APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-498/87-01
50-499/87-01

Construction Permits: CPPR-128
CPPR-129

Dockets: 50-498
50-499

Licensee: Houston Lighting & Power Company (HL&P)
P. O. Box 1700
Houston, Texas 77001

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

Inspection At: South Texas Project, Matagorda County, Texas

Inspection Conducted: January 5-9, 1987

Inspector: J. Blair Nicholas 2/4/87
J. B. Nicholas, Senior Radiation Specialist Date
Facilities Radiological Protection Section

Approved: Blaine Murray 2/4/87
B. Murray, Chief, Facilities Radiological Protection Section Date

Inspection Summary

Inspection Conducted January 5-9, 1987 (Report 50-498/87-01; 50-499/87-01)

Areas Inspected: Routine, announced preoperational inspection of the licensee's chemistry/radiochemistry program including the review of outstanding open items in the following areas: organization and management controls, staffing and staff qualifications, training program, primary chemistry program, secondary chemistry program, primary chemistry sampling, secondary chemistry sampling, postaccident sampling system (PASS), facilities and equipment, analytical instrumentation, quality assurance (QA) program of chemistry/radiochemistry activities, and procedures.

Results: Within the areas inspected, no violations or deviations were identified. Eleven previously identified open items were reviewed and their status updated.

DETAILS

1. Persons Contacted

HL&P

*J. W. Loesch, Plant Superintendent
*J. E. Behm, Operations QA Lead Auditor
S. E. Citzler, Lead Chemistry Technician
*J. C. Dierickx, Chemical Support Supervisor
H. E. Dudley, Technical Training Supervisor
*B. A. Franta, Manager, Staff Training
*R. A. Gangluff, Chemical Analysis Supervisor
R. B. Garcia, Lead Chemistry Training Instructor
*S. M. Head, Lead Licensing Engineer, Project Compliance
*W. G. Isereau, Operations QA Audits/Surveillance Supervisor
R. A. Latch, Nuclear Chemist
R. L. Meier, Senior Chemistry Training Instructor
S. Parthasarathy, Operations Support Electrical Engineer
N. F. Walker, Communications Consultant
J. J. Woods, Nuclear Chemist
*T. E. Underwood, Manager, Chemical Operations & Analysis (CO&A)

Others

*D. D. Campbell, Startup Engineer - Bechtel
R. J. Hart, Startup Supervisor - Bechtel
*T. Reis, NRC Operations Resident Inspector

*Denotes those present during the exit briefing on January 9, 1987.

The NRC inspector also interviewed several other STP station personnel during the inspection.

2. Chemical Operation and Analysis Organization and Management Controls

The NRC inspector reviewed the licensee's organization and staffing regarding chemistry and radiochemistry activities to determine agreement with commitments in Section 13.1.2 of the Final Safety Analysis Report (FSAR).

The NRC inspector verified that the organizational structure of the CO&A division was as defined in the FSAR and STP procedures. The NRC inspector reviewed STP management control procedures and position descriptions for the assignment of responsibilities for the management and implementation of the STP secondary chemistry and primary chemistry programs. The duties and responsibilities of the CO&A staff were adequately described in approved procedures and position descriptions.

The NRC inspector reviewed the staffing of the chemical analysis section (CAS) and chemical support section (CSS) of the CO&A division and noted that all of the 29 staff positions approved for Unit 1 operation had been filled. Since the previous NRC inspection in August 1986, the CAS had added a senior chemistry technician and the CSS had added a nuclear chemist to their staffs. The number of chemical analysis and support personnel appeared to be sufficient to meet staffing requirements for the routine five shift rotation.

No violations or deviations were identified.

3. Chemical Analysis Section Personnel Qualifications

The NRC inspector reviewed the qualifications of the CO&A division staff in regard to the CAS and CSS to determine agreement with commitments in Section 13.1.3 in the FSAR and the recommendations of Regulatory Guides (RG) 1.8 and 4.15, and ANSI/ANS 3.1-1981.

The NRC inspector reviewed the resumes of the present CAS and CSS staff to determine if the members of the staff met the education and experience qualification recommendations for chemistry/radiochemistry personnel as outlined in ANSI/ANS 3.1-1981 and STP position descriptions. Based on the review of the CAS and CSS resumes, it was noted that the two CO&A supervisors, the two nuclear chemists, the five lead chemistry technicians, the six senior chemistry technicians, and the six chemistry technicians all met the ANSI/ANS 3.1-1981 and STP position descriptions qualifications. The seven associate chemistry technicians do not meet the experience requirements. The NRC inspector reviewed the CAS personnel shift assignments and determined that each of the five shifts had at least two persons on shift met ANSI/ANS 3.1-1981 qualifications.

