



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

JUN 17 1993

Report No.: 50-400/93-11

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: May 17-21, 1993

Inspectors:

E. B. Pharr
 E. B. Pharr

6/14/93
 Date Signed

A. T. Boland
 A. T. Boland

6/16/93
 Date Signed

Approved by:

R. B. Shortridge for
 W. H. Rankin, Chief

6/17/93
 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 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.

Results:

Overall, the RC program appeared to be functioning adequately. The organization and staffing appeared stable overall. However, a change in Environmental and Radiation Control (E&RC) Managers had taken place since the previous inspection. An increased management focus in areas of the licensee's auditing program was noted, resulting in improvements in the quality of both assessments and followup actions. No concerns were identified with the licensee's implementation of revised 10 CFR Part 20 terminology and requirements into General Employee Training (GET) and craft technical

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training, nor into the dosimetry program and associated software. The licensee's dose performance during the first quarter of 1993 was excellent with a recorded cumulative exposure of less than 10 person-rem for the period.

Deficiencies were identified in the licensee's program for controlling radioactive material. One unlabeled pressurizer relief valve was identified which required labeling per licensee procedure and 10 CFR 20.1904(a). Additionally, eleven items with smearable and/or fixed contamination were inappropriately controlled for prevention of the spread of contamination, per licensee procedure. One apparent NRC-identified violation resulted from these examples of the failure to comply with procedural requirements for properly handling radioactive material (Paragraph 7.b).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *T. Anderson, Radiation Control Technician
- N. Bertrand, Specialist, Technical Training
- S. Browne, Corporate Health Physics, Dosimetry
- D. Cornett, Radiation Control Supervisor
- *J. Floyd, Senior Specialist, ALARA
- M. Hamby, Project Specialist, Regulatory Compliance
- *J. Kiser, Manager, Radiation Control
- *D. McCarthy, Manager, Regulatory Affairs
- *J. Moyer, Manager, Site Assessment
- *C. Neuschaefer, Nuclear Assessment Department
- *M. Parker, ALARA Technician
- R. Pasteur, Senior Specialist, Technical Training
- *F. Reck, Supervisor, Radiation Control
- *B. Robinson, Plant General Manager
- *B. Seyler, Manager, Project Management
- G. Simmons, Specialist, Technical Training
- R. Smith, Corporate, Nuclear Assessment Department
- *M. Wallace, Senior Specialist, Regulatory Compliance
- *B. White, Manager, Environmental and Radiation Control
- *E. Wills, Radiation Control Supervisor
- *B. Wilson, Manager, Shipping/Nuclear Fuel

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

Nuclear Regulatory Commission

- *W. Rankin, Chief, Facilities Radiation Protection Section, Region II
- *D. Roberts, Resident Inspector
- *J. Tedrow, Senior Resident Inspector

*Attended May 21, 1993 Exit Meeting

2.. Organization and Staffing (83750)

The inspector reviewed and discussed with licensee representatives changes made to the radiation control (RC) organization since the last inspection of this area conducted September 14-18, 1992, and documented in Inspection Report (IR) 50-400/92-19. The inspector noted that the organization and staffing had remained relatively stable, in that the RC organization continued to be staffed by approximately 40 technicians and supervisors. The inspector noted that since the previous inspection, the position of Chemistry Manager was vacant with the individual which had previously filled that position being assigned as the Environmental and Radiation Control (E&RC) Manager. The inspector was informed that the previous E&RC Manager had been transferred to another plant

department. The inspector noted that this organizational change did not adversely affect the program in that the RC Manager, who fulfilled Final Safety Analysis Report (FSAR) qualifications as the Radiation Protection Manager, had remained constant.

The inspector was also informed that during the period in which the E&RC Manager position was vacant and to date, during the transitional period for the newly appointed manager, the ALARA function was reporting to the RC Manager instead of directly to the E&RC Manager, as done previously. The inspector was informed that this was a temporary arrangement to lend stability to the ALARA function during the transitional period.

The inspector informed licensee representatives that the RC organization and staffing levels continued to be appropriate and appeared to be functioning adequately to support ongoing activities. Additionally, the recent organizational changes within the E&RC function did not appear to adversely affect the organization's ability to protect the health and safety of plant workers.

