



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

JUN 30 1992

Report No.: 50-302/92-13

Licensee: Florida Power Corporation  
 3201 34th Street, South  
 St. Petersburg, FL 33733

Docket No.: 50-302

License No.: DPR-72

Facility Name: Crystal River 3

Inspection Conducted: June 1-5, 1992

Inspector: E. D. Testa  
 E. D. Testa

6/26/92  
 Date Signed

Accompanying Personnel: D. Forbes

Approved by: J. P. Potter  
 J. P. Potter, Chief  
 Facilities Radiation Protection Section  
 Radiological Protection and Emergency  
 Preparedness Branch  
 Division of Radiation Safety and Safeguards

6/29/92  
 Date Signed

SUMMARY

Scope:

This routine, unannounced inspection of the licensee's radiation protection (RP) program involved the review of RP activities including: self assessments, changes to the program, outage planning and preparation, training and qualifications, external exposure control, control of radioactive materials, and contamination surveys/monitoring and maintaining occupational exposure As Low As Reasonably Achievable (ALARA).

Results:

Based on interviews with licensee management, supervisors, personnel from station departments, and records review, the inspector found the RP program to be adequately managed. The licensee's program for occupational radiation safety was

functioning to protect the health and safety of occupational radiation workers. Delays of up to 45 minutes for workers to obtain necessary personnel monitoring instruments held up some jobs. A limited number of "clean" survey instruments were available. The house and rental RP technician staffing provided sufficient coverage for the current refuel 8 outage activities, although several items identified during facility tours indicated the need for more aggressive observation and remediation of items. This could result in unnecessary personnel exposure (paragraphs 3, 4, 7). A plethora of different colored and marked plastic bags and sleeving were used for contamination containment. This provides the opportunity for material mixups or unwanted releases.

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*J. Alberdi, Manager, Nuclear Plant Operations
- \*D. Barker, Nuclear Radiological Instructor, Nuclear Training
- \*P. Beard, Jr., Senior Vice President, Nuclear Operations
- \*G. Boldt, Vice President, Nuclear Production, FPC
- \*P. Breedlove, Records Management Supervisor, Nuclear Information Service
- \*G. Clymer, Nuclear Waste Manager, FPC Chem/Rad
- \*B. Conklin, Director, Materials and Controls, FPC NMS
- \*G. Cowles, Senior Nuclear Results Engineer, FPC
- \*P. Ezzell, Radiochemistry and Environmental Specialist, FPC/SNS
- \*E. Froats, Manager, Nuclear Compliance, FPC Compliance
- \*R. Fuller, Senior Nuclear Licensing Engineer, FPC Licensing
- \*S. Garry, Corporation H. P., FPC/SNS
- \*A. Gelston, Acting Manager, Site Nuclear Engineering Services
- \*G. Hainon, Manager, Nuclear Plant System Engineer, FPC Engineering
- \*J. Hammond, Senior Nuclear Maintenance Specialist
- \*S. Hickle, Director Quality Programs
- \*S. Johnson, Manager, Nuclear Quality Assessments
- \*A. Kazemfar, Senior Radiation Protection Engineer
- \*D. Kurtz, Manager, Nuclear Operations, QA
- \*W. Marshall, Nuclear Operations Superintendent
- \*P. McKee, Director, Nuclear Plant Operations
- \*L. Morfatt, Nuclear Operations Support
- \*T. Montgomery, Senior Nuclear Maintenance Specialist
- \*S. Robinson, Nuclear Chem/Radiation Support
- \*W. Rossfeld, Manager, Site Nuclear Services
- \*R. Stevens, Senior Quality Auditor
- \*R. Trentham, Health Physics Technician
- \*R. Widell, Director, Nuclear Operations Site Support
- \*D. Wilder, Radiation Protection Manager
- \*R. Yost, Supervisor, Quality Audits

Other licensee employees contacted during the inspection included technicians, maintenance personnel, and administrative personnel.

