UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W., SUITE 2900
ATLANTA, GEORGIA 30323-0199

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Report No: 50-261/93-16

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

Docket No.: 50-261 License No.: DPR-23

Facility Name: H. B. Robinson

Inspection Conducted: June 28 - July 2, 1993

Inspectors: _____ 7/28/93
A. J. Bollard Date Signed

_____ 7/28/93
E. B. Pharr Date Signed

Approved by: _____ 7/29/93
William H. Rankin, Chief Date Signed
Facilities Radiation Protection Section
Emergency Preparedness and Radiological
Protection Branch
Division of Radiation Safety and Safeguards

SUMMARY

Scope:

This routine, announced inspection of the licensee's radiation control (RC) program involved review of health physics activities. The specific areas evaluated included organization and staffing; training and qualifications; audits and appraisals; external and internal exposure monitoring and assessment programs; control of radioactive material and contamination, surveys and monitoring; and As Low As Reasonably Achievable (ALARA) program implementation. In addition, licensee responses to previously identified inspection findings were reviewed.

Results:

Based on interviews with licensee personnel, records review, and observation of work activities in progress, the inspector found the RC program to be functioning adequately to protect the health and safety of plant workers. RC staffing levels appeared adequate to support on-going activities. Minor changes in the organization had occurred; however, no adverse impacts

associated with the changes were observed. Management attention and focus on the self-assessment program was noted as evidenced by improved quality of assessments and follow-up activities. The licensee continued to implement effective internal and external exposure control programs with all exposures less than 10 CFR Part 20 limits. Efforts to eliminate the contaminated process equipment areas as well as pursuing resolution to the increased personnel contamination events in 1992 were considered positive, and overall material control appeared adequate. The ALARA program continued to be effective in controlling overall collective dose. Two non-cited violations were identified for the failure to follow training/qualification procedures (Paragraph 3.b) and the failure to follow procedures for performing and assessing skin dose due to contamination (Paragraph 5.b).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*R. Barnett, Manager, Project Management
*S. Billings, Technical Aide, Regulatory Compliance
*W. Brand, Radiation Control (RC) Supervisor, Environmental and Radiation Control (E&RC)
E. Collins, RC Supervisor, E&RC
*M. Crabtree, RC Supervisor, E&RC
*A. Eaddy, Manager, E&RC Support
*W. Flanagan, Acting Plant Manager
*E. Gardner, RC Supervisor, E&RC
*J. Harrison, Manager, Regulatory Compliance
*P. Musse, Manager Engineering and Technical Support, Robinson Nuclear Assessment Department (NAD)
*A. Padgett, Manager, E&RC
R. Prichard, Technical Trainer
R. Reynolds, Lead Assessor, NAD
*L. Smith, Manager, Technical Training

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

Nuclear Regulatory Commission

*S. Bejwa, Acting Director, Project Directorate II-1, Office of Nuclear Reactor Regulation (NRR)
*J. Jauden, Deputy Director, Division of Reactor Safety, Region II
*C. Ogle, Resident Inspector
*W. Orders, Senior Resident Inspector

*Attended July 2, 1993 Exit Meeting

2. Organization and Staffing (83750)

The inspector reviewed and discussed with licensee representatives changes made to the Radiation Protection (RP) organization since the last NRC inspection of this area conducted June 1-5, 1992, and documented in Inspection Report (IR) 50-261/92-17, dated July 20, 1992.

The inspector noted that since the previous inspection, the licensee had created an additional supervisory position within the Environmental and Radiation Control (E&RC) group. With the addition, the E&RC unit consisted of the E&RC Manager supported by four Radiation Control (RC) Supervisors, an Environmental and Chemistry (E&C) Supervisor, and a Manager, E&RC Support. The new position was filled by promotion within the E&RC unit, and was primarily responsible for instrumentation, the counting room, surveillances, and emergency preparedness as well as job coverage and plant monitoring activities. Six technicians reported to

this individual. No changes were noted for the other supervisory positions with the exception of the transfer of the aforementioned responsibilities to the new supervisor as well as restructuring of the supporting technician staffs. The inspector had no concerns regarding the redistribution of supervisory responsibility, and all functions continued to be appropriately assigned. No other changes were noted with respect to lines of authority or organizational structure.

