the dial indicators did not represent a potential for misdiagnosing the correct position of a valve. This was accomplished by reviewing applicable operating procedures to verify that nonlicensed operators would not be required to verify valve positions by the sole use of dial indicators. There were no requirements identified which would cause this to happen. As such, the concern was indicative of a failure to capture previously disseminated engineering knowledge into the training program for nonlicensed operators.

On September 20, the inspector performed a walkdown of the accessible portions of the spent fuel pool cooling and cleanup system in Unit 2. System operability was verified by assuring that valve, electrical, and control board alignments were in the correct positions. Equipment condition was good and no leakage was noted. Area housekeeping was excellent. Only minor discrepancies were identified and reported to the control room shift supervisor.

On September 21, during night shift, the inspector observed a reactor plant operator securing equipment during his routine rounds in the protected area while the site was under a tornado watch.

c. Conclusions

The material condition of plant equipment continues to be excellent. The potential use of dial indicators on MOVs for verification of valve position by reactor plant operators was inconsistent with management expectations and was not adequately addressed in training.

O2.2 Engineered Safety Features Leakage Contribution to Accident Dose Rates

a. Inspection Scope (71707)

During a routine inspection of the emergency core cooling system, the inspectors questioned the potential for leakage from system valves to cause increased offsite doses following a postulated large-break loss of coolant accident. On September 11, 1996, resident inspectors determined that a valve in the emergency core cooling system had been leaking into the fuel handling building since February 22, 1996. This condition, the circumstances surrounding its identification, and the safety significance were reviewed.

b. Observations and Findings

Condition Report 96-2271 was written on February 22, 1996, to document that water was leaking into the fuel handling building sump from the emergency core cooling system. The condition report designated the leak as a material condition which needed to be repaired. This designation, CAQ-D, did not require a review for operability or reportability. Based on the historical pumping rate from the sump and decreases in refueling water storage tank water level, licensed operators had quantified the leakage at approximately 300 gallons per day (gpd). Operators had documented that the leakage was assumed to be seat leakage through Pump Suction Relief Valve 2-PSV-3941.

The system engineer informed the inspector that the relief valve had been scheduled for repairs in 1997. The inspector determined that the estimated leakage from the valve was greater than the design leak rate of 4,140 cubic centimeters per hour documented in Table 15.6-12 of the Updated Final Safety Analysis Report (UFSAR). The inspector noted that the estimated leak rate of 300 gpd was clearly in excess of the approximately 26 gpd maximum leak rate designated in the UFSAR for all components in the three engineered safety features trains. UFSAR Section 15.6.5.3.2 describes leakage from engineered safety features components located in the fuel handling building as a potential source of fission product leakage following a loss of coolant accident. When informed of this by the inspector, the licensed operators declared Train C of the emergency core cooling system inoperable and deenergized the associated containment sump suction valve in the closed position. The leaking valve was later determined to be the Train C high head safety injection pump discharge flush line valve, 1-SI-0120C. The valve was cut out and replaced.

On October 4, 1996, licensee engineers made a preliminary determination that the identified leakage from Valve 1-SI-0120C would have resulted in exceeding the thyroid dose limits of 10 CFR Part 50, Appendix A, General Design Criterion 19, in the Technical Support Center and in the control room. A 1-hour, nonemergency notification was made in accordance with 10 CFR 50.72 (b)(1)(ii)(B), because the condition was determined to be outside the design basis of the plant. Additional analyses performed by the licensee engineers since that time indicated that control room operator doses would have remained within General Design Criterion 19 limits. However, these new analyses change the initial evaluation by utilizing the actual measured primary containment leakage rate and not the maximum allowable containment leakage rate utilized in the accident analyses and referenced in the Technical Specifications. The adequacy of using the measured leakage rate instead of the maximum allowable rate has not been reviewed.

