U.S. NUCLEAR REGULATORY COMMISSION

REGION II

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Report Nos:	50-335/97-02, 50-389/97-02
Licensee:	Florida Power and Light Co.
Facility:	St. Lucie Nuclear Plant, Units 1 and 2
Location:	6351 South Ocean Drive Jensen Beach, FL 34957
Dates:	January 27 - 31, 1997
Inspectors:	F. Wright, Senior Radiation Protection Specialist G. Salyers, Emergency Preparedness Specialist
Approved by:	K. Barr, Chief, Plant Support Branch Division of Reactor Safety

Enclosure

EXECUTIVE SUMMARY

St. Lucie Nuclear Plant, Units 1 & 2
NRC Inspection Report Nos: 50-335/97-02, 50-389/97-02

This routine announced inspection of the licensee Radiation Protection (RP) program included aspects of the licensee's personnel dosimetry and contamination control programs.

Plant Support

- Personnel were provided radiation monitoring devices in accordance with regulatory and licensee requirements (Section R1.1).
- The licensee continued to improve controls for contaminated materials (Section R1.2).
- One Non-Cited Violation (NCV) was identified concerning failure to survey potentially contaminated liquid released from the licensee's Radiation Control Area (RCA) (Section R1.2).

Report Details

IV. Plant Support

R1 Radiological Protection and Chemistry Controls

R1.1 Personnel Dosimetry Issuance (83750)

a. Inspection Scope

Selected elements of the licensee's personnel dosimetry issuance program were reviewed to verify 10 CFR Part 20 and licensee requirements for radiation monitoring were being implemented. The licensee's dosimetry program was compared with the requirements of 10 CFR Part 20.1502.

This program review included observations made during facility tours, interviews with dosimetry and radiation protection personnel, and review of licensee records and procedures.

b. Observations and Findings

The inspectors reviewed licensee personnel monitoring requirements specified in licensee procedures, Health Physics (HP)-2, "Radiation Protection Manual," Revision 10; and Health Physics Procedure (HPP)-30, "Personnel Monitoring," Revision 6.

The licensee defined "visitors," in Appendix 10, "Access to the RCA by Visitors," of HPP 30, as persons that required access into the RCA to perform short term work assignments and were not expected to receive more than 100 mrem exposure in a year. The inspectors evaluated the licensee procedures for monitoring "visitors" entering the RCA.

The licensee routinely issued Thermoluminescent dosimeters (TLDs) for occupational workers entering the RCA. However, the licensee procedures permitted specifically authorized "visitors" to enter the RCA without a TLD provided the conditions specified in Appendix 10, of HPP-30 were completed. The licensee's procedures permitted "visitors," which were non-occupational workers, to enter the RCA without meeting all of the training and the monitoring requirements that occupational radiation workers were required to complete.

"Visitor" access in the RCA was restrictive. "Visitors" were not permitted access to high radiation areas, very high radiation areas, airborne radioactivity areas, contaminated areas, reactor containment building, or spent fuel pool buildings. Each "visitor" was assigned an Electronic Personnel Dosimeter (EPD) while in the RCA and each "visitor" was escorted by a qualified radiation worker. The "visitor" dose as measured with the EPD was recorded on Form HPP-30.6, "Visitors RCA Entry Authorization."

The inspectors verified that licensee "visitors" entering the RCA were issued an EPD, their exposure recorded on Form HPP-30.6, exposure levels were within limits, and records were archived. The inspectors verified completed forms of HPP-30 were in the licensee's document control room.