## Nuclear Regulatory Commission

- \*P. Holmes-Ray, Senior Resident Inspector
- \*J. Potter, Chief, Facilities Radiation Protection Section
- \*D. Seymour, Radiation Specialist

\*Attended exit meeting

### 2. Changes (83729)

The inspector reviewed the licensee's Radiation Protection Program to determine if any major changes had occurred since the last inspection in the organization, facilities, equipment, program, procedures, or personnel.

The inspector reviewed the recent organizational changes in the area of site nuclear services. A new manager of site nuclear services and a reorganization of that group has recently been implemented. The new manager was previously the manager of nuclear compliance. Reporting to this position in the area of health physics are the following positions: Senior Radiation Protection Engineer, ALARA Specialist, Corporate Health Physicist as well as Senior Nuclear Fire Protection Engineer, Senior Nuclear Fire Protection Specialist, Nuclear Fire Specialist, Nuclear Support Specialist Chem/Rad Protection Services and Radiochemistry and Environmental Specialist. The effect of the reorganization can not be gauged at the present time as the new program direction and results from their initiatives have not had an opportunity to come to fruition. The position of Manager Site Nuclear Services reports to the Director of Nuclear Operations Site Support. This is a corporate function outside the nuclear plant operations. Results of the new positions and their activities will be inspected during future inspections.

Goals and objectives of the Senior Radiation Protection Engineer, the Corporate Health Physicist and the Radiological Protection Program were reviewed. The licensee self-assessment recently issued on March 31, 1992 was also reviewed. The radiological protection program self-assessment was described in October 1990 in the radiological protection standard. Senior management requested at that time that a self-assessment be performed to determine the status of radiological protection programs to identified program strengths, potential program enhancements, and program weaknesses. The self-assessment states that in 1992 the site nuclear services will review the radiological protection program self-assessment and summarize for management the progress on items listed in the self-assessment. The tracking list developed for the self-assessment lists 34 strengths, 93 enhancements, and seven weaknesses. A refueling outage

closely followed the release of the self-assessment; therefore, the status of these items will be monitored during future inspections.

The nuclear plant operating organization had no significant changes affecting the licensee's program in that area.

No violations or deviations were identified.

### 3. Facility Tours (83729)

During the onsite inspection, the inspector toured selected areas of the containment, auxiliary building, laundry sorting area, instrument calibration facility, tool storage area, fuel handling building, yard storage, and berm area.

The inspector observed facility operations and selected work activities to evaluate the implementation and effectiveness of the licensee's RP program. The following specific radiation protection issues and industrial safety concerns were noted and discussed with licensee representatives.

#### a. Instrumentation

All survey meters and continuous air monitors in use within the RCA were observed to be operable, calibrated, and source checked in accordance with licensee procedures.

The inspector noted that radiation instrument RMG-20 had been out of service since 1990. A Request for Engineering (REI) was written (91-0301), and the licensee promptly attached a white information tag indicating that the instrument was out of service.

#### b. Independent Surveys

During the facility tour, the inspector independently verified radiation and/or contamination levels in radwaste storage areas, tool storage areas, the fuel handling building, and laundry sorting area. The inspector noted that all containers, materials, and areas were properly labeled, posted, and/or safeguarded in accordance with radiation hazards present. The licensee promptly corrected some weathered posting signs and some rope that needed replacement.

The inspector noted that only one "clean" RO2/RO2A was available for use to survey radwaste storage areas onsite outside the protected area.

## c. General Observations

During the plant tours, the following general observations regarding industrial safety were noted and discussed with the licensee;

- Nylon yellow bags near the waste oil storage cabinet and compactor room were labeled "contaminated material." They contained laundered PCs (gloves etc.). The licensee promptly removed the clothing from the yellow bags and placed them in caged 55 gallon drums.
- Step-off pads on the spent fuel floor were noted to be dirty and possibly ineffective as their stickiness had degraded. The step-off pads were promptly changed in the spent fuel area as well as other locations in the auxiliary building to maintain their sticky surface and thus their effectiveness. A stainless steel storage box number B-1 at the south end of the spent fuel floor contained tags indicating 10 mr/hr contact readings with the box general survey. On resurvey technicians found readings as high as 15 mr/hr. The licensee promptly resurveyed the box and corrected the posting.
- A wooden box containing parts of a refurbished control rod drive (CRD) was found in the berm area. Levels as high as 150 mr/hr were found on the top and 100 mr/hr near the bottom.