c. Conclusions

Licensed operators and the system engineer failed to identify that leakage from the emergency core cooling system into the fuel handling building was significant and failed to correct the problem in a timely manner. At the end of this inspection period, the inspectors were continuing to review the adequacy of the licensee's analyses, which were used to retract the nonemergency notification and to find that General Design Criterion 19 limits were not exceeded. Therefore, this issue will remain open and will be tracked as Unresolved Item (URI) 498;499/96007-01.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments on Field Maintenance Activities

a. Inspection Scope (62707)

The inspectors observed all or portions of the following work activities, identified by their work authorization numbers:

Unit 1:

- 95013551: Lubrication and Inspection of Reactor Containment Fan Cooler Supply Fan 11C
- 95014563: Lubrication and Inspection of Reactor Containment Fan Cooler Supply Fan 12C
- 96093883: Troubleshoot and Repair Normal Power Supply Inverter 8E241EIV002

Unit 2:

- 94037226: Calibration of ITE-51 Relays on Train C 4160 kV Breaker for Essential Cooling Water Pump 2C

- 96086596: Lubrication and Inspection of Limitorque Actuator for Motor Operated Valve SI-MOV-0016C

b. Observations and Findings

The inspectors found the work performed under these activities professional and thorough. The mechanics and technicians demonstrated a detailed knowledge of procedures and equipment associated with the tasks. Supervisors and system engineers were observed monitoring job progress and providing oversight.

c. Conclusions

The inspectors concluded that routine maintenance activities observed were professionally performed by very knowledgeable mechanics and technicians. Maintenance supervisors were providing an appropriate level of field supervision and oversight.

M1.2 General Comments on Surveillance Testing

a. Inspection Scope (61726)

The inspectors observed all or portions of the following surveillances:

Unit 1:

- Plant Surveillance Procedure 0PSP03-SP-0008C, Revision 2: Solid State Protection System Train C Slave Relay Test

Unit 2:

- Plant Surveillance Procedure 0PSP02-HC-0001, Revision 0: Containment Pressure ACOT

b. Observations and Findings

The inspectors found that the testing activities were professional and thorough. All observed tests were performed in accordance with the approved surveillance procedures. Technicians were experienced in and knowledgeable of their assigned tasks. Technicians in training status were appropriately supervised by qualified technicians. Surveillance tests were satisfactorily completed within their Technical Specification required frequencies, and procedures properly implemented the

surveillance requirements. Test instruments were within their current calibration cycles. Dual verification was observed when required by procedures, and the technicians informed the control room operators of expected alarms.

c. Conclusions

The inspectors concluded that the observed surveillance tests were well performed and fully implemented the associated Technical Specification surveillance requirements.

III. Engineering

E1 Conduct of Engineering

E1.1 Review of Emergency Core Cooling System Structural Support Anomaly

a. Inspection Scope (37551)

The inspectors identified a structural support anomaly in the Train A emergency core cooling system. A review of design change documents and engineering calculations supporting the acceptability of the anomaly was conducted.

b. Observations and Findings

On September 17, 1996, the inspector noted that a piping support bracket on the Train A emergency core cooling system containment sump suction piping was of a different design than the equivalent support for the Trains B and C piping. Since the Train A support did not appear to be as robust as the other supports, the inspector reviewed the associated design calculations. A review of Field Change Request DJ-08125 indicated that the piping support was initially intended to be identical to those on the other trains. However, since the piping was installed slightly offset from the centerline of the wall embed plate, a redesign of the support was required. Engineering Calculation JC-SI-9101-550008 was generated to evaluate the new design. The inspector reviewed the calculation and determined that the design of the support bracket and the weld were acceptable.

c. Conclusion

The inspector determined that the licensee's calculation associated with a redesigned support bracket for the containment sump recirculation piping was acceptable.