The NRC inspector reviewed the on-the-job (OJT) qualification cards for selected CAS personnel. It was noted that not all of the lead chemistry technicians, senior chemistry technicians, chemistry technicians, and associate chemistry technicians presently on staff had completed all three phases of OJT qualification requirements.

Open Item 498/8624-01, Chemical Analysis Section Personnel Qualifications, will remain open pending the five lead chemistry technicians, the four senior chemistry technicians, and six chemistry technicians that were on site prior to August 1, 1986, completing phase III OJT qualification prior to initial criticality.

No violations or deviations were identified.

4. Chemical Analysis Section Training Program

The NRC inspector reviewed the licensee's CAS training program to determine agreement with commitments in Section 13.2.2.2 in the FSAR.

The licensee's training facility was inspected and found to include offices, classrooms, and a chemistry/radiochemistry laboratory and counting room which are to duplicate in many aspects the plant's chemistry laboratories and counting facility. The laboratory and counting room were not fully equipped with analytical equipment at the time of the inspection. The NRC inspector noted that the training laboratory had not established log books for each laboratory instrument as part of the laboratory training to be consistent with plant procedures.

The NRC inspector discussed the training program for CAS personnel with the two chemistry training instructors who had developed the CAS training program. The NRC inspector reviewed the changes, since the previous NRC inspection conducted in August 1986, to the interdepartmental training procedures and selected nuclear training department procedures which administer and implement the nuclear training program for CAS personnel. The NRC inspector also reviewed the recently developed PASS course plan and the training schedule for 1987. It was noted that PASS training is scheduled to be conducted in January 1987. Selected lesson plans for the phase III chemical analysis technician training program (CATTP) dealing with various aspects of radiochemistry were reviewed.

The NRC inspector reviewed selected CAS staff individual training records. The records indicated that two out of the six senior chemistry technicians had not completed the specialized chemical analysis technician training program (SCATTP) and 7 out of the 13 chemistry technicians had not completed phase III of the CATTP. It was determined that the 7 associate chemistry technicians had completed the CATTP phase III classroom training in September 1986, but had not received the CATTP phase III laboratory training.

Open Item 498/8624-02, Chemical Analysis Section Training Program, will remain open pending completion of CATTP phase III qualification training for all associate chemistry technicians onsite prior to August 1, 1986, before initial criticality.

No violations or deviations were identified.

5. Primary Chemistry Program

The NRC inspector reviewed the licensee's primary chemistry program to determine agreement with commitments in Section 5 in the FSAR and Section 3 in the proposed Technical Specifications (TS).

The NRC inspector reviewed the licensee's primary chemistry program and found that it appeared to agree with the FSAR and the proposed TS. It was noted that most of the administrative procedures, surveillance procedures, chemical control procedures, instrument calibration and quality control procedures, and analytical procedures had been completed and approved. The remaining procedures in the areas of administration, primary system chemical control, and analytical analysis which had been identified by the licensee were in the review process.

The NRC inspector reviewed selected primary chemistry procedures which had been written or revised since the previous NRC inspection of this area. The licensee had not completed a procedure for the preparation and quality control of nuclear instrument radioactive calibration standards traceable to the National Bureau of Standards (NBS). The NRC inspector reviewed the status of the primary chemistry in-line process instrumentation on the reactor coolant system, reactor water make-up storage tank, component cooling water system, and the boron recycle system. It was determined that some of the in-line process instruments had undergone startup testing but had not been calibrated or turned over to the nuclear plant operations division (NPOD). The licensee had not moved into the Unit 1 primary chemistry laboratory and had not installed instrumentation or furniture in the laboratory. Primary chemistry analytical procedures were being tested and verified using known standards and revised as needed.

Open Item 498/8624-03, Primary Chemistry Program, will remain open pending the completion of the following prior to initial criticality.

- Completion of all identified administrative procedures, primary chemistry system procedures, TS surveillance procedures, primary chemistry analytical procedures, instrument calibration procedures, and instrument quality control procedures.

- Completion of a detailed preparation procedure for all nuclear instrument radioactive calibration standards which are traceable to the NBS.

