

APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

NRC Inspection Report: 50-498/92-25  
50-499/92-25

Operating Licenses: NPF-76  
NPF-80

Licensee: Houston Lighting & Power Company (H&P)  
P.O. Box 1700  
Houston, Texas 77251

Facility Name: South Texas Project Electric Generating Station (STP)  
Units 1 and 2

Inspection At: Energy Development Complex  
12301 Kurland Drive  
Houston, Texas

STP Site, Bay City, Matagorda County, Texas

Inspection Conducted: July 13-17, 1992

Inspector: J. B. Nicholas, Ph.D., Senior Radiation Specialist  
Facilities Inspection Programs Section

Approved: Blaine Murray  
Blaine Murray, Chief, Facilities Inspection  
Programs Section

7/29/92  
Date

Inspection Summary

Inspection Conducted July 13-17, 1992 (Report 50-498/92-25; 50-499/92-25)

Areas Inspected: Routine, announced inspection of the licensee's radiological environmental monitoring program including organization and management controls, training and qualifications, quality assurance, meteorological monitoring program, and implementation of the radiological environmental monitoring program.

Results: Within the areas inspected, no violations or deviations were identified. Two previously identified inspection followup items were closed. The following is a summary of the inspection findings:

- o The Radiation Laboratory had experienced very low staff turnover.

- o An excellent Radiation Laboratory technician training program had been established. The Radiation Laboratory had an adequate, well qualified staff.
- o An excellent quality assurance audit and surveillance program had been implemented. The audits were technically comprehensive and provided excellent program evaluation and management oversight.
- o An excellent radiological environmental monitoring program was being implemented.
- o The annual land use censuses had been performed and documented.
- o The licensee's environmental thermoluminescent dosimeter results compared very well with the NRC's and state's results at collocated sites.
- o Good quality Annual Radiological Environmental Operating Reports which contained the required information were submitted in a timely manner.
- o The Radiation Laboratory's performance in the U.S. Environmental Protection Agency's (EPA) Environmental Radioactivity Laboratory Intercomparison Program was good.
- o A good meteorological monitoring program was being maintained.

DETAILS

1. PERSONS CONTACTED

HL&P

- \*W. H. Kinsey, Vice President, Nuclear Generation
- \*T. J. Jordan, General Manager, Nuclear Assurance
- \*W. J. Jump, General Manager, Nuclear Licensing
- \*C. A. Ayala, Supervising Engineer, Nuclear Licensing
- \*H. W. Bergendahl, Manager, Technical Services
- \*M. K. Chakravorty, Executive Director, Nuclear Safety Review Board
- \*R. A. Dally-Piggott, Engineering Specialist, Nuclear Licensing
- E. M. Hardcastle, Senior Radiation Laboratory Technician
- \*R. E. Lockwood, Acting Radiation Protection Supervisor, Radiation Laboratory
- \*M. A. Ludwig, Administrator, Participant Services
- M. A. Markovich, Nuclear Radiation Laboratory Technician
- \*T. A. Meinicke, Senior Staff Consultant, Planning and Assessment
- A. R. Passafuma, Jr., Senior Radiation Laboratory Technician
- \*J. D. Sherwood, General Supervisor, Radiation Laboratory
- \*G. E. Williams, Staff Engineer, Radiation Laboratory
- \*W. D. Wood, Senior Staff Consultant, Planning and Assessment

NRC

- J. I. Tapia, Senior Resident Inspector, SIP
- R. J. Evans, Resident Inspector, STP

\*Indicates those present at the exit meeting on July 17, 1992.

2. FOLLOWUP ON PREVIOUSLY IDENTIFIED INSPECTION FINDINGS (92 )

(Closed) Inspection Followup Item (498/9038-01): Steam Generator Sodium Intrusion (Unit 1) - This item was discussed in NRC Inspection Report 50-498/90-38; 50-499/90-33 and involved the inadvertent introduction of sodium hydroxide into the Unit 1 auxiliary feedwater storage tank and subsequently into the Unit 1 steam generators. This was a result of sodium hydroxide contamination being present in one of the blue hydrazine storage barrels which was used to makeup the 35 percent hydrazine injection tank for chemical addition into the Unit 1 auxiliary feedwater storage tank. The blue storage barrel in question was labeled 35 percent hydrazine but had no container tag or material issued report information attached. Station procedures for transferring hydrazine into the 35 percent hydrazine injection tank only required verification of the barrel labeling and did not require chemical sampling and analysis prior to addition into the hydrazine injection tank. The licensee investigated the incident and developed a root cause analysis and, based on the analysis, developed a list of appropriate remedial and corrective actions. The inspector reviewed the documentation and results of

