APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-498/94-05
50-499/94-05

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: Energy Development Complex
12301 Kurland Drive
Houston, Texas

STP Site, Bay City, Texas

Inspection Conducted: January 24-28, 1994

Inspectors: L. T. Ricketson, P.E., Senior Radiation Specialist
L. C. Carson II, Radiation Specialist

Approved: Blaine Murray 3/1/94
B. Murray, Chief, Facilities Inspection Programs Branch — Date

Inspection Summary

Areas Inspected (Units 1 and 2): Routine, announced inspection of the radiological environmental monitoring program, including audits and appraisals, changes, program implementation, meteorological monitoring program, internal quality assurance, and training and qualifications.

Results:

- The quality assurance audits of the radiological environmental monitoring program were thorough and conducted by qualified personnel (Section 1).
- The internal program reviews conducted annually by radiological laboratory personnel were a strength (Section 1).

- A violation involving two examples of failures to implement the corrective action program was identified (Sections 3 and 4).
- An excellent radiological environmental monitoring program was implemented (Sections 3 and 5).
- Several problems were experienced with the meteorological instruments (Section 4).
- Staff turnover was low and program personnel were well qualified (Sections 2 and 6).

Summary of Inspection Findings:

- Violation 498/9405-01; 499/9405-01 was opened (Section 3).

Attachment:

- Attachment - Persons Contacted and Exit Meeting

DETAILS

RADIOLOGICAL ENVIRONMENTAL MONITORING (84750)

The licensee's program was inspected to determine compliance with Technical Specifications 3.3.3.4, 4.3.3.4, 6.5.2.8, 6.8.1, 6.9.1.3, 6.14, and the requirements of 10 CFR Part 20, and agreement with the commitments of Chapter 13 of the Updated Final Safety Analysis Report and the recommendations of Regulatory Guides 1.23 and 4.15.

1 AUDITS AND APPRAISALS

The inspectors reviewed the 1992 and 1993 quality assurance audits performed on the Radiological Environmental Monitoring Program. The objectives of the audits were clearly defined and addressed. The audits were comprehensive and included recommendations for program improvement. A technical expert was included on the audit team for the 1992 audit. Auditors had experience in radiological environmental monitoring programs and/or health physics practices. Station Problem Reports were initiated to document, trend, and ensure corrective actions were taken in response to audit findings. No responses to the Station Problem Reports were required from the radiological laboratory staff, because corrective actions were taken at the time of the audit.

In addition to the quality assurance audits, the radiological laboratory personnel performed an annual, internal review of the radiological environmental monitoring program in accordance with Procedure OPRP10-ZL-0002, "Quality Assurance for the Radiological Laboratory." The inspectors reviewed the results of the reviews performed in 1992 and 1993. The 1993 review was the better of the two. It contained more detailed comments and also included recommendations for improvement from an experienced staff member. However, the review did not cover all items which step 5.1.1.1 of the procedure stated "should" be covered. Two items which were not addressed were "procedure compliance" and "status of collection/analysis commitments." Overall, the assessment was very good and, therefore, a positive management tool.

Another management tool used by the licensee was the monthly, documented observations of laboratory and worker practices by the Radiological Environmental Monitoring Program supervisor. The results of these observations were routed to the training department for evaluation and subsequent determination of training needs of the technicians.

The inspectors reviewed selected examples of the Radiological Environmental Monitoring Program Station Problem Reports, radiological laboratory Observation Reports, and Metrology Laboratory Condition Reports. The licensee discontinued using Radiological Laboratory Observation Reports in late 1992, because they were directed to use Station Problem Reports. Later, the Metrology Laboratory Condition Report was used as a lower-tier document for minor findings. The inspectors found that the licensee normally addressed Station Problem Reports and Radiological Laboratory Observation Reports in an appropriate manner.

2 CHANGES

The inspectors examined organization structure and personnel changes in the Radiological Environmental Monitoring Program. Since the previous inspection, the radiological laboratory section, which contains the Radiological Environmental Monitoring group, was established as a part of the new Metrology and Radiological Division, which was a part of the Technical Services Department. The radiological laboratory supervisor stated that the reorganization was a positive change and that it gave his group easier access to resources. The inspectors had no concerns with the Radiological Environmental Monitoring Program Section's ability to receive proper support.

