

ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

Inspection Report: 50-498/95-30  
50-499/95-30

Licenses: NPF-76  
NPF-80

Licensee: Houston Lighting & Power Company  
P.O. Box 1700  
Houston, Texas

Facility Name: South Texas Project Electric Generating Station, Units 1 and 2

Inspection At: Bay City, Texas

Inspection Conducted: December 11-14, 1995

Inspector: Michael P. Shannon, Radiation Specialist, Plant Support Branch  
Division of Reactor Safety

Approved:

Blaine Murray  
Blaine Murray, Chief, Plant Support Branch  
Division of Reactor Safety

12/27/95  
Date

Inspection Summary

Areas Inspected (Units 1 and 2): Routine, announced inspection of the licensee's radiation protection program, which included the following activities: surveillance, field observations and self assessments; program changes; planning and preparation; training and qualifications of personnel; external exposure controls; internal exposure controls; control of radioactive materials and contamination, surveys and monitoring; and maintaining occupational exposure as low as reasonably achievable (ALARA).

Results (Units 1 and 2):

Plant Support

- The licensee's surveillance, field observation, self-assessment and condition reporting programs were effectively implemented to determine proper oversight of radiation protection activities (Section 2.1).
- Good pre-job briefings and radiation work permit radiological controls were noted. Appropriate radiological controls were discussed during ALARA briefings (Section 2.3).
- A good continuing training program was in place for radiation protection personnel. Plant management was effectively involved in the radiation protection training program (Section 2.4).

- The personnel dosimetry, access controls and postings, and high radiation control programs were well implemented and maintained (Section 2.5).
- Internal exposure controls were effectively maintained and implemented. (Section 2.6).
- Good programs were in place concerning radiation surveys, personnel contamination monitoring equipment, and contamination controls (Section 2.7).
- The ALARA committee was fully supported by the plant and effectively involved in exposure goal setting and monitoring. ALARA work packages were thorough (Section 2.8.1).
- The hot spot reduction and temporary shielding programs were effectively maintained (Section 2.8.2).
- The ALARA suggestion program was not effectively communicated to some licensee personnel (Section 2.8.3).

Attachment:

- Attachment - Persons Contacted and Exit Meeting

## DETAILS

### 1 PLANT STATUS

During the inspection period, both units operated at 100 percent power.

### 2 OCCUPATIONAL RADIATION EXPOSURE (83750)

The licensee's program was inspected to determine compliance with Technical Specifications, the requirements of 10 CFR Part 20, and agreement with the commitments of the Final Safety Analysis Report.

#### 2.1 Surveillance, Field Observations and Self Assessments

The inspector reviewed the licensee's surveillance, field observation, self-assessment and condition reporting programs, to determine oversight of radiation protection activities. Particular attention was devoted to the licensee's self-assessment activities that identified programmatic weaknesses. The quality and timeliness of the responses to self-assessment recommendations were also reviewed.

##### 2.1.1 Surveillance Reports and Audits

The inspector reviewed the following five surveillance reports issued by the quality division that involved radiation protection activities:

- Surveillance Report 95-048, "Health Physics-Radiological Postings/Scaffolding Surveys," dated May 31, 1995.
- Surveillance Report 95-059, "Health Physics Activities," dated June 21, 1995.
- Surveillance Report 95-068, "Health Physics Activities," dated July 17, 1995.
- Surveillance report 95-080, "Health Physics Activities," dated August 7, 1995, and
- Surveillance report 95-090, "Special Nuclear Material Receipt, Inspection and Storage," dated September 11, 1995.

The inspector noted that appropriate reference and guidance documents were included as part of the above surveillance reports. The quality monitoring reports and surveillance checklists used as guidance by the auditors to perform the surveillances were clearly written. The inspector noted that in

addition to requests by the radiation protection division to perform specific surveillance activities, the quality division performed an independent review of radiological condition reports to determine which radiological activities should be reviewed and at what frequency. The inspector considered that this independent review was a program strength.

The inspector reviewed the surveillances performed, and determined that they provided a good cross-sectional assessment of the radiation protection program. The inspector noted that of the five surveillances performed, one deficiency and one recommendation were identified. The deficiency was placed in the station's "Condition Reporting" system for tracking purposes and the recommendation was evaluated by radiation protection management. The inspector noted that both the deficiency and recommendation had been corrected and implemented in a timely manner.

The inspector interviewed the individual assigned to perform radiation protection audits, and noted, that although the auditor had a number of years of auditing experience, the individual had little technical and operational radiation protection experience.

