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REGION II
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February 23, 1995

Report Nos.: 50-250/95-03 and 50-251/95-03

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

Docket Nos.: 50-250 and 50-251 License Nos.: DPR-31 and DPR-41

Facility Name: Turkey Point Units 3 and 4

Inspection Conducted: January 30 - February 3, 1995

Inspector: D. B. Forbes 2/17/95
D. B. Forbes Date Signed

Approved by: William H Rankin 2/22/95
W. H. Rankin, Chief Date Signed
Facilities Radiation Protection Section
Radiological Protection and Emergency Preparedness Branch
Division of Radiation Safety and Safeguards

SUMMARY

Scope:

This routine, announced inspection of the licensee's radiation protection (RP) program involved review of health physics (HP) activities. The specific areas evaluated included organization and staffing, self-assessment programs, training, external and internal exposure controls, control of radioactive material and contamination, surveys and monitoring, and As Low As Reasonably Achievable (ALARA) program implementation.

Results:

Based on interviews with licensee personnel, records review, and observation of work activities in progress, the inspector found the RP program to be functioning adequately to protect the health and safety of plant workers. RP staffing levels appeared adequate to support on-going activities. The licensee continued to implement effective internal and external exposure control programs with all exposures less than 10 CFR Part 20 limits. The ALARA program continued to be effective in controlling overall collective dose.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*T. Abbatiello, Manager, Site Quality
J. Bates, Support Supervisor - Health Physics
*K. Beatty, Corporate, Manager, Nuclear Training
S. Blitchington, Supervisor, Operations
R. Brown, ALARA Supervisor - Health Physics
*J. Danek, Corporate, Health Physics
M. Eades, Quality Assurance Specialist
*G. Hollinger, Training Manager
*D. Jernigan, Plant General Manager
*H. Johnson, Operations Manager
*J. Knorr, Engineer, Licensing
*J. Lindsay, Supervisor, Health Physics
*T. Plunkett, Vice President
*A. Singer, Operations Supervisor
*E. Weinkam, Manager, Licensing
J. Williams, Dosimetry and Records Supervisor

Other licensee employees contacted included engineers, technicians, operators, and office personnel.

Nuclear Regulatory Commission

*B. Desai, Resident Inspector
T. Johnson, Senior Resident Inspector
L. Trocine, Resident Inspector

*Attended February 3, 1995 Exit Meeting

2. Organization and Management Controls (83750)

The inspector reviewed the licensee's organization, staffing levels, and lines of authority as they related to the Radiation Protection (RP) Department 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 one change in the RP Department reporting chain since the previous inspection conducted October 3-7, 1994, and documented in Inspection Report (IR) No. 50-250, 251/94-19. The Operations Manager, to whom the Radiation Protection Manager reported, had changed. The previous Operations Manager had been promoted to General Plant Manager and the Operations Supervisor had been promoted to the Operations Manager. The inspector interviewed the new Operations Manager and

discussed licensee ALARA initiatives. At the time of the inspection, the RP staff employed approximately 75 personnel including 40 Radiation Protection Men (RPMs). The RPMs observed performing work and interviewed by the inspector appeared knowledgeable and well trained.

Based on discussions with licensee representatives and observation of activities in progress, the RP staffing levels appeared adequate to support on-going activities.

No violations or deviations were identified.

3. Audits and Appraisals (83750)

a. Quality Assurance (QA) Audits

10 CFR 20.1101(c) requires that the licensee periodically review the RP program content and implementation at least annually.

Technical Specification (TS) 6.5.2.8 requires audits of facility activities to be performed under the cognizance of the Company Nuclear Review Board (CNRB) encompassing conformance of facility operation to all provisions contained in the TSs and applicable License Conditions at least once per 12 months, and the Process Control Program (PCP) and implementing procedures at least once per 24 months.