The occupational dose limit of 500 mrem/term for declared pregnant workers apply only to women who receive occupational doses in the course of employment in which the individual's assigned duties involve exposure to radiation and the individual has chosen to declare their pregnancy. The licensee utilized Form HPP-30.7, "Access to the RCA By Female Employees and Visitors," to document that a female had been provided a copy of Regulatory Guide 8.13, "Instruction Concerning Prenatal Radiation Exposure." The completed form also documented the "visitor" had read and understood recommendations of the Regulatory Guide 8.13 which informed a female of the potential health risks to an embryo/fetus from radiation exposure of the expectant mother. The inspectors noted that Form HPP-30.7 was not discussed or referenced in HPP-30, Appendix 10. The inspectors inquired about the licensee's intent to have "visitors" review Regulatory Guide 8.13 since the title of Form HPP-30.7 included visitors. The licensee reported that "visitors" were not occupational radiation workers and it was not necessary for female "visitors" to review Regulatory Guide 8.13. The inspectors concluded that there were no requirements for "visitors," as defined by the licensee's procedures, to review Regulatory Guide 8.13; however, informing non-occupational female personnel of the risk to embryo/fetus from low levels of radiation would be a good practice. The inspectors communicated to licensee management that the title of Form HPP-30.7 implied that "visitors" were to use the form and comply with the requirements specified in the document. The issue was a procedural inconsistency. The inspectors also pointed out to licensee management, that the responsibilities for processing radiation workers and non-radiation workers "visitor" into the RCA was not clearly defined in HPP-30. Licensee management stated the issues would be reviewed for additional clarification in procedural guidance.

As personnel entered the site, they obtained their assigned TLDs from the TLD storage racks in the security buildings. Personnel leaving the site returned their TLDs to the TLD storage racks prior to passing through the security exit portals. The licensee had been utilizing the process for approximately two years. The inspectors observed that a potential existed for someone to mistakenly remove another person's TLD from the TLD storage rack. The inspectors reviewed the licensee's controls to prevent an individual with the wrong TLD from entering the RCA.

The inspectors verified that the licensee's access control system required the worker to identify their TLD and RWP numbers prior to permitting the assignment of an individual administrative dose limits and the issuance of a functional EPD. The inspectors observed an HP technician test the RCA entry process at the RCA access control point by entering his TLD number, then scan the bar code on the inspectors TLD.

The access control system stopped the log in process and the system monitor indicated an error between the TLD number entered by the technician and the TLD number scanned. The monitor required the individual to review and re-enter the data. At that point, it would be radiation worker's responsibility to determine whether they had the TLD specifically assigned to them. The assigned individual's name is on the TLD label. The inspector concluded that if an individual mistakenly removed the wrong TLD from the storage rack, the system would identify the error prior to their entering the RCA. To enter the RCA with the incorrect TLD a worker would have to deliberately falsify access control information. The inspectors asked if the access control system maintained a history of access errors. The licensee reported records were not maintained because error messages were common. Most of the errors resulted from a scanner failing to read all of the bar code or an individual striking a wrong number on the key pad while entering their TLD number.

Approximately 1,200 TLDs were issued at the site each month. At the first of the month, new TLDs were issued and the previous month TLDs were collected. The licensee maintained a record of TLDs that were not in the racks at the end of the month. The inspector reviewed the records for 1996, and noted that as the licensee personnel became accustom to depositing and removing their TLDs from the TLD storage racks, the number of TLD missing form the storage racks continued to decrease in 1996. Most of the missing TLD were from individuals who had left TLDs on their hard hats or in their office. Several of these individuals were repeat offenders and corrective actions were taken toward the repeat offenders by the licensee. In 1996, after the location of the "missing" TLDs were resolved, the licensee had four (4) TLDs that were lost out of approximately 14,400 issued.

Procedure HPP-30, Section 7.3, "EPD/TLD Discrepancy Investigations," required the licensee to investigate:

- Any monthly accumulated dose equal to or greater than 300 mrem in which the differential dose between the EPD and TLD is equal to or greater than 25 percent.

- Any monthly accumulated dose equal to or less than 300 mrem in which the differential dose between the EPD and TLD is equal to or greater than 60 mrem.

The licensee performed approximately thirteen EPD/TLD discrepancy investigations in 1996. The inspector verified that the discrepancies were properly evaluated and appropriate dose assignments were made to radiation worker dose records.