The inspector noted that in an effort to improve the experience level of the auditor assigned to perform the radiation protection audits, the licensee's quality division supervisor sent the auditor through the licensee's radiation protection training course. This was a 2 1/2-month course designed for initial training of a radiation protection technician. Additionally, in an effort to gain operational experience, the auditor qualified and worked Unit 2's refueling outage in October 1995 as a junior radiation protection technician. In this position, the auditor was assigned such duties as routine radiological surveys and control point monitoring. The inspector considered that this cross training was a program strength.

#### 2.1.2 Self-Assessment Program

The inspector reviewed the radiation protection division's self-assessment report, which was performed during the second quarter of 1995, and found it to be a thorough review of the radiation protection division's program. The inspector noted that qualified supervisory and technician level radiation protection division personnel from both units were involved in the self-assessment process and that a number of recommendations for improvement were identified. The inspector noted that all recommendations were evaluated in a timely manner and a large percentage of the recommendations were incorporated into the radiation protection program.

#### 2.1.3 Condition Reports

The licensee's corrective action document was the condition reporting system. Through a review of a condition reporting system summary, the inspector determined that licensee personnel used the corrective action system extensively. Selected examples were reviewed, and it was noted by the

inspector that responses to condition reports by radiation protection personnel were timely, and addressed the issues with proper corrective actions. The inspector noted no adverse trends in the radiation protection program during the review of radiological protection condition reports.

#### 2.1.4 Field Observations

The inspector determined that health physics field observations performed by radiation protection supervision encompassed a wide variety of radiation protection tasks. Field observations were documented and included items such as the task and division being observed, deficiencies if any, and corrective action taken. The inspector noted that deficiencies, which could not be corrected at the time of the observation, were captured in the licensee's condition reporting system.

#### 2.2 Changes

There were no significant changes in organization, personnel, facilities, equipment, programs, or procedures since the previous review of this program area.

#### 2.3 Planning and Preparation

The inspector observed the planning and preparation of work required to correct a steam leak of Unit 1 secondary side Steam Generator C manway cover, which was located inside the containment building.

The inspector attended the mechanical maintenance work briefing which was held prior to the ALARA pre-job briefing. The inspector noted, that in addition to the workers and supervisor who were involved in the task, the mechanical maintenance planner was also present. The supervisor discussed the task in detail with the workers and asked for comments and questions before assigning individual task assignments to each worker. The inspector noted that there was a good exchange of ideas and comments at this briefing.

The ALARA pre-job briefing was conducted in preparation for the repair of the secondary side manway of Unit 1 Steam Generator C. The radiation work permit and ALARA requirements were discussed with the personnel involved in the task by the ALARA supervisor. The inspector noted that there was a good exchange of information between the mechanical maintenance and radiation protection personnel during the briefing. Task assignments were discussed by both mechanical maintenance and radiation protection supervision. The inspector noted that during the briefing the radiation protection supervisor made a statement that "one of you (workers) need to wear the lapel air monitor." Not evaluating which worker was likely to work in the highest potential airborne area and assigning the lapel air sampler to that individual during the briefing could cause an improper airborne survey evaluation. When the inspector discussed this issue with radiation protection management, they

stated that they would re-evaluate their practice of assigning lapel air samplers for certain tasks. The inspector concluded that the briefing appropriately addressed questions by the workers and special instructions related to the radiation protection requirements.

The inspector reviewed Radiation Work Permit 95-1-2346, Revision 0 (Work Order 72032) "Repair "C" S/G Secondary Manway Steam Leak," and associated ALARA-Package 1-95-020, and determined that they addressed specific radiological conditions and provided adequate guidance.

## 2.4 Training and Qualifications of Personnel

The inspector reviewed the radiation protection technician continuing training program, professional development of radiation protection personnel and training staff qualifications.

### 2.4.1 Radiation Protection Technician Continuing Training Program

The inspector determined, by review of the summary of continuing training topics and selected examination material, that continuing training content was appropriate. A continuing training schedule was developed for 1995 and included discussions of current industry and site events, technical issues, new equipment topics, and the review of certain plant procedures. During the review of training records, the inspector noted that plant management, including the vice president of nuclear generation, was actively involved in the observation of radiation protection technician continuing training classes. The inspector noted that a large percentage (75 percent) of the radiation protection technician staff had received certification by the National Registry of Radiation Protection Technologists.