No violations or deviations were identified.

3. Radiation Protection Training (83750)

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. General Employee Training (GET)

The inspector reviewed the licensee's program for providing radiation protection training to licensee employees. The inspector noted that GET appropriately included revised 10 CFR Part 20 terminology, definitions, and regulatory limits. As well, plant security, emergency preparedness, industrial safety, recent industry events, and exposure concerns were included in the training. The inspector also noted that the GET material, or craft technical training, was updated as needed to include recent concerns with radiation worker practices, and subsequent revisions to E&RC-related plant policies.

The inspector informed licensee representatives that GET appeared to be thorough and well prepared and appropriate for informing plant workers as required by 10 CFR 19.12.

No violations or deviations were identified.



b. RC Technician Training

During the onsite inspection, the inspector reviewed the initial training program for newly hired RC technicians and the continuing training program offered on a quarterly basis to the RC staff.

The inspector reviewed training records for a recently hired RC technician and noted that the individual had received GET and respiratory protection training as required for all radiation area workers. The inspector noted that the RC technician training also included Emergency Plan training as well as Radiological and Environmental Monitoring training. The inspector also noted that the initial technical training included courses related to mitigating core damage, basic PWR systems, providing RC coverage and support activities, and radiation control. Additionally, the inspector noted that after successfully completing prerequisite training the technician had completed task qualification cards for various field activities. The inspector also verified that individuals evaluating the new technician's proficiency in these tasks were qualified and certified as task evaluators.

The inspector reviewed quarterly continuing training presented to RC technicians since the previous inspection conducted September 14-18, 1992, and documented in IR 50-400/92-19. The inspector noted that 12 to 16 hours of continuing training were offered each quarter. During review of course outlines the inspector noted that the training material included review of recently implemented procedures and major revisions to existing procedures, industry events and exposure concerns, various plant systems, emergency response, and revised 10 CFR Part 20. The inspector reviewed the revised 10 CFR Part 20 training material and noted that the training included an overview of the regulatory revisions and how these revisions would apply to plant radiation protection activities. The inspector also noted that the training addressed procedural changes resulting from Part 20 revisions.

The inspector informed licensee representatives that their training program for licensee RC technicians appeared to be comprehensive and no concerns were noted with the training material.

No violations or deviations were identified.

c. Contractor Technician Training

At the time of the onsite inspection the licensee was in the process of finalizing a CP&L-wide generic training program for contractor RC technicians. The program was designed to require the contracted vendor to certify that the technicians meet certain licensee determined qualifications. Following the contractor RC technician's successful completion of GET, the licensee would administer a basic knowledge test, appropriate to the contractor's

job classification, to verify the vendor's qualification program. Site specific training with an orientation program would also follow.

The inspector reviewed study guides which the licensee had developed for the basic knowledge test, and test questions which comprised the examination bank for the basic knowledge test and the supplemental tests for different job classifications. The inspector noted that the study guides and test questions incorporated revised 10 CFR Part 20 terminology and requirements. The inspector further noted that the guides and examinations seemed appropriate to assure the qualifications of contract RC technicians.

The inspector was informed that the licensee was still in the process of finalizing implementing procedures for the contractor RC technician training program. Thus, the program was subject to management review and revisions. The inspector informed licensee representatives that the finalized training program would be reviewed in detail during future inspections.

No violations or deviations were identified.

4. Self-Assessment Program (83750)

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 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 inspector reviewed reports of NAD assessments conducted since the previous NRC inspection conducted September 14-18, 1992, and documented in IR 50-400/92-19. The inspector also noted that since the previous inspection, the E&RC position within the site NAD organization had been assumed by an individual with an appropriate level of E&RC knowledge and experience. Those particular assessments reviewed by the inspector included a Harris Nuclear Plant (HNP) Sitewide assessment conducted October 5-16, 1992, an HNP outage assessment conducted September 12, - December 4, 1992 (H-OUT-92-01), and an HNP E&RC assessment conducted March 8-12, 1993 (H-ERC-93-01). The inspector noted that the assessments appeared to be well planned and documented. The assessment reports were thorough with numerous strengths and improvement items being identified. The inspector also noted improvements in management oversight in that appropriate focus was given to identified findings, proposed corrective items, and resolution of concerns. Additionally, the inspector reviewed frequent observations of program effectiveness



made by the site E&RC auditor. Although these plant walkdowns, work performance observations, procedural reviews, and housekeeping inspections, were not formal NAD assessments, the inspector noted that identified weaknesses were brought to E&RC management's attention and were promptly corrected.