The licensee's RC staffing continued to remain stable with approximately 47 positions allocated to the organization. This staffing included 25 health physics (HP) technicians, 3 dosimetry technicians, and 13 personnel assigned to the E&RC support staff. At the time of the onsite inspection, one technician position was vacant, and licensee representatives stated that they were actively pursuing hiring. Since the previous inspection, two new technicians were employed. The qualifications of these individuals are discussed are Paragraph 3.b below.

Based on discussions with licensee representatives and observation of activities during the inspection, the RC staffing levels appeared adequate to support on-going, routine activities. Additionally, the recent organizational changes within the E&RC unit did not appear to adversely impact the organization's ability to protect the health and safety of plant workers.

No violations or deviations were identified.

3. Health Physics Training and Qualifications (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.

The inspector reviewed the licensee's program for qualifying HP technicians and contractor technicians as well as selected aspects of the HP technician continuing training.

a. Contractor Health Physics Technician Training

Licensee Procedure ERC-012, Transient Health Physics Training and Qualification, Revision (Rev.) 5, dated August 30, 1991, establishes the requirements for selection, in-processing, training, and qualifying contractor personnel with radiation control responsibilities.

The inspector discussed with licensee training representatives the process for qualifying and training contract RC technicians for the job functions they were expected to perform. The licensee had established minimum work experience and education requirements for each classification of RC contractor. The program required that HP technicians successfully complete a baseline assessment/basic concepts examination with at least an 80 percent score in accordance with Training Instruction (TI) 120, Baseline Assessment Program for Transient Personnel Qualification, Rev. 0, dated January 3, 1992. All HP contractors were required to attend approximately 12 hours of instruction on plant procedures and industry events. Further, junior and senior RC technicians were required to attend an additional seven hours of instruction. For each of the four instructional units, personnel were required to pass a written examination with a score of 80 percent. Transient personnel were also required to read and sign-off on the procedures applicable to their job classification. Decontamination technicians were not required to complete the baseline assessment nor the additional seven hours of specialized procedure training.

The inspector reviewed selected training outlines and associated examinations and found the material appropriately inclusive and consistent with the stated objectives. In addition, the inspector noted that the training material and test questions incorporated the revised 10 CFR Part 20 terminology and requirements. During 1993, the licensee employed four contractor personnel (one senior HP technician and three decontamination technicians) for the contaminated process equipment area (CPEA) reclamation project. Review of training and qualification documentation for these personnel by the inspector verified successful completion of the required training, examinations, and procedural reviews in accordance with requirements. No discrepancies were noted.

No violations or deviations were identified.

b. RC Technician Initial and Continuing Training

Technical Specification (TS) 6.5.1.1.(a) states that written procedures shall be established, implemented, and maintained covering the activities referenced in Appendix A of Regulatory Guide 1.33, Rev. 2, dated February 1978.

TI 114, Related Technical Training and On-the-Job Training for Environmental and Chemistry and Radiation Control Classification, Rev. 0, dated August 23, 1985, describes the licensee's program for initial, continuing, and on-the-job training for technician qualification and requalification under the requirements of ANSI Standard N18.1-1971. The initial technician qualification program consists of generic training, plant specific training, on-the-job training, and task performance evaluation.

Since the last inspection of this area conducted in June 1992, the licensee had hired two new RC technicians. According to licensee representatives, one of the technicians was previously a contractor RC technician while the other technician had little prior experience. The inspector reviewed the training and qualification records for these two technicians. During the review, the inspector noted that one of the individuals (the previous contractor technician) had been determined to be initially qualified on approximately 23 of 65 qualification checkout cards (QCCs) by an RC Supervisor using the Qualification Review Form (QRF). In essence, this process allowed performance of the specific QCC tasks without completing the prerequisite training or task performance evaluations specified in each QCC. Licensee representatives stated that the QRF was utilized to establish a baseline qualification for the technician, and the RC Supervisor qualification determination was based on observation of the individual's previous performance at the site during outages. Although relief from the QCC requirements may have been appropriate based on the knowledge and experience level of the individual, the inspector informed licensee representatives that in accordance with Section 5.1 of Procedure TI-114 all RC personnel are required to participate in the training and qualification program documenting proficiency in tasks as defined on the QCCs unless otherwise designated by the Manager, E&RC. In this case, the exemption was not granted at the required level of management prescribed by the procedure. In addition, the inspector discussed with the licensee that the QRF form, itself, did not appear to support the manner in which it was being used. Specifically, the form did not include provisions for qualification on a QCC by exemption and/or QCC equivalent experience.