A new Radiological Environmental Monitoring Program supervisor had been designated since the last inspection of the program. The former supervisor transferred to the site health physics staff. The inspectors reviewed the qualifications of the new Radiological Environmental Monitoring Program supervisor and determined that the individual met qualification requirements. The Radiological Environmental Monitoring Program group included three radiological laboratory technicians. The inspectors concluded that licensee staffing was appropriate, and staff turnover since the previous inspection was low.

Changes in equipment included the replacement of the primary meteorological instrumentation tower in December 1993 because of corrosion and instrument reliability problems.

3 RADIOLOGICAL ENVIRONMENT MONITORING PROGRAM IMPLEMENTATION

The inspectors reviewed the 1992 Annual Radiological Environmental Operating Report and the 1992 sample collection summary table and determined that the Radiological Environmental Monitoring Program was implemented as described in Table A5-1 of the Offsite Dose Calculation Manual. The inspectors toured laboratory facilities, visited selected sampling locations to observe licensee personnel collecting and processing samples, and reviewed sample tracking, and inhouse analysis. The inspectors determined that these portions of the program were properly conducted.

The inspectors reviewed the 1993 Land Use Census and determined that the licensee had appropriately assessed the land use around the facility and documented significant changes. The census report concluded that no changes in the Radiological Environmental Monitoring Program were necessary.

Although the 1993 edition of the Annual Radiological Environmental Operating Report was not due until May 1, 1994, the inspectors asked radiological laboratory personnel if there were anomalous findings or problem areas. Licensee personnel stated that no major problems had been encountered in obtaining and analyzing environmental samples. However, for the first time, cobalt-58 and cobalt-60 was detected in a weekly Radiological Environmental Monitoring Program air sample collected in an unrestricted area on March 27, 1993. In order to review the effectiveness of the licensee's feedback mechanism and corrective actions, the inspectors requested, for review, copies of the Station Problem Report and any other documents related

to this abnormal occurrence. The Radiological Environmental Monitoring Program supervisor was not able to provide a Station Problem Report on the Radiological Environmental Monitoring Program investigation; however, data relating to the Radiological Environmental Monitoring Program finding were provided. The air samples measured 0.002 picocuries/cubic meter (pCi/m3)(2E-15μCi/ml) cobalt-58 and 0.0016 pCi/m3 (1.6E-15μCi/ml) cobalt-60. The inspectors asked if the Radiological Environmental Monitoring Program group provided any followup or corrective actions. Licensee management explained that discussions were held among site effluents personnel, the radiological laboratory supervisors, and the manager of the Technical Services Department. However, the licensee could not provide documentation which fully addressed the cobalt-58 and cobalt-60 matter. The Radiological Environmental Monitoring Program supervisor provided radwaste effluent release data and a Station Problem Report written by site health physics personnel concerning an airborne containment release which licensee personnel believed was related to the elevated cobalt-58 and cobalt-60 sample results. Licensee management explained they planned to include the abnormal occurrence in the upcoming 1993 Annual Radiological Environmental Operating Report.

The inspectors reviewed the licensee's requirements to report items like the abnormal cobalt-58 and cobalt-60 measurements on a Station Problem Report. (Table A5-3 of the Offsite Dose Calculation Manual did not list reporting levels for cobalt as an airborne particulate.) Procedure OPGP03-ZX-0002, Revision 0, "Corrective Action Program [CAP]," Section 4.1, "Station Problem Report Initiation," stated, "Any person at STPEGS who identifies or becomes aware of a Condition Adverse to Quality (CAQ) SHALL promptly document the occurrence using an SPR Form."

In Addendum 3B of the station problem reporting procedure, under "Examples of Radiological Related Conditions That Constitute a CAQ," unexpected licensed material identified outside the restricted area and Radiologically Controlled Area were listed as examples of abnormal occurrences that required a Station Problem Report.

Technical Specification 6.8.1 states, in part, that written procedures shall be established, implemented, and maintained covering applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. Specifically, Regulatory Guide 1.33, Section 1(d) of Appendix A, lists administrative controls for procedure adherence. Licensee Procedure OPGP03-ZA-0010, "Plant Procedure Adherence," developed pursuant to Technical Specification 6.8.1, Section 4.1.1, states, in part, that procedures shall be strictly adhered to when performing plant activities. Regulatory Guide 1.33, Section 6(y), lists procedures for events such as abnormal releases of radioactivity. Regulatory Guide 1.33, Section 7(e), requires radiation protection procedures for the control of radioactivity and contamination for limiting materials released to the environment.

