UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W., SUITE 2900
ATLANTA, GEORGIA 30323-0199

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Report Nos: 50-335/93-17 and 50-389/93-17

Licensee: Florida Power and Light Company
9250 West Flagler Street
Miami, FL 33102

Docket Nos.: 50-335 and 50-389 License Nos.: DPR-67 and NPF-16

Facility Name: St. Lucie 1 and 2

Inspection Conducted: July 12-16, 1993

Inspector: J R Decker for 8/2/93
R. P. Carrion, Radiation Specialist Date Signed

Approved by: J R Decker 8/2/93
T. R. Decker, Chief Date Signed
Radiological Effluents and Chemistry Section
Radiological Protection and Emergency Preparedness Branch
Division of Radiation Safety and Safeguards

SUMMARY

Scope:

This routine, announced inspection was conducted in the areas of the organization of the Chemistry Department and Radwaste Group, primary water chemistry, effluent release permits, status of the Unit 1 nitrogen system check valve installation, the Post Accident Sampling System (PASS), the Radiological Environmental Monitoring Program (REMP), the Annual Environmental Operating Report, the Refueling Water Tank (RWT) Leak, the Control Room Emergency Ventilation, radioactive waste shipping documentation, and contaminated sludge disposal.

Results:

The licensee's organization of its Chemistry Department and Radwaste Group satisfied Technical Specification (TS) requirements (Paragraph 2).

The licensee's plant water chemistry was maintained well within required TS limits (Paragraph 3).

The licensee's records for radioactive liquid and gaseous effluent releases were adequate (Paragraph 4).

The licensee was making progress in the upgrade of the Unit 1 nitrogen system to prevent future valve leakby potential with the installation of double check valves (Paragraph 5).

The licensee's PASS was capable of fulfilling its intended sampling function (Paragraph 6).

The licensee had an effective program in place to monitor radiological effluents, direct radiation, etc. due to plant operations. In 1992, plant operations caused minimum impact to the environment and virtually no dose to the general public from those effluents (Paragraph 7).

The Annual Environmental Operating Report for 1992 was well written and complied with applicable regulations (Paragraph 8).

The licensee acted expeditiously in identifying and patching the source of the RWT leak (Paragraph 9).

The licensee's Control Room Emergency Ventilation System was adequate for its intended function and it was maintained in compliance with the applicable TSs (Paragraph 10).

The licensee's radwaste shipping documentation was thorough and in compliance with the applicable regulations (Paragraph 11).

The licensee had proceeded in a prudent manner on the issue of contaminated sludge disposal (Paragraph 12).

# REPORT DETAILS

1. Persons Contacted

Licensee Employees

*H. Buchanan, Health Physics (HP) Supervisor
R. Cox, Chemistry Effluents Supervisor
*R. Dawson, Acting Plant Manager
*J. Dyer, Quality Control Supervisor
*R. Englmeier, Site Quality Manager
D. Faulkner, Primary Chemistry Supervisor
*R. Frechette, Chemistry Supervisor
*J. Geiger, Vice President, Nuclear Assurance
D. Harte, Nuclear Analyst
*L. McLaughlin, Licensing Manager
*K. Mohindru, JPN Manager
*S. Valdes, Acting Technical Manager
*J. West, Operations Supervisor

Other licensee employees contacted during this inspection included technicians and administrative personnel.

Florida Department of Health and Rehabilitative Services (DHRS)

V. Mangold, Public Health Physicist II

Nuclear Regulatory Commission (NRC)

*S. Elrod, Senior Resident Inspector
M. Scott, Resident Inspector

*Attended exit interview

Acronyms and Initialisms used throughout this report are listed in the last paragraph.

2. Organization (84750 and 86750)

Technical Specification (TS) 6.2 describes the licensee's organization.

The inspector reviewed the licensee's organization, staffing levels, and lines of authority as they related to the Chemistry Department and Radioactive Waste Group to verify that the licensee had not made organizational changes which would adversely affect the ability to control radiation exposures or radioactive material.

There had been no structural changes in the Chemistry Department since the previous inspection. However, the Supervisor of Secondary Chemistry, who had been temporarily transferred to the Unit 1 Outage Management Group during the outage, had returned to assume his normal duties and the senior technician who had been "acting" in his absence

had returned to his normal duties. In addition, one technician had left the staff and been replaced by a technician from the Chemistry Department of the licensee's sister nuclear plant at Turkey Point.