the completion of the remedial and corrective actions taken by the licensee and determined that these actions had returned the Unit 1 affected systems to normal chemistry conditions and would prevent the recurrence of the use of "old" empty chemical drums for storage of uncontrolled chemicals and the introduction of bulk chemicals into plant systems without prior chemical verification.

(Closed) Inspection Followup Item (498/9039-01; 499/9039-01): Dose Calculations - This item was discussed in NRC Inspection Report 50-498/90-39; 50-499/90-39 and involved differences in the calculated offsite dose results between the licensee and the NRC for all age groups and all critical organs for the ingestion pathways of cow milk, cow meat, and vegetation from airborne tritium, iodine, and particulate effluents. The licensee and the inspector reviewed and evaluated the licensee's computer code dose factor tables, radionuclide half-lives, and site-specific calculation parameters used by the licensee and determined the proper site-specific values to be used for each specific calculation parameter in the NRC computer code, PC-DOSE. The inspector performed confirmatory offsite dose calculations using the proper site-specific computer code calculation parameter values and was able to resolve the major differences between the licensee's and NRC's calculated offsite dose results. The inspector verified that the calculated doses resulting from airborne tritium, iodine, and particulate effluents compared satisfactorily within a four percent difference between the licensee and the NRC for all age groups and all critical organs. The licensee's actions were satisfactory to close this item.

### 3. ORGANIZATION AND MANAGEMENT CONTROLS (84750)

The inspector reviewed the organization, management controls, staffing, and assignment of radiological environmental monitoring program responsibilities for STP Units 1 and 2 to determine agreement with commitments in Chapter 13.1 of the Updated Safety Analysis Report and compliance with the requirements in Technical Specification 6.2.

The inspector verified that the organizational structure of the Technical Services Department's Radiation Laboratory, which was responsible for the implementation of the radiological environmental monitoring program, was as defined in the Updated Safety Analysis Report and Technical Specifications. Management control procedures were reviewed for the assignment of responsibilities for the management and implementation of the radiological environmental monitoring program. The inspector determined that the duties and responsibilities of the Radiation Laboratory staff, that were specified in approved procedures, were being implemented. The procedures, which were reviewed, are listed in the Attachment to this inspection report.

The inspector reviewed the staffing of the Radiation Laboratory and noted, that since the previous NRC radiological environmental monitoring program inspection conducted in May 1990, there had been one resignation from the technical staff which was responsible for the implementation of the radiological environmental monitoring program. The vacated technician

position was filled in June 1990 by a chemistry shift supervisor recruited from the STP chemistry analysis staff. This personnel change represented approximately a 10 percent turnover in the Radiation Laboratory staff and had no negative affect in accomplishing the required tasks assigned to the Radiation Laboratory. The Radiation Laboratory staffing was determined to be in accordance with licensee commitments.

No violations or deviations were identified.

#### Conclusions

The Radiation Laboratory's organizational structure and staffing met the Technical Specification requirements. The Radiation Laboratory management controls were being implemented in accordance with approved procedures. During the past two years, the Radiation Laboratory had experienced a very low turnover of technician personnel.

#### 4. TRAINING AND QUALIFICATIONS (84750)

The inspector reviewed the training and qualification program for the Radiation Laboratory personnel responsible for implementing the radiological environmental monitoring program to determine agreement with commitments in Chapter 13 of the Updated Safety Analysis Report and compliance with the requirements in Technical Specification 6.4.

The inspector reviewed the education and experience backgrounds of the Radiation Laboratory staff and determined that all supervisory and technical staff met the education and experience qualification requirements specified in the Updated Safety Analysis Report and Technical Specifications. It was determined that the Radiation Laboratory had an adequate, qualified staff.

