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

OCT 16 1992

Report No.: 50-400/92-19

Licensee: Carolina Power and Light Company
P. O. Box 1551
Raleigh, NC 27602

Docket No.: 50-400 License No.: NPF-63

Facility Name: Shearon Harris

Inspection Conducted: September 14-18, 1992

Inspectors: A. T. Boland 10/16/92
A. T. Boland Date Signed

Accompanying Personnel: D. B. Forbes

Approved by: William H. Rankin 10/16/92
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, unannounced inspection of the licensee's radiation control (RC) program involved a review of health physics (HP) activities including organization and staffing; self-assessment programs; training and qualifications; internal and external exposure controls; control of radioactive material; and ALARA program implementation primarily associated with Refueling Outage-4 activities. In addition, followup action related to previously identified inspection findings were also reviewed.

Results:

The RC technician staffing appeared adequate to support outage activities. The RC technician and general employee training programs were conducted in accordance with approved procedures. The licensee continued to implement effective internal and external exposure programs with all exposures less than 10 CFR Part 20 limits. Improvements were noted in the self-assessment program related to the tracking and trending of E&RC Feedback

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Reports, and the acquisition of support for onsite RC Nuclear Assessment Department activities. Contamination control and overall housekeeping practices as well as ALARA outage initiatives were considered program strengths. A poor contamination control practice was observed for workers sorting potentially contaminated trash. Overall, the licensee's RC program was conducted in accordance with approved procedures and functioned adequately to protect the health and safety of plant workers.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*R. Black, Manager, Management/Organization, Project Assessment
S. Browne, Corporate Health Physics, Dosimetry
D. Cornett, Radiation Control Supervisor
*J. Cribb, Manager, Quality Control
*J. Floyd, Senior Specialist, ALARA
*M. Hamby, Project Specialist, Regulatory Compliance
*C. Hinnant, General Manager - Harris Plant
*J. Kiser, Manager, Radiation Control Operations
*S. Mabe, Project Engineer, Nuclear Assessment
*J. McKay, Manager, Engineering/Technical Support - Project Assessment
*B. Meyer, Manager, Environmental and Radiation Control
*J. Moyer, Manager, Project Assessment
*M. Parkes, ALARA Technician
*A. Poland, Manager, E&RC Support
F. Reck, Supervisor, Radiation Control
S. Scott, Decontamination Supervisor
G. Simmons, Specialist, Technical Training
R. Smith, Corporate, Nuclear Assessment
*R. VanMetre, Manager, Harris Engineering Support
*M. Wallace, Senior Specialist, Regulatory Compliance
*E. Wills, Radiation Control Supervisor

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

Nuclear Regulatory Commission

*M. Shannon, Resident Inspector
*M. Thomas, Reactor Inspector, Region II
*D. Roberts, Project Inspector, Region II
*H. Whitener, Reactor Inspector, Region II

*Attended September 18, 1992, Exit Meeting

2. Organization and Staffing (83729)

The inspector reviewed and discussed with licensee representatives changes made to the radiation control (RC) organization since the last inspection of this area conducted June 1-5, 1992, and documented in Inspection Report (IR) 50-400/92-09. Cognizant licensee representatives stated that no significant changes had been made to the organizational structure or lines of authority as they related to the RC function. The inspector noted that a few minor personnel changes had been implemented, the

most significant of which involved the reassignment of an ALARA technician. The vacated position was filled from within the RC group with no loss in program continuity noted.

The licensee continued to maintain a core technician staffing of approximately 40 RC technicians. For Refueling Outage-4 (RFO-4), the inspector noted that approximately 65 contractor health physics technicians were employed to supplement the routine staff. This number included senior technicians, junior technicians, and health physics clerks. Review of documentation associated with technician qualifications revealed that a significant number of the technicians had previous experience at the Harris site.

Based on discussions with licensee representatives and observations of activities in progress, no concerns were identified regarding the licensee's organization and staffing. The staffing levels appeared adequate to support ongoing and planned outage activities.

No violations or deviations were identified.

