ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-498/95-22
50-499/95-22

Licenses: NPF-76
NPF-80

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

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

Inspection At: Bay City, Texas

Inspection Conducted: August 28 through September 1, 1995

Inspectors: J. B. Nicholas, Ph.D., Senior Radiation Specialist
Facilities Inspection Programs Branch

G. L. Guerra, Radiation Specialist
Facilities Inspection Programs Branch

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

9/20/95
Date

Inspection Summary

Areas Inspected (Units 1 and 2): Routine, announced inspection of the licensee's water chemistry and radiochemistry programs including water chemistry and radiochemistry confirmatory measurements.

Results (Units 1 and 2):

- The organizational structure and staffing of the chemistry division met commitments and requirements. During the past 3 years, the chemistry division had experienced a low turnover of personnel. The chemistry division was fully staffed with qualified personnel. Effective chemistry department management controls were implemented. Chemistry division interactions with other station divisions and the presentations of chemistry related operational problems and concerns to station management were considered a strength (Section 1.1).

- An excellent chemistry division training program was implemented. Fourteen of the 20 shift chemistry technicians were fully qualified to perform independent chemistry sampling and analyses. The chemistry division had an adequate trained and qualified staff (Section 2.1).

- Excellent quality assurance audits of the chemistry program were performed. The audits were technically comprehensive and provided excellent program evaluation and management oversight. Excellent quality assurance surveillances were performed (Section 3.1).

- A good water chemistry program was implemented. The chemistry laboratory and analytical instrumentation were maintained satisfactorily. The licensee's performance in the water chemistry confirmatory measurements showed improved performance in the water chemistry confirmatory measurements area when compared with the results achieved during the previous inspection of this area (Section 4.1).

- An excellent radiological analytical measurement program was implemented. The licensee had properly calibrated and maintained state-of-the-art radiological counting instrumentation. The licensee's performance in the area of radiological confirmatory measurements was excellent and consistent with the high quality performance achieved during the previous NRC inspection of this area (Section 5.1).

Attachments:

- Attachment 1 - Persons Contacted and Exit Meeting
- Attachment 2 - Water Chemistry Confirmatory Measurements Results (Unit-1 Secondary Chemistry Laboratory)
- Attachment 3 - Water Chemistry Confirmatory Measurements Results (Unit-1 Primary Chemistry Laboratory)
- Attachment 4 - Water Chemistry Confirmatory Measurements Results (Unit-2 Secondary Chemistry Laboratory)
- Attachment 5 - Water Chemistry Confirmatory Measurements Results (Unit-2 Primary Chemistry Laboratory)
- Attachment 6 - Criteria for Comparing Water Chemistry Analytical Measurements
- Attachment 7 - Radiological Confirmatory Measurement Results (Unit-1 Chemistry Counting Room)
- Attachment 8 - Radiological Confirmatory Measurement Results (Unit-2 Chemistry Counting Room)

- Attachment 9 - Criteria for Comparing Radiological Analytical Measurements

DETAILS

1 ORGANIZATION AND MANAGEMENT CONTROLS (84750)

The inspectors reviewed the organization and staffing of the chemistry department to determine agreement with commitments in the Updated Safety Analysis Report and compliance with the requirements in Technical Specification 6.2.

1.1 Discussion

The inspectors reviewed the organizational structure and staffing of the chemistry operations and analytical division including staffing and organizational changes since the previous NRC inspection of this area conducted in June 1992. During the past 3 years, there were several personnel and organizational changes in the chemistry operations and analytical division. The most significant organizational change occurred in March 1994, when the chemistry operations and analytical division was divided into two divisions, the chemistry division and the chemical operations division. Personnel changes within the chemistry division were mainly due to staff reduction and the loss of several staff positions. There were only five new chemistry technicians during the past 3 years. This represented a low turnover of chemistry technician staff. The personnel changes had no negative effect on the performance of the chemistry program. The chemistry division was currently fully staffed and was directly responsible for the monitoring and controlling of chemistry parameters in the station's water systems and radiological effluent systems by collecting and analyzing samples in accordance with the Technical Specifications and Offsite Dose Calculation Manual requirements. The inspectors interviewed several chemistry supervisors and chemistry technicians and determined that they were familiar with the requirements of the station's chemistry program and that they maintained a high level of responsibility and performance. Staffing of the chemistry division was in accordance with the Updated Safety Analysis Report and Technical Specifications. Station administrative and chemistry division procedures were reviewed for the assignment of responsibilities for the management and implementation of the chemistry program. The inspectors determined that the duties and responsibilities specified in the station's procedures were being implemented, and the chemistry division activities were well managed.

The inspectors attended the daily morning meetings held by the chemistry division and health physics division managers with the chemistry and health physics supervisors who were responsible for the daily chemistry and health physics activities performed in Units 1 and 2. During these daily morning meetings, the chemistry and health physics supervisory staff briefed the chemistry division and health physics division managers on chemistry and health physics activities from the previous day and night and discussed the chemistry and health physics activities scheduled for the remainder of the day. The daily morning meetings were very informative to both divisions and

enabled the two divisions to interact and perform very well together. These daily morning meetings also provided necessary information to the two division managers which was presented and discussed at the station's general Plan of the Day meeting held each morning and attended by station management. The inspectors noted that much of the daily critical chemistry and health physics data from each unit was presented in daily reports for each unit and was presented to station management and discussed at the Plan of the Day meeting. The inspectors also noted that, each Tuesday during the Plan of the Day meeting, the chemistry division was given an opportunity to present to station management an update of chemistry division activities including chemistry related operational problems and/or concerns. These methods of interacting with other station operational divisions and informing station management of chemistry related operational problems and concerns was considered a strength.

It was noted that the chemistry supervisors and the chemistry division manager made frequent entries into the radiological controlled areas and the chemistry laboratory areas within Units 1 and 2. The inspectors determined that chemistry division management was providing adequate supervisory oversight of the chemistry daily activities.

1.2 Conclusions

The organizational structure and staffing of the chemistry division met the commitments in the Updated Safety Analysis Report and the requirements in the Technical Specifications. During the past 3 years, the chemistry division had experienced a low turnover of personnel. The chemistry division was fully staffed with qualified personnel. Chemistry division management controls were implemented in accordance with station procedures. Chemistry division interactions with other station operational divisions and the presentations of chemistry related operational problems and concerns to station management were considered a strength.

2 TRAINING AND QUALIFICATIONS (84750)

The inspectors reviewed the training and qualification program for chemistry division personnel to determine agreement with commitments in the Updated Safety Analysis Report and compliance with the requirements in Technical Specification 6.4.

2.1 Discussion

The inspectors reviewed the qualifications of the present chemistry division staff. It was determined that all but the 6 most recently hired chemistry technicians (hired in January 1994) met the qualification requirements of ANSI 18.1-1971, and that the remaining 14 shift chemistry technicians were fully shift qualified and had completed the chemistry division's initial training program requirements in accordance with the station's training division procedures. The 6 most recently hired shift chemistry technicians were in the process of completing the chemistry division's initial training program requirements. The chemistry division's training goal was to have all

chemistry technicians fully trained on all chemistry tasks. It was determined that the chemistry division had an adequate trained and qualified staff to meet shift staffing requirements.

The inspectors reviewed the training program for chemistry division personnel which included a review of the chemical analysis technician training and qualification program procedure and associated initial training program courses, the chemistry division's continuing training program, selected chemistry training lesson plans, the chemistry training instructors' qualifications, and selected individual chemistry technician qualification checkout cards and training records. The chemistry analysis technician training and qualification program was implemented and documented in accordance with the station's training division procedures. The licensee had developed a chemistry continuing training program which was effectively implemented by two experienced training instructors who took an active interest in the day-to-day operating chemistry program activities. The two chemistry training instructors were former qualified chemistry division personnel who were very familiar with the station's chemistry program. Each chemistry training instructor spends a minimum of 6 hours per month in the operating units to maintain familiarity with current chemistry activities, equipment, and instrumentation.

2.2 Conclusions

The licensee had developed and implemented excellent chemistry division initial and continuing training programs. Fourteen of the 20 shift chemistry technicians were fully qualified to perform independent chemistry sampling and analyses. The chemistry division had an adequate trained and qualified staff.