As discussed in Paragraph 4, the inspector noted that a similar finding had been identified by the Nuclear Assessment Department (NAD) during their Training and Qualification Assessment conducted September 7, 1992 through June 11, 1993, and documented in Report No. R-TO-93-01, dated June 26, 1993. The NAD issue identified concerns regarding the adequacy, documentation, and criteria for the training/qualification exemption process. The issue affected various plant disciplines and specific examples were identified in the E&RC area. The licensee response to the NAD assessment was due on July 26, 1993, subsequent to the onsite inspection.

Based on NAD's prior identification of the issue, the inspector informed licensee representatives at the exit that this issue would be tracked by NRC as an Unresolved Item (URI) pending a determination of corrective actions and resolution within the NAD program. On July 26, 1993, the inspector was provided the licensee's formal response to the NAD assessment, dated July 24, 1993. Committed corrective actions included development of a new TI which specifies the exemption methodology for all site personnel. Specific review of E&RC personnel qualifications

revealed two individuals who had been qualified using the QRF. The licensee determined the individuals to be able to perform assigned tasks; however, documentation of QCC completion will be documented. In addition, licensee representatives stated that QRFs would no longer be utilized for initial qualification purposes. Procedural completion is to be in place by August 16, 1993.

Based on the review of the committed corrective actions, the inspector informed licensee representatives that this issue would be identified as a non-cited violation (NCV) of TS 6.5.1.1.1(a), because the licensee's actions to identify and correct the procedural violation were consistent with the criteria specified in Section VII.B of the Enforcement Policy (NCV: 50-261/93-16-01).

The inspector also reviewed the licensee's continuing training program for RC technicians. Licensee training representatives stated that required instruction for technicians and supervisors was conducted quarterly and at a minimum consisted of 32 hours annually. Review of course outlines for the training conducted since the last NRC inspection noted that the training included recent industry events, various health physics topical reviews, selected plant systems, and specific requalification tasks to support the upcoming outage. In addition, the inspector noted that approximately 16 hours of instruction was provided on the new 10 CFR Part 20 requirements during the third quarter 1992. Review of this course material and the supporting examination determined that the training appeared to provide an appropriate overview of the regulatory revisions and their affect on plant radiation protection activities. Overall, the inspector concluded that the content of the continuing training programs was appropriate to maintain and improve the knowledge level of the RC technician staff, and no concerns were noted.

One NCV for the failure to follow training procedures for initially qualifying an RC technician was identified.

4. Audits and Appraisals (83750)

TS 6.5.4.1 requires audits of the facility to be performed by the 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.

The inspector was informed that since the previous NRC inspection of this program area, the licensee had undergone a personnel change in the E&RC auditor position within the site NAD organization. The inspector noted that this individual was appropriately knowledgeable of E&RC functions and responsibilities.

The inspector reviewed NAD assessments related to the RC function which had been performed since the last NRC inspection of this area, conducted June 1-5, 1992, and documented in IR 50-261/92-17. Specifically, the inspector reviewed R-TQ-92-01, Robinson Nuclear Plant (RNP) Training and Qualification Assessment, dated July 17, 1992, R-SP-92-07, Refueling Outage 14 Special Assessment, dated August 28, 1992, R-SP-92-13, RNP Sitewide Follow-up, dated November 10, 1992, R-ERC-93-01, RNP Environmental and Radiation Control Assessment, dated February 9, 1993, and R-TQ-93-01, RNP Training and Qualification Assessment, dated June 26, 1993. The inspector noted that the assessments performed during 1993 continued to identify strengths, weaknesses, issues, and items for management consideration, and corrective actions taken in response to identified issues continued to be reviewed for closure. However, the 1993 assessments also required that responsible organizations respond within 30 days to identified weaknesses. The inspector noted that these responses to identified weaknesses and issues, including causal factors, corrective actions and implementation dates, were reviewed by appropriate management levels. The inspector also noted that corrective actions for weaknesses and program changes made in response to items identified for management consideration were reviewed during follow-up assessments. The inspector noted that this improvement in management oversight appeared to be beneficial in that appropriate focus was given to identified findings, proposed corrective actions, and resolution of concerns.