3. Radiation Protection Training (83729)

10 CFR 19.12 requires, in part, that the licensee instruct all individuals working in or frequenting any portion 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. Contractor Technician Training

Licensee Procedure ERC-104, Contract E&RC Personnel Qualifications and Training, Revision (Rev.) 5, described the requirements for verifying and documenting the qualifications and training of contractor personnel with radiation control responsibilities.

The inspector reviewed with licensee representatives the process for qualifying and training RC contractor technicians for the job functions they were expected to perform. The training program consisted of site familiarization, health physics procedure reviews, and specific job factors depending upon the assigned duties of the technician. The latter was accomplished through oral examinations conducted by a qualified evaluator

using a pre-established outline (qualification card). Actual demonstration of surveys, dosimetry tasks, and whole body counter operations was required, as applicable; however, demonstration of other job factors was dependent on oral examination achievement.

During the review, the inspector noted that the licensee did not require a written examination for contractor RC technicians. Licensee representatives informed the inspector that a written examination question bank was being prepared by a company task force; however, a final completion date for the written examination had not been established. The licensee also informed the inspector that they were involved in an initiative to prepare an examination in conjunction with other Region II licensees. The intent, of which, was to standardize a basic level of knowledge for contractor technicians. The inspector encouraged the licensee to proceed in these efforts.

The inspector reviewed resumes for the contractor technicians employed onsite for RFO-4 and verified compliance with ANSI 3.1, 1981 requirements. Review of training documentation and interviews with several contractor RC technicians and licensee training staff members determined successful completion of procedural reviews and qualification tasks.

The licensee's program for contractor RC technician training was adequate and was conducted in accordance with approved procedures.

No violations or deviations were identified.

b. General Employee Training (GET)

Licensee Administrative Instruction, AI-13, Rev. 6, described the training program for employees granted unescorted access to the Harris site. GET was divided into two levels, depending on the degree of access required. Level I training was provided to employees needing unescorted access to only the protected area. For workers needing unescorted access to the radiologically controlled area (RCA), Level II training was required, in addition to Level I. Both levels of training required personnel to pass an examination with a minimum passing score of 80 percent.

Based on the review of selected training procedures, examinations, and course outlines, the inspector determined that the licensee's GET program met the provisions of 10 CFR 19.12.

In response to an observed poor contamination control practice (Paragraph 8.b), the inspector further evaluated the content of GET related to the use of partial protective clothing. The inspector concluded that the licensee's GET Level I and Level II training did not address the use of partial protective clothing and associated frisking practices, rather they only focused on use of a full complement of protective clothing. At the exit meeting, the licensee informed the inspector that a Feedback Report would be initiated to evaluate the need for training program enhancements in this area.

No violations or deviations were identified.

4. Self-Assessment Program (83729)

Technical Specification (TS) 6.5.4.1 required audits of the facility to be performed by the Nuclear Assessment Department (NAD) encompassing conformance of facility operation to the provisions contained within the TS 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.

Since the last NRC inspection of this area in June 1992, no assessment of the RC program had been performed by the Nuclear Assessment Department (NAD). The last such assessment was conducted March 23-27, 1992, and was evaluated by NRC during inspection 50-400/92-09. However, at the time of the onsite inspection, a spent fuel program assessment and a training program assessment were underway which included various aspects of the RC program.

The inspector discussed with licensee representatives the status of actions to fill the onsite E&RC assessor position within NAD which had been vacant for sometime. Licensee representatives stated that the position had not yet been permanently filled; however, actions had been taken to obtain support for conducting routine onsite E&RC observations. Specifically, in July 1992 the licensee acquired part-time assistance from the Corporate NAD organization as well as recently hired a contractor for observation of E&RC activities related to RF0-4. The inspector noted that both individuals had appropriate levels of health physics experience. Discussions with the Corporate NAD Assessor and a review of the observation database revealed that increased field assessments were being conducted resulting in substantive observations. The inspector informed licensee representatives that the status of this area as well as the followup actions related to

recent field observations would be evaluated during future NRC inspections.