3 QUALITY ASSURANCE PROGRAM (84750)

The inspectors reviewed the quality assurance audit and surveillance programs regarding the chemistry program activities to determine agreement with the commitments in the Updated Safety Analysis Report and compliance with the requirements in Technical Specification 6.5.2.8.

3.1 Discussion

The inspectors reviewed the annual quality assurance audit schedules for 1992 through 1995. These schedules reflected a biennial audit schedule for the chemistry program. The audit schedules were in compliance with the Technical Specification's audit frequency requirement. The inspectors reviewed the quality assurance audit plans and reports for the chemistry program audits performed in 1992 and 1994 and the qualifications of the quality assurance auditors and technical specialists who performed the audits of the chemistry program.

The 1992 and 1994 quality assurance audit reports of the chemistry program were reviewed for scope, thoroughness of program evaluation, and timely followup of identified deficiencies. The audits were performed by qualified

auditors and technical specialists who were well qualified and knowledgeable of nuclear chemistry program activities at nuclear power generation facilities and in accordance with quality assurance procedures and schedules. The audits evaluated the implementation of the chemistry program by the auditors and technical specialists performing document reviews and performance based observations of chemistry technicians performing calibrations and quality control checks on various chemistry analytical and process instrumentation and performing routine chemistry activities. The audits generated several Deficiency Reports, which documented identified chemistry program deficiencies, and several programatic concerns and weaknesses. The inspectors reviewed the Deficiency Reports and the corrective actions to the identified deficiencies. The inspectors noted that corrective actions had been completed and that the Deficiency Reports were closed in a timely manner. The audits of the chemistry program were comprehensive and of excellent quality to evaluate the licensee's performance in implementing the chemistry program.

The inspectors reviewed performance based quality assurance surveillances which were performed periodically to monitor selected chemistry division activities. The inspectors determined that the operational quality assurance surveillances of the chemistry program were thorough and technically comprehensive and were conducted in sufficient depth to provide excellent evaluation of the licensee's compliance with Technical Specification and Offsite Dose Calculation Manual requirements.

3.2 Conclusions

Excellent quality assurance audits of the chemistry program were performed. The audits were technically comprehensive and provided excellent program evaluation and management oversight. Excellent quality assurance surveillances, which monitored chemistry program activities, were performed.

4 WATER CHEMISTRY CONTROL, CHEMICAL ANALYSIS, AND CONFIRMATORY MEASUREMENTS (84750)

The inspectors reviewed the water chemistry analysis program including facilities and equipment, implementation of the quality control program for chemical measurements, selected analytical procedures, and performed water chemistry confirmatory measurements to determine agreement with commitments in the Updated Safety Analysis Report and compliance with the requirements in Technical Specifications 3/4.4.7 and 6.8.3.c.

4.1 Discussion

The inspectors' review of the water chemistry program determined that the licensee had approved administrative procedures, surveillance procedures, chemical control procedures, sampling procedures, analytical instrument calibration and quality control procedures, and analytical procedures. A review of selected water chemistry procedures indicated that the licensee had established and implemented good water chemistry programmatic procedures that

met the commitments in the Updated Safety Analysis Report and the requirements in the Technical Specifications.

The inspectors inspected the Unit-1 and Unit-2 secondary and primary chemistry laboratories and the analytical instrumentation used by the chemistry staff for water chemistry analytical measurements and control. The chemistry laboratories were equipped with the necessary chemicals, reagents, and state-of-the-art analytical instrumentation to perform the required analyses to monitor the various water system chemical parameters. It was verified that instrument quality control and calibration standards were prepared from different standard stock solutions. The inspectors noted that new digital readout process instrumentation was installed in both the Unit-1 and Unit-2 secondary laboratories.

The inspectors reviewed selected chemistry analytical procedures and procedures for the operation, calibration, and quality control of the analytical instrumentation used for the analyses of the NRC water chemistry standards. It was verified that the chemistry laboratories analytical instruments were calibrated, and an instrument quality control program was implemented in accordance with licensee's procedures. Chemical standards and reagents were properly labeled, and none were found to be expired.

During the inspection, the inspectors provided prepared standard chemical solutions to the licensee for confirmatory measurement analyses. The standard solutions were prepared by the Oak Ridge National Laboratory, Analytical Chemistry Division, for the NRC. The NRC standards were analyzed by the licensee in both the secondary and primary chemistry laboratories in Unit-1 and Unit-2 using routine analytical methods and instrumentation. The analytical results of the chemical standards were used to verify the licensee's capability to monitor chemical parameters in the various station water systems with respect to Technical Specification requirements and industry standards. In addition, the chemical analyses of the NRC standards were used to evaluate the licensee's analytical procedures with respect to accuracy and precision.

The results of the water chemistry confirmatory measurement analyses and their comparison with the NRC's certified known analytical concentrations are listed for the secondary and primary chemistry laboratories in Unit-1 and Unit-2 in Attachments 2 through 5. Attachment 6 contains the criteria used to evaluate the analytical results.

The licensee's initial analytical results from the analyses performed in the secondary and primary chemistry laboratories indicated minor problems with the analyses for hydrazine and silica. The initial water chemistry analytical results indicated that 60 of the 66 analytical results compared (91 percent) were in agreement or qualified agreement when compared with the NRC's certified analytical concentrations using the criteria presented in Attachment 6. The following paragraphs discuss items identified during the water chemistry confirmatory measurements activities:

- The licensee's initial hydrazine low range concentration analytical results in both the Unit-1 and Unit-2 secondary laboratories were in disagreement. The analytical results were biased low (approximately 10 percent) indicating a possible dilution or instrument calibration problem. The licensee prepared a new NRC standard dilution of the low range concentration hydrazine standard and performed a retest hydazine analysis. The retest analytical results matched the first results and were still in disagreement. In addition to the licensee's preparation and retest of the NRC hydrazine standard, the licensee also prepared and analyzed two independent hydrazine standards supplied by a commercial vendor to the licensee for conducting their chemistry technician quality control and analytical performance evaluation program. These hydrazine standards were independent from the instrument calibration and/or quality control standards. The licensee's analytical results for the two independent hydrazine standards were within 4 percent of the known standard concentrations.

- The licensee's initial silica low range concentration analytical results in both the secondary and primary laboratories in both Unit-1 and Unit-2 were in disagreement. The analytical results were biased high (approximately 30 percent) indicating a possible contamination or instrument calibration problem. The licensee evaluated the high analytical result problem and determined that the reagent blank water was not contributing to the high silica results as first suspected. The licensee prepared a new NRC standard dilution for the low range silica concentration and performed a retest silica analysis. The retest analytical results matched the first results and were still in disagreement.

The licensee's final analytical results from the analyses performed in the secondary and primary chemistry laboratories in both Unit-1 and Unit-2, after performing retest analyses in an attempt to resolve the initial disagreements, indicated that **91 percent** of the compared analytical results were in agreement or qualified agreement with the NRC's certified analytical concentrations based on 66 analytical results compared.

The licensee's performance in the area of water chemistry confirmatory measurements showed an improved analytical performance in the secondary and primary chemistry laboratories when compared with the performance documented during the NRC inspection of this area in January 1990. The six analytical disagreements did not indicate any significant programmatic problems.

4.2 Conclusions

A good water chemistry program was implemented. The secondary and primary chemistry laboratories and analytical instrumentation were maintained satisfactorily. The licensee's performance in the water chemistry

confirmatory measurements showed improved performance in the water chemistry confirmatory measurements area when compared with the results achieved during the previous inspection of this area in January 1990.

5 RADIOLOGICAL CONFIRMATORY MEASUREMENTS (84750)

The inspectors reviewed the radiochemistry program including facilities and equipment, implementation of a quality control program for radiochemistry measurements, and performed radiological confirmatory measurements to determine agreement with commitments in the Updated Safety Analysis Report and compliance with the requirements in Technical Specifications 3/4.4.8 and 6.8.1, and the Offsite Dose Calculation Manual.

5.1 Discussion

The inspectors reviewed the radiochemistry analytical program and determined that the licensee had implemented satisfactory procedures to meet commitments in the Updated Safety Analysis Report, the Technical Specifications, and Offsite Dose Calculation Manual requirements.