During rigging and transport the source material had shifted within the box and the highest posted radiation survey point had moved about 6-8 ft. down the box.

The licensee promptly moved the box to the mezzanine of the Outage Support Building (OSB) and subsequently to the spent fuel floor. The refurbished CRD was removed and the box was carried back to the RCA.

- Surveys indicated as high as 90 mr/hr on contact readings with the wall in the high rad storage area at the waste compactor "yellow room" as well as 10 mr/hr in the general walk corridor. Since this is a normal egress and ingress area with personnel traffic, the licensee promptly sorted the material and placed the higher activity bags in a sea/land container for shipment.
- An eye wash station located at MUV-73 near the sodium

hydroxide sampling station was located inside the contaminated area. The licensee took prompt corrective actions to repost the eye wash station so as not to include it within the contaminated area.

- ° A dumpster containing clean surveyed material was found unsecured within the RCA. A sign posted on the dumpster stated, "if found unlocked or with a lock missing, notify health physics." The inspector pointed out the open lock and the licensee promptly resurveyed the material to ensure that it was clean for release. The licensee was also evaluating the removal of the dumpster to eliminate the control of material.
- ° A plethora of different types, color, and markings on plastic bags used to contain contaminated material were found in use during the inspection. Clear bags with and without radiation trefoil markings, yellow bags with and without radiation trefoil markings, and pink bags with and without trefoil marking were found in use. Yellow sleeving containing wires were found both in the contaminated and noncontaminated areas and running through contaminated areas. This item was discussed with the licensee and the short comings of this method of controlling contaminated material was pointed out to the licensee. A cognizant representative of the licensee stated that at the end of this outage there will be only one color bag used with the radiation trefoils markings on it.
- ° During a tour of the containment the inspector noted the absence of emergency lighting and a plan to evacuate the containment in the event of a fire and/or power outage. The licensee noticed the inspectors concern and stated that this would be evaluated. The inspector also noted the absence of posting of low dose waiting areas. The licensee agreed to evaluate this item.

d. Fuel Handling Building

The inspector toured the fuel handling building and reviewed dose rate surveys associated with defueling the reactor during the current refuel 8 outage. Surveys conducted during fuel movements indicated no abnormally high radiation dose rates associated with once and twice burned fuel moving through the X and Y transfer tubes.

No violations or deviations were identified.

4. As Low As Reasonably Achievable (ALARA) (83729)

10 CFR 20.1(c) states that persons engaged in activities under licenses issued by the NRC should make every reasonable effort to maintain radiation exposures ALARA.

The inspector reviewed and discussed with licensee representatives the ALARA program implementation and initiatives. The following documents were reviewed:

- a. Radiological Protection Standard, Revision 0 dated October 5, 1990
- b. Administrative Instruction, AI 1600 ALARA Program Manual, Revision 7 dated January 26, 1990
- c. ALARA Awareness Week Memorandum
- d. Health Physics Guide for Major Maintenance and Refueling Activities Refuel 8 dated 1992
- e. 1993 Minor Capital Budget NS92-0102 dated May 13, 1992
- f. Crystal River Unit 3 Mid-cycle 8 Outage Report dated February 1992

The inspector reviewed the outage exposure summary for the 8M outage. The initial 8M outage dose budget was set at 110 person-rem in late 1990 based on work, activities, and a 35 day duration. A dose contingency budget of additional 50 person-rem was approved in addition to the 110 person-rem outage dose budget. This additional dose approval was intended to be used for emergency work. The 8M outage cumulative dose of 77 person-rem made the goal. Approximately 80 percent of the plant annual dose was received during this outage. No individual received exposure in excess of one rem for the outage. The highest individual exposure for the fourth quarter of 1991 was 0.975 rem.