In addition to the above, the inspector evaluated the licensee's progress on improvements associated with the E&RC internal corrective action system, the Feedback Reporting System. The inspector noted that a procedural revision was in progress which was intended to provide additional guidance on the assignment of causal factors for identified items, tracking and trending of root causes, and the responsibilities for timely followup and corrective action. The inspector noted that this program was receiving increased management oversight and attention as exemplified by the closure of numerous old action items, the assignment of causal factors to newly and previously identified items, and the trending and tracking of Feedback Reports in the monthly Health Physics and Chemistry Performance Report. Review of the licensee's trending information as well as selected Feedback Reports revealed no indications of adverse performance trends in the RC area.

No violations or deviations were identified.

5. External Exposure Controls (83729)

10 CFR 20.101 requires that no licensee possess, use, or transfer licensed material in such a manner as to cause any individual in a restricted area to receive in any period of one calendar quarter a total occupational dose in excess of 1.25 rem to the whole body, head and truck, active blood forming organs, lens of the eyes, or gonads; 18.75 rem to the hands, forearms, feet and ankles; and 7.5 rem to the skin of the whole body.

a. Personnel Dosimetry

10 CFR 20.202(a) requires each licensee to supply appropriate monitoring equipment to specific individuals and requires the use of such equipment.

10 CFR 20.202(c) requires that dosimeters used to comply with 10 CFR 20.202(a) shall be processed and evaluated by a processor accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the types of radiation for which the individual is monitored.

The inspector reviewed and discussed the licensee's dosimetry program with Corporate and site personnel. The licensee employed the Panasonic UD-802 thermoluminescent dosimetry (TLD) system. The TLDs consisted of two lithium borate elements with density

thicknesses of 14 mg/cm^2 and 350 mg/cm^2 and two calcium sulfate elements with density thicknesses of 350 mg/cm^2 and 1000 mg/cm^2. The inspector was informed that a TLD analysis algorithm corrected the measured values to report deep and shallow dose at 1000 mg/cm^2 and 7 mg/cm^2, respectively. The TLDs were processed onsite by the dosimetry group, and the inspector noted that the licensee was NVLAP accredited in all eight dosimetry categories.

The inspector reviewed the licensee's program for evaluating beta dose to the skin. The licensee stated that the TLD algorithm included beta correction factors for adjusting measured values to account for TLD under-response to various beta radiations. Review of licensee algorithm documentation revealed that the beta correction factor was based on the efficiency of the TLD to measure Thallium-201 and Strontium-90/Yttrium-90 beta energies, and was adjusted for intermediate energies depending on the characteristics of the radiation to which the TLD was exposed (i.e. actual beta TLD response). The licensee provided to the inspector a 1984 Beta Dosimetry Study which contained the supporting data for the validation of the correction factor. In response to questions regarding the current validity of the correction factor, the inspector was provided 1991 steam generator diaphragm smear data obtained during RFO-3. Review of the data indicated that the Harris average beta energy was similar to the energy used in the 1984 Study discussed above; therefore, indicating the basis for the licensee's correction factor continued to be valid.

Based on the review of the TLD algorithm, the 1984 Beta Dosimetry Study, and the 1991 Harris Steam Generator Beta Field Study, the inspector did not identify any anomalies associated with the licensee's methodology for determining beta skin dose.

No violations or deviations were identified.

b. Whole Body Exposure

The inspector discussed the cumulative whole body exposures for plant and contractor employees. Licensee representatives stated and the inspector confirmed that all whole body exposures assigned since the previous NRC inspection of this area were within 10 CFR Part 20 limits. Review of pertinent records revealed that the maximum whole body exposure for an individual for the second quarter 1992 was 231 millirem (mrem). In addition, the maximum whole body dose recorded thus far

in the third quarter 1992 was 474 mrem, based on TLD and pocket dosimeter data.

No violations or deviations were identified.

6. Internal Exposure Controls (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.

a. Respiratory Protection and Breathing Air Quality

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

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 atmosphere-supplying respirators.

Lesson Plan, General Employee Respiratory Protection Training, Rev. 3, provided the training requirements for personnel using respirators, self-contained breathing apparatus (SCBAs), and bubble hoods. In general, the inspector found training content appropriately inclusive of respiratory protection principles. Safety precautions for emergency removal of respirators and SCBAs was included in the lesson plan, however, the inspector noted emergency removal of bubble hoods was omitted from the training. Licensee training personnel stated a new respiratory lesson plan revision was forth coming and improved guidance on the use of bubble hoods would be evaluated. The inspector observed the use of bubble hoods during steam generator mockup training and no concerns were noted.