There had been no changes in the Radwaste Group since the last time this area was reviewed. (Refer to Inspection Report (IR) 50-335, 389/93-09, Paragraph 2.)

The inspector concluded that the licensee's organization in the areas of Chemistry and Radioactive Waste satisfied the requirements of the TS.

No violations or deviations were identified.

3. Plant Primary Water Chemistry (84750)

During the inspection, St. Lucie Units 1 and 2 were both operating at one hundred percent power. Unit 1 was in its twelveth fuel cycle and Unit 2 was in its seventh fuel cycle. The recent Unit 1 refueling outage was completed in late May. The next Unit 2 refueling outage was scheduled to begin in February 1994 and the next Unit 1 refueling outage was scheduled to begin in October 1994.

The inspector reviewed the plant chemistry controls and operational controls affecting primary plant water chemistry since the last inspection in this area. TS 3.4.7 specifies that the concentrations of dissolved oxygen (DO), chloride, and fluoride in the Reactor Coolant System (RCS) be maintained below 0.10 parts per million (ppm), 0.15 ppm, and 0.10 ppm, respectively. TS 3.4.8 specifies that the specific activity of the primary coolant be limited to less than or equal to 1.0 microcuries/gram ($\mu$Ci/g) dose equivalent iodine (DEI).

These parameters are related to corrosion resistance and fuel integrity. The oxygen parameter is established to maintain levels sufficiently low to prevent general and localized corrosion. The chloride and fluoride parameters are based on providing protection from halide stress corrosion. The activity parameter is based on minimizing personnel radiation exposure during operation and maintenance.

Pursuant to these requirements, the inspector reviewed daily summaries for both units which correlated reactor power output to chloride, fluoride, and dissolved oxygen concentrations, and specific activity of the reactor coolant. For Unit 1, the period of April 1, 1993 through July 12, 1993 was reviewed and the parameters were determined to have been maintained well below TS limits. Typical values for DO, chloride, and fluoride were less than five parts per billion (ppb), less than four ppb, and six ppb, respectively. The inspector noted an increase in the fluoride concentration for the period of June 18 to July 8, to values of about 25 ppb. Discussions with the licensee determined that the increase was due to a residual inventory of fluoride in the demineralizers. When an ammonia addition was made to the system, the more-weakly held fluoride ions were dislodged from the resin matrix of the demineralizer, thereby increasing the concentration of free fluoride

ions in the RCS. When the old resin was replaced by new resin, the fluoride concentrations dropped to less than four ppb. Similarly, for Unit 2, the period of April 1, 1993 through July 12, 1993 was reviewed and the parameters were also determined to have been maintained well below TS limits. Typical values for DO, chloride, and fluoride were less than five ppb, less than four ppb, and less than four ppb, respectively. A similar situation as described for Unit 1 (above) occurred in Unit 2 from before April 1 to May 9, at which time the demineralizer resin was replaced and the concentrations dropped to less than four ppb. Typical DEI values at steady-state conditions ranged from 2.61E-3 $\mu$Ci/g to 1.02E-2 $\mu$Ci/g for Unit 1 and from 5.27E-3 $\mu$Ci/g to 3.48E-2 $\mu$Ci/g for Unit 2. Neither unit had shown any evidence of leaking fuel.

The inspector concluded that the Plant Water Chemistry was maintained well within the TS requirements.

No violations or deviations were identified.

4. Effluent Processing and Monitoring (84750)

Radiation monitoring instrumentation is required to monitor and control the release of radioactive materials during normal and abnormal plant conditions, including effluents during normal effluent releases. The alarm/trip setpoints for the effluent monitors are calculated to ensure that the alarm/trip will occur prior to exceeding the limits of 10 CFR 20.

a. Release Permit Review

TSs 3.11.1 and 3.11.2 define the requirements for liquid and gaseous effluent concentrations, doses and dose rates, and waste treatments released to Unrestricted Areas. These requirements are intended to ensure that the limits of 10 CFR 20 and 10 CFR 50 are satisfied. TSs 4.11.1 and 4.11.2 define the surveillance requirements for the sampling and analysis program. Permits from both units were included, from the period since the last inspection in April 1993. The inspector reviewed three randomly-selected Liquid Release Permits (1-93-34, 1-93-39, and 1-93-40) and four randomly-selected Gaseous Release Permits (1-93-23, 1-93-28, 2-93-37C, and 2-93-46) to verify compliance. The permits included both release information and projected dose calculations and were found to be complete, including the identification of the source of the release, the activity released (identified by isotope), and the volume of the effluent discharged.