The licensee's independent audits and appraisals in the radiation control area consisted of formal audits per TS requirements, documented observations, and specific surveillances. A qualified auditor with health physics and chemistry experience was assigned to the station to implement the licensee's assessment activities.

The inspector reviewed licensee activities, audits, and appraisals to determine the adequacy of identification and corrective action programs for deficiencies or weaknesses related to the control of radiation or radioactive material. Observations by the inspector and discussions with cognizant licensee personnel indicated that these efforts were accomplished by reviewing procedures, observing work, reviewing industry documentation, and performing plant walkdowns to include surveillance of work areas by supervisors and technicians. The inspector reviewed and discussed with licensee representatives the Quality Assurance Audit, QAO-PTN-94-018, Radiation Protection, conducted during the fall of 1994.

In general, the audit reviewed was determined to be well planned and met requirements for conducting an annual audit in the area of radiation protection, as required by the licensee's appraisal process.

No violations or deviations were identified.

b. Radiological Incident Reporting System

The inspector reviewed the licensee's RP internal program for identifying and correcting deficiencies and weaknesses related to radiation exposure and the control of radioactive material. The program included the Radiation Deficiency Report (RDR). The inspector also reviewed and discussed with licensee representatives methods for tracking and trending RDRs. The inspector reviewed selected RDRs written since the last inspection of this area and determined the RDRs were well documented and corrective action was assigned normally via a licensee condition report.

No violations or deviations were identified.

4. Training and Qualifications (83729)

10 CFR 19.12 requires, in part, that the licensee instruct all individuals working in or frequenting any portions of a restricted area in the health protection aspects associated with exposure to radioactive material or radiation; in precautions or procedures to minimize exposure; in the purpose and function of protection devices employed; in the applicable provisions of the Commission regulations; in the individual's responsibilities; and in the availability of radiation exposure data.

a. Continuing Health Physics Training

The inspector discussed with cognizant licensee management, training requirements for RPMs. At the time of the inspection, the licensee was conducting RPM continuing training which included lectures, written examinations and practical exercises. The continuing training curriculum for the period of January 23, 1995 through March 10, 1995, included topics such as a review of 1994 feedback, internal exposure controls, fire brigade training, radwaste shipping, digital alarming dosimetry, and sample analysis using the Multi-Channel Analyzer. The inspector also interviewed RP personnel, to determine if the RPM continuing training was effectively being implemented.

b. General Employee Training (GET) and Radiation Controlled Area Training (RCAT)

The inspector reviewed the licensee's program for GET training which was provided to employees needing unescorted access to only the protected area. For workers needing unescorted access to the radiologically controlled area (RCA), RCAT was required, in addition to GET and Fitness For Duty Program Training. The inspector noted specific mockup training had been conducted for selected jobs with the potential for high radiation exposures.

Based on observations and discussions with selected managers, supervisors, training personnel, and an evaluation of training procedures, student handouts, and course outlines, the inspector determined that the licensee's GET and RCAT training programs met the provisions of 10 CFR 19.12.

No violations or deviations were identified.

5. External Exposure Controls (83750)

a. Total Effective Dose Equivalent Exposure

10 CFR 20.1201 (a) requires each licensee to control the occupational dose to individual adults, except for planned special exposures under 10 CFR 20.1206, to the following dose limits:

(1) An annual limit, which is the more limiting of:

(i) The total effective dose equivalent being equal to 5 rems; or
(ii) The sum of the deep-dose equivalent and the committed dose equivalent to any individual organ or tissue other than the lens of the eye being equal to 50 rems;

(2) The annual limits to the lens of the eye, to the skin, and to the extremities, which are:

(i) An eye dose equivalent of 15 rems; and
(ii) A shallow-dose equivalent of 50 rems to the skin or to any extremity.

TS 6.11.1 requires procedures for personnel radiation protection to be prepared consistent with the requirements of 10 CFR Part 20 and be approved, maintained, and adhered to for all operations involving personnel radiation exposure.