The inspector reviewed and discussed with licensee representatives the program for testing and qualifying breathing air as Grade D, particularly as it related to preparation for RFO-4 activities. The inspector, accompanied by licensee personnel, inspected the in-use breathing air system which included a portable compressor air line system backed up by compressed air bottles. 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 hood and hoses available for use were compatible per manufacturer's instructions.

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

No violations or deviations were identified.

b. Whole Body Counting

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 for radioactivity by exposed individuals.

Licensee Procedure HPP-251, Personnel Decontamination and Documentation of Contamination Events, Rev. 5, required that special whole body counts be performed for contamination events at or near the facial area. The inspector reviewed selected Feedback Reports generated since the last NRC inspection in June 1992, detailing individuals reported to have positive facial contamination. For the records reviewed, one such event was identified, and followup whole body counts reported no positive measurements.

The inspector was informed by licensee representatives that no positive internal contaminations had been identified to date in 1992.

Based on the above, the inspector concluded that the licensee was effectively controlling internal contaminations with no exposure greater than the 40

Maximum Permissible Concentration - hour control limit identified.

No violations or deviations were identified.

7. Operational and Administrative Controls (83750)

a. Radiation Work Permits (RWPs)

The inspector reviewed selected routine and special RWPs associated with RFO-4 activities for adequacy of the radiation protection requirements based on work scope, location, and conditions. For the RWPs reviewed, the inspector noted that appropriate protective clothing, respiratory protection, and dosimetry were required. In particular, the inspector reviewed special RWP 92-0061 related to reactor coolant pump maintenance. The RWP, as well as the associated pre-job briefing attended by the inspector, appropriately addressed radiological concerns.

The inspector observed briefings conducted for workers prior to entering the radiologically controlled area (RCA). The briefings included reviews of current radiation surveys with emphasis on high dose areas and low dose waiting areas. The interaction between RC and the workers entering the RCA, in this regard, was considered adequate.

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

No violations or deviations were identified.

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 various plant locations permitting adequate worker access. In addition, notices were posted referencing the location where the license, procedures, and supporting documents could be reviewed.

No violations or deviations were identified.

8. Control of Radiative Material and Contamination, Surveys, and Monitoring (83729)

10 CFR 20.201(b) 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 radiological hazards that may be present.

a. Posting and Labelling

10 CFR 20.203(f) requires, in part, each container of licensed material containing greater than Appendix C quantities to bear a durable, clearly visible label identifying the radioactive contents and providing sufficient information to permit individuals handling or using the containers, or working in the vicinity thereof, to take precautions to avoid or minimize exposures.

Licensee Procedure HPP-030, Control/Release of Material in Radiation Control Areas, Rev. 5, detailed the licensee's implementation of the aforementioned regulatory requirements. During tours of the Containment, Auxiliary Building, Waste Processing Building and various radioactive material storage locations, the inspector noted that radioactive material areas were appropriately posted and containers were labelled consistent with regulatory requirements with one noted exception. The inspector observed two of five B-25 storage boxes located adjacent to the laundry sorting area in the Waste Processing Building which were not labelled with a radioactive material tag. The inspector was informed that the boxes contained used protective clothing that was ready for shipment to an offsite laundry facility, and the boxes were secured with an inventory seal. Independent surveys performed by the inspector did not reveal any radiation levels above background. The two boxes were properly labeled by the licensee immediately upon identification by the inspector. No other labeling problems were identified.

The inspector was informed that the licensee was in the process of clarifying procedural guidance for the posting and labeling of radioactive material in response to a 1992 NAD Assessment finding. The inspector reviewed the associated Adverse Condition Report 92-137 which addressed the NAD concern, root cause analysis, and corrective actions to be competed by December 1, 1992. The inspector informed licensee representatives that the completion of planned actions in this area would be reviewed during future inspections.