- Calibration of all primary chemistry in-line process instrumentation and primary laboratory analytical instrumentation and implementation of an approved instrument quality control program.

- Verification of all primary chemistry analytical procedures using known standards.

No violations or deviations were identified.

6. Secondary Chemistry Program

The NRC inspector reviewed the licensee's secondary chemistry program to determine agreement with commitments in Sections 9 and 10 in the FSAR and Section 3 in the proposed TS.

The NRC inspector reviewed the licensee's secondary chemistry program and found that it appeared to agree with the FSAR and proposed TS. The program development appeared to be on schedule and near completion. The NRC inspector noted that all the secondary analytical procedures had been completed, approved, and tested using known standards. The remaining procedures in the areas of chemical addition and secondary chemical process systems operation which had been identified by the licensee were in the review process.

The NRC inspector reviewed selected secondary chemistry procedures which had been written or revised since the previous NRC inspection of this area. The procedures appeared to be adequate to monitor and control the secondary chemistry program.

The licensee had moved into the make-up demineralizer (MUD) laboratory and the secondary chemistry laboratory and both laboratories were fully equipped and operational to support startup activities. The NRC inspector verified that all the analytical instrumentation in both laboratories had been calibrated and a quality control program had been implemented in accordance with STP procedures.

The licensee had approved procedures for the operation, calibration, and quality control of the secondary chemistry in-line process instrumentation. The NRC inspector verified that all the secondary chemistry in-line process instrumentation for STP Unit 1 had been installed and that startup testing and calibration was in progress.

Open Item 498/8624-04, Secondary Chemistry Program, will remain open pending the completion of the following prior to initial criticality.

- Completion of remaining secondary chemistry program procedures.
- Completion of calibration of all secondary chemistry in-line process instrumentation and the implementation of an instrument quality control program.

No violations or deviations were identified.

7. Primary Chemistry Sampling System

The NRC inspector reviewed the licensee's primary chemistry sampling system to determine agreement with commitments in Sections 9 and 11 in the FSAR and in Sections 3 and 6 in the proposed TS.

The NRC inspector inspected the STP Unit 1 primary chemistry sampling areas. The Unit 1 primary chemistry sample panels were installed and the grab sample valves and lines had been tested, verified, and flushed. The NRC inspector verified the startup test results. The licensee had traced and measured the primary chemistry sample lines as a basis for determining sample line purge times. The sample line purge times had been determined and the data were being incorporated into the appropriate sampling procedures. The licensee had not completed the procedure to operate the primary chemistry sample panel, ZLP-131, and obtain grab samples.

The licensee had not verified tank volumes for all potentially contaminated tanks and had not determined recirculation times to obtain representative samples. However, the licensee had written and approved the procedure, OTEPØ7-ZC-ØØØ1, "Determination of Tank Recirculation Time Test," Revision 0, December 9, 1986, to determine tank recirculation times

for primary chemistry and radwaste tanks. The NRC inspector reviewed the procedure and determined that it would be performed prior to initial criticality.

Open Item 498/8624-05, Primary Chemistry Sampling System, will remain open pending the completion of primary chemistry sampling procedures prior to STP Unit 1 fuel loading and completion of primary chemistry and radwaste tank recirculation times determinations prior to initial criticality.

No violations or deviations were identified.

8. Secondary Chemistry Sampling System

The NRC inspector reviewed the licensee's secondary chemistry sampling system to determine agreement with commitments in Section 10 in the FSAR and in Sections 3 and 6 in the proposed TS.

The NRC inspector inspected the STP Unit 1 secondary sampling areas for the water treatment systems, makeup demineralized water system, secondary support systems, and the Unit 1 secondary system including the condenser, condensate polishing system, and steam generators. The NRC inspector determined that all secondary chemistry sampling panels had been installed. The grab sample valves and lines had been tested, verified, and flushed for all sample lines except for four demineralizer cells in the condensate polishing system which had not been verified or flushed and put into service. The NRC inspector reviewed the startup test procedures and results. The licensee had not verified secondary chemistry tank volumes and had not determined sample line purge times to obtain representative samples. The licensee had not revised secondary chemistry system sampling procedures to incorporate sample line purge times and also to indicate which sample points have continuous recirculation.

Open Item 498/8624-06, Secondary Chemistry Sampling System, will remain open pending completion of the following prior to initial criticality.