The inspector discussed the Total Effective Dose Equivalent (TEDE) exposures for plant and contractor employees. Licensee representatives stated and the inspector confirmed that all TEDE exposures assigned since the previous NRC inspection of this area were within 10 CFR Part 20 limits. A discussion with licensee representatives and a review of pertinent records determined the licensee had established an annual site exposure goal for 1994 of approximately 475 person-rem. The licensee's annual site exposure for 1994 was approximately 440 person-rem which was based on operational exposure and dual outage exposure for Units 3 and 4. The licensee's total exposure for the Unit 4 refueling outage was

approximately 220 person-rem compared to a pre-established outage exposure goal of 175 person-rem. However, discussions with the licensee and a review of records determined the additional exposure was primarily attributed to emergent work which was not initially pre-planned prior to the outage.

No violations or deviations were identified.

b. Personnel Dosimetry

10 CFR 20.1501(c)(1) and (2) requires that dosimeters used to comply with 10 CFR 20.1201 shall be processed and evaluated by a processor accredited by the national Voluntary Laboratory Accreditation Program (NVLAP) for the types of radiation being monitored.

10 CFR 20.1502(a) requires each licensee to monitor occupational exposure to radiation and supply and require the use of individual monitoring devices by:

(1) Adults likely to receive, in one year from sources external to the body, a dose in excess of 10 percent of the limits in 10 CFR 20.1201(a);

(2) Minors and declared pregnant women likely to receive, in one year for sources external to the body, a dose in excess of 10 percent of any of the applicable limits of 10 CFR 20.1207 or 10 CFR 20.1208; and

(3) Individuals entering a high or very high radiation area.

The inspector reviewed and discussed the licensee's dosimetry program with site personnel and determined licensee dosimetry was being processed under NVLAP certification. The licensee continued to implement both Digital Alarming Dosimeters (DADs) and self-reading pocket dosimeters (SRPDs); however, the former were being used as the primary devices for containment entries. Thermoluminescent Dosimeters (TLDs) were required for all entries into the RCA. The licensee recently implemented a new DAD system and was training personnel on the use of the new equipment at the time of the inspection. The licensee informed the inspector they had obtained approximately 600 new DADs to support ongoing and outage activities. The licensee also informed the inspector that the new DAD system obtained had software and hardware to support a more integrated exposure tracking system. The licensee was also continuing the use of wireless Direct Reading Dosimeters (DRDs) (teledosimetry) for remotely monitoring the dose rates of areas and exposure of personnel during selected higher dose work activities. During tours of the plant, the inspector observed personnel wearing appropriate monitoring devices on the location of the body as specified by posted requirements and the Radiation Work Permits.

Based on observations, records reviews, and interviews with plant workers, the inspector concluded the licensee was effectively controlling external radiation exposure.

No violations or deviations were identified.

6. Internal Exposure (83750)

a. Respiratory Protection

10 CFR 20.1703(a)(3) permits the licensee to maintain and to implement a respiratory protection program that includes, at a minimum: air sampling sufficient to identify the hazard; surveys and bioassay to evaluate the actual intakes; testing of respirators immediately prior to each use; written procedures regarding selection, fitting, issuance, maintenance and testing of respirators; written procedures regarding supervision and training of personnel and monitoring, including air sampling and bioassays; record keeping; and determination by a physician prior to the use of respirators, that the individual user is physically able to use respiratory protective equipment.

The inspector reviewed records for selected employees who had recently worn respiratory protection equipment. The inspector verified that for the records reviewed, each worker had successfully completed respiratory protection training, was medically qualified, and was fit-tested for the specific respirator type used in accordance with licensee procedural requirements.

The inspector reviewed the respirator log sheets indicating the number and types of respirators used during 1994 which included approximately 156 full face respirators. The inspector discussed with the licensee respirator reduction efforts for the previous Unit 3 and Unit 4 outages. The licensee had continued to implement engineering controls for respirator reductions such as permanent and portable worksite ventilation, face shields, decontamination efforts, and worker training. During tours of the facility the inspector observed portable worksite ventilation systems available for use. The licensee reduced respirator usage during the 1994 Unit 4 outage by approximately 30 percent since the 1994 Unit 3 outage.