The inspectors inspected the primary chemistry laboratories and the radiochemistry counting facilities in both Unit-1 and Unit-2 and determined that the licensee had sufficient state-of-the-art analytical instrumentation to perform the required radiochemistry analytical measurements. The inspectors verified that the two radiochemistry counting facilities instruments were properly calibrated and that a good quality control program was implemented. The inspectors accompanied and observed chemistry personnel collect and prepare for analysis a radioactive waste liquid sample from the Unit-1 Waste Monitor Tank D and a Unit-1 reactor coolant sample following a Unit-1 reactor trip. The sampling and preparation of the samples for analysis were performed in accordance with approved procedures.

It was observed during the sampling of the Unit-1 waste monitor tank at the sample sink, that the chemistry technician collected the monitor tank sample directly into a 1 liter Marinelli beaker for analysis and into a 250 milliliter bottle for the compositing requirement rather than into a sample collection container for transfer of the sample to the primary chemistry laboratory for sample preparation prior to analysis. The licensee explained that this technique was used to avoid the possibility of loosing isotopic radioactivity by deposition on the inside walls of the sample collection container, hence, not transferring the total isotopic radioactivity in the sample to the analysis counting geometry. However, it was observed that the 1 liter Marinelli beaker analysis counting geometry had a high risk of becoming contaminated on the outside surface during the sampling process, which adds radioactivity to the outside surface of the counting geometry. The inspectors noted that there was no "clean" water at the monitor tanks' sample sink for decontamination of the Marinelli beaker or the sample sink after sample collection. This observation was discussed with the licensee during the inspection and during the exit meeting on September 1, 1995. The licensee agreed to evalutate the technique used for sampling monitor tanks and the

possibility of installing "clean" water at the sample sink for decontamination purposes.

During the inspection, radiological confirmatory measurements were performed on split or duplicate samples analyzed by the chemistry department staff in each of the radiochemistry counting facilities located in Unit-1 and Unit-2, and analyzed by the inspectors in the Region IV mobile laboratory on site. The samples were analyzed by the licensee using routine methods and instrumentation.

Radiological confirmatory measurements were performed on the following samples:

- Unit-1 Spent Fuel Pool Inlet Sample (1 liter liquid Marinelli beaker)
- NRC Charcoal Cartridge Standard
- Particulate Filter Sample (Smear Sample)
- Chemical Volume Control System Inlet Gas Sample (15 cc serum vial)
- Reactor Coolant System Sample (20 ml scintillation vial)
- 1994 Capability Test Sample

The radiological confirmatory measurement tests consisted of comparing the analytical results from the licensee's radiochemistry counting instrumentation in both Unit-1 and Unit-2 with the NRC Region IV mobile laboratory's analytical results. The NRC Region IV mobile laboratory's measurements were referenced to the National Institute of Standards and Technology by laboratory intercomparisons.

The licensee maintained four high purity germanium detectors in each of the Unit-1 and Unit-2 radiochemistry counting facilities. At the time of the inspection, detectors 1, 3, and 4 in Unit-1 were being used routinely for isotopic analyses of radioactive samples. Detector 2 in Unit-1 was being calibrated and was not available for routine analyses of radioactive samples. In Unit-2 detectors 1, 2, 3, and 4 were being used routinely for isotopic analyses of radioactive samples. These detectors were used to demonstrate compliance with Technical Specification and Offsite Dose Calculation Manual requirements. Individual sample analytical results and their comparison with the NRC analytical results are tabulated in Attachment 7 for Unit-1 and Attachment 8 for Unit-2. The tabulated analytical results from the licensee's detectors in each radiochemistry counting facility are listed in the order designated in the sample table header.

The Unit-1 radiochemistry counting facility's isotopic analytical results from the samples listed in Attachment 7 showed 98 percent agreement with the NRC's isotopic analytical results based on 106 agreement results out of 108 total analytical results compared, and the Unit-2 radiochemistry counting facility's isotopic analytical results from the samples listed in Attachment 8 showed 98 percent agreement with the NRC's isotopic analytical results based on 160 agreement results out of 163 total analytical results compared. The criteria used to compare the analytical results is presented in Attachment 9. The

licensee's performance in the area of radiological confirmatory measurements was consistent with the high quality performance achieved during the previous NRC inspection of this area in June 1992.

The licensee performed radiological confirmatory measurements during the fall of 1994 on a quality assurance liquid capability test sample prepared by the NRC's reference laboratory, the Department of Energy's Radiological and Environmental Sciences Laboratory, in Idaho Falls, Idaho. The licensee's analytical results were compared to the sample's certified radionuclide activities and the results of the analytical results comparisons are presented in Attachments 7 and 8, as Sample 7. The analytical results for tritium, iron-55, strontium-89, and strontium-90 were in agreement.

5.2 Conclusions

An excellent radiological analytical measurement program was implemented. The licensee had properly calibrated and maintained state-of-the-art radiological counting instrumentation. The licensee's performance in the area of radiological confirmatory measurements was excellent and consistent with the high quality performance achieved during the previous NRC inspection of this area in June 1992.

ATTACHMENT 1

1 PERSONS CONTACTED

1.1 Licensee Personnel

*J. F. Groth, Vice President, Nuclear Generation
*G. L. Parkey, General Manager
J. E. Behm, Senior Quality Specialist, Quality Assurance
D. J. Bryant, Primary Plant Chemist
*W. J. Chatterton, Instrument Specialist, Chemistry
K. K. Coffey, Chemistry Supervisor
S. H. Daniel, Secondary Plant Chemist
*R. A. Gangluff, Chemistry Division Manager
*W. M. Gattis, Jr., Staff Specialist, Chemistry
P. M. Green, Chemistry Technician
S. M. Head, Compliance Supervisor, Licensing
S. D. Korenek, Staff Specialist, Chemistry
*R. E. Lockwood, General Supervisor Chemistry Programs
*R. E. Masse, Plant Manager, Unit-2
R. F. Mead, Senior Staff Specialist, Chemistry
*R. T. Ragsdale, Acting Chemistry General Supervisor, Unit-1
*K. W. Reynolds, Effluents Waste Manager
R. G. Strebeck, Chemistry Technician
S. J. Tanner, Chemistry Training Instructor
*K. J. Taplett, Licensing Engineering Consultant
P. J. Thorne, Chemistry Supervisor
*T. E. Underwood, Administrator, Participant Services
W. E. Veiock, Senior Staff Chemist
B. L. Whitmer, Health Physics General Supervisor, Unit-1
J. J. Woods, Senior Staff Chemist

1.2 NRC Personnel

*J. M. Keeton, Resident Inspector
*W. C. Sifre, Resident Inspector

In addition to the personnel listed above, the inspectors met and held discussions with other personnel of the licensee's staff during the inspection.

*Indicates those present at the exit meeting on September 1, 1995.

2 EXIT MEETING

An exit meeting was conducted on September 1, 1995. During this meeting, the inspectors reviewed the scope and findings of the inspection. 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 inspectors.