A number of exposure reduction techniques were incorporated in the 8M outage. These included the following:

- a. Pre-fabrication of sub assemblies and tests performed outside the radiological control area or in specified low dose rate areas.
- b. Flushing contaminated vessels with demineralized water to remove source material prior to commencing work.



- c. Use of automatic cutting/welding machines.
- d. Quick connect/disconnect type fittings to reduce equipment setup and removal times.
- e. Use of specialized and/or remotely monitored equipment.
- f. Use of smaller sludge drums to facilitate handling and storage.
- g. Better communications between workers and the control room to shorten observation and data collection exposure time during testing.
- h. Use of mock-ups to improve worker efficiency.

The inspector reviewed activities associated with refuel 8 contained in the Health Physics Guide for Refuel 8 and found the document to be detailed, well organized and useful for the preparation and planning of the outage. The guide provides precautions and direction for the health physics technicians for performing their jobs. This helps to reduce their exposures and others whom they monitored.

The inspector reviewed the contractor health physics workforce added for the outage. It was noted that a total of 166 personnel were added. There were 110 Sr. techs, 51 Jr. techs, and 5 dose/clerk techs added. The normal 60 to 70% repeat/return of techs was not achieved this outage. Only about 30% returned. A large number of them arrived very close to the outage. Training and qualifications of these techs almost became a critical item on the outage plan.

The inspector noted an example of valve rework caused by maintenance personnel incorrectly extracting newly replaced packing on MUV 166. The valve that was scheduled for maintenance was valve MUV 380. Since the original valve was not worked and the incorrect valve had to be repacked, additional personnel exposure of about 0.800 person-rem was necessary to remediate the problem.

The inspector reviewed the hotspot identification tracking and elimination guideline used by the licensee. The current guidelines have not been incorporated into a formal program; however, the inspector noted that a number of hotspots had been identified and several had been removed by flushing.

The inspector attended an ALARA pre-job briefing and observed that the material presented to crafts people was appropriate and accurate. The presentation included pictures of the area to be worked. The pictures were taken by the ALARA planning group using a digital electronic camera. This information aided the crafts people in preparing for the job.

During discussions about pre job briefing it was noted that multiple briefs for craft persons for the same RWP often took place due to inefficient scheduling for worker briefs. The time consumed for conducting multiple briefs took time from the ALARA staff and reduced their effectiveness.

The inspector reviewed the proposed source term reduction team member list and the goals associated with the reorganized corporate ALARA organization. Both of these areas will be reviewed in future inspections as they have not had time to come to full fruition. The inspector noted that the licensee had exceeded the 274 person-rem goal allocated for the outage by the conclusion of the inspection period.

No violations or deviations were found.

5. Internal Exposure Control (83729)

10 CFR 20.103(a)(1) states that no licensee shall possess, use, or transfer licensed material in such a manner as to permit any individual in a restricted area to inhale a quantity of radioactive material in any period of one calendar quarter greater than the quantity which would result from inhalation for 40 hours per week for 13 weeks at uniform concentrations of radioactive material in air specified in Appendix B, Table 1, Column 1.

10 CFR 20.103(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.

10 CFR 20.103(c)(2) permits a licensee to maintain and implement a respiratory protection program that includes, at a minimum: air sampling to identify the hazard; surveys and bioassays to evaluate the actual exposures; written procedures to select, fit and maintain respirators; written procedures regarding the supervision and training of personnel and issuance of records; and determination by a physician prior to the use of respirators, that the individual is physically able to use respiratory protective equipment.

The inspector interviewed the licensee's respiratory training coordinator and reviewed the licensee's technical procedure for the respiratory program, RSP-500 Respiratory Protection Program, Revision 3, dated September 23, 1991.

The inspector reviewed the respiratory training program and found no problems.