During review of assessment reports and observations performed by the site E&RC auditor, the inspector noted that the audits were thorough with numerous strengths and items for improvement being identified. In particular, the inspector reviewed a training and qualification weakness related to inadequacies in the exemption process for qualification of new E&RC technicians. The inspector's concerns regarding this issue are further discussed in Paragragh 3.b of this IR. The inspector noted that concerns identified during formal program assessments and during observations by the site E&RC auditor were promptly brought to management's attention with corrective actions initiated. The inspector informed licensee representatives that the increased management attention to NAD identified issues appeared to be beneficial in improving the overall effectiveness of the NAD function.

The inspector also reviewed the licensee's program for self-identification of weaknesses related to the RP program and the appropriateness of corrective actions taken. Specifically, the inspector reviewed 1993 E&RC Concern Reports and Radiation Safety Violations (RSVs). Both of these self-identification mechanisms were implemented in accordance with the E&RC Corrective Action Sub-program, which the licensee used to investigate, resolve, track, and trend both positive and negative work practices in the areas of E&RC responsibility. The inspector noted that 61 concerns and three RSVs were identified during the period from January 1, to July 1, 1993. Numerous concern reports were initiated in response to weaknesses identified during NAD audits and observations. The inspector noted that the licensee was appropriately utilizing their Corrective Action Sub-

program to identify and correct radiation control deficiencies. The inspector also noted that the licensee was tracking and trending these deficiencies and no adverse performance trends were identified.

No violations or deviations were identified.

5. External Exposure Control (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.

10 CFR 20.1208(a) requires that the dose to the embryo/fetus not exceed 500 millirem during the entire pregnancy due to occupational exposure of a declared pregnant woman.

a. External Exposure and Dosimetry Program

The inspector reviewed the licensee's revised program for external exposure monitoring and control in response to their implementation of new 10 CFR Part 20 requirements. The inspector reviewed the Radiation Control and Protection Manual (RC&PM) and selected licensee procedures, which established implementation guidelines for the licensee's external exposure control program. Overall, the inspector did not identify any concerns with the licensee's procedural requirements nor with their implementation of Part 20 requirements.

The inspector noted that the licensee established a new annual administrative dose limit of 2000 millirem (mrem), total effective dose equivalent (TEDE), provided that prior exposure history be documented on an NRC Form-4. The licensee also allowed dose extensions above 2000 mrem provided certain criteria were met. The inspector reviewed 1993 exposure records for selected workers involved with Radiation Work Permit (RWP) R93-0178. This RWP was associated with the Modification 1104 project for installing, removing, and repairing hangers and hanger supports in the pipe alley. For those individuals reviewed, the inspector verified an appropriately documented NRC Form-4 on file, thus allowing the individuals an annual TEDE limit of 2000 mrem. The inspector noted two individuals whose year-to-date TEDEs were 1030 mrem and 1196 mrem, respectively. The inspector discussed with licensee representatives the rapid dose accumulation for both individuals and the fact that the modification project was still requiring dose intensive work. Licensee representatives informed the

inspector that they were aware of the individuals approaching their administrative dose limit and were taking steps to control their exposures. The inspector was informed that no exposure extensions had been granted, to date, during 1993.

During discussions with licensee representatives, the inspector was informed that no significant changes had been made to the dosimetry program since the previous NRC inspection. The licensee continued to use Panasonic UD-802 and UD-807 thermoluminescent dosimeters (TLDs) for recording whole body and extremity dose, respectively. The TLDs continued to be read on a quarterly frequency. Additionally, the licensee used self-reading pocket dosimeters (SRPDs) for tracking daily dose. The inspector noted that accumulation of an SRPD dose of 500 mrem, since the previous TLD read, warranted a special TLD read. The inspector also noted that the licensee appropriately performed daily quality checks of the TLD reader in accordance with applicable procedures. The inspector did not identify any concerns with the licensee's implementation of their dosimetry program.

The inspector also reviewed the licensee's policy regarding declaration of pregnancy. The inspector noted that, in accordance with licensee procedures, dose to the declared pregnant female was limited to 500 mrem during the pregnancy with an attempt to maintain a uniform exposure rate of 50 mrem during each month of pregnancy. This was verified by monthly TLD reads and prohibiting work in high radiation areas. Additionally, the licensee's policy did not permit declared pregnant females to perform work in airborne radioactivity areas, nor work requiring multibadging, due to inconsistencies with determining dose to the embryo/fetus. The inspector was informed that to date the licensee did not have any declared pregnant females onsite. The inspector did not identify any concerns with the licensee's declared pregnant female policy.

