ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket Nos.:	50-498 50-499
License Nos.:	NPF-76 NPF-80
Report No.:	50-498/96-18 50-499/96-18
Licensee:	Houston Lighting & Power Company
Facility:	South Texas Project Electric Generating Station, Units 1 and 2
Location:	FM 521 - 8 miles west of Wadsworth Wadsworth, Texas
Dates:	June 3-7, 1996
Inspector:	Thomas H. Andrews, Radiation Specialist
Approved By:	Blaine Murray, Chief, Plant Support Branch Division of Reactor Safety

ATTACHMENTS:

Attachment 1: Partial List of Persons Contacted
List of Inspection Procedures Used
List of Items Opened, Closed, and Discussed
List of Acronyms

EXECUTIVE SUMMARY

South Texas Project Electric Generating Station, Units 1 and 2
NRC Inspection Report 50-498/96-18; 50-499/96-18

This routine, announced inspection focused upon the licensee's radiation protection program and its conduct during the Unit 1 refueling outage. The inspection occurred during the final week of the outage, providing a good opportunity to observe activities associated with job completion, and cleanup of areas.

Plant Support

- Excellent pre-outage and ongoing planning processes were established that incorporated very good ALARA controls. Effective preparations for the outage permitted a short outage schedule without significantly affecting personnel exposures. The longer cleanup period to remove antimony from the leaking neutron source provided the additional benefit of reducing doses from other activation products (R1.1).

- Exposure controls were effectively implemented to maintain workers exposures low. Personnel dosimetry was used properly. Radiological postings of areas was satisfactory (R1.2).

- Good housekeeping in the radiological control area, including containment, was a major strength that reduced requirements for protective clothing, thereby improving the accessibility and efficiency of workers. Radiation protection technicians provided good support for work activities. The number of recorded contamination events was very low (R1.3).

- The skill and knowledge of contract radiation protection technicians was high (R4).

- The licensee's self assessment of the radiation protection program was excellent. Assessments were performed on a wide scope of activities. Proper corrective actions were implemented in a timely manner (R7).

Report Details

Summary of Plant Status

During this inspection, Unit 1 was shut down for refueling and Unit 2 operated at full power. The Unit 1 outage began on May 18, 1996 and was scheduled to end on June 9, reflecting a 22-day refueling outage. This was the sixth refueling outage for Unit 1.

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 Planning and Preparation

a. Inspection Scope (83750)

The inspector reviewed planning and preparation for selected radiation work activities for the refueling outage. This included a review of pre-outage planning as well as the planning of ongoing activities.

b. Observations and Findings

The licensee completed a comprehensive review of outage tasks prior to the start of the outage. Because the duration of the outage was only 22-days, very good coordination was needed to ensure the schedule was met. However, this reduction in outage duration was not performed by sacrificing radiation exposure savings. Tasks were reviewed to ensure that appropriate dose reduction techniques could be employed.

The licensee established an outage goal of 140 person-rem. This goal was based upon the summation of estimated exposures from the tasks involved. This outage required additional exposures associated with steam generator work and inservice inspection. Given the scope of work planned, the goal of 140 person-rem appeared to be reasonable.

Exposures were tracked on a daily basis and compared to the projected exposures based on the scheduled activities. The licensee was achieving lower than projected exposures for most tasks. This was attributed to a longer reactor coolant system cleanup at the beginning of the outage to reduce contamination from a leaking neutron source in the reactor core.

The inspector reviewed the licensee's assessment of the potential impact of the leaking neutron source (Antimony-124). Prior to the start of the refueling outage, the licensee began detecting antimony in the reactor coolant. The antimony was from a leaking neutron source. The licensee

contacted other facilities to discuss problems with antimony in the reactor coolant system and the affects on radiation exposures. As a result, the licensee anticipated increased skin doses from beta contamination and beta exposures.