### 2.4.2 Training Staff Qualifications

From interviews held with instructors in the training department responsible for providing training to the radiation protection staff, the inspector determined that the staff had many years of health physics practical and operational field experience. The inspector noted that the training staff routinely worked with the plant radiation protection division, during nonoutage conditions, in an effort to assess the effectiveness of the training program.

## 2.5 External Exposure Control

The inspector reviewed the external exposure control program, which included personnel dosimetry program, posting and labeling, access control, and control of high radiation areas. Additionally, the inspector conducted several independent radiation surveys within the radiological controlled area and protected areas to verify that these areas were properly surveyed, posted, and controlled.

### 2.5.1 Personnel Dosimetry Program

The inspector reviewed the personnel dosimetry program, including the use of electronic dosimetry, the processing of the station's thermoluminescent dosimeters and blind spiking programs, and the neutron monitoring program.

The inspector verified that individuals who entered the radiological controlled area wore the required personnel monitoring devices. Electronic dosimetry was worn by all workers observed by the inspector in the radiological controlled area. All workers questioned by the inspector were knowledgeable of the proper response to the electronic dosimeter alarms.

The licensee was certified by the National Voluntary Laboratory Accreditation Program certified to process their inhouse thermoluminescent dosimeters. The inspector reviewed the results of the licensee's third quarter thermoluminescent dosimetry blind spiking test and noted no problems with the program. Additionally, calibration records and quality control charts reviewed by the inspector for the thermoluminescent dosimeter reader indicated no program problems.

The inspector reviewed the licensee's program for neutron monitoring of personnel working in a neutron environment (i.e., containment at power). In addition to performing surveys using a Ludlum Model 12-4 neutron survey meter to determine neutron radiation levels, the licensee also issued special neutron thermoluminescent dosimetry to establish the dose of record. Panasonic Model UD 802 thermoluminescent dosimeter chips were used in conjunction with a Model 810 holder to detect neutrons. The inspector reviewed the process for tracking the daily neutron dose and noted that radiation protection personnel manually entered neutron dose into the access control system. The inspector reviewed selected radiation work permits for entry into likely neutron environments and noted that neutron thermoluminescent dosimetry was required and issued in all cases.

### 2.5.2 Posting, Labeling, and Access Controls

The inspector conducted several tours of the radiological controlled area and performed independent radiation measurements to confirm the appropriateness of radiological postings. All areas were found to be appropriately surveyed, controlled, and posted in accordance with regulatory requirements.

The inspector reviewed the access control requirements, including selected radiation work permits. The licensee used electronic dosimetry to monitor all personnel entering the radiological controlled area. The inspector determined, by interviews with workers and observation that the electronic access control system was a user friendly system. Personnel were aware of their dose limits and electronic dosimeter alarm settings.

The inspector reviewed selected radiation work permits and determined that they were written clearly, radiological controls were consistent and were easy to read and understand.

### 2.5.3 High Radiation Areas and Housekeeping

The inspector determined that appropriate access control had been established for high radiation areas greater than 100 millirem per hour. Appropriate barricades and postings were found to be in place. Locked high radiation control, required for areas greater than 1000 millirem per hour, was effective, and all doors challenged by the inspector were found to be secured.

The inspector noted that housekeeping conditions in the radiological controlled area were very good.

### 2.6 Internal Exposure Controls

At the time of this inspection, the licensee had not identified any elevated whole-body counts that required an internal dose assessment as a result of radiological work.

During tours of the radiological controlled area, the inspector observed that the licensee had established appropriate air sampling equipment and air filtration units in the work place. In addition to job-specific air samplers, the licensee also had appropriately positioned continuous air monitors throughout the radiological controlled area. The inspector observed that all air sampling equipment located in the work place had current calibration dates and documented operational checks. Air filtration units had been placed in some potentially high contaminated areas to ensure worker safety.

### 2.7 Control of Radioactive Materials and Contamination, Surveys and Monitoring

The inspector reviewed the licensee's program concerning adequacy of the surveys necessary to assess personnel exposure, proper use of personnel contamination monitors and whole body counters, performance testing of portable radiation detection instrumentation, and the control of contaminated areas.

#### 2.7.1 Surveys and Use of Portal Monitors and Whole Body Friskers

The inspector reviewed a number of radiological surveys performed in both units and noted that all surveys were written in a clear, consistent manner and were easy to read and understand. High radiation area and contaminated boundaries were properly identified. The inspector noted that personnel contamination monitors and whole body counters were properly maintained and performance checked. The inspector noted that this equipment was properly used by radiological workers.



### 2.7.2 Portable Instrument Performance Testing and Contamination Controls:

The inspector examined a number of portable radiation survey instruments in use or ready to be issued, and found that all instrumentation was calibrated and had been properly performance checked.