The Radiation Laboratory technicians were responsible for the collection, analyses, and documentation of all of the radiological environmental samples. The inspector reviewed selected Radiation Laboratory technician training and qualification records and verified that the Radiation Laboratory technicians responsible for performing radiological environmental monitoring program activities had completed all of the required training and were qualified to perform their assigned responsibilities. The Radiation Laboratory technician training program was included in the accredited training program for STP Technical Services Department personnel. The Radiation Laboratory training program was being implemented in accordance with approved procedures and documented in official training records.

No violations or deviations were identified.

#### Conclusions

The licensee had implemented an excellent training program. The Radiation Laboratory had an adequate, well qualified staff.

## 5. QUALITY ASSURANCE PROGRAM (84750)

The inspector reviewed the quality assurance audit and surveillance programs regarding the radiological environmental monitoring program to determine agreement with commitments in Chapter 17 of the Updated Safety Analysis Report and compliance with the requirements in Technical Specifications 6.5.2.8 and 6.8.1.

The inspector reviewed the quality assurance audit and surveillance schedules for 1990, 1991, and 1992; audit plans and checklists; and the qualifications and training of the quality assurance auditors, technical specialists, and inspectors who performed the audits and surveillances of the radiological environmental monitoring program. Audit and surveillance reports of quality assurance activities performed during 1990, 1991, and 1992 of the radiological environmental monitoring program were reviewed for scope, thoroughness of program evaluation, and timely followup of identified deficiencies. The quality assurance audits and surveillances reviewed are listed in the Attachment to this inspection report. The quality assurance audits of the radiological environmental monitoring program were performed in accordance with approved procedures and schedules and by qualified auditors and assisted by qualified technical specialists. Two quality assurance deficiency reports were issued in the radiological environmental monitoring program audit conducted in 1991. The two deficiency reports had been closed in a timely manner. The quality assurance audits and surveillances of the radiological environmental monitoring program were of excellent quality and satisfactory to evaluate the licensee's performance in implementing the radiological environmental monitoring program Technical Specifications and Offsite Dose Calculation Manual requirements, and they met the quality assurance audit Technical Specification requirement.

The Radiation Laboratory staff performed quarterly internal assessments of the Radiation Laboratory activities during 1990, 1991, and 1992. The inspector reviewed the quarterly assessment checklists, worksheets, and observation reports issued as a result of the assessments for the period January 1990 through June 1992. A total of 29 Radiation Laboratory observation reports were issued in 1990 as compared to 49 issued in 1989, and only 16 Radiation Laboratory observation reports were issued in 1991. All of the Radiation Laboratory observation reports issued in 1990 and 1991 had been closed. It was noted that 13 Radiation Laboratory observation reports had been issued during the first half of 1992. As a result of these internal assessments and observation reports, many program improvements have been implemented.

No violations or deviations were identified.

### Conclusions

Quality assurance audits had been performed of the radiological environmental monitoring program as required, and they were technically comprehensive and provided excellent program evaluation and management oversight. The quality assurance surveillance program of the radiological environmental monitoring

program activities was satisfactory. The Radiation Laboratory internal assessments were a program strength.

#### 6. RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (84750)

The inspector reviewed the radiological environmental monitoring program to determine agreement with the commitments in Appendix 11.A.3 of the Updated Safety Analysis Report and compliance with the requirements in Technical Specifications 3/4.12, 6.8.1, and 6.9.1.3 and the Offsite Dose Calculation Manual.

The inspector reviewed the licensee's implementation of the radiological environmental monitoring program to ensure compliance with the sampling and analyses requirements, analyses sensitivities, analytical results, and reporting limits and requirements specified in the Technical Specifications and Offsite Dose Calculation Manual. Procedures for the administration of the radiological environmental monitoring program; sample collection, accountability, preparation, and analysis; and Radiation Laboratory instrumentation operation, calibration, and quality control were written with sufficient detail to ensure Technical Specification and Offsite Dose Calculation Manual compliance. Selected sample collection logs, sample receipt logs, and sample data reports for the period January 1990 through June 1992 were reviewed. The procedures which were reviewed are listed in the Attachment to this inspection report.