The inspectors concluded that Radiological Environmental Monitoring Program personnel chose to notify the technical service manager of an abnormal occurrence the first time cobalt-58 or cobalt-60 was identified in an unrestricted area instead of writing a Station Problem Report, the only appropriate document available to the Radiological Environmental Monitoring

Program group at the time of the event. The Radiological Environmental Monitoring Program group's failure to adhere to Procedure OPGP03-ZX-0003 and write a Station Problem Report to document the abnormal condition of identifying cobalt-58 and cobalt-60 in a Radiological Environmental Monitoring Program air sample on April 26, 1993, was identified as a violation of Technical Specification 6.8.1 (498/9405-01; 499/9405-01). A second example of a violation of Technical Specification 6.8 is discussed in Section 4.

On January 28, 1994, the technical services manager wrote Station Problem Report 940211 identifying that a Station Problem Report was not initiated to document the abnormal cobalt-58 and cobalt-60 results in the air sample. Subsequent to this inspection, the licensee provided a copy of Procedure OPG03-ZR-0039, "Radiological Environmental Monitoring Program." Section 4.5, "Anomalous Data," required Radiological Environmental Monitoring Program personnel to investigate and document detectable anomalies that met certain thresholds. However, the licensee had no specific threshold values for cobalt-58 and cobalt-60 in air samples.

4 METEOROLOGICAL MONITORING PROGRAM

Technical Specification 3.3.3.4 requires instrumentation for determining wind speed, wind direction, and vertical temperature difference. The inspectors and the meteorological instrumentation system engineer toured and observed the operation of meteorological instrumentation system. The meteorological instrumentation system was inspected at the 60-meter primary and 10-meter backup meteorological instrumentation towers. The required instrumentation was present and operational. The system engineer demonstrated the meteorological instrumentation systems operability at the meteorological instrumentation towers and at a remote data retrieval station. The inspectors reviewed the meteorological instrumentation system daily functional checks and weekly preventative maintenance checksheets.

Technical Specification 4.3.3.4 required that instrumentation for measuring the wind speed, wind direction, and vertical temperature difference be calibrated semiannually. Through a records review, the inspectors confirmed that calibrations of the primary and secondary meteorological instruments had been performed at the required frequency. The primary and backup meteorological instrumentation tower surveillance test and calibrations were performed in accordance with the following procedures:

- OPSP05-EM-0001, "Primary Meteorological System Calibration (60-Meter Tower)"

- OPSP05-EM-0002, "Backup Meteorological System Calibration (10-Meter Tower)"

Discussions about the meteorological instrumentation system's technical specification surveillances and calibrations were held with the system engineer and the cognizant instrumentation and controls supervisor. They explained that the primary meteorological instrumentation tower was replaced in December 1993 because of corrosion and instrument reliability problems. The instrumentation and controls supervisor gave the inspector a listing of

all maintenance activities that had occurred on the meteorological instrumentation towers since October 1987. The inspectors noted that there were a total of 357 activities listed.

The inspectors examined the meteorological instrumentation system Technical Specification semiannual surveillances performed March and August 1993. During the calibration of the primary meteorological instrumentation in March 1993, an instrumentation and controls technician found data points out of tolerance for the wind direction signal processors, transmitters, speed indicators, and recorders. The instrumentation and controls technician wrote a service request that documented the situation and directed attention to it. The inspectors noted that the technician's actions were appropriate. During the August 11, 1993 surveillance, instrumentation and controls technicians found 10 of 14 data points for the 10-meter Wind Direction Signal Processor 8131B were out of tolerance. Eight of 14 data points for the 10-meter Wind Direction Processor 8150B were found out of tolerance. Also, the instrumentation and controls technicians found data points on both the wind speed signal processors out of tolerance. The instruments were adjusted so that the readings were within tolerances, and no further actions were taken. Instrumentation and controls technicians neither wrote a service request to investigate out-of-tolerance data points nor did they write a Station Problem Report pursuant to the Corrective Action Procedure OPGP03-ZX-0002.

The inspectors discussed the meteorological instrumentation system surveillance findings with the system engineer and the instrumentation and controls supervisor. The inspectors asked if the system engineer reviewed the results of each meteorological instrumentation surveillance test. The system engineer stated that he reviewed the meteorological instrumentation system surveillances only if instrumentation and controls personnel identified that the calibration was unsuccessful. Because the instrumentation and controls technician was able to adjust the instrument to read within tolerances, the calibration was not considered to have been unsuccessful. Therefore, the system engineer was not informed. The system engineer stated that if he had been informed that the meteorological instrumentation was in an out-of-tolerance condition, he would have evaluated the operability of the meteorological instrumentation system and informed the users (Radiological Environmental Monitoring Program and radiological effluents groups) that the meteorological instrumentation system data validity was questionable.