b. Records Review

TS 6.10.2.e requires that the licensee retain records of liquid and gaseous releases to the environment "for the duration of the unit Operating License." The inspector went to the licensee's Document Control Vault and requested the records for Unit 1

gaseous releases for the arbitrarily-chosen periods of May 1976 (76-3 and 76-5), and the first quarter of 1986 (1-86-01 and 1-86-04), and liquid releases for the second quarter of 1976 (76-1, 76-8, 76-25, and 76-26), the second quarter of 1977 (77-27 and 77-31), mid-1979 (79-12, 79-20, and 79-23), and mid-1986 (86-73, 86-74, and 86-86). The documents were produced (via microfiche) for the inspector's review in a timely manner. The records were complete, satisfying regulatory requirements.

The inspector concluded that the licensee's records for radioactive liquid and gaseous effluent releases were available.

No violations or deviations were identified.

5. Check Valve Installation Status (84750)

Due to two similar unplanned releases via leakby of the nitrogen supply valve, the licensee had decided to install a double check valve on the nitrogen supply line to the Unit 1 Reactor Auxiliary Building (RAB) identical to that of Unit 2 to prevent back flow from the potentially radioactive RAB to the Secondary Plant side of the nitrogen system. (The installation would bring the Unit 1 design to a par with the Unit 2 design, which had incorporated the double check valve into its original design. Refer to Paragraph 7 of IR 93-09.) The design change will be executed per the Plant Change Modification (PCM) process. Originally, the licensee had hoped that the work could be done during the recent Unit 1 refueling outage. However, due to planning/scheduling constraints, this was not possible. The licensee currently plans to execute the check valve installation via PCM-142-193, which was in the procurement cycle on an expedited basis. Upon receipt of the valves on site, they would be installed at the earliest opportunity but no later than the next scheduled Unit 1 refueling outage.

The inspector concluded that the licensee was taking appropriate action to upgrade the nitrogen system to prevent future valve leakby potential by the installation of the double check valves.

No violations or deviations were identified.

6. Post Accident Sampling System (PASS) (84750)

NUREG-0737 requires that the licensee be able to obtain a sample of the reactor coolant and containment atmosphere. Furthermore, the sample must be promptly obtained and analyzed (within three hours total) under accident conditions without incurring a radiation exposure to any individual in excess of 3 and 18 3/4 rem to the whole body and/or extremities, respectively.

TS 6.8.4.e requires that a program be established, implemented, and maintained to ensure the capability to obtain and analyze, under accident conditions, reactor coolant, radioactive iodines and particulates in plant gaseous effluents, and containment atmosphere

samples. The PASS should provide these capabilities and should enable the licensee to obtain information critical to the efforts to assess and control the course and effects of an accident.

a. PASS Operability

The inspector reviewed the most recent PASS operability log sheets for both units and discussed the results with the Primary Chemistry Supervisor. The operability tests had been performed within the required six-month time limits, on March 17, 1993, for Unit 1 and May 6, 1993 (and a retest for oxygen and boron on June 14, 1993). A comparison of six parameters (pH, boron, dissolved oxygen, and dissolved hydrogen concentrations, gross activity, and I-131 activity) of the daily-analyzed RCS sample to the readings taken from the PASS satisfied the acceptance criteria of both units.

b. Topical Report CEN-415

The licensee had received a response, dated April 12, 1993, from the NRC review and evaluation of the Combustion Engineering Owners Group (CEOG) Topical Report CEN-415, Rev. 1, "Modification of Post Accident Sampling System Requirements," examined NUREG-0737, II.B.3, "Clarification of TMI Action Plan Requirements," and how those requirements were met by the PASS. (Refer to Paragraph 5 of IR 92-22.) The report identified alternative methods of meeting the intent of those requirements. The proposed alternative methods would employ existing safety-grade equipment and take credit for analyses performed in the FSAR. It was noted that many of the required functions were done in a more timely manner by the safety-grade systems than by the PASS. (For example, the reactor vessel level monitoring system and vessel head vent provided the operator with the capability to monitor the reactor vessel water level on a real-time basis and a means of ensuring that the core remained covered during and after an accident.) The use of those systems formed the basis for meeting several of the requirements of NUREG-0737, II.B.3 while de-emphasizing the use of the PASS. The report addressed numerous elements of the PASS (RCS pH, containment hydrogen, RCS hydrogen/total gas, RCS oxygen, etc.), and reviewed their specific requirements, purpose, the proposed modification, and the justification for the modification. The report concluded that adoption of the proposed modifications not only met the intent of the NUREG, but would provide improved accuracy of some parameters (e.g. the RCS hydrogen and core damage assessment via the containment atmosphere). In addition, a reduction in worker dose would be realized due to the diminished maintenance requirements of the PASS as increased reliance on plant instrumentation became the standard.