No violations or deviations were identified.

b. Breathing Air Quality

30 CFR 11.121 requires that compressed, gaseous breathing air meet the applicable minimum grade requirements for Type 1 gaseous air set forth in the Compressed Gas Association (CGA) Commodity Specification for Air, G-7.1 (Grade D or higher quality).

The inspector reviewed and discussed with the licensee representatives the program for testing and qualifying breathing air as Grade D. The inspector inspected the in-use breathing air system which included a plant in-line system using two permanently installed compressors labeled as A and B compressors. The inspector examined breathing air manifolds for physical integrity, current calibration of gauges, and the presence of carbon monoxide monitoring equipment. In addition, the inspector further noted that the supplied air hoods and hoses available for use were compatible per manufacturer's instructions as were air supplied respirators and hoses.

Review of breathing air testing records verified that the licensee was calibrating in-line carbon monoxide monitors and sampling in-use breathing air systems for certification in accordance with procedural requirements. For the tests reviewed, breathing air met Grade D requirements.

No violations or deviations were identified.

c. Whole Body Counting and Exposure Tracking

10 CFR 20.1204(a)(3) requires, in part, that the licensee, as appropriate, use measurements of radioactivity in the body, measurements of radioactivity excreted from the body, or any combination of such measurements as may be necessary for timely detection and assessment of individual intakes of radioactivity by exposed individuals.

The inspector was informed by licensee representatives that 14 positive internal contaminations were identified in 1994. At the time of the inspection, no positive internal contaminations had been identified as of February 3, 1995. The inspector reviewed licensee survey records for selected individuals and determined through discussions with licensee dosimetry management that all exposures in 1994 and through February 3, 1995 were well below regulatory limits of 5 Rem per year for Total Effective Dose Equivalent (TEDE). The licensee considered any count that gave a result greater than the minimal detectable activity for any nuclide other than potassium-40 to be "positive." No problems were noted by the inspector during a review of selective records of the bioassay program.

Based on the above, the inspector concluded that the licensee was effectively controlling internal contaminations.

No violations or deviations were identified.

7. Control of Radioactive Materials and Contamination, Surveys, and Monitoring (83250)

10 CFR 20.1902 specifies the posting and control requirements for radiation areas, high radiation areas, very high radiation areas, airborne radioactivity areas, and radioactive material areas.

10 CFR 20.1904(a) requires the licensee to ensure that each container of licensed material bears a durable, clearly visible label bearing the radiation symbol and the words "Caution, Radioactive Material," or "Danger, Radioactive Material." The label must also provide sufficient information (such as radionuclides present, and the estimate of the quantity of radioactivity, radiation levels, kinds of materials, and mass enrichment) to permit individuals handling or using the containers, to take precautions to avoid or minimize exposures.

10 CFR 20.1501(a) requires each licensee to make or cause to be made such surveys as (1) may be necessary for the licensee to comply with the regulations and (2) are reasonable under the circumstances to evaluate the extent of radioactive hazards that may be present.

TS 6.11.1 requires procedures for personnel radiation protection to be prepared consistent with the requirements of 10 CFR Part 20 and be approved, maintained, and adhered to for all operations involving personnel radiation exposure.

a. Routine Surveys, Posting, and Labelling

The inspector independently verified radiation and/or contamination levels of selected areas during tours of the Dry Storage Warehouse, RadWaste Building, Auxiliary Building, and outside radioactive material storage areas and no concerns for area postings were noted. The inspector also reviewed selected records of radiation and contamination surveys and concluded the licensee was effectively maintaining survey records. The inspector also noted that radioactive material inspected was appropriately labeled and all areas observed during facility tours were properly posted.