The system engineer appeared to be the only linkage between instrumentation and controls personnel and the Radiological Environmental Monitoring Program or radiological effluents personnel who would use the meteorological information. Records of meteorological information were reviewed by a consulting meteorological expert who identified problems, such as missing or inconsistent information, and indicated areas in which backup or alternate information should be used to obtain the required 90 percent data recovery. However, there was no evidence to suggest that the consultant was capable of determining that the meteorological data was obtained from instrumentation which was out of calibration.

The inspectors asked the instrumentation and controls supervisor why the instrumentation and controls technicians did not write a service request as they did in March 1993 or a Station Problem Report as required by the corrective action procedure. The instrumentation and controls supervisor showed the inspectors that the meteorological instrumentation system surveillance procedures did not provide guidance as to what instrumentation and controls technicians had to do when meteorological instrumentation system instruments were found out of tolerance. The service request written after the March 1993 surveillance was fortuitous and evidently not motivated by any particular guidance.

Additionally, the supervisor believed that out-of-tolerance meteorological instruments were reviewed and tracked by an engineering trending group in accordance to Procedure OPGP03-ZM-0016, "Installed Plant Instrumentation Calibration Verification Program." However, the inspectors determined that Procedure OPGP03-ZM-0016 was not applicable to the meteorological instrumentation system surveillances.

Station Problem Report 932707 was written on September 15, 1993, to document reliability problems associated with the meteorological tower in August and September 1993. Although it referenced the calibration performed on August 11, 1993, it made no mention of the calibration points being found out of tolerance, and it did not address the implications of the condition, such as potential problems of offsite dose calculations being performed based on erroneous meteorological data. The corrective action determined to be appropriate by Station Problem Report 932707 was the replacement of the meteorological instrumentation with newer equipment.

Procedure OPGP03-ZX-0002, "Corrective Action Program," Revision 1, (implemented May 26, 1993), requires, in part, in Section 4.1, Station Problem Report instructions, "Any person at STPEGS who identifies or becomes aware of a Deficiency or a Significant Deficiency as specified in Section 1.2 shall write an SPR by following the directions on the SPR Form."

Technical Specification 6.8.1 states, in part, that written procedures shall be established, implemented, and maintained covering applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. Specifically, Regulatory Guide 1.33, Section 1(d) of Appendix A, requires administrative controls for procedure adherence. Licensee Procedure OPGP03-ZA-0010, "Plant Procedure Adherence," developed pursuant to Technical Specification 6.8.1, states in Section 4.1.1 that procedures shall be strictly adhered to when performing plant activities. Regulatory Guide 1.33, Section 7(h), requires meteorological monitoring procedures for the control of radioactivity and contamination for limiting materials released to the environment. Regulatory Guide 1.33, Section 8(b), requires specific procedures for surveillance tests, inspections, and calibrations.

The inspectors concluded that the instrumentation and controls technicians identified meteorological instrumentation system conditions adverse to quality during a quality-related process but did not write a Station Problem Report. The failure to follow Procedure OPGP03-ZX-0003 and initiate a Station Problem Report after finding out-of-tolerance data points on meteorological

instrumentation during technical specification surveillances on August 11, 1993, was identified as a second example of a violation of Technical Specification 6.8.1 (498/9405-01; 499/9405-01).

Station Problem Report 940212 was initiated by the instrumentation and controls supervisor on January 28, 1994, to document the fact that there was no administrative requirement to report or evaluate out-of-tolerance values from meteorological instruments calibrated in accordance with Surveillance Test OPSP05-EM-0001 and OPSP05-EM-0002.

5 ENVIRONMENTAL MONITORING QUALITY ASSURANCE PROGRAM

The inspectors reviewed selected procedures used by the radiological laboratory personnel and determined that they provided appropriate guidance. Procedures for laboratory activities followed the guidance of Regulatory Guide 4.15. Procedures were reviewed by qualified personnel such as the Radiological Environmental Monitoring Program supervisor.

In accordance with Procedure OPRP10-ZL-0002, "Quality Assurance for the Radiological Laboratory," the licensee performed an internal review of the program on an annual basis. The inspectors reviewed the results of the internal review performed in 1992 and 1993. The 1993 review was the better of the two. It contained much more detailed comments and included many recommendations for improvement. However, the review did not cover all items Step 5.1.1.1 of the procedures stated "should" be covered. Two items which were not addressed were "procedure compliance" and "status of collection/analysis commitments." Overall, the assessment was a positive management tool.