During tours of the plant, the inspectors observed personnel wearing appropriate monitoring devices on the location of the body as specified by the RWPs.

c. Conclusion

The inspectors concluded that dosimetry issuance procedures were being implemented properly, individuals were using dosimetry correctly, and the verification measures within the RCA access control system were reasonable to prevent the unauthorized use of an individual's TLD. Possible improvements in procedure HPP-30 were identified concerning access requirements for non-occupational radiation workers. However, no violations of regulatory requirements were identified.

R1.2 Control of Contaminated Material (83750)

a. Inspection Scope

The purpose of this inspection effort was to review implementation of licensee procedures for controlling clean and contaminated tools and radioactive contaminated materials.

This program review included the performance of radiation and contamination surveys, observations made during facility tours, interviews with maintenance and radiation protection personnel, and review of licensee records and procedures.

b. Observations and Findings

In 1996 the licensee experienced problems with tools having contamination in excess of the licensee's contamination limits. Tools were found outside the RCA with contamination above the unconditional release limits and tools were found inside the RCA hot tool rooms with contamination levels exceeding prescribed limits for use within the RCA. The licensee had recently implemented additional contamination control measures in response to contamination control problems and the inspectors reviewed the implementation and status of the various corrective actions.

To improve controls of tools and equipment leaving the RCA and tools within the RCA, the licensee had implemented the following controls:

- Revision of the radiation survey policy to require Health Physics (HP) personnel to perform surveys of "personal items" exiting the RCA;
- Assignment of a HP technician to monitor the primary RCA exit points on day shifts, Monday through Friday;
- Use of video monitoring and recording equipment to monitor radiation workers exiting the Unit 1 and 2 RCA control points;
- Increased clean tool room routine survey frequency from monthly to weekly;

- Established a lower fixed contamination goal/limit of less than 10,000 dpm (direct frisk) for hot tool room tools;
- Cleanup, inventory and sorting of stockpiled tooling and equipment accumulated and stored following recent refueling outages;
- Reduce the amount of tools located in the RCA to permit a more thorough and efficient radiation and contamination surveys;
- Established a larger tool room to supply all the tools used in the RCA during non-outage periods;
- Assignment of a utility person to operate the tool room on day shifts, Monday through Friday;
- Established a Tool Task Team to address site tool control issues; and
- Conducted stand-down meetings with HP personnel to stress the importance of performing thorough unconditional release surveys.

While on site and during tours of the licensee's facilities, the inspectors looked for implementation of the licensee's corrective actions. In general, the inspectors found that the licensee was satisfactorily implementing the proposed corrective actions. The inspectors observed that the number of uncontrolled tools, and the number of tools accessible to maintenance personnel within the RCA had been reduced. HP technicians were assigned to monitor the primary RCA exits and were in the portal areas during day shift and the licensee's video monitoring equipment was operational.

The clean and hot tool rooms were inspected. Numerous radiation and contamination surveys of tools and equipment in the facilities were made by the inspectors. No contaminated tools were found in the clean tool room and the inspectors did not find any tools that exceeded the licensee's fixed contamination limits in the hot tool room. However, some confusion among the HP technicians concerning the fixed contamination limits for the hot tool room were observed. Several HP technicians reported the fixed contamination limits for the hot tool room were less than 10,000 dpm/scan which was significantly below the 10 mrem/hr limit stated in licensee the procedures. The inspectors found several tools in the hot tool room at were in excess of the 10,000 dpm/scan, the highest being approximately 30,000 dpm/scan. However, no tools were found in excess of the 10 mrem/hr limits specified in the licensee procedures. Technicians reported the tools the inspectors had found were in excess of hot tool room limits and the technicians removed the tools from the hot tool room. When this was brought to the attention of HP management the inspectors were informed that the 10,000 dpm value was only a guideline and not a limit. The inspectors reported to licensee management that the staff's understanding of the guideline or goal was not clearly evident as observed by their response to the inspectors findings. The inspectors reported that the purpose of the

guideline or goal should be clearly defined and understood by the HP staff.