No violations or deviations were identified.

b. High Radiation Areas

TS 6.12.1 required, in part, that each High Radiation Area (HRA) with radiation levels greater than or equal to 100 mrem/hr but less than or equal to 1000 mrem/hr be barricaded and conspicuously posted as a HRA. In addition, any individual or group of individuals permitted to enter such areas are to be provided with

or accompanied by a radiation monitoring device which continuously indicates the radiation dose rate in the area or a radiation monitoring device which continuously integrates the dose rate in the area, or an individual qualified in radiation protection procedures with a radiation dose rate monitoring device.

During plant tours, the inspector noted that high radiation areas (HRAs) were locked as required and other entry controls were in place as necessary. In addition, the inspector observed licensee personnel perform an audit of the HRA key control locker and determined HRA keys were adequately controlled. At the time of the inspection, no problems were noted in the area of HRA controls.

No violations or deviations were identified.

c. Area and Personnel Contamination

The licensee maintained approximately 117,746 square feet (ft^2) of floor space as a Radiologically Controlled Area (RCA). The licensee maintained approximately 1498 ft^2 as contaminated or approximately 1 percent of the RCA. The amount of contaminated floor space had been reduced from approximately 4 percent since the conclusion of the Unit 4 outage.

The inspector reviewed selected Personnel Contamination Event (PCE) reports prepared by the licensee to track, trend, determine root cause, and any necessary followup action. Approximately 202 PCEs had occurred in 1994, primarily during the Unit 3 outage in April. The licensee had established a 1994 goal of 200 PCEs; which included outages on both Unit 3 and Unit 4. Of the 202 PCEs, 116 PCEs occurred during the Unit 3 spring of 1994 outage as compared to approximately 50 PCEs during the Unit 4 fall of 1994 outage. The licensee attributed this reduction to several planned contamination control initiatives such as the cooling of the Unit 4 containment to prevent contamination caused by sweat through while wearing protective clothing, increased us of containments for work involving high levels of contamination, increased emphasis on area work controls and decontamination efforts, plant supplied modesty garments to add additional protection factor from clothing, improved laundry techniques and laundry monitoring controls, and the procurement of a large portable facility to be used as an entry/exit control point to the Unit 4 containment for the purpose of providing workers with a larger area in which to remove protective clothing. The licensee informed the inspector that a similar entry exit control point is being planned for the next Unit 3 outage scheduled to begin in September 1995. The inspector also noted that the reduction in radioactive waste and contaminated square footage were contributors to PCE reductions. The licensee informed the inspector that no PCEs had occurred in 1995 as of February 3.

Based on a review of records, facility tours and discussions with licensee personnel the inspector determined the licensee was effectively implementing contamination control practices.

No violations or deviations were identified.

d. Radiation Detection and Survey Instrumentation

During facility tours, the inspector noted that survey instrumentation and continuous air monitors in use within the RCA were operable and currently calibrated. The inspector toured the instrument calibration room and observed instruments staged for issue. The inspector further noted an adequate number of survey instruments were available for use.

No violations or deviations were identified.

8. Operational and Administrative Controls (83750)

a. Radiation Work Permits (RWPs)

The inspector reviewed licensee procedure O-HPA-001, Radiation Work Permit Initiation and Termination, dated December 2, 1994. The inspector also reviewed selected routine and special RWPs for adequacy of the radiation protection requirements based on work scope, location, and conditions and observed several pre-job briefings. For the RWPs reviewed, the inspector noted that appropriate protective clothing, respiratory protection, and dosimetry were required. During tours of the plant, the inspector observed the adherence of plant workers to the RWP requirements and discussed the RWP requirements with selected plant workers and RP personnel. The inspector reviewed Radiological Status Boards used to enhance RWP survey information and discussed RWP requirements for HRAs with RPMs.

