



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

Report Nos.: 50-250/78-21 and 50-251/78-21

Docket Nos.: 50-250 and 50-251

License Nos.: DPR-31 and DPR-41

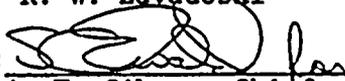
Licensee: Florida Power and Light Company
9250 West Flagler Street
Miami, Florida 33101

Facility Name: Turkey Point Units 3 and 4

Inspection at: Turkey Point Site, Homestead, Florida

Inspection Conducted: September 11-15, 1978

Inspectors: D. M. Collins
R. W. Zavadoski

Reviewed by: 
A. F. Gibson, Chief
Radiation Support Section
Fuel Facility and Materials Safety Branch

11/3/78
Date

Inspection Summary

Inspection on September 11-15, 1978 (Report Nos. 50-250/78-21 and 50-251/78-21)

Areas Inspected: Routine, unannounced inspection of radiation protection program including radiation protection procedures, training, qualifications of health physics technicians, external radiation exposure control, respiratory protection, posting and access control, air sampling, radiation surveys, unusual occurrences, shipments of radioactive materials, liquid effluent cleanup systems, and followup on previously identified enforcement matters.

Results: Of the twelve areas inspected, no apparent items of noncompliance or deviations were identified in 9 areas; 3 apparent items of noncompliance were identified in 3 areas (infraction - issuance and use of respirators (78-21-1); infraction - preparation of shipments of radioactive material not in accordance with container requirements (78-21-2); infraction - failure to lock access to high radiation areas (78-21-3)).

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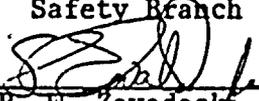
DETAILS I

Prepared by:



D. M. Collins, Radiation Specialist
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11/3/78
Date

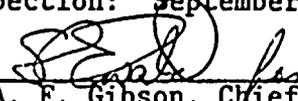


R. W. Zavadowski, Radiation Specialist
Radiation Support Section
Fuel Facility and Materials
Safety Branch

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Dates of Inspection: September 11-15, 1978

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A. F. Gibson, Chief
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1. Persons Contacted

- *H. E. Yaeger, Plant Manager
- *J. K. Hays, Plant Superintendent, Nuclear
- *H. F. Storey, Corporate Health Physicist
- *P. W. Hughes, Health Physics Supervisor
- *J. M. Puckett, Health Physics Operations Supervisor
- T. Coleman, Health Physics Shift Supervisor
- J. Bates, Health Physics Shift Supervisor
- *J. L. Danek, Health Physics Training Supervisor
- J. Ferguson, Health Physics Administrative Assistant
- *T. S. Peck, Health Physics Administrative Supervisor
- *D. W. Jones, Quality Control Supervisor
- E. R. LaPierre, Radiochemist

The inspectors also talked with and interviewed eight radiation protection men and 29 operations and contractor personnel.

*Denotes those present at the exit interview.

2. Licensee Action on Previous Inspection Findings

(Open) Noncompliance (78-11-01) Compliance With Procedures. Full compliance with HP-41, "Movement of Material Inside the Radiation Control Area," had not been achieved (paragraph 9.b.).

3. Unresolved Items

No new unresolved items were observed during this inspection.

4. Radiation Work Permits (RWPs)

The inspector examined selected RWPs posted at the entrance to the Radiation Controlled Area (RCA). The inspector examined selected records from the file "Terminated RWPs" for the period August 15 through September 11, 1978. The inspector observed a Health Physics Supervisor discussing with maintenance personnel the radiation safety requirements for specific work and issuing RWPs. The inspector toured the Auxiliary Building, Units 3 and 4 Spent Fuel Buildings, and Unit 4 Containment and observed the implementation of RWP requirements for selected operations. Procedure HP-1, "Radiation Work Permit," requires that specified work be done in accordance with the conditions of an RWP. No items of noncompliance or deviations were observed by the inspector.