The inspector informed licensee representatives that the addition of a permanent E&RC auditor within the site NAD organization and increased management attention to NAD identified issues appeared to be beneficial in improving the overall effectiveness of the NAD function.

In addition, the inspector reviewed and discussed with licensee representatives the program for identifying and correcting deficiencies and weaknesses related to the implementation of the radiation protection program. Since the last inspection of this area in September 1992, the licensee had finalized and issued Procedure ERC-201, E&RC Feedback Report, Revision (Rev.) 3, dated October 13, 1992. This revision, formalized the improvements in trending, tracking, and followup actions discussed in NRC IR 50-400/92-19. In addition, the licensee had modified the radiation safety violation program as described in Procedure PLP-511, Radiation Safety Program, Rev. 7, dated January 1, 1994, to reflect two categories of findings, significant and non-significant. The former type was followed-up utilizing the Adverse Condition Report (ACR) program and the latter was assessed and corrected utilizing the Feedback Report System.

Review of selected Feedback Reports and Radiation Safety violations for the period October 1, 1992 through May 19, 1993, noted that the licensee was appropriately identifying and correcting health physics problems areas, and no trends of adverse performance were identified. In particular, the inspector noted that the licensee's continuing efforts to reduce the backlog of old Feedback Reports were effective.

No violations or deviations were identified.

5. External Exposure Controls (83750)

10 CFR 20.1201 (a) requires each licensee to control the occupational dose to individual adults, except for planned special exposures, to the following dose limits: (1) an annual limit, which is the more limiting of the total effective dose equivalent, being equal to 5 rems, or 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, and (2) the annual limits to the lens of the eye, to the skin, and to the extremities, which are an eye dose equivalent of 15 rems, and a shallow-dose equivalent of 50 rems to the skin or to any extremity.

The inspector reviewed and discussed with licensee representatives external exposures for plant and contractor employees for the period October 1, 1992 through May 18, 1993. For the period, the inspector verified that the assigned 1992 fourth quarter doses and year-to-date

1993 doses were within the applicable 10 CFR Part 20 limits. For the fourth quarter 1992, the maximum whole body, skin, and extremity exposures assigned at the Harris plant were 1080 millirem (mrem), 1080 mrem, and 1493 mrem, respectively. For 1993, the maximum year-to-date total effective dose equivalent (TEDE) assigned by TLD was 213 mrem with similar doses assigned for the skin of the whole body, lens of the eyes, and the extremities.

For those individuals who had exceeded or who were expected to exceed 1.25 rem in the fourth quarter of 1992, the inspector verified that exposure extensions were authorized. Review of corresponding records determined that exposure history files were completed (NRC Form-4) and extensions were granted based on quarterly and lifetime exposures, as required. For the period, most extensions were associated with steam generator and cavity painting/stripping activities, with the maximum extension granted to 2000 mrem. Effective January 1993, the licensee established new annual administrative dose limits coincident with implementation of the new Part 20. These limits were as follows: 500 mrem TEDE without determination of additional current year dose and 2000 mrem and 4000 mrem TEDE if current year dose was determined. In addition, a lifetime administrative dose limit of 1N rem, where N equals the individual's age in years, had been established. The inspector was informed that no dose extensions had been granted thus far in 1993. No concerns were noted with the licensee's administrative limits or dose extension process.