As a result of the evaluation, the NRC had given limited approval to the Topical Report and defined the basis for that approval. Topics of the Topical Report which were approved included: the

measurement of reactor coolant pH, the measurement of containment hydrogen concentration, the heat tracing of sample lines, the analysis of reactor coolant oxygen, and the sample point requirements. Two topics were determined not to meet the guidelines of Section II.B.3 of NUREG-0737 and, therefore, were not approved, including: the use of hydrogen/total gas measurements as a backup (rather than primary) method for the determination of conditions in the reactor vessel, and a modification to consider the time requirements for performing the PASS analyses to be only a recommendation (and allow PASS sampling results to be obtained any time during an accident). The evaluation did note that the time requirement may undergo some changes, subject to Commission approval.

The inspector concluded that the PASS was capable of fulfilling its intended sampling function.

No violations or deviations were identified.

7. Radiological Environmental Monitoring Program (REMP) (84750)

TSs 3/4.12.1 specify that the licensee shall conduct a Radiological Environmental Monitoring Program to monitor radiation and radionuclides in the environs of the plant and define how the program shall be conducted. The REMP shall provide representative measurements of radioactivity in the highest potential exposure pathways and verification of the accuracy of the effluent monitoring program and modeling of environmental exposure pathways. Accumulation of radioactivity in the environment can thereby be measured and trends can be assessed to determine whether the radioactivity resulted from plant operations and to project the potential dose to offsite populations based on the cumulative measurements of any plant-originated radioactivity, as well as to detect unanticipated pathways for the transport of radionuclides through the environment. The St. Lucie Nuclear Plant Environmental Monitoring Program is designed to detect the effects, if any, of plant operation on environmental radiation levels by monitoring airborne, waterborne, ingestion, and direct radiation pathways in the area surrounding the plant site. It also supplements the REMP by verifying that the measurable concentrations of radioactive materials and levels of radiation are not higher than expected on the basis of the effluent measurements and the modeling of the environmental exposure pathways. Indicator sampling stations are located where detection of the radiological effects of the plant's operation would be most likely, where the samples collected should provide a significant indication of potential dose to man, and where an adequate comparison of predicted radiological levels might be made with measured levels. Control stations are located where radiological levels are not expected to be significantly influenced by plant operation, i.e., at background locations. An environmental impact assessment of plant operation is made from the radiological measurements of the sampling stations.

The REMP was conducted at the St. Lucie Plant by the Office of Radiological Control, Florida Department of Health and Rehabilitative Services (DHRS). Samples were collected and analyzed by DHRS personnel at the DHRS Environmental Radiation Control Laboratory in Orlando, Florida. The REMP was discussed with the Florida DHRS Health Physicist.

a. Observation of Sample Collection

The inspector accompanied the Health Physicist on part of his normal weekly rounds to collect samples to observe collection technique and to check the physical condition and operability of the sampling stations. Samples were taken at an indicator station (H-14) and a control station (H-32) as well as milk from a dairy (supplemental sample). Both stations included thermoluminescent dosimeters (TLDs) for the detection of direct gamma radiation. The DHRS Health Physicist also pointed out additional TLD locations as well. The air sampling stations were located such that there would be no interference from tall weeds/vegetation in taking representative samples. The inspector noted that the sampling units were well maintained, within calibration, in good working order, and that there was no evidence of vandalism. The inspector observed that the samples were properly collected and that the technician used good HP techniques to avoid sample contamination and conducted his work in an efficient, competent manner.

b. 1992 Annual Radiological Environmental Operating Report

TS 6.9.1.8 requires that the Annual Report be submitted prior to May 1 of the following year. TS 6.9.1.8 also states format and content requirements for the Report.

The inspector reviewed the Annual Radiological Environmental Operating Report for calendar year 1992 to verify compliance with the TSs. The Report had been submitted in compliance with TS 6.9.1.8 on March 26, 1993, and the format and contents were as prescribed by the TS. There were no changes to the environmental monitoring network during 1992. Analytical results were divided into four categories based on exposure pathways: Airborne, waterborne, ingestion, and direct radiation. Each of the pathways was described as follows:

- The airborne exposure included airborne iodine and airborne particulate samples. No fission products or other man-made isotopes in the airborne particulate media were detected in 1992. Overall 1992 airborne results were very similar to those of previous years and preoperational levels.