Attachment 2

WATER CHEMISTRY CONFIRMATORY MEASUREMENTS RESULTS

Unit 1 Secondary Chemistry Laboratory

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

NRC INSPECTION REPORT: 50-498/95-22; 50-499/95-22

1 Chloride Analysis (Ion Chromatography)

Sample	STP Results (ppm)	NRC Results (ppm)	STP/NRC Ratio	Comparison Decision
92A-20	19.53±0.34	19.42±0.54	1.01	Agreement
92B-59	37.27±0.62	36.49±1.12	1.02	Agreement
92C-36	78.00±1.18	77.01±2.59	1.01	Agreement

2 Sulfate Analysis (Ion Chromatography)

Sample	STP Results (ppm)	NRC Results (ppm)	STP/NRC Ratio	Comparison Decision
92A-20	19.47±0.25	19.42±0.26	1.00	Agreement
92B-59	39.27±0.50	38.83±0.60	1.01	Agreement
92C-36	77.47±1.61	79.34±1.73	0.97	Agreement

Attachment 2 (cont'd)

3 Hydrazine Analysis (UV-VIS Spectroscopy)				
Sample	STP Results (ppm)	NRC Results (ppm)	STP/NRC Ratio	Comparison Decision
92P-39	11.5±0.00	13.23±0.06	0.87	**Disagreement**
92Q-30	30.0±0.41	34.12±0.32	0.88	Agreement
92R-98	51.5±0.41	56.52±0.95	0.91	Agreement

4 Silica Analysis (UV-VIS Spectroscopy)				
Sample	STP Results (ppm)	NRC Results (ppm)	STP/NRC Ratio	Comparison Decision
92S-217	16.00±0.16	12.17±0.13	1.31	**Disagreement**
92T-5	29.37±0.19	28.36±0.36	1.04	Agreement
92U-240	61.28±0.16	60.14±0.99	1.02	Agreement

5 Sodium Analysis (Atomic Emmission - Flame)				
Sample	STP Results (ppm)	NRC Results (ppm)	STP/NRC Ratio	Comparison Decision
92J-178	4.90±0.00	5.32±0.18	0.92	Agreement
92K-249	10.67±0.24	10.2±0.3	1.05	Agreement
92L-173	16.00±0.00	15.5±0.4	1.03	Agreement

Attachment 3

WATER CHEMISTRY CONFIRMATORY MEASUREMENTS RESULTS

Unit 1 Primary Chemistry Laboratory

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

NRC INSPECTION REPORT: 50-498/95-22; 50-499/95-22

1 Chloride Analysis (Ion Chromatography)				
Sample	STP Results (ppm)	NRC Results (ppm)	STP/NRC Ratio	Comparison Decision
92A-20	20.20±0.28	19.42±0.54	1.04	Agreement
92B-59	37.53±0.25	36.49±1.12	1.03	Agreement
92C-36	77.20±1.72	77.01±2.59	1.00	Agreement

2 Sulfate Analysis (Ion Chromatography)				
Sample	STP Results (ppm)	NRC Results (ppm)	STP/NRC Ratio	Comparison Decision
92A-20	21.87±0.47	19.42±0.26	1.13	Qualified Agreement
92B-59	40.60±1.14	38.83±0.60	1.05	Agreement
92C-36	77.80±2.55	79.34±1.73	0.98	Agreement

Attachment 3 (cont'd)

3 Boron Analysis (Manitol Titration)

Sample	STP Results (ppm)	NRC Results (ppm)	STP/NRC Ratio	Comparison Decision
92D-7	1069±2	1049±11	1.02	Agreement
92E-109	3079±3	3038±36	1.02	Agreement
92F-83	5148±32	5062±80	1.02	Agreement

4 Lithium Analysis (Atomic Absorption - Flame)

Sample	STP Results (ppm)	NRC Results (ppm)	STP/NRC Ratio	Comparison Decision
92JJ-12	5.33±0.09	4.93±0.07	1.08	Agreement
92KK-55	12.43±0.09	12.4±0.2	1.00	Agreement
92LL-3	24.17±0.17	24.3±0.3	0.99	Agreement

5 Silica Analysis (UV-VIS Spectroscopy)

Sample	STP Results (ppm)	NRC Results (ppm)	STP/NRC Ratio	Comparison Decision
92S-7	16.27±0.05	12.17±0.13	1.34	**Disagreement**
92T-145	29.95±0.29	28.36±0.36	1.06	Agreement
92U-170	61.62±0.66	60.14±0.99	1.02	Agreement

Attachment 4

WATER CHEMISTRY CONFIRMATORY MEASUREMENTS RESULTS

Unit 2 Secondary Chemistry Laboratory

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

NRC INSPECTION REPORT: 50-498/95-22; 50-499/95-22

1 Chloride Analysis (Ion Chromatography)				
Sample	STP Results (ppm)	NRC Results (ppm)	STP/NRC Ratio	Comparison Decision
92A-20	19.47±0.50	19.42±0.54	1.00	Agreement
92B-59	37.87±0.82	36.49±1.12	1.04	Agreement
92C-36	79.60±1.49	77.01±2.59	1.03	Agreement

2 Sulfate Analysis (Ion Chromatography)				
Sample	STP Results (ppm)	NRC Results (ppm)	STP/NRC Ratio	Comparison Decision
92A-20	20.73±0.19	19.42±0.26	1.07	Agreement
92B-59	41.0±0.56	38.83±0.60	1.06	Agreement
92C-36	81.47±1.64	79.34±1.73	1.03	Agreement

Attachment 4 (cont'd)

3 Hydrazine Analysis (UV-VIS Spectroscopy)				
Sample	STP Results (ppm)	NRC Results (ppm)	STP/NRC Ratio	Comparison Decision
92P-39	11.67±0.94	13.23±0.06	0.88	**Disagreement**
92Q-30	32.33±0.85	34.12±0.32	0.95	Agreement
92R-98	52.67±0.24	56.52±0.95	0.93	Agreement

4 Silica Analysis (UV-VIS Spectroscopy)				
Sample	STP Results (ppm)	NRC Results (ppm)	STP/NRC Ratio	Comparison Decision
92S-217	15.97±0.05	12.17±0.13	1.31	**Disagreement**
92T-5	30.87±0.10	28.36±0.36	1.09	Qualified Agreement
92U-240	61.78±0.12	60.14±0.99	1.03	Agreement

5 Sodium Analysis (Atomic Emmission - Flame)				
Sample	STP Results (ppm)	NRC Results (ppm)	STP/NRC Ratio	Comparison Decision
92J-101	5.37±0.05	5.32±0.18	1.01	Agreement
92K-249	11.5±0.00	10.2±0.3	1.13	Qualified Agreement
92L-173	17.0±0.00	15.5±0.4	1.10	Agreement

Attachment 5

WATER CHEMISTRY CONFIRMATORY MEASUREMENTS RESULTS

Unit 2 Primary Chemistry Laboratory

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

NRC INSPECTION REPORT: 50-498/95-22; 50-499/95-22

1 Chloride Analysis (Ion Chromatography)				
Sample	STP Results (ppm)	NRC Results (ppm)	STP/NRC Ratio	Comparison Decision
92A-20	20.87±0.25	19.42±0.54	1.07	Agreement
92B-59	39.07±0.19	36.49±1.12	1.07	Qualified Agreement
92C-36	76.93±0.41	77.01±2.59	0.99	Agreement

2 Sulfate Analysis (Ion Chromatography)				
Sample	STP Results (ppm)	NRC Results (ppm)	STP/NRC Ratio	Comparison Decision
92A-20	21.87±0.47	19.42±0.26	1.13	Qualified Agreement
92B-59	40.93±0.52	38.83±0.60	1.05	Agreement
92C-36	79.80±0.33	79.34±1.73	1.01	Agreement

Attachment 5 (cont'd)

3 Boron Analysis (Manitol Titration)				
Sample	STP Results (ppm)	NRC Results (ppm)	STP/NRC Ratio	Comparison Decision
92D-1	1057±1	1049±11	1.01	Agreement
92E-35	3066±5	3038±36	1.01	Agreement
92F-25	5101±2	5062±80	1.01	Agreement

4 Copper Analysis (Inductively Coupled Plazma)				
Sample	STP Results (ppm)	NRC Results (ppm)	STP/NRC Ratio	Comparison Decision
92G-64	20.72±0.05	20.2±0.2	1.03	Agreement
92H-92	39.73±0.25	40.3±0.4	0.99	Agreement
92I-78	81.73±0.38	81.0±1.0	1.01	Agreement

5 Iron Analysis (Inductively Coupled Plazma)				
Sample	STP Results (ppm)	NRC Results (ppm)	STP/NRC Ratio	Comparison Decision
92G-64	20.20±0.24	19.9±0.2	1.02	Agreement
92H-92	39.20±0.16	39.8±0.4	0.98	Agreement
92I-78	82.67±0.25	79.5±0.7	1.04	Agreement

Attachment 5 (cont'd)

6 Lithium Analysis (Atomic Absorption - Flame)				
Sample	STP Results (ppm)	NRC Results (ppm)	STP/NRC Ratio	Comparison Decision
92JJ-12	5.67±0.09	4.93±0.07	1.15	Agreement
92KK-55	13.13±0.05	12.4±0.2	1.06	Agreement
92LL-56	23.77±0.12	24.3±0.3	0.98	Agreement