To minimize the impact of the antimony on personnel, the licensee extended the reactor coolant system cleanup from 10 to 18 hours to permit removal of more activated products from the reactor coolant system. The licensee had projected the curie content for antimony to be removed based upon the concentration observed in the reactor coolant. The actual amount removed was lower than projected. However, the longer cleanup cycle also permitted removing more cobalt yielding lower than expected radiation exposures.

Based upon experiences at other facilities, the licensee monitored for additional skin exposures early in the outage. The results were reviewed and the licensee determined that the additional monitoring was not warranted. Therefore, the additional effort associated with skin dose monitoring was not continued.

The inspector observed preparations for repair of a core instrument thimble tube connection. The task involved installing a freeze seal, removing the old connection, and installing a new connection. The inspector observed the discussion between workers and supervision as well as the ALARA pre-job briefing for portions of the work being performed. The work scope was very well defined, and workers asked relevant questions during the briefing.

Following the briefing, the inspector followed the workers into containment and observed the work performed on a remote video monitor using a pre-installed camera. Workers were observed using good ALARA practices to minimize exposures. Job coverage by technicians was adequate to ensure the workers knew the radiological conditions in the area.

c. Conclusions

The licensee had excellent pre-outage and ongoing planning processes that incorporated very good ALARA controls. Preparations for the outage permitted a short outage schedule without significantly affecting personnel exposures. The longer cleanup period to remove antimony from the leaking neutron source provided the additional benefit of reducing doses from other radioactive nuclides.

R1.2 Exposure Control

a. Inspection Scope (83750)

The inspector reviewed personnel exposure records, and observed worker usage of electronic personnel dosimetry. Independent radiation surveys

of areas were made by the inspector to confirm postings and survey maps. The inspector queried workers in the radiological control area to determine their knowledge of postings and conditions in the area where they were working.

b. Observations and Findings

The licensee provided information associated with internal dose assessments. While there were small intakes of radioactive material, the dose assessment results were small and dose assignments were not required.

At the entrance to the radiological control area, there was information provided to workers instructing them to wear the dosimeter on the front of the torso. During tours of the radiological control area, the inspector observed the placement of electronic dosimeters. Workers demonstrated good placement techniques during normal work and during work requiring the use of protective clothing.

While touring containment, the inspector discovered an area outside of the "C" residual heat removal pump room where radiation levels were approximately 15 millirem per hour. The room was posted as a contamination and a radiation area, but it was not immediately clear that the walkway outside the room was also a radiation area.

The inspector notified the licensee of the discovery of this radiation area outside of the posted boundary. The area was surveyed by a technician, then posted with a radiation area sign.

The licensee noted that the entrance to the containment was posted as a radiation area and that radiation area signs provided additional information within containment as to known areas where radiation levels were likely to exist. The inspector discussed regulatory guidance related to posting large areas as a radiation area when only specific areas met the criteria for posting as a radiation area. The licensee was familiar with this guidance and agreed that posting of areas such as the auxiliary building were covered by this guidance. However, because conditions change rapidly throughout containment as a result of system realignment, etc., posting of the containment entrance was considered appropriate.

The inspector queried workers inside containment as to whether or not they were in a radiation area. In most cases, workers indicated that they were in a radiation area. In the other instances, workers looked around to see if there was a posting in the proximity, then noted that they had seen the sign at the containment entrance.

The inspector reviewed the existing survey that showed radiation levels outside the room did not require posting as a radiation area at the time of the survey. The survey had been performed 6 days earlier. The

licensee's procedures required surveys of common areas on a weekly basis. Because the survey was current, and because workers had a general knowledge that they were likely to be in a radiation area, the inspector determined that the posting at the entrance to containment was adequate.

The inspector checked radioactive material storage areas to ensure the accuracy of area postings and information tags. Boundaries of high radiation areas were surveyed to verify that the dose rates at the boundary were below the limits for posting of the area. No discrepancies were noted.

c. Conclusions

Exposure controls were effectively implemented to maintain workers exposures low. Personnel dosimetry was used appropriately. Radiological posting of areas were satisfactory.

