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

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Report Nos.: 50-335/90-12 and 50-389/90-12

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: April 9-13, 1990

Inspector: R. R. Marston 5/14/90
R. R. Marston Date Signed

Accompanying Personnel: R. Carrion

Approved By: Thomas R Decker 5/14/90
T. R. Decker, Chief Date Signed
Radiological Effluents and Chemistry Section
Emergency Preparedness and Radiological
Protection Branch
Division of Radiation Safety and Safeguards

SUMMARY

Scope:

This routine, unannounced inspection was conducted in the areas of liquid and gaseous effluent and waste systems and monitoring, and water chemistry.

Results:

Liquid and gaseous effluent releases were within Technical Specification and 10 CFR 50, Appendix I limits and review of water chemistry, effluent monitoring instrumentation, lab instrumentation, and air cleaning systems showed all programs to be adequate. The quality assurance program contributed significantly to the performance of the chemistry group.

No violations or deviations were identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*G. Boissy, Plant Manager
C. Burton, Operations Supervisor
*R. Church, Chairman, Independent Safety Engineering Group
*R. Cox, Chemistry Effluent Supervisor
*C. Crider, Outage Management Supervisor
*D. Culpepper, Site Engineering Supervisor
*B. Dawson, Maintenance Supervisor
*R. Decker, Licensing Engineer
*R. Englmeier, Site Quality Manager
D. Faulkner, Chemistry Process Monitoring Supervisor
*B. Frechette, Chemistry Supervisor
*J. Geiger, Vice President
*D. Lowens, Quality Assurance Engineer
*M. MacLeod, Site Nuclear Lead
*D. Sager, Site Vice President
*R. Sipos, Services Manager
*R. Weller, Nuclear Plant Supervisor
*D. West, Technical Staff Supervisor
*J. West, Assistant Superintendent Mechanical Maintenance
*C. Wilson, Plant Personnel Manager
*G. Wood, Reliability Systems Maintenance Supervisor

Other licensee employees contacted during this inspection included engineers, operators, technicians, security personnel, and administrative personnel.

NRC Resident Inspectors

*S. Elrod, SRI
M. Scott, RI

*Attended exit interview

2. Audits (84750)

Technical Specification (TS) 6.5.2.8 requires that audits of unit activities shall be performed under the cognizance of the Company Nuclear Review Board (CNRB), and specifies the areas that these audits shall encompass and the frequency at which they shall be conducted.

The inspector reviewed the following audit reports to confirm TS compliance:

- QSL-OPS-89-664, Primary Coolant Sources Outside Containment, conducted February 21 through April 13, 1989. One finding on documentation was identified in this audit. The finding was closed on July 10, 1989.

- QSL-OPS-89-683, Monthly Performance Monitoring Audit for June 1989. This audit included observation of post-maintenance testing of the Post Accident Sampling System (PASS), and observation of conduct of Initial Startup and Fill portion of the PASS Operating Procedure. No negative findings were identified

- QSL-OPS-89-695, Radiological Effluents & Radiological Environmental Monitoring, conducted from September 26 through October 25, 1989. This audit evaluated the programs for compliance to TSs 3/4.11 and 3/4.12 and identified no negative findings.

- QSL-OPS-89-699, Administrative Controls, conducted November 7 through December 11, 1989. This audit evaluated the programs for compliance to TS 6.0, specifically Sections 6.8 through 6.15. No negative findings were identified.

The audit checklists were reviewed and determined to be thorough and comprehensive. The audits included positive and negative findings, as well as status on corrective action on findings opened in previous audits.

No violations or deviations were identified.

3. Changes to Chemistry Program (84750)

The inspector discussed status and changes to the chemistry organization and program with the Chemistry Supervisor to assess quality and assess program associated programmatic weaknesses. The Supervisor reported to the Operations Group Superintendent, and, in turn, had five Supervisors and two Coordinators reporting directly to him. The authorized and actual manning for the Chemistry Department was 25 personnel. The Supervisor stated that during normal operations, only one Chemistry Technician manned the backshift. The Department had one Supervisor in charge of purchasing. The Chemistry Supervisor stated that considering the specialized material and equipment used by the Department, it was easier to do their own purchasing rather than use a centralized plant purchasing department.