- Completion of testing, verification, and flushing of the remaining condensate polishing system grab sample points.
- Determination of all secondary chemistry tank volumes and sample line purge times for each secondary chemistry sample point to produce a representative sample.
- Completion of approved sampling procedures and valve lineups for all the various secondary chemistry sampling panels and development and implementation of detailed sampling procedures for each secondary chemistry system to be sampled incorporating sample line purge times.

No violations or deviations were identified.

9. Postaccident Sampling System

The NRC inspector reviewed the licensee's PASS to determine agreement with commitments in Section 9.3.2 in the FSAR and the requirements in NUREG-0737, Item II.B.3.

The NRC inspector inspected the area in STP Unit 1 where the PASS was installed. The liquid and gas sample panel, PASS laboratory fume hood, and PASS control panels were installed and sample lines and ventilation ducts were connected. The PASS area construction was completed and turned over to NPOD for startup. The PASS system was under startup control, but had not undergone preoperational testing. The PASS in-line instrumentation was installed in the various PASS panels but had not been tested or calibrated. PASS operating procedures had been written and backup analytical procedures to the in-line analyzers had been written.

Open Item 498/8624-07, Postaccident Sampling System, will remain open pending the following to be completed prior to exceeding 5 percent power.

- Testing and calibration of the in-line analytical instrumentation and the implementation of a maintenance and quality control program on the PASS.
- Completion of theoretical and operational training of CAS technicians on the PASS.
- Checkout of system operation by performing trial runs using the sample transport devices and sample preparation laboratory facilities.
- Verification of system performance by collecting samples of reactor coolant and containment atmosphere under simulated accident conditions and performing required comparative analyses.

No violations or deviations were identified.

10. Facilities and Equipment

The NRC inspector inspected the facilities and equipment to be used by the CAS staff in performing their various chemistry support responsibilities. The following facilities were inspected at STP Unit 1: secondary chemistry laboratory, MUD laboratory, primary chemistry laboratory, radiochemistry counting room, chemistry sampling panels, PASS control room and laboratory, training chemistry laboratory, training counting room, and CAS personnel study area. At the time of the inspection, the secondary chemistry laboratory, MUD laboratory and CAS personnel study area were completed, fully equipped, and occupied for routine use. The chemistry sampling panels were installed and turned over to startup for testing. The PASS area construction was completed and the area turned over to NPOD but the PASS instrumentation was not calibrated and operational. The training laboratory and training counting room construction was completed

and the areas equipped with equipment for routine instruction. The radiochemistry laboratory construction was near completion and was scheduled to be turned over to NPOD from construction by the end of January 1987. Laboratory equipment and furniture will be installed during February and March 1987. The radiochemistry counting room construction was completed and the counting equipment had been moved into place and was ready for calibration and routine use.

Open Item 498/8624-08, Facilities and Equipment, will remain open until construction of all of the above named CAS work areas has been completed and the areas turned over to NPOD from construction for routine occupancy and use prior to initial criticality.

11. Chemistry/Radiochemistry Analytical Instrumentation and Quality Control

The NRC inspector reviewed the licensee's inventory of analytical equipment and supplies to be used in the laboratories and counting room. The type and quantity of analytical instrumentation purchased appeared to be adequate to perform the analyses specified in the FSAR and proposed TS. Analytical instruments had been moved into the MUD laboratory, secondary chemistry laboratory, and radiochemistry counting room leaving the primary chemistry laboratory the only space yet to be equipped with instrumentation.

The NRC inspector verified that the licensee had demonstrated operability of all the laboratory instrumentation in use and had calibrated and implemented a quality control program on the instrumentation to support startup activities. The NRC inspector reviewed the status of the radiochemistry counting room instrumentation calibration and quality control to determine agreement with the recommendations of ANSI N323-1978 and Regulatory Guide (RG) 4.15. At the time of the inspection, the primary chemistry laboratory instruments had not been calibrated and the radiochemistry counting room instruments were in the process of being initially calibrated. The licensee had not implemented a quality control program on radiochemistry counting instruments.

Open Item 498/8624-09, Chemistry/Radiochemistry Analytical Instrumentation, will remain open pending completion of the following prior to initial criticality.

- Placement of analytical instrumentation in the primary chemistry laboratory.
- Verification of operability and calibration of all analytical instrumentation in the laboratories and radiochemistry counting room.
- Implementation of an instrument quality control program for analytical instruments.

- Successful completion of radiochemistry confirmatory measurements on radiochemistry counting instrumentation.

No violations or deviations were identified.