10 CFR 20.1208(a) requires that the dose to the embryo/fetus not exceed 500 mrem during the entire pregnancy due to occupational exposure of a declared pregnant woman. Licensee procedure RC-PD-07, Embryo/Fetus Exposure Monitoring, dated December 28, 1992, establishes the licensee's program with respect to the aforementioned requirements. The inspector noted that the provisions of the procedure were consistent with regulatory requirements and no concerns were noted. Since January 1993, the licensee stated that only one such declaration had been made, and the inspector noted that appropriate documentation was maintained. The individual had not received any 1993 exposure as of the time of the onsite inspection.

Licensee representatives stated that no significant changes had been made to the dosimetry program since the last inspection of this area in September 1992. The licensee continued to utilize the Panasonic UD-802 thermoluminescent dosimeters (TLDs) for measurement of dose of record and pocket ion chambers (PICs) as secondary dosimeters for daily dose tracking. Licensee representatives stated that efforts to implement digital alarming dosimeters (DADs) were on-going. Testing of various products had been completed with a recommendation for a specific vendor expected by July 1993. Full implementation was targeted for the next refueling outage in 1994.

During observation of activities in the Auxiliary Building, Waste Processing Building, and the Fuel Handling Building, the inspector observed workers wearing personal dosimetry devices in accordance with licensee procedural requirements. No concerns were observed.

No violations or deviations were identified.

6. Internal Exposure Controls (83750)

10 CFR 20.1204 states that for purposes of assessing dose used to determine compliance with occupational dose equivalent limits, the licensee, when required to monitor internal exposure, shall take suitable and timely measurements of concentrations of radioactive materials in air, quantities of radionuclides in the body, quantities of radionuclides excreted from the body, or combinations of these measurements. When specific information on the behavior of the material in an individual is known, that information may be used to calculate the Committed Effective Dose Equivalent (CEDE).

a. Whole Body Counting and Exposure Tracking

The inspector reviewed and discussed the licensee's program for monitoring internal dose. Radiation Control and Protection Manual, Revision 21, dated April 1, 1993, states that based on historical bioassay data plant workers are not likely to exceed 10 percent of the annual intake limits during routine operations; therefore, routine internal exposure monitoring is not required to comply with 10 CFR 20.1502(b). However, the licensee's program continues to require periodic monitoring for internal radioactivity. The program includes the following:

- (1) Performance of an initial and termination bioassay;
- (2) Performance of a bioassay on workers within 2 weeks of completing work involving planned internal exposures when exposures exceeding 40 Derived Air Concentration-hours (DAC-hrs) could have been received based on a prospective evaluation;
- (3) Performance of a bioassay at least once each calendar year for individuals permanently assigned dosimetry; and
- (4) Performance of a bioassay when conditions indicate the intake of an appreciable quantity of radioactive material may have occurred.

Further, the inspector noted that DAC-hrs would not be individually tracked; however, discussions with licensee personnel and review of the Radiation Control and Protection Manual revealed that internal and external doses are required to be summed, regardless of the amount, whenever an individual is determined to have a measurable body burden due to licensed activities. The

inspector reviewed the licensee's software to support the tracking and summation of doses. Review of a test case by the inspector noted that internal and external doses were properly added to determine TEDE, and no concerns were identified.

Licensee representatives stated that no positive internal contaminations had been identified to date in 1993; therefore, no determinations of internal dose or summing of doses had occurred.

The inspector reviewed two internal contamination events which occurred during the 1992 refueling outage. The first event, documented in ACR 92-471, occurred on October 7, 1992, during cavity drain down. According to the licensee's investigation, the event was caused by elevated airborne radioactive material (up to 54 percent of maximum permissible concentration) due to the rapid cavity drain down. The licensee performed whole body counts for the affected workers and determined the maximum exposure to be 3.10 Maximum Permissible Concentration-hours (MPC-hrs) due to Cobalt-58. The other workers' exposures were determined to be less than 1 MPC-hr. Discussions with licensee representatives determined that implemented corrective actions were effective in preventing similar airborne problems during the subsequent drain down. The second event, documented in ACR 92-567, occurred on November 3, 1992, during refueling operations. The event was associated with elevated airborne concentrations due to the securing of the containment pre-entry purge when a high humidity alarm was received. During refueling operations, RC was identifying and monitoring increasing airborne levels; however, they were unaware that the purge had been secured. Refueling workers were allowed to continue work during this period based on initial sampling data, and MPC-hr tracking was initiated. Upon exit from containment, the crew alarmed the personnel contamination monitors and subsequent whole body analyses were performed. For the four affected workers, the maximum exposure was approximately 5 MPC-hours due to Cobalt-58 and 60. Based on the inspector's review of the two events, the licensee's followup and investigation activities appeared appropriate, and no concerns were noted.