The Supervisor stated that the Technician training program was more On-The-Job than classroom oriented. Normally a Technician took one year to complete his training. The first 14 weeks would be spent working two week basic assignments in each of seven areas. By the end of the year, all of approximately 110 modules would have been completed. Requalification was done on a two year cycle. The Requalification program did not cover the basic modules, but concentrated on the more sensitive or complicated ones.

The Supervisor stated that chemical cleaning of the steam generators was under consideration for the next outage. Boric acid secondary chemistry was to be used in Unit 1 on startup from the current outage. The plan was for a hot soak for four days at 50 parts per million (ppm) boric acid concentration at 30 percent power, then use a concentration of 5 ppm boric acid when running at power. The licensee had started reusing Steam Generator Blowdown Radwaste resin. Previously it had been disposed of. Primary coolant Lithium had been maintained at 3.5 ppm. It was planned to drop this concentration to 2.2 ppm for man-rem reduction purposes and to comply with EPRI recommendations.

Hydriding had been taking place in the titanium tubes in the condensers. The licensee had been plugging the tubes where hydriding took place, before leaks developed. The steam generators in Unit 1 had been losing approximately 150 tubes per cycle. Hydriding had a slow growth rate and needed galvanic protection for prevention.

No violations or deviations were identified.

4. Laboratories and Count Room (84750)

To evaluate the licensee's analytical capability to make consistently accurate radioactivity measurements, the inspector and a cognizant licensee supervisor toured the plant, examining the Count Room and Chemistry Laboratories. The Count Room was equipped with three gamma spectroscopic systems with ND9900 Analysis Systems and two NMC gas flow proportional alpha/beta counting systems.

The Unit 1 Primary Hot Lab was equipped with a Thermo Jarrell Ash Atomic Absorption/Atomic Emission (aa/ae) Spectrophotometer which was used primarily for the analysis of Iron and Copper in effluents. The Lab was also equipped with a Dionex Model 2000i Ion Chromatograph and a Fisher Gas Partitioner, Model 1200 which was used to analyze hydrogen, oxygen, and nitrogen from Volume Control Tank samples. A tritium distillation apparatus was also available. The licensee Supervisor stated that the primary uses were to analyze Reactor Coolant and samples from the Waste Sparger on the plant vents.

The Unit 2 Primary Hot Lab was similarly equipped. One Dionex was used for Anion analysis. The Lab was also equipped with a GA Process Monitor Computer, which provided readouts from the process monitors to the Control Room, Health Physics Office, and to the Unit 2 Hot Lab. A Thermo Jarrell Ash aa/ae Spectrophotometer, Model 257 was used for Iron and Copper analysis, and to analyze for Sodium in a high Hydrazine matrix.

From the observations made during this tour, the licensee demonstrated that a good analytical program was in place.

No violations or deviations were identified.

5. Laboratory and Count Room Quality Control (84750)

TS 6.8.1.i requires that written procedures shall be established, implemented and maintained covering the Quality Control Program for effluent monitoring, using the guidance in Regulatory Guide 1.21. Chemistry Procedure No. C-48C, Operation of the Nuclear Data (ND) 9900 Computer Based Counting System specifies the calibration and quality control requirements for the subject system. The inspector reviewed documentation which showed that the three gamma spectroscopic systems were last calibrated at various geometries during the period from May 12, 1989, through January 18, 1990. The inspector also reviewed the Calibration Check Sheets and the Control Charts for the detector systems for the period from January 1 through April 2, 1990. The inspector reviewed the calibration and quality control records and control charts for the Lab instruments such as the Orion Chloride Monitor, Dionex, and Boron-Lithium Determinations.

The inspector reviewed records for the Chemistry Lab and the Count Room replicate sample program for the period from January 1, 1989, through April 10, 1990. The Radiochemistry program included liquids, gases, charcoal cartridges, and particulate filters. The inspector also reviewed records of the licensee's intralab program between the Health Physics Count Room and the Chemistry Count Room.

From these observations, the inspector concluded that the quality control program was adequate for instrument and analyst results. The instruments appeared to be stable and to maintain results within specified limits, and the results of the individual analyst's efforts were generally within agreement limits with very few disagreements.

No violations or deviations were identified.