- The waterborne exposure pathway included surface water samples and shoreline sediment samples. Tritium and Co-58 were the only man-made isotopes detected in the surface water or shoreline sediment at collection station H-15.

Activity levels in the surface water samples were consistent with past measurements. Tritium was reported in four (of sixty-four) samples. The highest measured tritium activity was less than one percent of the reporting level defined in Table 3.12-2 of the TSs. Co-58 was detected in two (of the same sixty-four) samples. The highest measured Co-58 activity was less than two percent of the reporting level defined in Table 3.12-2 of the TSs. It was noted that no single sample contained detectable activities of both tritium and Co-58. The shoreline sediment contained no detectable levels of any man-made isotopes but the naturally-occurring K-40, Ra-226, and Th-232 were detected.

- The ingestion exposure pathway included fish and crustacea, and broad-leaf vegetation samples. Naturally-occurring K-40, Ra-226, and Ra-228 were detected at normal environmental levels. One fish sample contained cesium-137 at a concentration of less than one percent of the reporting level defined in Table 3.12-2 of the TSs. Vegetation samples yielded concentrations of radioisotopes which were similar to those of the control sampling stations and of the preoperational period. Activities of Cs-137 slightly above the Lower Limit of Detection (LLD) were detected at sampling station H-51. The maximum measured activity was less than two percent of the reporting level defined in Table 3.12-2 of the TSs. Naturally-occurring K-40 and Be-7 were also detected.

- The environmental direct radiation exposure pathway was measured by use of TLDs. TLD results for 1992 remained consistent with those of previous years, i.e. essentially unchanged since the preoperational period.

The report showed that the program was conducted in accordance with requirements and that supplemental sampling and analyses were performed. The radiological environmental data indicated that plant operations had no significant impact on the environment or public health and safety. The maximum radiation dose from airborne, waterborne, ingestion, or direct exposure pathways attributed to plant operations in 1992 to any offsite member of the public was well within the limits established by 10 CFR 50, Appendix I.

c. Analytical Comparison of 1992 Report

The NRC contracts with the Radiological and Environmental Sciences Laboratory (RESL) to analyze samples split between the State of Florida and the NRC. The NRC compares the RESL results to those of the State of Florida for analysis confirmation.

The inspector randomly selected the analytical results for gross beta in air particulates at Sample Station H-14 for the four samples collected in August 1992 and those as reported in the 1992 Annual Report for comparison of the results as reported by RESL. After adjusting for the different units used by the different laboratories to report the results, the inspector determined that the reported results compared favorably with those of RESL. Typical values for gross beta in the air particulates were 0.010 pCi/m$^3$. The inspector also compared the analytical results of shoreline sediment of Sample Station H-15 taken on February 20, 1992 and August 3, 1992 and determined that the reported results compared favorably. Typical values of Cs-137 were 10 picocuries per kilogram (pCi/kg) and K-40 were 1100 pCi/kg, for example.

The inspector concluded that the State of Florida was capable of analyzing environmental samples as required for the Annual Radiological Environmental Operating Report.

The inspector concluded that the licensee had an effective program in place to monitor radiological effluents, direct radiation, etc. due to plant operations and that the Report was in compliance with the TSs. In 1992, plant operations caused minimum impact to the environment and virtually no dose to the general public from those effluents.

No violations or deviations were identified.

8. Annual Environmental Operating Report for 1992 (84750)

Section 5.4.1 of the St. Lucie Unit 2 Environmental Protection Plan (EPP) requires the submittal of an annual report for various activities at the plant site related to Federal and State environmental permits and certifications.

A report on aquatic and terrestrial sea turtle monitoring programs as required by EPP Subsections 4.2.1 (Beach Nesting Surveys), 4.2.3 (Studies to Evaluate and/or Mitigate Intake Canal Mortality), and 4.2.5 (Capture and Release Program) was submitted on April 26, 1993. (The NRC is considered to be the lead federal agency relative to the Endangered Species Act and, therefore, has jurisdiction for the sea turtle studies.) The inspector reviewed the report to verify compliance with the referenced regulation. Although the inspector noted a minor arithmetic error, the report was otherwise well-written and thorough. It detailed methods utilized to capture and release turtles found in the intake canal, to determine the sex of immature turtles, to analyze nesting data, etc. In addition, it included a listing of six non-routine reports submitted to the NRC in 1992 in accordance with Section 5.4.1(c) of the EPP, such as incidents involving the release of hydrazine to the Stormwater Basin and exceeding the National Pollutant Discharge Elimination System (NPDES) Permit minimum pH limitation for

sewage treatment plant effluent. No non-compliances under EPP Section 5.4.1(a), as determined by the licensee, were identified. No plant activities were determined to be reportable, as determined by the licensee, under Section 5.4.1(b) of the EPP.