7 Silica Analysis (UV-VIS Spectroscopy)				
Sample	STP Results (ppm)	NRC Results (ppm)	STP/NRC Ratio	Comparison Decision
92S-7	16.20±0.36	12.17±0.13	1.33	**Disagreement**
92T-145	28.87±0.20	28.36±0.36	1.02	Agreement
92U-64	60.63±0.14	60.14±0.99	1.01	Agreement

Attachment 6

CRITERIA FOR COMPARING WATER CHEMISTRY ANALYTICAL MEASUREMENTS

The following are the criteria used in comparing the results of the capability tests and verification measurements. The criteria for the judgement limits was based on the data from Table 2.1 of NUREG/CR-5244, "Evaluation of Non-Radiological Water Chemistry at Power Reactors," applied to Oak Ridge National Laboratory data. Licensee values within the plus or minus two standard deviations range of the known values are considered to be in agreement. Licensee values outside the plus or minus two standard deviations range but within the plus or minus three standard deviations range of the know values are considered to be in **qualified agreement**. Licensee values greater than the plus or minus three standard deviations range of the known values are in **disagreement**. The standard deviations were computed using the average percent standard deviation values of each analyte in Table 2.1 of NUREG/CR-5244.

Analyte	Sample	Agreement Range	Qualified Agreement Range
Ammonia	92M	99.02 - 120.54	93.64 - 125.92
	92N	275.70 - 334.26	261.06 - 348.90
	92O	436.48 - 527.08	413.85 - 549.71
Boron	92D	1028 - 1070	1018 - 1080
	92E	2977 - 3099	2947 - 3129
	92F	4941 - 5183	4880 - 5244
Chloride	92A	18.0 - 20.8	17.3 - 21.5
	92B	34.2 - 38.8	32.9 - 40.0
	92C	70.7 - 83.4	66.0 - 84.6

Attachment 6 (cont'd)

Analyte	Sample	Agreement Range	Qualified Agreement Range
Chromium	92G	18.0 - 22.0	17.0 - 23.0
	92H	35.9 - 44.5	33.8 - 46.6
	92I	73.5 - 87.3	70.0 - 90.8
Copper	92G	18.3 - 22.1	17.3 - 23.1
	92H	36.0 - 44.6	33.9 - 46.7
	92I	74.2 - 87.8	70.8 - 91.2
Fluoride	92A	16.5 - 23.9	14.6 - 25.8
	92B	36.8 - 43.6	35.1 - 45.3
	92C	77.9 - 92.3	74.4 - 95.8
Hydrazine	92P	12.83 - 13.63	12.63 - 13.83
	92Q	29.96 - 38.28	27.88 - 40.36
	92R	52.00 - 61.04	49.74 - 63.3
Iron	92G	19.6 - 21.2	17.9 - 21.9
	92H	35.9 - 43.7	33.9 - 45.7
	92I	69.6 - 89.4	64.7 - 94.3
Lithium	92JJ	4.05 - 5.81	3.61 - 6.25
	92KK	10.9 - 13.9	10.1 - 14.7
	92LL	21.4 - 27.2	20.0 - 28.6

Attachment 6 (cont'd)

Analyte	Sample	Agreement Range	Qualified Agreement Range
Nickel	92G	18.6 - 21.2	17.9 - 21.9
	92H	36.6 - 43.4	35.0 - 45.0
	92I	77.1 - 82.9	75.7 - 84.3
Silica	92S	10.40 - 13.97	9.43 - 14.87
	92T	26.32 - 30.40	25.30 - 31.42
	92U	56.53 - 63.75	54.73 - 65.55
Sodium	92J	4.37 - 6.27	3.90 - 6.74
	92K	9.00 - 11.4	8.30 - 12.1
	92L	13.7 - 17.3	12.8 - 18.2
Sulfate	92A	17.5 - 21.3	16.5 - 22.3
	92B	35.8 - 41.8	34.4 - 43.2
	92C	70.9 - 87.7	66.7 - 91.9
Zinc	92X	----------	----------
	92Y	----------	----------
	92Z	----------	----------

Attachment 7

RADIOLOGICAL CONFIRMATORY MEASUREMENT RESULTS

Unit 1 Chemistry Counting Room

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

NRC INSPECTION REPORT: 50-498/95-22; 50-499/95-22

1 SPENT FUEL POOL INLET SAMPLE - (1 liter Marinelli Beaker)
Sampled: 13:15, CDT, August 28, 1995
Unit-1 Counting Room Detectors: 1, 3, and 4

Nuclide	STP Results (μCi/ml)	NRC Results (μCi/ml)	STP/NRC Ratio	Comparison Decision
Mn-54	1.758±0.283E-6	1.700±0.173E-6	1.03	Agreement
	1.787±0.248E-6		1.05	Agreement
	1.749±0.204E-6		1.03	Agreement
Co-57	2.255±0.202E-6	2.310±0.117E-6	0.98	Agreement
	2.379±0.219E-6		1.03	Agreement
	2.301±0.216E-6		1.00	Agreement
Co-58	3.153±0.012E-4	3.261±0.068E-4	0.97	Agreement
	3.316±0.013E-4		1.02	Agreement
	3.195±0.012E-4		0.98	Agreement
Co-60	4.660±0.042E-5	4.749±0.073E-5	0.98	Agreement
	4.816±0.044E-5		1.01	Agreement
	4.714±0.042E-5		0.98	Agreement

Attachment 7 (cont'd)

1 SPENT FUEL POOL INLET SAMPLE - (1 liter Marinelli Beaker) (cont'd)
Sampled: 13:15, CDT, August 28, 1995
Unit-1 Counting Room Detectors: 1, 3, and 4

Nuclide	STP Results (μCi/ml)	NRC Results (μCi/ml)	STP/NRC Ratio	Comparison Decision
Nb-95	8.197±2.444E-7	7.101±1.072E-7	1.15	Agreement
	9.932±2.906E-7		1.40	Agreement
	7.399±2.331E-7		1.04	Agreement
Sb-124	1.371±0.192E-6	1.639±0.097E-6	0.84	Agreement
	1.399±0.181E-6		0.85	Agreement
	1.515±0.173E-6		0.92	Agreement
Sb-125	1.751±0.689E-6	1.661±0.679E-6	1.05	Agreement
	1.844±0.703E-6		1.11	Agreement
	2.196±0.684E-6		1.32	Agreement
Cs-137	0.868±0.309E-6	1.029±0.159E-6	0.84	Agreement
	1.045±0.344E-6		1.02	Agreement
	0.628±0.270E-6		0.61	Agreement

Attachment 7 (cont'd)

2 NRC CHARCOAL CARTRIDGE STANDARD
Sampled: 11:00, CDT, August 29, 1995
Unit-1 Counting Room Detectors: 3 and 4

Nuclide	STP Results (μCi/Sample)	NRC Results (μCi/Sample)	STP/NRC Ratio	Comparison Decision
Co-57	1.735±0.024E-2	1.340±0.028E-2	1.29	Agreement
	1.662±0.024E-2		1.24	Agreement
Co-60	1.702±0.008E-1	1.456±0.022E-1	1.17	Agreement
	1.703±0.008E-1		1.17	Agreement
Sr-85	4.574±0.252E-3	4.302±0.149E-3	1.06	Agreement
	4.717±0.334E-3		1.10	Agreement
Y-88	3.372±0.044E-2	2.944±0.055E-2	1.15	Agreement
	3.400±0.044E-2		1.15	Agreement
Cd-109	5.371±0.067E-1	4.436±0.191E-1	1.21	Agreement
	5.240±0.069E-1		1.18	Agreement
Sn-113	2.011±0.047E-2	1.750±0.057E-2	1.15	Agreement
	1.958±0.048E-2		1.12	Agreement
Cs-137	1.612±0.001E-1	1.386±0.029E-1	1.16	Agreement
	1.615±0.001E-1		1.17	Agreement
Ce-139	8.501±0.234E-3	6.889±0.204E-3	1.23	Agreement
	8.203±0.225E-3		1.19	Agreement

Attachment 7 (cont'd)