The inspector also attended a briefing conducted for workers performing a Unit 3 reactor power level entry for the purposes of performing a scheduled seal table leak inspection, a letdown heat exchanger visual leak test, and replacing the paper on the reactor head leak detector. The briefing was conducted by an RP supervisor with the main focus of the briefing to include various planning techniques to be implemented by personnel to minimize personnel exposure to both gamma and neutron radiation. The inspector concluded that the flow of information during the briefing was interactive between workers and radiation protection personnel and that the RWP requirements were adequately addressed.

The inspector found the licensee's program for RWP implementation to adequately address radiological protection concerns and to provide for proper control measures.

b. Notices to Workers

10 CFR 19.11(a) and (b) require, in part, that the licensee post current copies of 10 CFR Part 19, Part 20, the license, license conditions, documents incorporated into the license, license amendments and operating procedures, or that a licensee post a notice describing these documents and where they be examined.

10 CFR 19.11(d) requires that a licensee post form NRC-3, Notice to Employees. Sufficient copies of the required forms are to be posted to permit licensee workers to observe them on the way to or from licensee activity locations.

During the inspection, the inspector verified that NRC Form-3 was posted properly at plant locations permitting adequate worker access. In addition, notices were posted referencing the location where the license, procedures, and supporting documents could be reviewed. The inspector interviewed selected licensee and contractor personnel and verified personnel were familiar with the requirements of 10 CFR 19.11(d).

No violations or deviations were identified.

9. Program for As Low As Reasonably Achievable (ALARA) (83750)

10 CFR 20.1101(b) requires that the licensee shall use, to the extent practicable, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are As Low As Reasonably Achievable (ALARA).

The inspector reviewed licensee procedures O-HPA-071, ALARA Job Reviews, dated July 7, 1994 and also interviewed the ALARA Supervisor, ALARA staff, the RP Supervisor and other licensee representatives to discuss ALARA program implementation and ALARA initiatives to reduce dose during outages and non-outage periods. Discussions with licensee management personnel indicated the licensee was also evaluating new wireless headsets to be used in conjunction with new camera systems purchased to further improve communications and remote monitoring of workers in remote locations or areas of higher dose activity. The licensee's non-outage exposure for 1994 was approximately 84 person-rem for an average of 7 person-rem per month. Discussions with licensee management and a review of monthly person-rem budget reports determined the licensee had reduced non-outage site exposure goals to 60 person-rem for 1995 for an average of 5 person-rem per month. Licensee total site exposure for January 1995 was approximately 3 person-rem which was lower than the new 5 person-rem per month goal.

The inspector reviewed minutes from the last 4 ALARA Review Board Meetings dating back to September 8, 1994. Records reviewed determined the ALARA Review Board was attended by senior plant management staff and chaired by the General Plant Manager. A review of the meeting minutes

indicated items of substance addressing person-rem reductions were addressed and assigned actions to accomplish such tasks were being performed. The inspector also reviewed and discussed with licensee representatives the licensee's ALARA plan for 1995.. The plan was designed to provide a more aggressive management overview of person-rem expenditures. The following are some of the highlights of the plan:

- Incorporates manrem into a Plant Budget Program that is directly controlled by the Managers and Supervisors.
- Requires the respective supervisors to authorize the expenditures of budgeted person-rem.
- Requires ALARA Review Board's approval for 5 person-rem or greater task.
- Requires ALARA Review Board Chairman's approval for budget changes.
- Requires Managers and Department Supervisors to provide the Board with exposure reduction plans for their respective Departments.

Based on the above, the inspector informed the licensee representatives that the ALARA program continued to be effective in controlling exposures. Overall, collective dose expended was consistent with the work performed.

No violations or deviations were identified.

10. Exit Interview (83750, 92701)

At the conclusion of the inspection on February 3, 1995, an exit meeting was held with those licensee representatives indicated in Paragraph 1. The inspector summarized the scope and findings of the inspection. The licensee did not indicate any of the information provided to the inspector during the inspection as proprietary in nature and no dissenting comments were received from the licensee.