The inspector concluded that the report was well written and complied with applicable regulations.

No violations or deviations were identified.

9. Refueling Water Tank (RWT) Leak (84750)

The licensee had noticed a steady inventory loss from its Unit 1 RWT beginning in mid-June. The magnitude of the loss was approximately one inch per day which corresponded to about one gallon per minute (gpm). The RWT was designed to withstand hurricane, tornado, and seismic events as well as normal operating loads and provide 500,000 gallons of borated water as a backup source for reactor coolant makeup and reactivity control during plant operation. The licensee inspected piping systems connected to the RWT as well as the exterior above-ground surfaces of the tank. Selected lines were also isolated. Despite these actions, the source of the inventory loss was not identified and the RWT's inventory continued to decrease. The licensee sampled test wells located near the RWT on July 6 and found concentrations of both boron and tritium, which indicated that the bottom of the RWT had a leak. (No other radioisotopes were detected in the samples.) The maximum tritium activity was determined to be 2.7E-2 microcuries per milliliter ($\mu$Ci/ml). On July 7, the licensee sampled the contents of the RWT and found the activity for tritium (which accounted for 99.47% of the tank's activity) to be 3.12E-2 $\mu$Ci/ml. Based on this activity and an assumed release rate of one gpm for the period of June 15 to July 8, the licensee calculated that 4.0 Curies of tritium had leaked from the RWT.

The inspector went to the RWT location to see the general area, including nearby structures and monitoring wells, and to observe activities related to finding the leak. The inspector also reviewed a draft report prepared by a consultant in late June for the licensee about the hydrogeology in the area of the RWT which indicated that ground water movement in the upper surficial aquifer was approximately 0.15 feet per day in a westerly direction, toward the intake canal. (This flow pattern was caused by the difference in water levels of the intake and discharge canals during plant operation, that of the intake canal being at a lower level than that of the discharge canal.) The report also indicated that the surficial aquifer at the site was at least forty feet thick and that the ground water from the surficial aquifer was considered to be naturally brackish. And although a thin layer of fresh water may exist in the surficial aquifer during wet periods of the year, there was no source of potable water or irrigation. All potable water was transported to Hutchinson Island via pipeline from the mainland.

The licensee employed numerous techniques to identify and locate the source of the leak, including: camera-equipped submersibles, acoustic analysis (both interior and exterior to the RWT), and divers. The leak was found shortly after the completion of this inspection and was temporarily repaired by epoxying a patch over the leak (a 3/16 inch corrosion pit). The licensee plans to make a permanent repair during the next Unit 1 refueling outage in October 1994.

The licensee planned to account for the RWT release as a continuous release and take daily samples to be composited and analyzed monthly and quarterly. Also, the tank level was to be recorded on a daily basis to be able to calculate release volumes. These totals would be incorporated into the monthly, quarterly, and annual totals of Curies released, including the Semiannual Radioactive Effluent Release Report.

The inspector concluded that the licensee acted expeditiously in identifying the source of the RWT leak and that the public health and safety was not jeopardized by the release.

No violations or deviations were identified.

10. Control Room Emergency Ventilation System (84750)

Per 10 CFR 50, Appendix A, Criterion 19, licensees shall assure that adequate radiation protection be provided to permit access to and occupancy of the control room under accident conditions and for the duration of the accident. Specifically, operability of the control room emergency ventilation system ensures that 1) the ambient air temperature does not exceed the allowable temperature for continuous duty rating for the equipment and instrumentation cooled by this system and 2) the control room remains habitable for operations personnel during and following all credible accident conditions such that the radiation exposure to personnel occupying the control room is limited to 5 rem or less whole body, or its equivalent.

TS 3.7.7 defines operability requirements for the control room emergency air cleanup systems under the various design scenarios. TS 4.7.7 sets the surveillance requirements for the system.

The inspector reviewed the latest test results for the charcoal and High Efficiency Particulate Air (HEPA) filters of the Unit 2 system to verify compliance with TS requirements. The test was conducted on April 16, 1992 and the filters performed satisfactorily and no irregularities were noted.