The inspector accompanied and observed the licensee's Radiation Laboratory staff as they performed the various tasks associated with the collection, preparation, and analyses of the required environmental samples and the documentation of the analytical results. It was determined that the sampling, processing, and analyses of the radiological environmental samples were being performed in accordance with approved procedures and that the sampling met Technical Specification and Offsite Dose Calculation Manual requirements.

The inspector reviewed the Annual Radiological Environmental Operating Reports for 1990 and 1991 and determined that the sampling and analysis requirements and the reporting requirements specified in the Technical Specifications and Offsite Dose Calculation Manual had been met. The licensee had conducted the annual land use censuses for 1990 and 1991 in accordance with Technical Specification requirements, and the results of the censuses were documented as required in the respective Annual Radiological Environmental Operating Reports.

The inspector reviewed the Offsite Dose Calculation Manual, Revision 4, dated June 1991, and determined that it contained the required radiological environmental monitoring program in accordance with the Technical Specifications.

The inspector inspected selected environmental media sampling locations associated with the radiological environmental monitoring program. The following types of sampling locations were inspected: airborne, surface

water, well water, soil, broad leaf vegetation, and TLDs. The required equipment at the selected sampling locations was in place, operational, and calibrated. During the inspection of the selected environmental sampling locations, the inspector verified that the sampling locations were as described in the Offsite Dose Calculation Manual and the Annual Radiological Environmental Operating Reports. The inspector also verified that the licensee had a sufficient supply of environmental sampling equipment stored at a convenient storage location on site.

The inspector reviewed the environmental TLD program. The licensee had implemented approved procedures for the placement, collection, preparation, and analysis of the environment TLDs. The environmental TLDs were being exchanged quarterly. The licensee's TLD results were compared to the NRC's and state's TLD results for the collocated TLD sites for 1990 and 1991, and the results were in satisfactory agreement.

No violations or deviations were identified.

#### Conclusions

The licensee was implementing an excellent radiological environmental monitoring program in accordance with the Technical Specifications and Offsite Dose Calculation Manual. The environmental sampling locations were as described in the Offsite Dose Calculation Manual, and the required sampling equipment was available, operational, and calibrated. The annual land use censuses had been performed and documented as required. The environmental TLD program was being implemented in accordance with approved procedures. The licensee's TLD results compared very well with the NRC's and state's TLD results at collocated sites. The Annual Radiological Environmental Operating Reports had been issued and contained the information as required by the Technical Specifications and Offsite Dose Calculation Manual.

#### 7. FACILITIES, EQUIPMENT, AND SUPPLIES (84750)

The inspector inspected the Radiation Laboratory located at the Energy Development Complex including the environmental sample receipt and storage area, sample preparation and laboratory areas, counting room, and TLD processing area. The Radiation Laboratory areas were equipped with the necessary sample processing equipment and analytical instrumentation to perform the Technical Specifications and Offsite Dose Calculation Manual required analyses. The counting room had replaced one high purity germanium detector on the multichannel analyzer system since the previous NRC inspection conducted in May 1990. The Radiation Laboratory facilities, equipment, and instrumentation were adequate to perform the required radiological environmental monitoring program sample processing and analyses to meet the Technical Specifications and Offsite Dose Calculation Manual requirements.

No violations or deviations were identified.



## Conclusions

The Radiation Laboratory facilities had remained unchanged since the previous NRC inspection. One high purity germanium detector had been replaced on the multichannel analyzer system. The Radiation Laboratory facilities, equipment, and instrumentation were adequate to perform the required radiological environmental monitoring program sample processing and analyses.

### 8. QUALITY CONTROL OF RADIOLOGICAL ANALYTICAL MEASUREMENTS (84750)

The inspector reviewed the Radiation Laboratory's program for maintenance, calibration, and quality control of the environmental air samplers and the radiological analytical instrumentation to determine agreement with the recommendations in Regulatory Guide 1.15 and compliance with the requirements in Technical Specifications 3/4.12.3 and 6.8.1.

The inspector reviewed the calibration and quality control records for the radiological environmental monitoring program air samplers. Calibration of the air flow for each of the operating air samplers was being performed during each weekly sample filter change in accordance with an approved procedure. The primary standard air flow meters used to calibrate the operating air samplers in the field had been calibrated and certified annually by the manufacturer. The licensee's environmental air sampler calibration and quality control program was found to be satisfactory.