No violations or deviations were identified.

b. Personnel and Area Contamination

The licensee maintained approximately 460,000 square feet (ft^2) of floor space as radiologically controlled. As of September 15, 1992, the licensee was tracking approximately 2900 ft^2 of recoverable space as contaminated; however, subsequent to the onsite inspection, the inspector was informed that contaminated area was further reduced to approximately 1200 ft^2. This represented approximately 0.2 percent of the RCA. The inspector noted that for the current stage of RFO-4 activities, the licensee efforts in this area were excellent.

As of September 15, 1992, approximately 35 Personnel Contamination Events (PCEs) had occurred in 1992 compared to a 1992 goal of 135. Discussions with licensee representatives and review of PCE data revealed that 7 were skin contaminations and 28 were clothing contaminations. For those PCE's occurring since the last inspection of this area, the inspector noted that none met the licensee's threshold for performing skin dose calculations.

During plant tours, the inspector generally observed excellent housekeeping and contamination control practices. However, during tours of the Waste Processing Building personnel processing potentially contaminated trash (wearing a lab coat and gloves) were observed exiting a table top posted as a contaminated area without first removing gloves or frisking. Although the material being frisked was considered "clean" trash, the activities observed were contrary to good contamination control practices. Upon identification, the licensee took immediate action to brief decontamination personnel on the proper frisking practices as well as reconfigure the work area to promote better contamination control. No other

instances of similar practices were identified. Additional licensee corrective actions associated with this issue are discussed in Paragraph 3.a of this report.

No violations or deviations were identified.

c. 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.

Licensee Procedure PLP-511, Radiation Control and Protection Program, Rev. 6, described the licensee's specific requirements for establishing, posting, and controlling HRAs. In addition, Procedure AP-504, Administrative Controls for Locked and Restricted High Radiation Areas, described the licensee's specific requirements for entry into these areas.

During tours of the Auxiliary Building, Waste Processing Building, and the Containment, the inspector noted that all HRAs and locked HRAs were locked and/or posted, as required. During the preplanned chemical crud burst for RFO-4, the inspector closely monitored licensee actions for upgrading and downgrading HRA postings as a result of transient radiation levels, particularly areas containing residual heat removal system (RHR) piping. In general, the licensee's posting of the affected areas was conservative and appropriate. The inspector did note, however, that the licensee utilized normal access doors to post and barricade several of the potential HRAs. The doors were routinely used entrance doors and were generally not posted as HRAs. Although the posting of the doors met the TS minimum requirements for posting and barricading of HRAs, the inspector discussed with licensee representatives posting/barricading alternatives which could increase worker attentiveness to the posting and reduce the potential for inadvertent access. Of particular concern to the inspector was the

visibility of the posting when the door was open. At the exit, the licensee agreed to evaluate their current practice of posting routine access doors and the need for additional controls for infrequent HRAs. In addition, the licensee's use of flashing lights for temporary HRAs that could not be locked was consistent with NRC guidance.

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 displayed current calibration stickers. The inspector further noted an adequate number of survey instruments were available for use, and background radiation levels at personnel survey locations were observed to be within the licensee's procedural limit of 300 counts per minute (cpm).

No violations or deviations were identified.

e. Independent Surveys

During facility tours, the inspector independently verified radiation and/or contamination levels in radioactive waste areas, various Auxiliary and Waste Processing Building areas, and the Containment. The inspector noted that excluding the isolated instance of the B-25 boxes in the Waste Processing Building (Paragraph 8.a) all containers, materials, and areas were properly labeled, posted, and/or safeguarded in accordance with the radiation hazard present.

No violations or deviations were identified.

9. Program for Maintaining Exposures As Low As Reasonable Achievable (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 as low as reasonably achievable.

Regulatory Guides 8.8 and 8.10 provide information relevant to attaining goals and objectives for planning and operating light water reactors and provide general philosophy acceptable to the NRC as a necessary basis for a program of maintaining occupational exposures as low as reasonably achievable (ALARA).