The inspector reviewed Heating, Ventilation, and Air Conditioning (HVAC) Drawings 8770-G-879, Rev. 24, "HVAC - Control Diagrams - Sheet 2," 2998-G-879, Rev. 13, "HVAC - Control Diagrams - Sheet 2," and 2998-G-879, Rev. 16, "HVAC - Control Diagrams - Sheet 3," which showed the general layout of the components of the Control Room Air Conditioning System for Unit 1 and Unit 2. The inspector walked down

the system, from the air intake to the Control Room, to air exhaust, noting the major components, such as isolation dampers, filter banks, and fans as well as detectors for smoke, radiation, etc. All components were well maintained, with no sign of physical degradation. During the walkdown, the inspector noted a labeling irregularity on the Unit 1 system. The labels of two Magnahelix gauges (FG-25-HVE-13A and FG-25-HVE-13B) were switched. These gauges were used to determine the gross pressure differential across the HEPA filter and charcoal beds locally. The licensee reviewed the field condition for verification, agreed with the inspector, and changed the labels to the appropriate gauges. The inspector reviewed Chemistry Procedure C-74, Rev. 12, "Particulate and Iodine Filter Testing," and noted that the differential pressure was determined by using an MTE manometer during TS-required surveillances. (The Magnahelix gauges were not required by TSs or Chemistry Procedures nor did they send a signal to or annunciate in the Control Room.) The inspector reviewed Section 9.4 of the Unit 1 FSAR for system description and design bases and discussed system operation under both normal and emergency conditions with the cognizant system engineer.

Based on the scope of this review, the inspector concluded that the System was adequate for its intended function and that it was being maintained in compliance with the applicable TSs.

No violations or deviations were identified.

11. Radwaste Processing and Transportation (86750)

10 CFR 71.5 (a) requires each licensee who transfers licensed material outside of the confines of its plant or other place of use, or who delivers licensed material to a carrier for transport, shall comply with the applicable requirements of the regulations appropriate to the mode of transport of the Department of Transportation (DOT) in 49 CFR, Parts 170 through 189.

Pursuant to these requirements, the inspector reviewed the licensee's activities affiliated with these requirements, to determine whether the licensee effectively packages, stores, and ships radioactive solid materials.

The licensee's program for the packaging and transportation of radioactive materials, including solid radwaste, was conducted by the Radioactive Waste Group within the HP Department. Radwaste was processed and packaged (including the preparation of shipping documentation) by the Radwaste Group, with the assistance of Radiation Protection Men on loan from the HP Operations Department to complete specific tasks, such as loading a shipment or compacting contaminated material.

The inspector reviewed documentation packages for four radioactive material shipments made since Inspection 93-09. They were Radioactive Material Shipment Nos. 93-30, 93-33, 93-36, and 93-38, and included a

shipment of contaminated tools and equipment to a nuclear power plant, two Low Specific Activity (LSA) Type A shipments destined for processing (incineration and/or compaction) before final disposal, and one Limited Quantity shipment of samples to a laboratory for analysis. The packages contained thorough documentation about the shipments and included items such as unique shipment and shipping container numbers, waste content and volume, total activity, analytical summary and breakdown of isotopes with a half-life greater than five years, special comments, etc. The radiation and contamination survey results were within the 49 CFR requirements and the shipping documents were being maintained as required.

To date, July 14, 1993, the licensee had made twelve radwaste shipments, including two to Quadrex, four to Scientific Ecology Group, Incorporated (SEG), and six to the disposal facility.

The inspector concluded that the licensee's documentation of shipments of radioactive material was thorough and in compliance with the applicable regulations.

No violations or deviations were identified.

12. Contaminated Sludge Disposal (84750)

In 1982, the licensee discovered that its Unit 1 sewage treatment plant (STP) had become contaminated with radioactive material as the result of an incorrectly routed floor drain. The suspected source of the contamination was determined and eliminated at that time and the contaminated system was later cleaned using high-pressure water. However, radioactive material was detected occasionally in periodic samples of the waste material since that time, primarily Co-60 at activity levels of about 0.1 picocuries per gram (pCi/g). The licensee suspected that it was residual contamination leaching from the concrete piping of the drainage system. Through 1991, the licensee sampled and analyzed its "domestic waste water residuals" and if any radioactive contamination was detected, the residuals were transferred to a highway tank trailer situated next to the STP, pursuant to permission granted by the Florida Department of Environmental Regulation (DER). The contaminated material was collected and stored until a sufficient quantity was accumulated for processing into a form acceptable to a low level radioactive waste disposal facility. Processing the material into an acceptable disposal form had become more difficult and expensive to meet new regulatory requirements.