The Radiation Laboratory radiological analytical instrumentation calibration and quality control procedures and the counting room instruments' calibration and quality control data were reviewed. The radiological analytical instruments' calibration and quality control procedures were satisfactory and met Technical Specification requirements and regulatory guidance. The records of the calibration data and the quality control measurements for the radiological counting instruments were reviewed and found to be satisfactory and documented in accordance with approved procedures.

The Radiation Laboratory participated in the EPA's Environmental Radioactivity Laboratory Intercomparison program as required by the Technical Specifications. The inspector reviewed the Radiation Laboratory's performance in the EPA intercomparison program during 1990 and 1991 as reported in the respective licensee's Annual Radiological Environmental Operating Reports and verified that the licensee's analytical results were normally within the EPA's acceptance criteria of three standard deviations of the known EPA values.

No violations or deviations were identified.

## Conclusions

The Radiation Laboratory's performance in the EPA's Environmental Radioactivity Laboratory Intercomparison Program was satisfactory and met the Technical Specification requirements.

9. METEOROLOGICAL MONITORING PROGRAM (84750)

The inspector reviewed the meteorological monitoring program to determine agreement with commitments in Chapter 2.3 of the Updated Safety Analysis Report and compliance with the requirements in Technical Specification 3/4.3.3.4.

The meteorological data monitoring and recording instrumentation were inspected at the 60-meter primary and 10-meter backup meteorological towers. All instrumentation was found operational and currently calibrated. The meteorological instrumentation calibration procedures and the instrumentation required surveillance channel checks and calibration records were reviewed for the primary and backup meteorological towers. All records reviewed for the period January 1990 through June 1992 indicated that the instruments were being properly maintained, tested, and calibrated in compliance with Technical Specification requirements.

The inspector reviewed the meteorological monitoring data recovery for the period January 1990 through June 1992 and determined that the data recovery for the individual meteorological parameters required by the Technical Specifications exceeded the 90 percent recovery recommendation.

No violations or deviations were identified.

Conclusions

The primary and backup meteorological towers' instrumentation was being maintained, tested, and calibrated in accordance with approved procedures and in compliance with Technical Specification requirements. The meteorological towers' instrumentation supplied reliable meteorological data.

10. EXIT MEETING

The inspector met with the licensee representatives identified in paragraph 1 of this report at the conclusion of the inspection on July 17, 1992. The inspector summarized the scope and findings of the inspection and discussed the closure of the two inspection followup items and the details of the current inspection findings. The licensee did not identify as proprietary any of the materials provided to, or reviewed by, the inspector during the inspection.

ATTACHMENT

SOUTH TEXAS PROJECT UNITS 1 AND 2

NRC INSPECTION REPORT 50-498/92-25; 50-499/92-25

DOCUMENTS REVIEWED

1. Plant General Procedure (PGP)

<u>Number</u>	<u>Title</u>	<u>Revision</u>	<u>Date</u>
OPGP03-ZR-0039	Radiological Environmental Monitoring Program	4	01/31/90

2. Plant Technical Procedures (PTP)

<u>Number</u>	<u>Title</u>	<u>Revision</u>	<u>Date</u>
OPTP01-ZE-0001	Management of Technical Services Laboratory Quality Assurance Programs	1	08/27/92
OPTP01-ZE-0002	USCEA/NIST Measurement Assurance Program	0	10/21/89
OPTP01-ZE-0003	Interlaboratory Radioassay Measurement Assurance Program	0	12/03/90

3. Plant Radiation Protection Procedures (PRP)

<u>Number</u>	<u>Title</u>	<u>Revision</u>	<u>Date</u>
OPRP10-RA-0001	Review and Editing of Meteorological Data	0	07/1/90
OPRP10-ZL-0001	Radiological Laboratory Administrative Procedure	5	07/01/90
OPRP10-ZL-0002	Quality Assurance for the Radiological Laboratory	3	02/05/92
OPRP10-ZL-0006	Sample Receipt, Accountability, and Storage	7	10/18/91