5. Radiation Protection Training

The inspector discussed radiation protection training, respiratory protection training, and experience in working with radioactive materials with operators, maintenance personnel and contract health physics technicians (radiation protection men (RPMs)). The inspector discussed the radiation protection training program for temporary employees with licensee representatives. The inspector examined the resume's of two contract technicians. The licensee was required by 10 CFR 19.12 to provide radiation protection instruction to workers, and by Technical Specification 6.3.3.1 to assure that contract RPM meet or exceed training and experience requirements. No items of noncompliance or deviations were observed.

6. External Radiation Exposure Control

- a. The inspector observed the wearing of TLD badges and pocket chambers by workers during tours of the RCA. The inspector discussed the control and monitoring of radiation exposure with operators, RPM and licensee representatives. The inspector examined the "Daily Dose Printouts" of third quarter accumulated dose to workers for the period September 1 through September 11, 1978. For selected individuals whose accumulated dose exceeded that specified in 10 CFR 20.101(a), the inspector verified that an NRC Form 4 was on file in the individual's dosimetry file. The inspector examined selected records from the "Control Point Access Log" and the "Visitor's Radiation Exposure Record" and compared these results with the "Current Radiation Exposure"

Report" to assure pocket chamber reading were being properly entered into the records of individuals' total quarterly doses. The licensee was required by 10 CFR 20.101, 20.202, and 20.102 to limit and measure radiation doses to workers. No items of non-compliance or deviations were observed by the inspector.

- b. During observation of the work on Unit 3 Spent Fuel Pool, the inspector observed an RPM check records to assure that an individual assigned work requiring a respirator was qualified to wear a respirator. Upon determining that the individual was not respirator qualified, the radiation protection technician did not issue the respirator. The inspector observed several individuals wait in the Spent Fuel Pool in a radiation field of 2-7 mrem/hr while an individual respirator qualified was assigned to the job. The inspector discussed with licensee representatives the need to be alert to occasions where radiation exposure to individuals could be decreased, such as in the pool work. The inspector had no further questions.
- c. The inspector discussed with licensee representatives steps taken to reduce dose to individuals during steam generator work. The inspector examined draft radiation protection procedures for such work. The inspector had no further questions.
- d. The inspector reviewed "The Current Radiation Exposure Report as of September 12, 1978 - 001 Hour" and calculated that approximately 240 man-rem has been expended in the present quarter (July 1, 1978, to September 12, 1978). Exposures were less than 0.5 mrem per man for ten groups of workers reviewed, and 1.26 for the eleventh group. This high exposure group of sixteen men were ladders and sheet metal workers who were removing and replacing insulation for inservice inspection requirements. Six of the sixteen individuals were on the plant alert list for radiation exposure. To qualify for the alert list an individual must have received at least 80% of the administratively controlled limit. On September 12, 1978, there were 17 individuals total on the alert list.
- e. The inspector reviewed the records of all the sixteen ladders/ sheet metal workers and verified that each had a properly completed NRC-4 form and noted those individuals who were trained and qualified to wear a respirator. The inspector discussed the scope and type of work performed by the ladders/ sheet metal workers with the job foreman and the FPL contract coordinator and was told that the present insulation on the reactor coolant piping was gradually being replaced with quickly removable insulation. At this refueling, no new quickly removable

insulation was being added to the system because the order had not been placed in time. The majority of the insulation removed was located in the lowest level of the containment inside the secondary shield wall where the general radiation levels were 30 - 50 mrem/hr. The nature of the work required hands-on-contact, in some very tight places, with reactor coolant piping where radiation hot spots exceed 1000 mrem/hr. The job is well known before a refueling starts, e.g., for this refueling, approximately 150 weld/places were to be inspected. Each weld/place is tagged prior to removal of the insulation. The inspector noted that radiation levels could be conveniently affixed to the tags, but were not, and brought this to the attention of the licensee's representatives, who said they would look into it.