Review of exposure files for selected contractor employees associated with Refueling Outage-4 (RFO-4) determined that the licensee was conducting initial and termination whole body analyses in accordance with procedural requirements. No concerns were noted.

Based on the above evaluation, the inspector concluded that the licensee's program for monitoring, assessing, and controlling internal exposures was conducted in accordance with regulatory and procedural requirements with no exposures in excess of 10 CFR Part 20 limits identified.

No violations or deviations were identified.

b. Respiratory Protection

10 CFR 20.1703(a)(3) permits the licensee to maintain and to implement a respiratory protection program that includes: air sampling to identify the hazard; surveys and bioassay to evaluate the actual intakes; testing of respirators for operability immediately prior to each use; written procedures regarding selection, fitting, issuance, maintenance, and testing of respirators; supervision and training of personnel; monitoring, including air sampling and bioassays; and recordkeeping; and determination by a physician prior to initial fitting of respirators, and at least every 12 months thereafter, that the individual user is physically able to use respiratory protective equipment.

The inspector reviewed records for selected individuals who were issued respiratory protective equipment during the period from January 1, to April 30, 1993, to verify that the licensee was conducting training to use respiratory equipment, fit-testing, and medical examinations in accordance with regulatory and procedural guidance. The inspector noted that according to licensee procedures users of respiratory protective equipment required training and fit-testing annually, with a 25 percent grace period. An NRC granted exemption permitted the licensee to administer physical examinations at an interval of every 9 to 15 months, rather than annually, provided that the total time over any three consecutive physical examination periods did not exceed 39 months. The inspector verified that for selected records reviewed users of respiratory protective equipment were appropriately trained, fit-tested, and medically qualified in accordance with licensee procedures.

No violations or deviations were identified.

7. Control of Radiative Material and Contamination, Surveys, and Monitoring (83750)

a. Area and Personnel Contamination

The licensee maintained approximately 460,000 square feet (ft²) of floor space as radiologically controlled, excluding the containment. According to licensee representatives, for 1992, the average daily contaminated surface area was approximately 1,940 ft², as compared to a goal of 3,500 ft². As of April 30, 1993, approximately 1,750 ft² of recoverable space was being tracked by the licensee as contaminated. This represented approximately 0.4 percent of the radiologically controlled area (RCA).

For 1992, the licensee essentially met their goal of 135 personnel contamination events (PCEs) with 38 skin contaminations and 96 clothing contaminations. Although the goals for the year were met, the licensee experienced an increase in PCEs during RFO-4 activities. Approximately 99 events occurred as compared to a goal of 91 and 69 during RFO-3. In general, the activity associated with the events was low; however, a majority were associated with discrete particles. The licensee's analysis of the increasing trend during RFO-4 determined the primary particle sources to be products of the fuel reconstitution project, steam generator work and the handling of associated materials, and cross contamination of protective clothing. Regarding the latter, the licensee performed increased surveys of laundered clothing, segregated materials, and requested that the vendor's laundry monitoring setpoint be lowered to 10,000 cpm (20,000 dpm/100 cm²). Following these actions, improved performance was observed, and licensee representatives stated that improved controls would be evaluated for the RFO-5 fuel reconstitution project. In general, the licensee's evaluation and follow-up actions were considered appropriate. Through April 30, 1993, approximately 13 PCEs had occurred in 1993, compared to an annual goal of 60.

Review of selected contamination events in detail noted that the licensee documentation and followup on the individual events was appropriate, and skin dose assessments were performed, when required. For the reports reviewed, resultant exposures were minor, and no concerns were noted.

During facility tours, the inspector observed overall excellent contamination control and housekeeping practices, and the licensee's efforts with respect to this area continued to be a program strength.