6. Process and Effluent Radiation Monitors (84750)

TS 4.3.3.9 requires that each radioactive liquid effluent monitoring instrumentation channel shall be demonstrated operable by performance of the channel check, source check, channel calibration and channel functional test operations at the frequencies shown in Table 4.3-8. TS 4.3.3.10 requires that each radioactive gaseous effluent monitoring instrumentation channel shall be demonstrated operable by performance of the channel check, source check, channel calibration and channel functional test operations at the frequencies shown in Table 4.3-9.

The inspector toured the plant with a cognizant Chemistry Supervisor and examined accessible process and effluent monitors to determine their operability. The inspector reviewed licensee documentation of the most recent calibration of a selection of effluent monitors. The documentation showed that the Liquid Waste Discharge Radiation Monitor was calibrated, functionally tested, and had the setpoint determined on November 16, 1989. The General Atomic Plant Vent Wide Range Gas Monitor was calibrated, functionally tested and had the setpoint determined on October 16, 1989,

for the Low Range Gas Monitor, on October 14, 1989, for the Mid Range Gas Monitor, and on October 27, 1989, for the Wide Range Gas Monitor. The records showed that the calibrations had been performed within the frequency specified by the TS.

No violations or deviations were identified.

7. Liquid Radwaste Effluents (84750)

TS 3.11.1 specifies the concentrations and doses authorized for liquid effluent releases. Therefore, the inspector reviewed a selection of liquid effluent release permits, the monthly liquid release log for April 1990, and the Liquid Waste Management Running Log for January through April 1990. The documentation showed that the release concentrations and the doses were within TS and 10 CFR 50, Appendix I limits.

No violations or deviations were identified.

8. Gaseous Radwaste Effluents (84750)

TS 3.11.2 specifies the concentrations and doses authorized for gaseous effluent releases. Therefore, the inspector reviewed a selection of gaseous effluent release permits and the Gaseous Waste Running Logs for Batch and Continuous Releases for January through April 1990. The documentation showed that the release concentrations and the doses were within TS and 10 CFR 50, Appendix I limits.

No violations or deviations were identified.

9. Air Cleaning Systems (84750)

TS 4.6.6.1 specifies in-place HEPA and charcoal filter testing and charcoal sampling and lab testing requirements for the Shield Building Ventilation System, TS 4.7.7.1 specifies these testing requirements for the Control Room Emergency Ventilation System, TS 4.7.8.1 specifies the testing requirenents for the ECCS Area Ventilation System, and TS 4.9.12 specifies the testing requirements for the Fuel Pool Ventilation System.

The inspector reviewed the testing records for the specified systems and for several non-TS systems to verify frequency of testing the system. The records showed that the systems were tested at the required frequencies and that all tests were passed successfully.

No violations or deviations were identified.

10. Liquid and Gaseous Radwaste Processing (84750)

TS 3.11.1.3 specifies requirements for liquid radwaste processing, and TS 3.11.2.4 specifies requirements for gaseous radwaste processing.

To become familiar with the radwaste system, the inspector toured the plant and examined its components. The system appeared to be as described in the FSAR. The inspector discussed radwaste operations with the Operations Supervisor. The Operations Department was authorized 142 personnel, half of them licensed. Radwaste operations was under the control of the Nuclear Watch Engineer, who supervised unlicensed operations. The radwaste operations did not have a "control room" as such, but there were separate control panels for gaseous and for liquid radwaste in each unit. Releases were made from the Unit 1 side of the system only, since that was where the Waste Monitor Tanks were located. Most of the liquid waste was held in the 40,000 gallon Aerated Waste Storage Tank (AWST), which was re-inforced with exterior steel beams. From the AWST it was pumped to the Waste Monitor Tanks for release.

The inspector observed a release, monitoring the Chemistry Department's role. It was noted that the Liquid Discharge Radiation Monitor was source checked manually. The inspector also observed sampling of the tank and analysis of the sample. The Technician followed a current procedure.

No violations or deviations were identified.