- f. The inspector reviewed the radiation work permits (RWP Nos. 78-437 and 78-444) for lagging removal, talked with the ladders and sheet metal workers about the work they were doing and personally observed some of the difficult work they were doing inside containment. From these discussions it was ascertained that no training on mock-ups had been provided prior to the job. However, the majority of the ladders/sheet metal workers had had previous experience at the plant. While the inspector was in the containment with the ladders/sheet metal workers for a period of approximately one hour, he noted that there were no HP technicians covering the operations. Discussions with the workmen revealed that HP coverage was not continuous and might be described as infrequent.
- g. The inspector discussed with HP management the feasibility of devoting more time and attention to high exposure jobs, such as the lagging removal, in order to reduce the exposures if possible. The licensee representatives said they would look into this and the inspector had no further questions.

7. Respiratory Protection

a. Use of Respirators

During tours of work areas the inspector observed the issuance and use of respiratory protection equipment. The inspector discussed the respiratory protection equipment with licensee representatives, RPM, and workers. The inspector examined selected records regarding use of respirators, air sampling, and MPC-hour exposures from the "MPC-Hour Log". The licensee was required by 10 CFR 20.103 to implement a respiratory protection program in accordance with Regulatory Guide 8.15. The licensee's

implementing procedures for the respiratory protection program include HP-66, "Issuance and Control of Respiratory Protection Equipment".

b. Issuance of Respirators

The inspector reviewed the Respirator Equipment Issuance Log and found two instances on September 11, 1978, where respirators (Nos. F-98 and F-138) were issued to an individual who was not medically certified to wear a respirator. The log indicated that the individual was qualified to wear a respirator contrary to the "Current Radiation Exposure Report, as of September 12, 1978 - 001 Hours", whereon qualified respirator users are indicated. The inspector verified by interview with the individual who was issued the respirator that he did not wear the respirator, but gave it instead to a person who was qualified to wear one. The individual stated that he was not qualified to wear a respirator. On August 31, 1978, the following respirators, F-111, F-285, F-153, F-42, F-25, F-164 and F-05 were issued to a corporation name rather than a trained, medically certified individual. Numerous examples of corporate issuance were noted by the inspector for the month of August 1978. The inspector informed the licensee representative that the apparent lack of control in issuance of respirators to certified individuals was an item of noncompliance with Section 8.3 of Procedure HP-66 (78-20-1).

- c. Air sample records and MPC-hour exposure calculations showed that on August 29, 1978, an individual entered a steam generator using a supplied air respirator with a protection factor of 2000. Air samples taken at the time showed the concentrations in the steam generator to be 44,444 times the concentration listed in Appendix B of 10 CFR 20. The records showed that the individual's stay time in the generator was limited to 8 minutes because of the radiation dose rates. The resultant exposure was 2.6 MPC-hours, which was less than the limit specified by 10 CFR 20.103. Regulatory Guide 8.15, Section C.2. specified that respiratory protective equipment was to be selected to provide a protection factor greater than the multiple by which peak concentrations of radioactive materials are expected to exceed the values specified in Table I, Column 1 of Appendix B to 10 CFR Part 20. The inspector questioned licensee representatives concerning the steam generator entry. Licensee representatives stated that the entry was probably made after tube plugging and that the ventilation system had probably not removed the resulting airborne contamination prior to the individual's entry. A licensee representative stated that no investigation of the high sample result was made. Licensee

representatives also stated that it had been their experience that dose rate in the steam generators was the factor limiting time in the generator. The inspector had no further questions.