The licensee provided good controls to prevent the spread of radioactive contamination. Contaminated areas were posted and marked with tape or rope. Step-off pads were placed at the entrances and exits to these areas to alert workers to a change from a contaminated area to a noncontaminated area. Receptacles provided for the collection of potentially contaminated protective clothing were emptied in a timely manner. The undressing areas were neatly kept to prevent inadvertent spread of contamination. After leaving a contaminated area and removing potentially contaminated protective clothing, appropriate radiological instruments were maintained for workers to check their hands and feet for contamination. Personnel contamination monitors were used to detect radiological contamination or potential intakes when personnel exited the radiological controlled area. Monitoring equipment was performance checked and had current calibration stickers.

## 2.8 Maintaining Occupational Exposure ALARA

The inspector reviewed ALARA committee activities, selected ALARA work packages, hot-spot reduction program, temporary shielding program, and the ALARA-suggestion program.

### 2.8.1 ALARA Committee and ALARA Work Packages

The inspector reviewed the minutes of meetings for the second and third quarters of 1995 and determined that the committee was fully supported by all plant departments. Meeting minutes were documented and distributed in a timely manner and the committee was appropriately involved with the plants exposure setting goals and monitoring of these goals.

All ALARA work packages reviewed by the inspector were determined to be thorough and included such items as pre-job briefings, radiation work permit recommendations, and specific ALARA concerns. Lessons learned for previously performed site work and industry experiences were incorporated in the work package. ALARA work packages reviewed by the inspector indicated that adequate ALARA evaluations were routinely performed.

### 2.8.2 Hot-Spot Reduction and Temporary Shielding Programs

The inspector reviewed the radiation trend point reports for the second and third quarters of 1995 and noted that hot-spot tracking was a major part of this report. During the last two quarters, the ALARA group had worked with operation personnel from both units in the successful reduction of 18 hot spots. At the end of the third quarter, the licensee had identified a total of 39 hot spots, 21 in Unit 1 and 18 in Unit 2. Hot spots were updated during task group (routine) surveys performed by the radiation protection personnel.

The inspector noted that hot spots identified for removal were tracked in the licensee's condition reporting system.

During tours of the radiological controlled area, the inspector noted that temporary shielding was used as part of the licensee's comprehensive ALARA program.

### 2.8.3 ALARA Suggestion Program

The inspector reviewed the status of suggestions submitted to the ALARA suggestion program between January 1 and December 11, 1995. The licensee had a goal of 80 ALARA suggestions for 1995. As of this inspection, the licensee had received only 52 suggestions. Of the 52 suggestions received, 10 suggestions had not been evaluated as of the date of this inspection. The inspector noted that 2 of the 10 suggestions were submitted more than 8 months earlier. The inspector interviewed licensee individuals from various plant departments, such as operations and maintenance. The inspector asked the individuals questions pertaining to the ALARA suggestion program. The inspector received comments which indicated that some workers were not familiar with certain features of the ALARA suggestion program. After reviewing comments about the ALARA suggestion program with the licensee, the health physics division manager stated that he would review the effectiveness and implementation of the suggestion program.

## ATTACHMENT

### 1 PERSONS CONTRACTED

#### 1.1 Licensee Personnel

T. Cloninger, Vice President, Nuclear Engineering  
J. Groth, Vice President, Nuclear Generation  
S. Head, Compliance Supervisor, Licensing  
M. Huerta, Senior Health Physics Technician, Radiation Protection  
J. Inman, ALARA Specialist, Radiation Protection  
C. Johnson, Manager South Texas Activities, Licensing  
B. Kruse, Senior Specialist, Quality Division  
R. Logan, Radiation Protection Manager, Radiation Protection  
L. Martin, General Manager Nuclear Assurance and Licensing  
S. Rosen, Director Industry Relations  
D. Schulker, Compliance Engineer, Licensing  
C. Stone, Radiation Protection Supervisor, Radiation Protection

#### 1.2 NRC Personnel

C. Clark, Reactor Inspector, Region IV

The above individuals attended the exit meeting on December 14, 1995. In addition to the personnel listed above, the inspector met and held discussions with other personnel of the licensee's staff during the inspection.

### 2 EXIT MEETING

An exit meeting was conducted on December 14, 1995. During this meeting, the inspector reviewed the scope of the inspection. The licensee did not express a position on the inspection documented in this report. The licensee did not identify as proprietary, any information provided to, or reviewed by the inspector.