IV. Plant Support

R1 Radiological Protection and Chemistry Controls

R1.1 Tours of Radiological Controlled Areas (RCAs)

a. Inspection Scope (71750)

The inspectors routinely toured the RCAs in Units 1 and 2. These tours included observation of work, verification of proper radiological work permits, sampling of locked doors, and observations of entrance and egress from the RCAs.

b. Observations and Findings

On September 17, 1996, the inspectors observed an extension ladder laying across bags labeled as radiological materials in the fuel handling building radiological waste truck bay. The inspectors reported the ladder to a health physics technician who was in the area. The technician stated that the ladder was not properly stored and immediately moved the ladder to its proper storage location.

On September 24, the inspectors toured the accessible portions of the Unit 1 reactor containment building with a health physics technician. Housekeeping was excellent and no loose debris was observed. The technician was knowledgeable about radiological conditions and work in progress inside the containment building.

c. Conclusions

Implementation of radiological controls in the Unit 1 reactor containment building were very good and housekeeping was excellent with one isolated exception.

P2 Status of EP Facilities, Equipment, and Resources (71750)

On September 23, the inspector toured the Unit 1 Technical Support Center (TSC). The facility was in a good emergency readiness state with no substantive discrepancies observed. Minor discrepancies were reported to the shift supervisor and immediately corrected. The inspector also toured the TSC load center and air handling equipment room. The drain valve for the TSC Chilled Water Pump 11B discharge pressure indicator was leaking and appeared to have been leaking for a some time, based on the amount of water on the floor. An unsecured hoist was also found adjacent to the TSC air handling unit. The inspector notified the shift supervisor of these conditions. On September 25, the inspector revisited the TSC air handling equipment room and verified the correction of the reported discrepancies. The inspector-identified standing water from the TSC Chilled Water Pump 11B discharge pressure indicator leak was considered an isolated example of inattention to detail in plant tours.

S1 Conduct of Security and Safeguards Activities (71750)

On September 21, the inspector toured the protected area boundary during the night shift. Isolation zones were free of obstructions, lighting was appropriate, and security officers were observed on routine patrols.

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee

A. Aldridge, Supervisor, Engineering Specialist
T. Cloninger, Vice President, Nuclear Engineering
K. Coates, Manager, Maintenance 2
D. Daniels, Manager, Operating Experience
B. Dowdy, Assistant to Group Vice President
A. Granger, Administrator
J. Groth, Vice President, Nuclear Generation
E. Halpin, Manager, Design Engineering Department
W. Harrison, Supervising Licensing Engineer
S. Head, Licensing Supervisor
T. Jordan, Manager, Systems Engineering
M. Kanavos, Manager, Mechanical Fluid Systems
D. Leazar, Director, Nuclear Fuels and Analysis
J. Lovell, Plant Operations Manager, Unit 1
F. Mangan, General Manager, Plant Services
B. Masse, Plant Manager, Unit 2
G. Parkey, Plant Manager, Unit 1
D. Rencurrel, Manager, Electrical/Instrumentation and Controls
D. Schulker, Compliance Engineer
S. Thomas, Manager, Design Engineering Department
W. Waddell, Manager, Maintenance 1
F. Wagar, General Manager, Human Resources
G. Weldon, Manager, Nuclear Training Department

INSPECTION PROCEDURES USED

IP 37551:	Onsite Engineering
IP 61726:	Surveillance Observations
IP 62707:	Maintenance Observations
IP 71707:	Plant Operations
IP 71750:	Plant Support Activities
IP 92901:	Followup - Plant Operations
IP 92903:	Followup - Engineering
IP 93702:	Prompt Onsite Response to Events at Operating Power Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

499/96007-01	URI	review the circumstances surrounding the failure of plant personnel to identify that leakage from the emergency core cooling system into the fuel handling building was significant

LIST OF ACRONYMS USED

gpd	gallons per day
NRC	Nuclear Regulatory Commission
PDR	Public Document Room
RCA	radiological controlled area
TSC	Technical Support Center
UFSAR	Updated Final Safety Analysis Report
URI	unresolved item