In an effort to reduce the expense while continuing to satisfy all regulatory requirements, as well as being concerned with the potential loss of the licensed disposal facility in the southeast region, the licensee undertook a study to investigate other alternatives. Of the alternatives studied, the licensee eventually selected the land application method of disposal due to its cost and low projected dose rates to members of the public (0.1 mrem per year). Before implementing the alternative, the licensee sent a letter on April 14, 1992, to the

Florida Department of Health and Rehabilitative Services (DHRS) requesting concurrence that the subject material was acceptable for disposal via land application. DHRS, in turn, requested technical assistance from the NRC's Office of Nuclear Material Safety and Safeguards for four questions of interest to the state. On August 10, 1992, DHRS requested additional information from the licensee concerning comments and issues raised by the NRC. The licensee responded via a letter on September 28, 1992. A meeting between the licensee and DHRS was held on January 14, 1993 at which the licensee was told that DHRS would approve its request for land application with the following modifications:

- The material must be buried four feet below grade.
- A plan of action, including drawings of the proposed application area indicating where each batch of material would be placed, must be submitted to DHRS.
- DHRS must be notified prior to the disposal of each batch to allow for the observation and sampling of the batch.

Following the meeting with DHRS, the licensee was in contact with a vendor which proposed two new processing options: to de-water the sludge with a centrifuge and ship it to SEG for incineration; or to centrifuge and steam dry the sludge and ship it directly to the Barnwell disposal facility. Because the backlog of sludge could soon exceed the licensee's storage capacity, the licensee has made arrangements with the vendor to process the current backlog and ship it to SEG for incineration before final disposal at Barnwell. The inspector went to the STP to observe field conditions and discuss the processing operations with the responsible licensee representative. The vendor was in the process of setting up his equipment. Additional equipment was due to arrive at the site within a few days of the inspection and the processing of the sludge would begin shortly thereafter.

Future potential alternatives to this issue include: securing approval from DHRS to dispose of the material by land application; continuing to use the services of the vendor (depending upon his performance with the current job); and (eventually) tying the licensee's STPs directly into the county's proposed new STP to be built near the plant site.

The inspector concluded that the licensee had proceeded in a prudent manner on this issue.

No violations or deviations were identified.

13. Exit Interview (84750)

The inspection scope and results were summarized on July 16, 1993, with those persons indicated in Paragraph 1. The inspector described the areas inspected and discussed the inspection results, including likely informational content of the inspection report with regard to documents

and/or processes reviewed during the inspection. The licensee did not identify any such documents or processes as proprietary. Dissenting comments were not received from the licensee.

14. Acronyms and Initialisms

CEOG - Combustion Engineering Owners Group
CFR - Code of Federal Regulations
Ci - curie
CP - Chemistry Procedure
DEI - Dose Equivalent Iodine
DER - Department of Environmental Regulation
DHRS - Department of Health and Rehabilitative Control
DO - Dissolved Oxygen
DOT - Department of Transportation
EPP - Environmental Protection Plan
FPL - Florida Power and Light
FSAR - Final Safety Analysis Report
g - gram
gpm - gallons per minute
HEPA - High Efficiency Particulate Air
HP - Health Physics
HVAC - Heating Ventilation and Air Conditioning
IR - Inspection Report
kg - kilogram
l - liter
LLD - Lower Limit of Detection
LSA - Low Specific Activity
m - meter
μCi - micro-Curie (1.0E-6 Ci)
ml - milli-liter
mrem - milli-rem
NPDES - National Pollutant Discharge Elimination System
NRC - Nuclear Regulatory Commission
PASS - Post Accident Sampling System
pCi - pico-Curie (1.0E-12 Ci)
PCM - Plant Change/Modification
ppb - parts per billion
ppm - parts per million
PSL - Plant Saint Lucie
RAB - Reactor Auxiliary Building
RCS - Reactor Coolant System
REMP - Radiological Environmental Monitoring Program
RESL - Radiological and Environmental Sciences Laboratory
Rev - Revision
RWT - Refueling Water Tank
SEG - Scientific Ecology Group, Incorporated
STP - Sewage Treatment Plant
TLD - Thermoluminescent Dosimetry
TS - Technical Specification