8. Posting and Control

a. Posting

The inspector observed the posting on bulletin boards throughout the plant of the notices and reports required by 10 CFR 19.11.

b. Warning Signs

- i. The inspector toured the Radiation Control Area and observed the posting of warning signs and the locking of access points to certain areas. The inspector took radiation level readings at selected locations and requested that air samples be taken at selected locations to assure that areas were posted and locked as required by 10 CFR 20.203(c)(1) and Technical Specification 6.13.1 respectively. The inspector observed a RPM measure a radiation level approximately 18" from the regenerative heat exchangers. The measurements showed radiation levels of from 1 - 3 rem/hr. The area was not locked and was not under observation by an individual who could limit access to the area.
- ii. While reviewing the emergency filtration systems inside containment, on September 12, 1978, the inspector noted that reactor cavity liquid filters, which are partially shielded with lead, were not locked up. A review of survey records showed that the field surrounding the filters was in excess of 1 R/hour. On September 13, 1978, an inspector again observed the same situation of unlocked access to the filters and no one assigned to limit access to the filters.
- iii. The inspector reviewed records of surveys which showed that radiation levels exceeded 1 rem/hr in the TIP room.
- iv. The inspector informed licensee representatives that the failure to barricade and lock access points to areas where radiation levels exceeded 1 rem/hr would be considered an item of noncompliance with Technical Specification 6.13.1.b.

9. Surveys

a. Air Samples

The inspector examined selected records of in-plant air sample results and selected records MPC-hour exposures for the period August 15 through September 11, 1978; records of duct samples for the period September 11-14, 1978; and records of air sample results for selected RWPs during the period August 14 through September 11, 1978. The licensee was required by 10 CFR 20.103 and 20.201(b) to limit and survey to measure intakes of radioactive material by workers. No items of noncompliance or deviations were observed by the inspector.

b. Contamination Surveys

The inspector toured the plant, took, and requested RPM to take, smears for removable contamination in various locations and on selected pieces of equipment. The inspector examined records of contamination surveys posted in areas of the plant. The inspector examined the wrapping and tagging of potentially contaminated items in the RCA. The licensee was required by HP-41, "Movement of Material Inside the Radiation Controlled Area" to survey, contain, tag, and store contaminated materials. The inspector noted that the conditions that lead to the item of noncompliance, noted in Inspection Rpt. Nos. 50-250/78-11 and 50-251/78-11 (78-11-02), had not been corrected. The licensee had not formally responded to the item of noncompliance. The inspector observed potentially contaminated and contaminated materials not double wrapped and sealed, not tagged, and not in specified storage locations. Licensee representatives stated that the procedure was being reviewed and corrective actions would be completed by October 15, 1978. The inspector had no further questions.

c. Housekeeping

During the plant tour, the inspectors noted, as did a previous inspection (see RII Rpt. Nos. 50-250/78-11 and 50-251/78-11, page I-3, paragraph 4.c), that the housekeeping in several work areas did not appear to be consistent with good health physics practice. The inspectors noted several instances where shoe covers, rubber and cotton gloves and miscellaneous bags of waste were stacked in entrances to equipment rooms or left in the waste laydown area. Licensee representatives again acknowledged this situation and stated that cleanup efforts were continuing.

d. Surveys After Spills Behind Refueling Building

i. On the night of September 11, 1978, while touring the Auxiliary Building the inspectors were informed that there had been a spill of contaminated liquid behind the Refueling Building. When the inspectors arrived, the area was being roped off and absorbant material was being placed on the spill. The inspectors observed the cleanup operations, discussed the cause of the release of the liquid with licensee representatives and operators, and examined records of liquid analyses made by the licensee. The inspectors examined subsequent contamination surveys and observed further cleanup of the area. The pump which failed was taken out of service by the licensee. The three drains in the room were clogged and, therefore, did not channel liquid to the radwaste holdup tank. Later the drains were unclogged, and in the process radioactive liquid backed onto the charging pump room floor.

ii. The inspectors examined results of analyses of water that had spilled from the Unit 4 Spent Fuel Pool and records of surveys of surface contamination made after cleanup of the spill. The inspectors examined the licensee's analysis of the radiological impact of the overflow. The inspectors made radiation level surveys at ground level in areas above the drywell where the liquid was routed. The inspectors had no further questions.