2 NRC CHARCOAL CARTRIDGE STANDARD (cont'd)
Sampled: 11:00, CDT, August 29, 1995
Unit-1 Counting Room Detectors: 3 and 4

Nuclide	STP Results (μCi/Sample)	NRC Results (μCi/Sample)	STP/NRC Ratio	Comparison Decision
Hg-203	4.181±1.668E-4	2.458±0.790E-4	1.70	Agreement
	3.792±1.597E-4		1.54	Agreement

Attachment 7 (cont'd)

3 PARTICULATE FILTER SAMPLE - (SMEAR SAMPLE)
Sampled: 14:45, CDT, August 28, 1995
Unit-1 Counting Room Detectors: 1, 3, and 4

Nuclide	STP Results (μCi/Sample)	NRC Results (μCi/Sample)	STP/NRC Ratio	Comparison Decision
Cr-51	9.079±2.825E-4	9.524±2.341E-4	0.95	Agreement
	9.770±4.308E-4		1.03	Agreement
	8.457±3.752E-4		0.89	Agreement
Mn-54	5.419±0.377E-4	4.583±0.278E-4	1.18	Agreement
	4.761±0.622E-4		1.04	Agreement
	5.880±0.705E-4		1.28	Agreement
Co-58	1.910±0.017E-2	1.792±0.040E-2	1.07	Agreement
	2.002±0.028E-2		1.12	Agreement
	2.052±0.028E-2		1.15	Agreement
Co-60	2.117±0.053E-3	2.082±0.049E-3	1.02	Agreement
	2.113±0.080E-3		1.01	Agreement
	2.234±0.081E-3		1.07	Agreement
Nb-95	9.373±0.469E-4	8.903±0.402E-4	1.05	Agreement
	9.892±0.789E-4		1.11	Agreement
	8.790±0.787E-4		0.99	Agreement
Zr-95	4.751±0.513E-4	4.643±0.374E-4	1.02	Agreement
	5.020±0.800E-4		1.08	Agreement
	4.833±0.824E-4		1.04	Agreement

Attachment 7 (cont'd)

4 CVCS INLET GAS SAMPLE - (1 liter Marinelli Beaker)
Sampled: 09:05, CDT, August 28, 1995
Unit-1 Counting Room Detectors: 1, 3, and 4

Nuclide	STP Results (μCi/Sample)	NRC Results (μCi/Sample)	STP/NRC Ratio	Comparison Decision
Ar-41	2.033±0.167E-3	2.160±0.178E-3	0.94	Agreement
	1.927±0.228E-3		0.89	Agreement
	2.014±0.187E-3		0.93	Agreement
Kr-85m	8.330±0.643E-4	8.686±0.494E-4	0.96	Agreement
	8.588±0.613E-4		0.99	Agreement
	9.375±0.646E-4		1.08	Agreement
Kr-87	1.962±0.205E-3	1.603±0.274E-3	1.22	Agreement
	1.886±0.265E-3		1.18	Agreement
	1.985±0.244E-3		1.24	Agreement
Kr-88	2.020±0.184E-3	2.282±0.188E-3	0.89	Agreement
	2.019±0.176E-3		0.88	Agreement
	2.438±0.194E-3		1.07	Agreement
Xe-133	1.971±0.201E-3	1.716±0.110E-3	1.15	Agreement
	2.005±0.135E-3		1.17	Agreement
	1.996±0.146E-3		1.16	Agreement
Xe-135	5.232±0.116E-3	5.296±0.197E-3	0.99	Agreement
	5.034±0.107E-3		0.95	Agreement
	5.587±0.115E-3		1.05	Agreement

Attachment 7 (cont'd)

5 REACTOR COOLANT GAS SAMPLE - (15 cc Gas Vial)
Sampled: 09:12, CDT, August 30, 1995
Unit-1 Counting Room Detectors: 3 and 4

Nuclide	STP Results (μCi/cc)	NRC Results (μCi/cc)	STP/NRC Ratio	Comparison Decision
Ar-41	5.608±0.875E-4	4.289±0.303E-4	1.31	Agreement
	5.877±0.997E-4		1.37	Agreement
Kr-85m	1.932±0.138E-4	1.611±0.106E-4	1.20	Agreement
	1.849±0.164E-4		1.15	Agreement
Kr-87	No Peak Found	2.850±0.325E-4	----	---------
	No Peak Found		----	---------
Kr-88	3.918±0.502E-4	3.921±0.346E-4	1.00	Agreement
	3.951±0.700E-4		1.01	Agreement
Xe-133	5.697±0.286E-4	3.978±0.300E-4	1.43	Agreement
	5.550±0.296E-4		1.40	Agreement
Xe-135	1.190±0.025E-3	1.047±0.042E-3	1.14	Agreement
	1.192±0.026E-3		1.14	Agreement

Attachment 7 (cont'd)

6 REACTOR COOLANT SYSTEM SAMPLE - (20 ml Scintillation Vial) Sampled: 09:10, CDT, August 29, 1995 Unit-1 Counting Room Detectors: 1, 3, and 4				
Nuclide	STP Results (μCi/gm)	NRC Results (μCi/gm)	STP/NRC Ratio	Comparison Decision
Na-24	No Peak Found	3.778±0.226E-4	----	---------
	3.350±0.471E-4		0.89	Agreement
	3.587±0.401E-4		0.95	Agreement
Co-58	2.183±0.014E-2	0.342±0.009E-2	6.38	**Disagreement**
	0.362±0.010E-2		1.06	Agreement
	0.337±0.009E-2		0.99	Agreement
Nb-95	4.884±0.316E-4	1.048±0.096E-4	4.66	**Disagreement**
	0.998±0.326E-4		0.95	Agreement
	1.188±0.394E-4		1.13	Agreement
Nb-97	No Peak Found	3.488±1.796E-4	----	---------
	1.576±0.419E-4		0.45	Agreement
	1.496±0.461E-4		0.43	Agreement
I-132	No Peak Found	1.270±0.907E-3	----	---------
	1.184±0.066E-3		0.93	Agreement
	1.138±0.060E-3		0.90	Agreement
I-133	No Peak Found	3.908±2.426E-4	----	---------
	5.055±0.464E-4		1.29	Agreement
	5.377±0.501E-4		1.38	Agreement

Attachment 7 (cont'd)

6 REACTOR COOLANT SYSTEM SAMPLE - (20 ml Scintillation Vial) (cont'd)
Sampled: 09:10, CDT, August 29, 1995
Unit-1 Counting Room Detectors: 1, 3, and 4

Nuclide	STP Results (μCi/gm)	NRC Results (μCi/gm)	STP/NRC Ratio	Comparison Decision
I-134	No Peak Found	2.045±0.269E-3	----	---------
	2.671±0.157E-3		1.31	Agreement
	2.311±0.103E-3		1.13	Agreement
I-135	No Peak Found	1.145±0.061E-3	----	---------
	1.188±0.088E-3		1.04	Agreement
	0.993±0.090E-3		0.87	Agreement
Cs-138	No Peak Found	2.244±0.183E-3	----	---------
	2.139±0.264E-3		0.95	Agreement
	2.145±0.131E-3		0.96	Agreement

Attachment 7 (cont'd)

7 1994 CAPABILITY TEST SAMPLE Unit-1 (9407-NRC-11)				
Nuclide	STP Results (μCi/ml)	NRC Results (μCi/ml)	STP/NRC Ratio	Comparison Decision
H-3	3.23E-05	3.241E-05	0.99	Agreement
Fe-55	3.48E-05	4.647E-05	0.75	Agreement
Sr-89	3.01E-05	2.900E-05	1.04	Agreement
Sr-90	3.31E-06	3.426E-06	0.97	Agreement

The H-3 analyses were performed by the licensee's plant chemistry laboratory. The Fe-55, Sr-89, and Sr-90 analyses were performed by Yankee Atomic Electric Company Environmental Laboratory.