R1.3 Control of Radioactive Materials and Contamination

a. Inspection Scope (83750)

The inspector toured the facility to observe activities associated with control of radioactive materials and contamination. The inspector observed workers removing items from containment and observed workers exiting the radiological control area. The inspector made regular tours of the Unit 1 auxiliary and containment buildings to observe conditions and worker practices within the plant. Particular attention was given to work activities inside containment.

b. Observations and Findings

The licensee maintained contamination levels low enough for access to major portions of containment to only require shoe covers as protective clothing. Contamination monitors were located near the containment exit to identify potentially contaminated personnel.

The inspector observed the disassembly of the plexiglass wall surrounding the refueling canal. Workers were in full sets of protective clothing and, where appropriate, using safety harnesses. At one point, one of the workers was observed by the inspector to be reaching outside the contamination zone around the corner of the plexiglass wall. This was also observed by a radiation protection technician who stopped the worker, then took steps to expand the zone outward to allow the worker to continue without reaching outside the zone. This was considered a good example of technician support for the ongoing activity.

While touring the containment on at approximately 2:00 p.m. on June 5, the inspector observed a frisker set up to support release of materials from a contaminated area. The response check sticker on this frisker indicated that it had been response checked at 00:33 on June 4. The licensee's procedure required response checking every 24 hours and provided for a 12 hour grace period. Based upon the information on the sticker, the grace period expired at 12:33 p.m. on June 5.

While searching the immediate area for a radiation protection technician, the inspector returned and observed a technician using the meter. The inspector pointed out the expired response check sticker. The technician stated that no materials had been released using this meter, then went to the containment entrance were additional friskers were located. Two more friskers were found with expired response check stickers at the containment entrance.

At this point, the lead technician at the containment entrance was informed via telephone that the instruments had been response checked at 00:33 on June 5 instead of June 4, and the wrong date had been written on the stickers. This was consistent with information on the stickers since the response check immediately prior to the last recorded entry was approximately 6:00 p.m. on June 3.

The inspector agreed that this was an error in recording the date on the response check stickers, but pointed out that technicians were continuing to use these instruments without checking or questioning the information on the response check stickers. The licensee initiated a condition report and discussed this observation with technicians during shift turnover.

The licensee used a combination of PCM-1B and PM-7 monitors in series to check for personnel contamination at the exit to the radiological control area. An individual exiting the area had to use the PCM-1B monitor, then proceed through the PM-7 monitor.

While observing personnel exiting from the radiological control area, the inspector noted occasional poor worker practices. Notable observations involved personnel in the PCM-1B leaning out to look at the display on top while the count was in progress and personnel not placing their feet on the foot detector. Because the PM-7 was used after the PCM-1B, the inspector determined that the likelihood of a person leaving the area with contamination was small. However, the inspector pointed out these practices to the licensee for their followup.

The inspector reviewed the licensee's contamination history and verified that the number of recorded contaminations was small. According to information provided by the licensee, there had been only 5 skin contaminations and 3 personal clothing contaminations recorded during the outage.

c. Conclusions

Good housekeeping in the radiological control area, including containment, was a major strength that reduced requirements for protective clothing, thereby improving the mobility and efficiency of workers. Technicians provided good support for work activities. The number of recorded contamination events was very low.

R2 Status of RP&C Facilities and Equipment

R2.1 Plant Areas Unusable as a Result of Operational Occurrences (83750)

During tours of the licensee's facilities, the inspector looked for areas of the plant that were unusable as a result of operational occurrences such as those identified in NRC Information Notice 96-14, "Degradation of Radwaste Facility Equipment at Millstone Nuclear Power Station, Unit 1." Special attention was given to areas that may not be entered on a regular basis.

According to the licensee, there were no known problem areas within the plant such as those identified in NRC Information Notice 96-14, "Degradation of Radwaste Facility Equipment at Millstone Nuclear Power Station, Unit 1." The inspectors observations confirmed that these areas were well maintained.