e. Radiation Level Surveys

The inspector discussed the radiation level survey program with licensee representatives. The inspector accompanied RPM and observed them making radiation level surveys. The inspector made confirmatory surveys of radiation levels using NRC instruments. The inspector examined selected records of radiation level surveys inside Unit 4 containment for the period August 13 through September 9, 1978. The inspector noted radiation levels at various locations inside containment as discussed in paragraph 8. The inspector had no further questions.

f. Bulletin 78-08, "Radiation Levels From Fuel Element Transfer Tubes"

This bulletin described potential problem of radiation streaming from fuel transfer tubes during fuel movement. The inspector examined the results of a survey of the Unit 4 fuel transfer tube performed during movement of fuel in the tube. The inspector had no further questions.

10. Spent Resin Shipments

The inspector reviewed records of shipment of radioactive materials from the plant and found that four shipments were not in compliance with the certificate of compliance. Specifically, the records show that on July 21, 1978, 6000 pounds containing 108 curies of mixed fission products (MFP), cobalt 60 (Co-60), and cobalt 58 (Co-58) were shipped as low specific activity (LSA) material, designated Group II, III and IV respectively, in a Model No. 7-100 shipping container under Certificate of Compliance No. 9113. Similarly, on July 27, 1978, 6000 pounds containing 53.9 curies were shipped; on August 25, 1978, 8000 pounds containing 425 curies were shipped; and on August 31, 1978, 8000 pounds containing 547 curies were shipped. Other than weight and total curies, the same details for the July 21, 1978, shipment apply to the other shipments. Prior to these shipments, during IE Inspection 50-250/78-11 and 50-251/78-11 Circular '78-03, "Packaging Greater Than Type A Quantities of Low Specific Activity Radioactive Material for Transport," had been discussed with licensee representatives. The inspectors pointed out to licensee representatives that according to 10 CFR 71.12(b)(1)(ii), a person using a package pursuant to the general license provided for in that paragraph, for which a Certificate of Compliance had been issued, must comply with the terms and conditions of the certificate. Section 5(b)(1) of Certificate of Compliance No. 9113 requires that the process solids shipped meet the requirements for low specific activity radioactive material, as defined in 10 CFR 71.4(g)(4); and under Section 5(b)(2) requires that the maximum weight of the contents and secondary containers shall not exceed 7000 pounds. The inspector noted that all the referenced shipments exceeded LSA concentrations for Group II radionuclides of 5 microcuries/gram and the August 25 and 31, 1978, shipments exceeded the 7000-pound limitation. In addition, Condition 7 of Certificate of Compliance No. 9113 requires, in part, that the lid lifting lugs shall be covered in transit. On September 12, 1978, the inspectors observed a flat bed truck with a full 7-100 shipping container mounted on the bed in transit from the Radiation Control Area and noted that the lid lifting lugs were uncovered. The inspectors immediately brought this condition to the attention of the licensee representatives who immediately halted the shipment until the lugs were covered. The inspectors informed the licensee representatives that the above items constituted an item of noncompliance. Later in the inspection a licensee representative provided an inspector a reevaluation of the quantities and types of radioactive materials shipped in which it was concluded that the material was less than LSA when shipped. The inspector stated that a reevaluation after the fact did not change the finding that, when shipped, the information available to the licensee showed greater than LSA was shipped and the item was still considered an item of noncompliance (78-21-2).



11. Boric Acid Batching Tank Room

While touring the Auxiliary Building the inspector noted the floor in the Boric Acid Batching Tank Room was incrustated with approximately a half-inch of boric acid crystals. The inspector discussed the problem with a licensee representative and was told that boric acid leaks had been occurring every two to three weeks for the past two years. The leaks appear to come from the diaphragm valves in the heat traced lines. The room is entered frequently by chemistry personnel who routinely obtain boric acid samples there. The inspectors requested that a smear survey of equipment and air sample be obtained from the area, since the leaking liquid has had activities in the order of 10^{-2} microcuries/ml, as verified by a record review. The air sample and smear survey were within acceptable limits, but the inspectors noted that all equipment in the room appeared to be quiescent. Since chemistry samples are obtained while the pumps are running, the inspectors discussed the possibility of obtaining air samples while the pumps are operating. The licensee representative said they would try to obtain such a sample in the near future. The inspectors had no further questions in this area.