12. Quality Assurance Program

The NRC inspector reviewed the licensee's internal audit/surveillance program regarding CAS activities to determine agreement with commitments in Section 17 in the FSAR, the requirements of 10 CFR Part 50, Appendix B, and the recommendations of ANSI N18.7-1976, and RGs 1.33, 1.144, 1.146, and 4.15.

The NRC inspector reviewed the changes to the QA department, selected QA audit and surveillance procedures, and interdepartmental procedures which direct QA audit and surveillance activities of the CO&A division. The audit and surveillance schedules for 1987 and 1988 were reviewed to determine that appropriate audits and surveillances of the CO&A division were being scheduled at the required frequency. The NRC inspector reviewed the qualifications of the QA auditors in the operations QA audit/surveillance section and of the technical specialist to be used as an audit team member on audits of the CO&A division. It was noted that all the auditors were lead auditor qualified in accordance with ANSI N45.2.23 and the technical specialist was qualified and knowledgeable in chemistry/radiochemistry procedures and activities. The NRC inspector determined that the licensee was making a strong effort to have a well qualified audit/surveillance staff.

The NRC inspector reviewed the audit summary plan for the audit of chemistry/radiochemistry activities which is scheduled for January 1987. At the time of the inspection, a detailed checklist for the audit had not been developed. The licensee was in the process of developing an audit summary plan for the audit of "Training & Qualification - Health & Safety Services and Chemistry Personnel."

The NRC inspector's review of the QA department activities, since the previous NRC inspection in August 1986, indicated that the licensee's audit/surveillance program is still in a stage of development and no audits or surveillances had been conducted of the CO&A division since August 1986.

Open Item 498/8624-10, Quality Assurance Program, will remain open pending completion of the following prior to initial criticality.

- Development and implementation of a comprehensive audit and surveillance program for CAS activities.

- Completion of detailed checklists.

- Completion of scheduled audits and surveillances of the CAS program and activities prior to initial criticality.

No violations or deviations were identified.

13. Procedures

The NRC inspector reviewed the licensee's CO&A division procedures to determine compliance with 10 CFR Part 20 requirements and agreement with recommendations contained in RGs 1.21, 1.33, 4.15; and ANSI N13.1-1969, N18.7-1976, and N323-1978.

The NRC inspector reviewed the plant general procedures, plant chemistry procedures, and plant surveillance procedures which direct the administration and operations of the CO&A division and CAS. The NRC inspector determined that the licensee had approved and issued 210 procedures (94 percent) out of 224 procedures identified for Unit 1 and common to both units. It was noted that the 14 procedures yet to be approved and issued were currently in the review process. The licensee's approved and identified procedures when implemented appear to meet the regulatory requirements and recommendations of those RGs and ANSI standards which are regarded as being necessary to effectively implement a chemistry/radiochemistry program. All approved CO&A procedures will be reviewed during future NRC inspections.

Open Item 498/8624-11, Procedures, will remain open until all identified Unit 1 and common CAS procedures have been completed and approved prior to initial criticality.

No violations or deviations were identified.

14. Routine and Emergency Facilities for the NRC Mobile Laboratory

The NRC inspector discussed with the licensee the installation of support electrical and telephone facilities for the NRC mobile laboratory, both onsite for routine inspections, and at the emergency operations facility (EOF) at the STP nuclear training center during radiological incident response activities. The licensee had installed electrical connections and a telephone modular connection at the EOF. The NRC inspector provided the licensee with six 115 volt 30 ampere twist-lock receptacles to be installed at the EOF and Unit 1 parking locations. The NRC inspector discussed several onsite locations with the licensee in close proximity to the entrance to the Unit 1 reactor building to accommodate easy access to the radiochemistry counting room. The licensee said they would evaluate a suitable parking location near Unit 1 and investigate how the electrical and telephone support requirements could be met.

15. Contractor Activities

The NRC inspector determined that the licensee was not using contractor personnel or laboratories to perform chemical or radiochemical analyses.

No violations or deviations were identified.

16. Exit Briefing

The NRC inspector met with the NRC operations resident inspector and the licensee's representatives identified in paragraph 1 of this report at the conclusion of the inspection on January 9, 1987. The NRC inspector discussed the scope and findings of the inspection. The NRC inspector stated that all open items should be resolved prior to initial criticality except for the PASS open item which must be resolved prior to Unit 1 exceeding 5 percent power. The licensee stated that they would review and evaluate the NRC inspector's findings and take action as necessary to resolve the identified open items.