R2.2 Review Of UFSAR Commitments

A recent discovery of a licensee operating their facility in a manner contrary to the Updated Final Safety Analysis Report (UFSAR) description highlighted the need for a special focused review that compares plant practices, procedures and/or parameters to the UFSAR descriptions.

While performing the inspections discussed in this report, the inspector reviewed the applicable portions of the UFSAR that related to the areas inspected. The inspector verified that the UFSAR wording was consistent with the observed plant practices, procedures and/or parameters.

R4 Staff Knowledge and Performance

a. Inspection Scope (83750)

The inspector reviewed the licensee's process for evaluating the experience and qualifications of contract technicians. The inspector discussed planning, preparation, and training with several contract technicians to determine their level of knowledge to perform tasks assigned to them.

b. Observations and Findings

The contract radiation protection technicians, with one exception, had all previously worked at the licensee's facility during recent outages. Therefore, the licensee was able to evaluate the technicians work history quickly. This process was reviewed by management and adjustment made as appropriate.

During conversations with contract technicians, the inspector determined that they were very familiar with the facility and the licensee's procedures. Often, they would point out features of the work activity that were contributing to dose savings.

c. Conclusions

The skill and knowledge of contract radiation protection technicians was high.

R7 Quality Assurance in RP&C Activities

a. Inspection Scope (83750)

The inspector reviewed the following evaluations, reports, assessments and audits:

- First Quarter 1996 Condition Report Summary
- Health Physics Procedure Adherence Assessment
- External Dosimetry (TLD) Program Annual Report
- A Study of Antimony in the Reactor Coolant System and its Potential Effects on Shutdown Conditions
- Quality Surveillance Report 96-15, Health Physics Activities
- Quality Surveillance Report 96-028, Health Physics - Diving Activities
- Quality Surveillance Report 96-048, Health Physics Activities
- Quality Surveillance Report 96-051, Health Physics Department Reorganization
- Quality Surveillance Report 95-105, Health Physics Activities

b. Observations and Findings

The documents reviewed provided a thorough assessment of various facets of the licensee's radiation protection program. In each case, the document was focused and thorough. Findings and recommendations were clearly identified and supported by data within the documents. Management response to findings and recommendations was determined by the inspector to be appropriate.

The inspector noted that particularly in the instance of the antimony study, the results provided a good understanding of the problems and effects caused by the leaking secondary source. This demonstrated that personnel within the radiation protection organization were very knowledgeable and able to respond to new challenges as they arise.

Quality surveillance were reviewed and found to be of the same caliber as the assessments and other documents. The findings and the presentation of the results indicated that the personnel performing the audits had a good working knowledge of the radiation protection program and the requirements for this program.

c. Conclusions

The licensee's self assessment of the radiation protection program was excellent. Assessments were performed on a wide scope of activities. Findings and recommendations were addressed by management appropriately.

V. Management Meetings

X1 Exit Meeting Summary

The inspector presented the inspection results to members of licensee management at the conclusion of the inspection on June 7, 1996. The licensee acknowledged the findings listed.

The inspector asked the licensee whether materials examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENT 1

PARTIAL LIST OF PERSONS CONTACTED

Licensee

T. Cloninger, V.P. Nuclear Engineering
J. Groth, V.P. Nuclear Generation
B. Kruppa, Health Physics Technician
R. Logan, Radiation Protection Manager
M. McBurnett, Licensing Manager
J. Sherwood, Health Physics Supervisor
D. Shulker, Compliance Engineer
M. Tomek, Health Physics Technician

NRC

J. Keeton, Resident Inspector
D. Loveless, Senior Resident Inspector
W. Sifre, Resident Inspector

INSPECTION PROCEDURES USED

83750 Occupational Radiation Exposure

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

None

LIST OF ACRONYMS USED

ALARA	As low as is reasonably achievable
RCA	Radiological Control Area
RWP	Radiation Work Permit
RPM	Radiation Protection Manager
RP&C	Radiological Protection and Chemistry
QA	Quality Assurance