No violations or deviations were identified.

b. Posting and Labeling of Radioactive Materials

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

Health Physics Procedure, HPP-800, Handling Radioactive Materials, Rev. 0, dated January 1, 1993, provides instructions for controlling material in RCAs. Section 9.1.a. requires, in accordance with 10 CFR 20.1904(a), each container of radioactive material with quantities greater than those listed in 10 CFR Part 20, Appendix C, bear a durable, clearly visible label bearing a radiation symbol and words "Danger, Radioactive Material" or "Caution, Radioactive Material." The label must provide sufficient information, such as radiation levels,

radionuclides, and amount of radioactivity, to allow individuals handling, using, or working in the vicinity of such containers to take precautions against exposure. Additionally, Section 6.1.3.b. of Attachment 13 requires a completed Radioactive Material Tag to be attached to the material when removable contamination is detected at a level greater than 100 net counts per minute (cpm) for a survey area of approximately 100 square centimeters (cm²). Section 6.5.2 of Attachment 13 requires tools and scaffolding having fixed contamination, greater than 100 net cpm per probe area, to be marked with magenta paint if they are to be reused.

During tours of the licensee's facility, the inspector observed equipment in the East Hot Machine Shop, a posted Radioactive Materials Area and Radiation Area, which was labeled as radioactive material, and/or bagged as contaminated radioactive material, and/or painted magenta, and/or identified as uncontaminated equipment. The inspector requested licensee representatives to survey two steam generator manway stud detensioners. Both detensioners were labeled with a small piece of "Radioactive" tape. Contamination surveys revealed 200 to 1200 cpm fixed contamination, and a maximum of 6000 disintegrations per minute per a 100 square centimeter area (dpm/100 cm²) smearable contamination on one detensioner, and 200 cpm fixed contamination with no smearable contamination on the other detensioner. Followup surveys of the remaining equipment in the room, indicated that an additional nine items were contaminated. All nine items had evidence of fixed contamination, ranging from 1,000 to 90,000 cpm, while one item revealed smearable contamination, with a maximum result of 3,000 dpm/100 cm². The inspector informed licensee representatives that these contamination levels were in excess of procedural limits and thus a violation of HPP-800 which required control of radioactive material by tagging material with smearable contamination or by painting material with fixed contamination with magenta paint (VIO: 50-400/93-11-01).

The inspector also noted, during review of the assessment reports and observations, as referenced in Paragraph 4, a recurring concern with the licensee's radioactive material control program. Specifically, during assessment report, H-ERC-92-01, conducted during March 1992, the licensee identified deficiencies with posting, labeling, and subsequent control of radioactive materials. Corrective actions did not appear to be effective in that additional posting and labeling deficiencies and inconsistencies and deficiencies in radioactive material storage areas were identified during observations and NAD assessments documented in reports H-OUT-92-01 and H-ERC-93-01. Based on the recurrence of these deficiencies, the licensee had initiated ACR 93-186 on April 27, 1993, to address the control of radioactive material control from a broader perspective.

Also, during facility tours, the inspector observed a pressurizer relief valve in the Receiving Warehouse which was contained in a yellow radioactive materials bag, placed within a posted Radioactive Material Area, but did not have a radioactive material label. Based on licensee followup, the inspector was informed that the valve was in temporary storage in the Receiving Warehouse. The inspector was also informed that no smearable contamination was detected on the valve and the maximum detectable radiation level was 0.1 mrem per hour (mrem/hr) on contact. However, the most recent isotopic analysis of the valve indicated cobalt-60 (Co-60) activity was 6 microCuries (uCi). The inspector informed licensee representatives that this activity exceeded 10 CFR Part 20, Appendix C limits of 1 uCi for Co-60 and was a violation of HPP-800 requirements for labeling with appropriate exposure reduction information.

Due to the licensee's immediate corrective actions to properly label the valve and to initiate procedural revisions to prevent recurrence, and minimal safety significance, during the exit interview on May 21, 1993, the inspector identified the violation as a non-cited violation (NCV) of 10 CFR 20.1904(a) requirements. However, based on a followup review of this matter, it was determined that due to the similarities of this violation and the cited violation (page 11), enforcement discretion as a NCV was not appropriate. Therefore this issue will be considered as another example of failure to properly handle radioactive material in accordance with HPP-800 requirements (VIO: 50-400/93-11-01).