10 CFR 20 Appendix A, Footnote (d), requires adequate respirable air of the quality and quantity in accordance with NIOSH/MSHA certification described in 30 CFR Part 11 to be provided for the atmosphere-supplying respirators.

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).

By procedure, the licensee samples breathing air lines quarterly, except for oil lubricated units, which are sampled monthly. The inspector selectively reviewed Station Breathing Air Analysis results and found no problems. The licensee is meeting or exceeding Grade D air requirements for breathing air.

During a tour of the containment, the inspector noted the use of breathing air manifolds. The inspector examined the breathing apparatus in use for physical integrity. The hoods and hoses in use were compatible per manufacturer instructions and gauges in use on manifolds had current calibration labels.

The inspector reviewed Administrative Instruction, AI 1801, Heat Stress Management Program, Rev. 5 dated April 9, 1992 with cognizant licensee representatives and found the procedure complete and detailed. The addition of supplemental containment cooling units has resulted in no heat stress related problems during this outage.

The licensee has reduced the use of respirators during this outage by forty-eight percent over the previous outage while ensuring an increase in uptakes has not occurred. In addition, the increased use of portable worksite ventilation has allowed workers to perform without respirators. This minimizes the time required to perform tasks due to improved worker comfort, visibility, and communications.

No violations or deviations were identified.

7. Surveys, Monitoring, and Control of Radioactive Material and Contamination (83729)

10 CFR 20.201(b) and 20.401 requires that surveys must be performed and records maintained of such surveys necessary to show compliance with regulatory limits.

During tours of the Auxiliary Building, the inspector performed independent radiation and contamination surveys and compared the results with surveys performed by the licensee. No discrepancies were found.

10 CFR 20.203(f) requires each container of licensed radioactive material to bear a durable, clearly visible label identifying the contents. No discrepancies were found although the inspector expressed his concern about the radiation levels in the walk way in the compactor room and the CRD box placement on the berm as discussed in 3.C. above. Aggressive monitoring and attention to detail by health physics technicians would reduce potential problems in this area.

No violations or deviations were identified.

8. TLD Study Followup

As a followup to several unexplained elevated dose values for NRC inspectors issued personnel dosimeters (TLDs), the inspector compared carry-on x-rays doses at two airports and at CR #3 by exposing 13 test TLDs. The NRC TLD badge contains one (1) TLD-100 chip and two (2) TLD-100 powder capsules (Inspection Report 50-302/91-22 Paragraph 9).

Since the last inspection conducted November 4-8, 1991, the licensee has installed a new security screening device. Results of test TLDs passed thru these machines in a similar orientation as the previous study and a similar number of passes found no exposure above background.

No violations or deviations were identified.

9. Commitment Closeout

At the request of the licensee, the inspector reviewed a commitment made during an inspection conducted February 28-March 8, 1988 (IR 50-302/78-5, paragraph 5e).

"The inspector noted that RP-202 did not address surveys of locked cubicles in the auxiliary building. These locked areas are usually radiation or high radiation areas and may or may not be contaminated. The inspector noted that radiation work permit procedures would require surveys prior to work in these areas. The inspector expressed concern that these areas could go indefinitely with no surveys performed and thus radiological conditions could change significantly with no recognition of any change. The Health Physicist acknowledged the inspector's concerns and stated that consideration would be given to developing a routine program for surveys of normally locked areas. The inspector had no further questions."

The inspector evaluated the commitment for developing a routine program for surveys of normally locked areas and determined that this was not ALARA. Relief from this commitment is granted with the recognition that Radiation Work Permit procedures or emergency work would require surveys in those areas prior to the commencement of work.

#### 10. Exit Meeting

At the conclusion of the inspection of June 5, 1992, an exit meeting was held with those licensee representatives indicated in Paragraph 1 of this report. The inspector summarized the scope and findings of the inspection and indicated that no apparent violations or deviations were identified. The licensee did not indicate that any of the information provided to the inspector during the inspection was proprietary in nature. No dissenting comments were received from the licensee.