Attachment 8

RADIOLOGICAL CONFIRMATORY MEASUREMENT RESULTS

Unit 2 Chemistry Counting Room

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

NRC INSPECTION REPORT: 50-498/95-22; 50-499/95-22

1 SPENT FUEL POOL INLET SAMPLE - (1 liter Marinelli Beaker) Sampled: 13:15, CDT, August 28, 1995 Unit-2 Counting Room Detectors: 1, 2, 3, and 4				
Nuclide	STP Results (μCi/ml)	NRC Results (μCi/ml)	STP/NRC Ratio	Comparison Decision
Mn-54	2.138±0.262E-6	1.746±0.147E-6	1.22	Agreement
	1.855±0.220E-6		1.06	Agreement
	1.831±0.342E-6		1.05	Agreement
	1.656±0.260E-6		0.95	Agreement
Co-57	2.210±0.192E-6	2.454±0.135E-6	0.90	Agreement
	2.386±0.239E-6		0.97	Agreement
	2.132±0.235E-6		0.87	Agreement
	2.260±0.235E-6		0.92	Agreement
Co-58	3.195±0.013E-4	3.237±0.069E-4	0.99	Agreement
	3.258±0.014E-4		1.01	Agreement
	3.046±0.016E-4		0.94	Agreement
	3.189±0.016E-4		0.99	Agreement
Co-60	4.606±0.041E-5	4.863±0.078E-5	0.95	Agreement
	4.795±0.048E-5		0.99	Agreement
	4.395±0.053E-5		0.90	Agreement
	4.549±0.052E-5		0.94	Agreement

Attachment 8 (cont'd)

1 SPENT FUEL POOL INLET SAMPLE - (1 liter Marinelli Beaker) (cont'd)
Sampled: 13:15, CDT, August 28, 1995
Unit-2 Counting Room Detectors: 1, 2, 3, and 4

Nuclide	STP Results (μCi/ml)	NRC Results (μCi/ml)	STP/NRC Ratio	Comparison Decision
Nb-95	0.751±0.215E-6	0.814±0.169E-6	0.92	Agreement
	0.844±0.245E-6		1.04	Agreement
	1.042±0.295E-6		1.28	Agreement
	0.902±0.278E-6		1.11	Agreement
Sb-124	1.375±0.215E-6	1.846±0.138E-6	0.74	Agreement
	1.412±0.215E-6		0.76	Agreement
	1.403±0.223E-6		0.76	Agreement
	1.351±0.233E-6		0.73	Agreement
Sb-125	1.825±0.698E-6	2.333±0.577E-6	0.78	Agreement
	1.827±0.815E-6		0.78	Agreement
	1.328±0.906E-6		0.57	Agreement
	1.256±0.807E-6		0.54	Agreement
Cs-137	7.789±2.843E-7	8.262±2.252E-7	0.94	Agreement
	8.519±3.548E-7		1.03	Agreement
	6.040±3.680E-7		0.73	Agreement
	8.554±3.969E-7		1.04	Agreement

Attachment 8 (cont'd)

2 NRC CHARCOAL CARTRIDGE STANDARD
Sampled: 11:00, CDT, August 29, 1995
Unit-2 Counting Room Detectors: 1, 2, 3, and 4

Nuclide	STP Results (μCi/Sample)	NRC Results (μCi/Sample)	STP/NRC Ratio	Comparison Decision
Co-57	1.551±0.022E-2	1.377±0.029E-2	1.13	Agreement
	1.611±0.030E-2		1.17	Agreement
	1.547±0.033E-2		1.12	Agreement
	1.577±0.030E-2		1.15	Agreement
Co-60	1.624±0.009E-1	1.441±0.022E-1	1.13	Agreement
	1.602±0.010E-1		1.11	Agreement
	1.501±0.012E-1		1.04	Agreement
	1.613±0.011E-1		1.12	Agreement
Sr-85	4.654±0.368E-3	4.162±0.169E-3	1.12	Agreement
	4.402±0.382E-3		1.06	Agreement
	4.544±0.462E-3		1.09	Agreement
	4.524±0.387E-3		1.09	Agreement
Y-88	3.269±0.054E-2	2.861±0.056E-2	1.14	Agreement
	3.274±0.059E-2		1.14	Agreement
	3.087±0.065E-2		1.08	Agreement
	3.305±0.061E-2		1.16	Agreement
Cd-109	5.313±0.088E-1	4.762±0.197E-1	1.12	Agreement
	5.479±0.072E-1		1.15	Agreement
	5.443±0.102E-1		1.14	Agreement
	5.644±0.099E-1		1.19	Agreement

Attachment 8 (cont'd)

2 NRC CHARCOAL CARTRIDGE STANDARD (cont'd)
Sampled: 11:00, CDT, August 29, 1995
Unit-2 Counting Room Detectors: 1, 2, 3, and 4

Nuclide	STP Results (μCi/Sample)	NRC Results (μCi/Sample)	STP/NRC Ratio	Comparison Decision
Sn-113	1.960±0.058E-2	1.722±0.054E-2	1.14	Agreement
	1.910±0.061E-2		1.11	Agreement
	1.870±0.074E-2		1.09	Agreement
	2.018±0.071E-2		1.17	Agreement
Cs-137	1.561±0.012E-1	1.365±0.029E-1	1.14	Agreement
	1.558±0.012E-1		1.14	Agreement
	1.489±0.014E-1		1.09	Agreement
	1.574±0.013E-1		1.15	Agreement
Ce-139	8.180±0.260E-3	6.865±0.203E-3	1.19	Agreement
	7.921±0.285E-3		1.15	Agreement
	7.668±0.290E-3		1.12	Agreement
	7.980±0.281E-3		1.16	Agreement
Hg-203	3.776±2.028E-4	3.128±0.827E-4	1.21	Agreement
	4.316±2.143E-4		1.38	Agreement
	3.582±2.093E-4		1.15	Agreement
	3.447±2.067E-4		1.10	Agreement
Am-241	5.750±0.220E-2	5.933±0.208E-2	0.97	Agreement
	5.348±0.200E-2		0.90	Agreement
	6.052±0.231E-2		1.02	Agreement
	6.520±0.260E-2		1.10	Agreement

Attachment 8 (cont'd)

3 PARTICULATE FILTER SAMPLE - (SMEAR SAMPLE)
Sampled: 14:45, CDT, August 28, 1995
Unit-2 Counting Room Detectors: 1, 2, 3, and 4

Nuclide	STP Results (μCi/Sample)	NRC Results (μCi/Sample)	STP/NRC Ratio	Comparison Decision
Cr-51	1.129±0.434E-3	0.500±0.292E-3	2.26	Agreement
	0.991±0.461E-3		1.98	Agreement
	1.662±0.691E-3		3.32	**Disagreement**
	1.055±0.601E-3		2.11	Agreement
Mn-54	5.793±0.617E-4	4.368±0.434E-4	1.33	Agreement
	4.636±0.639E-4		1.06	Agreement
	4.839±0.909E-4		1.11	Agreement
	7.425±0.810E-4		1.70	**Disagreement**
Co-58	2.080±0.028E-2	1.828±0.036E-2	1.14	Agreement
	1.901±0.029E-2		1.04	Agreement
	1.997±0.034E-2		1.09	Agreement
	2.438±0.039E-2		1.33	Agreement
Fe-59	1.170±0.541E-4	1.342±0.721E-4	0.87	Agreement
	No Peak Found		----	---------
	1.614±0.738E-4		1.20	Agreement
	No Peak Found		----	---------
Co-60	2.210±0.081E-3	2.561±0.070E-3	0.86	Agreement
	2.065±0.083E-3		0.81	Agreement
	2.205±0.097E-3		0.86	Agreement
	2.514±0.111E-3		0.98	Agreement

Attachment 8 (cont'd)

3 PARTICULATE FILTER SAMPLE - (SMEAR SAMPLE) (cont'd)
Sampled: 14:45, CDT, August 28, 1995
Unit-2 Counting Room Detectors: 1, 2, 3, and 4

Nuclide	STP Results (μCi/Sample)	NRC Results (μCi/Sample)	STP/NRC Ratio	Comparison Decision
Nb-95	0.946±0.086E-3	0.941±0.057E-3	1.01	Agreement
	0.905±0.084E-3		0.96	Agreement
	0.891±0.106E-3		0.95	Agreement
	1.138±0.093E-3		1.21	Agreement
Zr-95	4.625±0.854E-4	4.477±0.558E-4	1.03	Agreement
	4.697±0.840E-4		1.05	Agreement
	4.745±1.035E-4		1.06	Agreement
	6.942±1.005E-4		1.55	Agreement