No violations or deviations were identified.

b. Exposure to Skin

TS 6.11 states that procedures for 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.

Licensee Procedure RC-PD-17, Determining Skin Dose from Contamination, Rev. 5, dated December 28, 1992, requires that skin dose calculations be performed whenever an individual is expected to have received 100 mrem or greater skin dose from a skin contamination event and such an exposure may be indicated when 5,000 counts per minute - hours (cpm-hrs), if the contaminated area is less than probe area and 80,000 cpm-hrs, if the contaminated area is greater than probe area, is measured.

The inspector reviewed personnel contamination events (PCEs) for the period July 1, 1992 through July 1, 1993. Although the licensee had realized an increase in the number of contaminations during the period, the associated skin exposures were relatively minor. For the skin dose assessments reviewed by the inspector, the maximum calculated exposure was 713 mrem for a worker whose modesty garment was contaminated with a 50,000 ccpm particle during a residual heat removal (RHR) pit entry in January 1993 (Report No. 93-CC-04). For this case, the inspector noted that calculated dose was updated to the individual's computer exposure record as a shallow dose to the right leg; however, the calculated skin dose was not correctly added to the TLD whole body shallow dose in accordance with Section 10.6.1 of Procedure RC-PD-17. This error resulted in the individual's cumulative whole body skin exposure to be inaccurate, 713 mrem versus an actual exposure of 725 mrem. This event was the only contamination event in 1993 requiring assignment of a skin exposure; however, review of selected 1992 records noted that skin exposures meeting the threshold for dose assignment were recorded and input to exposures files in accordance with procedural requirements. Prior to the end of the onsite inspection, the licensee initiated an E&RC Event Report, corrected the discrepancy in the individual's dose record, and initiated training for RC technicians qualified for dosimetry activities.

In addition, during the review of 1993 contamination event documentation, the inspector noted that for event No. 93-SC-02 a worker received a skin exposure of approximately 10,500 ccpm-hrs for contamination covering approximately 4 cm^2 of the individual's upper arm. Based on the report, the exposure met the procedural threshold for calculation of a dose (i.e. 4 cm^2 area of contamination was less than approximately 15 cm^2 probe area) as stated in Section 6.1 of Procedure RC-PD-17. The inspector noted that the contamination report was annotated with a note indicating that the skin dose was less than 100 mrem; however, no skin dose calculation form was completed and attached to the report. Prior to the end of the onsite inspection, the licensee completed the skin dose calculation form which indicated a dose of 50 mrem. No update of the individual's exposure record was required in accordance with licensee procedure. The licensee also initiated an E&RC Event Report as well as training of E&RC Support personnel and RC technicians involved in the skin dose assessment process.

The inspector informed licensee representatives that the two aforementioned examples of the failure to follow procedures were a violation of TS 6.11. However, based on the safety significance and the licensee's efforts in identifying and correcting the violation, the inspector informed the licensee that the violation

would be considered non-cited because the criteria specified in Section VII.B of the Enforcement Policy were met (NCV: 50-261/93-16-02).

One NCV for the failure to follow procedures for skin exposures associated with contamination were identified.

c. Radiation Work Permits (RWPs)

The inspector reviewed selected RWPs for appropriateness of the radiation protection requirements based on work scope, location, and conditions. The inspector reviewed routine RWPs associated with current routine work activities, and special RWPs associated with various aspects of Modification 1104 for removing, repairing, and installing hangers and hanger supports. For the RWPs reviewed, the inspector noted that radiological concerns were appropriately addressed in that adequate protective clothing, respiratory protection, and dosimetry were required. ALARA evaluations and pre-job briefings were also performed as required. The inspector noted that during jobs in which respirators were not used, pre-job briefings documented techniques discussed to limit personnel intakes and to reduce airborne radioactivity levels. The inspector informed licensee representatives that their program for RWP implementation adequately addressed radiological protection concerns and provided for proper control measures.

No violations or deviations were identified.

6. Internal Exposure Control (83750)

a. Whole Body Counting and Exposure Tracking

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).