The new hot tool room was larger, more organized and was generally controlled. A utility worker was assigned to the facility on Monday through Friday day shift. The hot tool room door was locked with an electronic combination lock, but the combination appeared known to plant radiation workers and remained accessible to plant staff. The licensee continued to utilize an "honor system" for all work on evening, midnight and weekend shifts. NRC identified contamination control problems when the "honor system" was used twenty-four hours per day.

The inspectors found the tool issuance and accountability process was improved but still weak. The inspectors observed a loose leaf notebook that tool room personnel had been using to document tool issue. The documentation was not orderly and the content and format of the information recorded was not consistent. In some cases there was no indication on the status or location of an issued tool. A bar coding system for tool accountability had been planned during the previous year, however, the process had not been implementation at the time of this inspection.

Many of the licensee's corrective actions for better control of contaminated material had been incorporated into written and controlled procedures. However, the guidance for proper use of the hot tool room was not in controlled procedures. The guidance was documented in memorandums which were posted in several areas within the RCA. The advantages of describing operations of the hot tool room in a plant document was discussed with licensee management. However, the licensee had not determined that such a procedure was necessary.

The inspectors reviewed selected Condition Reports (Crs) relating to the control of contaminated material. Licensee CR 96-2199 initiated August 2, 1996, was written for failure to comply with licensee procedures controlling the release of potentially contaminated material out of the RCA.

The licensee's Emergency Diesel Generators (EDGs) are located within the licensee's RCA. Oil was periodically removed from the EDGs and collected into 55 gallon drums. Catchments in the EDG buildings which collected fluids such as oil and rain water were also periodically emptied into 55 gallon drums. The drained fluids from the EDGs were considered free of contamination, in that, they did not interface with any potential radiation contaminated systems. However, the EDG catchments were open to collect any fluids spilled in the EDG building and were not positively controlled. HP personnel analyzed and controlled the drained EDG fluids and the EDG catchment fluids differently. When drained EDG fluids were released from the RCA, the HP procedures only required radiation and contamination surveys of the drums prior to their release from the RCA. When the fluids from EDG catchments were released from the RCA, the HPs were required to sample the liquid contents to identify presence of any radioactivity.

Licensee procedure HPP-41, "Movement of Material and Equipment," Revision 2, dated 04/23/96, described the means by which Health Physics personnel were to exercise positive control of materials and equipment located in and leaving the RCA. The procedure, in part, required the following:

- Step 5.1 - Materials and equipment removed from the RCA shall be properly surveyed prior to release from the area;

- Step 5.7 - Free release of oil, liquids and bulk quantities of building or construction materials such as dirt and rock shall not be unconditionally released by use of gamma ray spectroscopy unless the samples are analyzed on a counting system and meet the environmental lower limit of detection limits contained in Chemistry Procedure C-200, Offsite Dose Calculation Manual; and

- Step 7.9 - No material with a detectable activity shall be approved for unconditional release from the RCA.

Contrary to the above, on August 2, 1996, HP technicians permitted the free release of EDG catchment fluids from the Unit 2 EDG building without first obtaining a gamma-ray spectroscopy assessment of the drum fluids.

In August 1996, Mechanical Maintenance (MM) personnel pumped the contents of the Unit 2 EDG oil catchment box into 55 gallon drums that were loaded onto a flatbed truck. On August 2, 1996, MM requested Chemistry to sample the contents of the barrels in accordance with MM procedures. Maintenance personnel also requested HP to survey the vehicle and drums in order to move the truck and its cargo outside the RCA. Chemistry personnel sampled the containers and HP personnel surveyed the exterior surfaces of the barrels and the truck. When the contamination survey of the barrel surfaces was completed, HP survey personnel permitted the vehicle and its contents to exit the RCA. Later that morning chemistry personnel analyzed the samples for radioactivity and forwarded a copy of the analysis to HP operations supervisor. At approximately 06:30 a.m., the HP operations supervisor recognized the catchment liquid had not been analyzed in accordance with licensee procedures. The truck and drums had been permitted to leave the RCA without a radiological assessment of the catchment fluids. The supervisor contacted MM and requested the vehicle and its contents be returned to the RCA. The HP staff initiated condition report 96-2199 to evaluate and correct the problems associated with the event.