11. Semiannual Radiological Effluent Report (84750)

TS 6.9.1.7 requires that routine Radioactive Effluent Release Reports covering the operation of the unit during the previous 6 months of operation shall be submitted within 60 days after January 1 and July 1 of each year. The TS further specifies requirements for the content and format of the report, referencing Regulatory Guide 1.21 as a guide. The inspector reviewed the licensee's Semiannual Radioactive Effluent Release Report for the last half of 1989 to verify conformance. The effluent release data summarized in Table A were obtained from current and previous release reports:

TABLE A

Effluent Release Summary for St. Lucie

Gaseous Effluents (Curies)	1987	1988	1989
Fission and Activation Gases	7.40E+3	1.06E+4	6.75E+3
Iodines and Particulates	4.73E-2	3.49E-2	1.41E-2
Liquid Effluents (Curies)			
Fission and Activation Products	5.70E-1	5.23E-1	5.09E-1
Tritium	3.38E+2	5.50E+2	8.30E+2

The report appeared to be complete and to include the information specified in the TS and in Reg Guide 1.21. The levels of the effluents

appeared to be decreasing from one year to the next with the exception of tritium in the liquid effluents, which showed an increase.

No violations or deviations were identified.

12. Water Chemistry (84750)

TSs 3.4.7 and 3.4.8 specify chemistry and radiochemistry requirements for the primary coolant, and TS 3.7.1.4 specifies the radiochemistry requirements for the secondary system. The inspector reviewed the primary and secondary logs and control charts for chemistry parameters for the period from January 1, 1990, through March 31, 1990. The parameters appeared to have been maintained within specified limits, and for those cases that drifted out of limits, were returned to within limits on a timely basis.

The inspector reviewed the Secondary Water Chemistry Laboratory to evaluate the licensee's analytical capability to make consistently accurate measurements. The licensee's Secondary Chemistry Area Supervisor, who was responsible for the analysis of the water quality in all steam plant systems and subsystems showed the inspectors through the lab. The laboratory housed instrumentation such as the Total Organic Carbon (TOC) Sampler, used to sample make-up water for changes in carbon dioxide concentration; a Milton Roy Spectronic 1001 plus spectrophotometer, used to determine concentrations of ammonia, hydrazine, silica, molybdates, and tolytriazole; a pH meter; an Obrizo Oxygen meter; a boron stand, which although not used before, would use the titration method to determine the boron concentration, which was adjusted during power ascension from 0-30 percent power to reduce/neutralize oxygen concentrations in the intergranular crevices of the steam generators and associated piping to reduce IGSCC; two Dionex ion chromatographs, one used for the determination of anion, sulfate, chlorine, and fluoride concentrations, while the other was primarily used for the analysis of sodium, magnesium, and calcium and serves as a back-up for the AA/AE spectrophotometer (with a furnace), which was primarily used for the analysis of iron and copper and occasionally for the analysis of sodium, magnesium, and calcium.

The Secondary Panels were reviewed by the inspectors, including the Sodium Analyzer for four hotwells, which were composed of cation resin columns and conductivity cells and were used to detect small sea water leaks; the Cation Conductivity panel, which analyzed the four hotwells as well as one condensate water discharge, one main steam line, and two steam generators; and an in-line orbisphere, which analyzes oxygen in the condensate and hydrazine in the feedwater.

It was necessary to leave the lab to collect samples for the Condensate Storage Tank, the Monitor Storage Tank (for blow-downs), and the Auxiliary Cooling Systems. All other samples could be taken directly in the laboratory.

Discussions with the supervisor concerning his organization and personnel training found that there were four technicians responsible for the work required of the Secondary Chemistry Laboratory. Typically, a technician had nuclear Navy experience. A newly-hired technician was required to complete several training modules and to complete several weeks of classroom training in combination with working in his department, all within the first 15 months of employment. Later, the technicians participated in a 6-month rotation program with other departments whereby one technician remained in the Department to teach the newcomers the new techniques and how to use the Department's equipment. This enabled the licensee to maintain a high quality, broadly-trained staff at all times, while giving the individuals involved some variety to their routines. Turnover in these positions was virtually non-existent, indicating a high degree of employee satisfaction with this program. The inspector also learned that a new training laboratory would be opened soon and would be advantageous in that training would no longer be done using process equipment.

No violations or deviations were identified.

13. Exit Interview (30703)

The inspection scope and results were summarized on April 13, 1990, with those persons indicated in Paragraph 1. The inspector described the areas inspected and discussed in detail the inspection results. No violations or deviations were identified. The Chemistry Department appeared to maintain an effective, well-controlled program. There appeared to be a close, well coordinated effort between Operations, Chemistry, and Health Physics in handling and processing radwaste.