The inspector reviewed the following procedures associated with ALARA program implementation:

- PLP-501, ALARA Program, Rev. 3, dated July 23, 1990
- PLP-511, Radiation Control and Protection Program, Rev. 6, dated April 4, 1992
- AP-514, ALARA Job Evaluations, Rev. 3, dated June 29, 1992
- AP-530, ALARA, Rev. 0, dated June 11, 1992
- HPP-015, Use of Temporary Shielding, Rev. 3, dated June

The inspector reviewed and discussed with cognizant licensee representatives ALARA program implementation and initiatives for RFO-4 and operations during non-outage periods. The inspector was informed that the collective dose through September 15, 1992, was approximately 42 man-rem (based on TLD and pocket dosimeter data) as compared to the licensee's 1992 goal of 215 man-rem. This dose was attributable primarily to normal operating conditions and spent fuel operations, as Harris continues to be a spent fuel repository for Robinson and Brunswick sites. In addition, approximately 7.4 man-rem was associated with the unplanned Resistance Temperature Detector (RTD) valve repair outage in March 1992. Although 1992 normal operating dose average slightly over 2 man-rem per month, an upward trend in annual collective doses was noted. Harris plant management recognizes this trend and is emphasizing initiatives aimed at improving dose performance.

For RFO-4, the licensee had established a challenging goal of 185 man-rem, based on estimated doses from ALARA pre-job evaluations. Significant work evolutions contributing to the dose estimate included two steam generator tube pulls (8.7 man-rem), pressurizer surge line hanger modification (8 man-rem), reactor coolant pump seal replacement (4 man-rem), steam generator sludge lancing and eddy current testing (15 man-rem), RTD valve cap installation (6 man-rem), and installation/removal of scaffolding (10 man-rem).

The inspector reviewed the ALARA pre-job evaluations for the steam generator tube pulls and pressurizer surge line hanger modifications. In general, the evaluations considered appropriate dose reduction techniques. Particular dose reduction items of note included the use of a specially designed shadow shield box to be used to encase workers during pressurizer surge line hanger modifications, and the planned use of remote cutting methods for the two steam generator tube pulls.

The inspector noted that the ALARA Committee was required to review work activities with a projected dose of greater than 20 man-rem. Although no RFO-4 activities required ALARA Committee review, the inspector noted that the Committee met and evaluated work packages which exceeded a 5 man-rem threshold. In addition, the licensee representatives provided to the inspector an ALARA Daily Checklist which implemented for RFO-4. The checklist required daily and/or shiftly tracking of dose by job, direct field observations, and discussions with workers and job coordinators regarding areas for improvement. These activities appeared to enhance ALARA visibility and worker/management involvement in dose savings activities.

Discussions with ALARA personnel and workers involved in RFO-4 activities revealed several dose reduction efforts. These included: (1) increased use of temporary shielding based on engineering analyses; (2) increased use of video for steam generator work; (3) use of remote dose monitoring for steam generator work; and (4) implementation of early boration. Regarding the latter, the licensee successfully removed approximately 715 curies of corrosion products which was approximately 125 curies greater than that achieved during RFO-3. At the time of inspection, the licensee had not yet fully quantified the overall effect of the crud removal on plant dose rates.

In addition, the inspector observed selected portions of a shielding installation training film as well as steam generator mockup training. Both included techniques to minimize exposure. The licensee informed the inspector additional mockups were planned for RFO-4, and that in general, additional emphasis on training films and mockups was planned to improve both work performance and dose reduction.

Based on the above, the inspector informed licensee representatives that ALARA initiatives associated with the current outage were a program strength.

No violations or deviations were identified.

10. Followup on Previous Enforcement Actions (92702)

(Closed) Violation 50-400/89-23-03: Failure to evaluate the extent of radiological hazards present in clean areas of the Fuel Handling Building during and following the fuel basket move on August 11, 1989, which resulted in several personnel contamination events. The inspector reviewed and verified implementation of corrective actions stated in the licensee's response dated October 2, 1990. As stated in the

response, the licensee implemented appropriate procedural revisions to preclude recurrence of similar events. The inspector informed the licensee that this item was considered closed.

11. Exit Interview (83729, 92702)

The inspection scope and results were summarized on September 18, 1992, with those persons indicated in Paragraph 1 above. The general program areas reviewed and the inspection findings were discussed in detail. The inspector also noted that a previously identified violation was reviewed and closed during the inspection. Licensee representatives acknowledged the inspector's comments and no dissenting comments were received. The licensee was informed that although proprietary information was reviewed during this inspection, such material would not be included in the report.