Failure of HP personnel to properly analyze potentially contaminated liquids from the RCA prior to authorizing their release from the RCA was identified as a violation 50-335/97-02-01, "Failure to follow licensee procedures for survey and release of potentially contaminated material out of the licensee's RCA." This violation will not be subject to enforcement action because the licensee's efforts in identifying and correcting the violation meet the criteria specified in Section VII.B of the Enforcement Policy.

In response to the event, the licensee revised HPP-41, Revision 3 dated 12/04/96 to:

- Better describe the counting capability and requirements for systems used to analyze low concentrations of radioactive material in liquids; and

- Limit the number of personnel authorized to approve the unconditional release of bulk materials.

The licensee also revised Unit 1 and 2 General Maintenance Procedures 1-M-0018, "Mechanical Maintenance Safety Related Preventative Maintenance Program," Revision 45 and 2-M-0018, "Mechanical Maintenance Safety Related Preventative Maintenance Program," Revision 45. The revised procedures added specific HP signoffs to:

- Notify HP prior to commencing any oil pumping operations in the RCA in order that contamination surveys of pumps, hoses, and drums can be made prior to the pumping operations; and

- Notify HP for sampling liquid from the oil catchment boxes, analyze samples for radioactivity, and verify the liquid meets the criteria for uncontrolled release as required by HPP-41.

The inspectors inquired about the disposition of the EDG fluids being released from the RCA. The licensee was taking the fluids from the EDG catchment to the turbine building for processing. The licensee utilized separators in the turbine building for the purposes of separating the oil and water mixture. The separated water was routed into the site storm drains and the oil would be collected and placed into a used oil storage tank. The storm drains emptied into an evaporation/percolation pond located within the site's protected area.

Following the premature release of the fluids out of the RCA on August 2, 1996, the licensee decided to stop the release of EDG catchment fluids from the RCA, and store the 55 gallon drums inside the RCA. The licensee had purchased an oil and water separator to separate the catchment fluids within the RCA. The water from the separation process would be routed to the plant radioactive waste systems and the oil would be sampled for free release. The new separator had not been placed into service at the time of the inspection and the licensee continued to store the catchment fluids within the RCA.

c. Conclusions

As a result of the licensee's recent corrective action efforts, the inspectors concluded the licensee was continuing to implement better control of contaminated tools, equipment and material.

One non-cited violation was identified concerning failure to follow licensee procedures for the survey and release of potentially contaminated material exiting the RCA.

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on January 31, 1997. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

E. Benken, Licensing Compliance Engineer
H. Buchanan, Health Physics Supervisor
B. Johnson, Dosimetry Supervisor
J. Marchese, Maintenance Manager
R. McCullers, Health Physics Operations Supervisor
J. Scarola, Plant General Manager
A. Stall, Site Vice President

Other licensee employees contacted included office, operations, engineering, maintenance, chemistry, and health physics personnel.

INSPECTION PROCEDURES USED

IP 83750: Occupational Radiation Exposure

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-335, 389/97-02-01	NCV	Failure to follow licensee procedures for the release of potentially contaminated liquids from the licensee's Radiation Control Area (Section R1.2)

LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
CR	Condition Report
dpm	Disintegrations Per Minute
DPR	Demonstration Power Reactor
EDG	Emergency Diesel Generators
EPD	Electronic Personnel Dosimeters
FP&L	Florida Power and Light
HP	Health Physics
HPP	Health Physics Procedures
IP	Inspection Procedure
MM	Mechanical Maintenance
NCV	Non-Cited Violation
NPF	Nuclear Production Facility
NRC	Nuclear Regulatory Commission
RCA	Radiation Control Area
RP	Radiation Protection
RWPs	Radiation Work Permit
TLDs	Thermoluminescent Dosimeter