One apparent NRC-identified violation regarding multiple examples of the licensee's failure to properly handle radioactive material in accordance with licensee procedure, HPP-800, was identified.

8. Program for Maintaining Exposures As Low As Reasonable Achievable (83750)

10 CFR 20.1101(b) states each 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 ALARA.

The inspector reviewed and discussed with cognizant licensee representatives ALARA program implementation and initiatives for RFO-4 and routine operations. For the year 1992, the site collective dose was 213.150 person-rem, just below the annual dose goal of 215 person-rem. This was the first time that Harris had met its annual site goal, and reflected 21.5 rem for normal operations, 7.6 rem for the spent fuel program, 146.3 rem for outages and special projects, and 37.8 rem for steam generator life extension.

For RFO-4, the licensee expended approximately 173.7 person-rem which was above the outage goal of 165 person-rem; however, this exposure was less than the approximately 181 person-rem estimated through the ALARA



job evaluation process. In addition, the outage was extended by 26 days due to the need to replace auxiliary feedwater piping as determined during in-service inspections. The inspector reviewed the RFO-4 ALARA Outage Report and discussed in detail several dose intensive job evolutions including: steam generator tube pulls, alternate mini-flow redesign, auxiliary feedwater piping replacement, pressurizer surge line hanger modification, and general steam generator activities. For the former three activities listed, approximately 15 person-rem was attributed to expanded work scope. The inspector also noted that the licensee's dose performance for repetitive outage tasks continued to trend downward; however, the dose for general and cavity decontamination activities was significantly higher than previous outages with approximately 14.5 person-rem expended. According to the licensee the dose was attributable, in part, to the use of a new strippable coating which was inadequate, a too rapid cavity drain down resulting in airborne contamination, and inadequate spray equipment. The licensee had developed a comprehensive outage report which appropriately addressed the lessons learned and strengths associated with the work activities. At the time of the onsite inspection, the resultant action items were being entered into the licensee's corrective actions program for resolution prior to the next outage. Overall, the inspector concluded that the dose expended for the outage was consistent with the work performed and improvements areas were being adequately addressed.

For 1993, the licensee had established a dose goal of 45 person-rem. As of April 30, 1993, approximately nine person-rem had been expended. The inspector discussed in detail on-going material upgrade and painting activities which had the potential to be a major contributor to routine doses. At the time of the inspection, approximately eight person-rem was estimated to complete work on the 190 South elevation of the Auxiliary Building with projected exposure for 190 North elevation work expected to be higher. ALARA personnel were closely monitoring this evolution to ensure unnecessary exposures are minimized. Overall, the inspector observed that the ALARA function was involved in day-to-day activities and had provided an increased focus on routine, operational doses.

The inspector discussed with ALARA personnel specific dose reduction activities implemented as well as those planned for RFO-5. Particular items of note included the use of tele-dosimetry for steam generator work, extensive use of cameras for remote observation, use of innovative shielding for the pressurizer surge line modification, maintenance of steam generator water levels during auxiliary feedwater piping replacement, worker mockup activities, and a shielded work station for resin transfer operations. The licensee stated that resistance temperature detector (RTD) bypass removal was planned for RFO-5 and planning had already begun. Other ongoing ALARA activities included purchase of a surrogate tour system, additional video and communications equipment, and shielding as well as the identification of cobalt containing valves.



Based on the above, the inspector informed licensee representatives that the ALARA program appeared to be effective in reducing overall collective dose, and was considered a strength to the overall radiation protection program.

No violations or deviations were identified.

9. Exit Interview (83750)

The inspection scope and results were summarized on May 21, 1993, with those persons indicated in Paragraph 1 above. The general program areas reviewed and the inspection findings were discussed in detail. 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.

Item Number

Description and Reference

50-400/93-11-01

VIO - Failure to comply with procedure, HPP-800, requirements for properly handling radioactive materials (Paragraph 7.b).

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