Attachment 8 (cont'd)

4 CVCS INLET GAS SAMPLE - (1 liter Marinelli Beaker)
Sampled: 09:05, CDT, August 28, 1995
Unit-2 Counting Room Detectors: 1, 2, 3, and 4

Nuclide	STP Results (μCi/Sample)	NRC Results (μCi/Sample)	STP/NRC Ratio	Comparison Decision
Ar-41	2.370±0.687E-3	1.618±0.340E-3	1.46	Agreement
	No Peak Found		----	---------
	No Peak Found		----	---------
	No Peak Found		----	---------
Kr-85m	9.946±0.968E-4	9.080±1.365E-4	1.10	Agreement
	8.081±1.253E-4		0.89	Agreement
	8.243±1.539E-4		0.91	Agreement
	6.995±1.519E-4		0.77	Agreement
Kr-88	2.295±0.423E-3	1.455±0.442E-3	1.58	Agreement
	2.120±0.735E-3		1.46	Agreement
	2.245±0.800E-3		1.54	Agreement
	1.510±1.190E-3		1.04	Agreement
Xe-133	2.069±0.145E-3	1.818±0.201E-3	1.14	Agreement
	1.976±0.138E-3		1.09	Agreement
	1.855±0.142E-3		1.02	Agreement
	1.819±0.140E-3		1.00	Agreement
Xe-135	5.704±0.141E-3	5.289±0.222E-3	1.08	Agreement
	5.376±0.166E-3		1.02	Agreement
	5.038±0.170E-3		0.95	Agreement
	5.173±0.177E-3		0.98	Agreement

Attachment 8 (cont'd)

5 REACTOR COOLANT GAS SAMPLE - (15 cc Gas Vial)
Sampled: 09:12, CDT, August 30, 1995
Unit-2 Counting Room Detectors: 1, 2, 3, and 4

Nuclide	STP Results (μCi/cc)	NRC Results (μCi/cc)	STP/NRC Ratio	Comparison Decision
Ar-41	4.875±0.924E-4	4.529±0.385E-4	1.08	Agreement
	4.893±0.549E-4		1.08	Agreement
	4.838±0.742E-4		1.07	Agreement
	4.260±0.456E-4		0.94	Agreement
Kr-85m	2.116±0.225E-4	1.906±0.211E-4	1.11	Agreement
	1.882±0.215E-4		0.99	Agreement
	1.749±0.138E-4		0.92	Agreement
	1.760±0.197E-4		0.92	Agreement
Kr-87	3.794±1.140E-4	2.963±0.512E-4	1.28	Agreement
	3.819±0.585E-4		1.29	Agreement
	4.161±0.943E-4		1.40	Agreement
	3.792±0.548E-4		1.28	Agreement
Kr-88	4.735±0.730E-4	3.699±0.697E-4	1.28	Agreement
	4.315±0.549E-4		1.17	Agreement
	4.052±0.492E-4		1.10	Agreement
	4.672±0.712E-4		1.26	Agreement
Xe-133	5.787±0.533E-4	3.733±0.503E-4	1.55	Agreement
	5.294±0.625E-4		1.42	Agreement
	4.582±0.261E-4		1.23	Agreement
	5.015±0.578E-4		1.34	Agreement

Attachment 8 (cont'd)

5 REACTOR COOLANT GAS SAMPLE - (15 cc Gas Vial) (cont'd) Sampled: 09:12, CDT, August 30, 1995 Unit-2 Counting Room Detectors: 1, 2, 3, and 4				
Nuclide	STP Results (μCi/cc)	NRC Results (μCi/cc)	STP/NRC Ratio	Comparison Decision
Xe-135	1.272±0.040E-3	1.038±0.047E-3	1.23	Agreement
	1.253±0.038E-3		1.21	Agreement
	1.194±0.027E-3		1.15	Agreement
	1.163±0.038E-3		1.12	Agreement

Attachment 8 (cont'd)

6 REACTOR COOLANT SYSTEM SAMPLE - (20 ml Scintillation Vial)
Sampled: 07:58, CDT, August 29, 1995
Unit-2 Counting Room Detectors: 1, 2, 3, and 4

Nuclide	STP Results (μCi/gm)	NRC Results (μCi/gm)	STP/NRC Ratio	Comparison Decision
Na-24	5.870±0.538E-4	6.134±0.425E-4	0.96	Agreement
	6.175±0.623E-4		1.01	Agreement
	5.600±0.735E-4		0.91	Agreement
	6.064±0.572E-4		0.99	Agreement
Co-58	3.737±0.492E-4	5.536±0.328E-4	0.68	**Disagreement**
	4.397±0.487E-4		0.79	Agreement
	4.957±0.590E-4		0.90	Agreement
	4.613±0.467E-4		0.83	Agreement
I-132	1.072±0.055E-3	1.020±0.744E-3	1.05	Agreement
	1.188±0.058E-3		1.16	Agreement
	1.190±0.081E-3		1.17	Agreement
	1.239±0.076E-3		1.21	Agreement
I-133	4.857±0.455E-4	3.623±2.772E-4	1.34	Agreement
	5.798±0.496E-4		1.60	Agreement
	5.049±0.499E-4		1.39	Agreement
	5.214±0.431E-4		1.44	Agreement
I-134	1.993±0.091E-3	1.713±0.226E-3	1.16	Agreement
	2.145±0.134E-3		1.25	Agreement
	2.011±0.271E-3		1.17	Agreement
	2.198±0.433E-3		1.28	Agreement

Attachment 8 (cont'd)

6 REACTOR COOLANT SYSTEM SAMPLE - (20 ml Scintillation Vial) (cont'd)
Sampled: 07:58, CDT, August 29, 1995
Unit-2 Counting Room Detectors: 1, 2, 3, and 4

Nuclide	STP Results (μCi/gm)	NRC Results (μCi/gm)	STP/NRC Ratio	Comparison Decision
I-135	1.023±0.081E-3	1.075±0.101E-3	0.95	Agreement
	1.126±0.093E-3		1.05	Agreement
	1.111±0.111E-3		1.03	Agreement
	1.113±0.106E-3		1.04	Agreement

Attachment 8 (cont'd)

7 1994 CAPABILITY TEST SAMPLE Unit-2 (9407-NRC-19)				
Nuclide	STP Results (μCi/ml)	NRC Results (μCi/ml)	STP/NRC Ratio	Comparison Decision
H-3	3.88E-05	3.707E-05	1.05	Agreement
Fe-55	3.85E-05	4.303E-05	0.89	Agreement
Sr-89	2.05E-05	1.727E-05	1.19	Agreement
Sr-90	2.69E-06	2.611E-06	1.03	Agreement

The H-3 analyses were performed by the licensee's plant chemistry laboratory. The Fe-55, Sr-89, and Sr-90 analyses were performed by Yankee Atomic Electric Company Environmental Laboratory.

Attachment 9

CRITERIA FOR COMPARING RADIOCHEMISTRY ANALYTICAL MEASUREMENTS

The following are the criteria used in comparing the results of capability tests and verification measurements. The criteria are based on an empirical relationship established through prior experience and this program's analytical requirements.

In these criteria, the judgement limits vary in relation to the comparison of the resolution.

$$\text{Resolution} = \frac{\text{NRC VALUE}}{\text{NRC UNCERTAINTY}}$$

$$\text{Ratio} = \frac{\text{LICENSEE VALUE}}{\text{NRC VALUE}}$$

Comparisons are made by first determining the resolution and then reading across the same line to the corresponding ratio. The following table shows the acceptance values.

RESOLUTION	AGREEMENT RATIO
< 4	0.40 - 2.50
4 - 7	0.50 - 2.00
8 - 15	0.60 - 1.66
16 - 50	0.75 - 1.33
51 - 200	0.80 - 1.25
> 200	0.85 - 1.18

The above criteria are applied to the following analyses:

(1) Gamma Spectrometry

(2) Tritium in liquid samples

(3) Iodine on adsorbers

(4) ^{89}Sr and ^{90}SR determinations

(5) Gross Beta where samples are counted on the same date using the same reference nuclide.