<u>Number</u>	<u>Title</u>	<u>Revision</u>	<u>Date</u>
ORPR10-ZL-0009	Radiological Laboratory Safety	6	02/05/92
ORPR10-ZL-0010	Preparation of Aqueous Samples for Liquid Scintillation Counting	5	01/05/90
ORPR10-ZL-0011	Gamma Analysis in Environmental Media	4	08/25/89
ORPR10-ZL-0012	Iodine-131 Analysis in Environmental Media	5	07/12/91
ORPR10-ZL-0013	Strontium 89/90 Analysis in Environmental Media	3	11/08/90
ORPR10-ZL-0015	Radiological Laboratory Preparation of Radioactive Standard Solutions and Calibration Sources	8	10/04/90
ORPR10-ZL-0016	Alpha/Beta Analysis in Environmental Media	4	10/16/90
ORPR10-ZL-0022	Quality Control of Radiological Laboratory Equipment	4	05/22/90
ORPR10-ZL-0023	Radiological Laboratory EPA Cross-Check Program	3	08/26/88
ORPR10-ZL-0024	Standardization of Carriers and Standard Chemical Solutions	4	05/06/91
ORPR10-ZL-0025	Radiological Laboratory Chemical and Reagent Control	4	02/21/91
ORPR10-ZO-0002	Operation and Standardization of the Tennelec Counter System	1	10/04/90
ORPR10-ZO-0003	Operation and Standardization of the ND66 MCA Counting System	3	02/05/91
ORPR10-ZO-0004	Operation and Standardization of the Liquid Scintillation Systems	1	01/05/90
ORPR10-ZO-0006	Operation of the Radiological Laboratory Data Analysis Systems	1	05/13/92

<u>Number</u>	<u>Title</u>	<u>Revision</u>	<u>Date</u>
OPRP10-ZQ-0001	Documentation and Testing of Radiological Laboratory Computer Programs	2	03/07/91
OPRP10-ZU-0001	REMP Sample Collection	1	02/19/92
OPRP10-ZU-0007	Environmental TLD Monitoring	5	04/24/92
OPRP10-ZU-0011	Operation of Northstar 800 Loran-C Receiver	0	08/29/91

4. Plant Surveillance Procedures (PSP)

<u>Number</u>	<u>Title</u>	<u>Revision</u>	<u>Date</u>
OPSP05-EM-0001	Primary Meteorological System Calibration (60-Meter Tower)	4	04/22/92
OPSP05-EM-0002	Backup Meteorological System Calibration (10-Meter Tower)	4	04/27/92

5. Quality Assurance (QA) Audits and Surveillances

QA Audit 90-15 (EM-1), "Environmental Monitoring," conducted October 1-26, 1990

QA Audit 91-13 (EN), "Radiological Environmental Monitoring Program," conducted September 3-13, 1991

QA Audit 91-16 (EF), "ODCM and Effluent Monitoring," conducted October 7-21, 1991

QA Surveillance Report (QASR) 90-003, "Environmental Air Sampling," performed January 17, 1990

QASR 90-004, "Environmental Sampling of Surface Water," performed January 17, 1990

QASR 90-023, "REMP - Biological Sample Analysis," performed February 22 and 26, 1990

QASR 90-025, "Radiological Environmental Monitoring Land Use Survey," performed February 22, 1990

- QASR 90-070, "REMP - Biological Sampling - Sediment Sampling, STPEGS Reservoir," performed June 19, 1990
- QASR 90-123, "REMP Biological Sampling," performed September 25, 1990
- QASR 90-181, "Environmental Radiological Laboratory - Land Use Census," performed November 29, 1990 and December 4-5, 1990
- QASR 91-012, "Environmental - REMP Biological Sampling," performed January 17, 1991
- QASR 91-015, "Environmental - Sampling of Surface and Ground Water," performed January 17, 1991
- QASR 91-017, "Environmental - REMP Air Sampling," performed January 23, 1991
- QASR 91-134, "Environmental - Environmental Sample Analysis," performed June 12, 1991
- QASR 91-222, "Environmental - Environmental Sample Analysis," performed November 22, 1991
- QASR 92-023, "Environmental - REMP Air Sampling," performed February 19, 1992
- QASR 92-024, "Environmental - Sampling of Surface Water," performed February 19, 1992