12. Open Containment/Spent Fuel Pool Buildings

- a. While touring the facility on September 11, 1978, the inspectors noted that approximately one-third of the roof and side of the Spent Fuel Pool Building for Unit No. 4 was open to the atmosphere. At the time, fuel was being moved in the pool and the pool contained all the spent fuel from the past ten refuelings (less thirteen assemblies) due to modifications being made on the Unit No. 3 spent fuel pool. In addition, a rainstorm appeared to be impending. The inspectors questioned the policy of leaving the building open while moving fuel and were told by licensee representatives that there were no requirements to maintain building integrity. The inspectors verified this statement by a review of the technical specifications and FSAR and had no further questions. Later the same day the inspectors observed that the door had been closed.
- b. On September 13, 1978, while touring inside containment the inspectors noted that the equipment and personnel hatches were open and the reactor vessel head was on the operating deck. All the fuel was in the reactor. The inspectors also measured the flow of air at the equipment hatch and found that air was flowing from the containment to the environment at a rate of 50 to 75 fpm. The inspectors questioned the lack of containment integrity and control over the release of radioactive gases and particulates to the environment. The licensee representatives stated that, by technical specifications, the containment could be open



during a refueling when motion of fuel in the cavity had ceased, as was the case. As to the release of radioactive gases and particulates, licensee representatives stated that periodic air samples were taken in containment and that the levels of airborne radioactivity were insignificant. The inspectors had no further questions.

13. Filtration/Demineralization System

- a. While touring the Radwaste Building with the licensee representatives, the inspectors noted a red plastic hose pulsating in an open hallway about six feet from the floor. The hose was being used to transfer waste reactor coolant liquid, with an activity of 10^{-2} to 10^{-3} microcuries/ml from a storage tank to a portable Filtration/ Demineralization System. The valving station for the system was in the same room as the filter and demineralizer units, and was composed mainly of plastic piping and valves, many of which were manually operated. The system could be operated from outside the room. The senior operator for the system had received his maximum administratively allowed dose of 2150 mrem for the quarter and was not allowed in the Radiation Controlled Area. The system called a "test" system by the facility, has been operating since January 16, 1978, and has processed over 1,270,000 gallons.
- b. The inspector examined the application to the Plant Nuclear Safety Committee (PNSC) for approval of operation of the system. The inspector examined the PNSC approval for operation of the system. The inspector had no further questions.

14. Exit Interview

The inspectors met with licensee representatives (denoted in paragraph 1) on September 15, 1977, and summarized the scope and findings of the inspection. With regard to the apparent item of noncompliance regarding the locking of high radiation areas, the plant manager stated that he disagreed that the license required the locking of such areas inside containment since entrances into containment were locked or an individual was stationed at the entrance to containment to limit access. The inspectors stated that during an outage that this control point was not effective in limiting access to specific areas in containment where radiation levels were in excess of 1 rem/hr, that these specific areas were not under positive access control, were not posted differently from other high radiation areas in the plant, and access should be limited by locked fencing or other means as required by the technical specifications. With regard to the item of noncompliance regarding transportation, a licensee representative stated that the shipping



procedures were being revised so that such shipments would not recur. With regard to the inspectors' comments concerning the control of contaminated items within the RCA, the plant manager stated that actions should result in full compliance by October 15, 1978. He stated that there was positive control over items leaving the RCA. An inspector commented that many of the records of surveys made by RPM were not being reviewed by supervisors and that such review, in many cases, was important to assure full evaluation of survey results. A licensee representative stated that attempts would be made to increase review of survey results. With respect to the clogged drain lines, an inspector asked if the licensee had any plans to perform periodic checks of drain lines to assure that they were not clogged. The plant manager stated that he would not commit to such a program.