The inspectors noted that instrument logbooks were reviewed by supervisors as required by the quality assurance procedure. The number of quality control samples analyzed by the laboratory exceeded the required 20 percent.

The inspectors reviewed checks and calibrations of counting equipment and determined that they had been performed properly and at the required frequencies. Records documenting the traceability of reference sources to Nation Institute of Standards and Technology were properly maintained. Computer codes were verified annually.

The radiological laboratory participated in the Environmental Protection Agency's laboratory intercomparison program. Additionally, the laboratory participated in interlaboratory comparisons with the National Institute of Standards and Technology and the radiological laboratory of another nuclear facility and achieved good agreement in all programs.

6 TRAINING AND QUALIFICATIONS

The inspectors reviewed the education, experience, training, and qualifications of the Radiological Environmental Monitoring Program supervisory and technical staff. The inspectors found that the new Radiological Environmental Monitoring Program supervisor had a Bachelors of Science degree in chemistry and biology, plus 9 years of prior nuclear

chemistry and environmental experience. One of the radiological laboratory technicians recently received a Bachelors of Science degree in chemistry. Two of the radiological laboratory technicians received certifications from the National Registry of Radiation Protection Technologists. The inspectors concluded that the Radiological Environmental Monitoring Program staff was well qualified.

The inspectors reviewed radiological laboratory staff training plans and records and found that training was up to date. Professional staff members received relevant industry Radiological Environmental Monitoring Program training and attended seminars; however, such opportunities for technicians were lacking. The inspectors found that radiological laboratory technicians relied on reviews of Radiological Environmental Monitoring Program procedures to re-enforce training requirements. Discussions with the radiological laboratory and Radiological Environmental Monitoring Program supervisors revealed that, in addition to the technician reviews of the procedures, each technician was assigned specific procedures and was responsible for becoming the expert in those areas. The inspectors reviewed many radiological laboratory procedure review sheets and qualification checklist cards that were located in each Radiological Environmental Monitoring Program technician's training files. The inspectors concluded that the licensee's training and qualifications program was appropriate for the assigned responsibilities.

Conclusions

The quality assurance audits of the radiological environmental monitoring program were thorough and conducted by qualified personnel. The internal program reviews conducted annually by radiological laboratory personnel were a strength.

A reorganization placed the radiological laboratory under the supervision of the Metrology Laboratory Division Manager.

An excellent radiological environmental monitoring program and a strong internal quality assurance program were implemented. However, the failure of program personnel to follow some of the information gathered with a Station Problem Report resulted in the identification of a violation for failure to use the corrective action program appropriately.

Several problems were experienced with the meteorological instruments.

Meteorological instrumentation was calibrated at the required intervals. However, the failure of instrumentation and controls personnel to initiate a Station Problem Report concerning certain calibration findings resulted in a second example of a violation of failure to use the corrective action program appropriately.

Staff turnover was low and program personnel were well qualified.

ATTACHMENT

1 PERSONS CONTACTED

1.1 Licensee Personnel

*H. W. Bergendahl, Manager, Technical Services
*W. T. Cottle, Group Vice President
*T. H. Cloninger, Vice President, Nuclear Engineering
*J. Groth, Vice President, Nuclear Generation
D. M. Harris, Supervisor, Radiological Environmental Monitoring
V. Hart, System Engineer, Meteorological Tower
*S. M. Head, Consulting Engineer, Licensing
*W. P. Moran, Manager, Metrology and Radiological Laboratory
*P. E. Parrish, Senior Licensing Specialist
*F. F. Reed, Crew Supervisor, Instrumentation and Controls
*J. D. Sherwood, General Supervisor, Radiological Laboratory
D. Towler, Supervisor, Quality Assurance-Audits
G. E. Williams, Health Physicist, Radiological Laboratory

1.2 NRC Personnel

*D. Loveless, Senior Resident Inspector
*M. Satorius, Project Engineer
*C. E. Johnson, Reactor Inspector

*Denotes personnel that attended the exit meeting. In addition to the personnel listed, the inspector contacted other personnel during this inspection period.

2 EXIT MEETING

An exit meeting was conducted on January 28, 1994. During this meeting, the inspectors reviewed the scope and findings of the report. The licensee did not express a position on the inspection findings documented in this report. The licensee did not identify as proprietary, any information provided to, or reviewed by the inspector.