The inspector reviewed the licensee's program for internal exposure controls in accordance with 10 CFR Part 20 revisions. The inspector noted appropriate revisions to and implementation of the RC&PM and procedural requirements for monitoring and control of internal exposures. The inspector noted that based on historical data review, the licensee determined that they did not meet the regulatory established threshold requiring internal exposure monitoring. The inspector noted however, that the licensee continued to maintain, for record, calculated Derived Air

Concentration hours (DAC-hrs) and CEDEs although these exposures were not tracked and summed with recorded external exposures. The inspector also noted that the licensee had established a program for periodic employee monitoring for internal radioactivity to verify the effectiveness of engineering controls and respiratory protection or to verify and quantify any suspected intakes. The inspector verified that for selected records reviewed, personnel with permanent dosimetry were participating in an annual bioassay program. The inspector was informed that during the period from January 1, to June 30, 1993, no positive whole body counts had been detected and no significant intakes of radioactivity, based on air sampling, were determined. The inspector did not identify any concerns with the licensee's implementation of revised Part 20 requirements.

Procedure ERC-013, E&RC Corrective Action Program, Rev. 7, dated May 21, 1993, states that whole body counting is required when facial contamination in excess of 100 ccpm or any nasal contamination is detected. The inspector reviewed selected personnel contamination reports for the period July 1, 1992 through June 30, 1993, detailing individuals reported to have positive facial contaminations. For the cases reviewed, special whole body analyses were conducted in accordance with procedural guidance, and calculated uptakes were all less than 10 Maximum Permissible Concentration-hours (MPC-hrs).

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.

During discussions with licensee representatives, the inspector was informed that during 1993, the licensee had greatly reduced respirator usage. This reduction was based on review of historical survey and exposure data. For those routine job evolutions in which this data review verified minimal associated airborne radioactivity levels the licensee had successfully reduced their use of respirators, with implementation of HEPA ventilation and faceshields.

Additionally, for selected records reviewed the inspector verified that users of respiratory protective equipment were appropriately trained, fit-tested, and medically qualified in accordance with procedural requirements. The inspector reviewed the respiratory protection training material and verified that the material was appropriately inclusive, including the licensee's policy to limit respirator use when external exposures could be reduced, and met the requirements of 10 CFR 20.1703(a)(3). The inspector also reviewed the licensee's fit-testing program. The inspector noted that the licensee utilized a PortaCount fit-testing device which was calibrated, as required, by the certified vendor. Also, the inspector noted that, in accordance with established regulatory acceptance criteria, the licensee required a satisfactory fit-factor greater than 10 times the protection factor, for a negative pressure mask, when using the PortaCount for quantitative fit-tests.

No violations or deviations were identified.

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

a. Posting and Labeling

10 CFR 20.1906 specifies the posting and control requirements for radiation areas, high radiation areas, airborne radioactivity areas, and radioactive material areas. Additional requirements for the control of high radiation and very high radiation areas are contained in TS 6.12 and 10 CFR 20.1602, respectively.

During tours of the plant, the inspector reviewed the licensee's program for posting and controlling areas with respect to the aforementioned requirements, and no discrepancies were noted. The inspector verified that selected locked high and very radiation areas were locked and posted, as required. In addition, the inspector noted that administrative and key controls had been established and were in place for locked high and very high radiation areas consistent with Procedure AP-31, Administrative Controls for Entry into Locked High Radiation Areas, Rev. 17, dated March 18, 1993.

10 CFR 20.1904 specifies that each container of radioactive material with quantities greater than those listed in 10 CFR 20, Appendix C, bear a durable, clearly visible label bearing specific information regarding the contents.

Licensee Procedure HPP-007, Handling and Storage of Contaminated and Radioactive Materials, Rev. 8, dated June 1, 1993, details the licensee's implementation of the radioactive material labeling requirements. During tours of the Auxiliary Building, Waste

Processing Building, and selected radioactive material storage locations, the inspector noted that radioactive material areas were appropriately posted and containers were labeled consistent with regulatory and procedural requirements.

No violations or deviations were identified.

b. Area and Personnel Contamination

The licensee maintained approximately 80,600 square feet (ft^2) of the floor space as radiologically controlled, excluding approximately 6000 ft^2 of contaminated space which was considered unrecoverable. As of June 29, 1993, approximately 3046 ft^2 of recoverable space was being tracked by the licensee as contaminated, of which 1700 ft^2 was associated with ongoing Modification 1104 - Piping Upgrade activities. This equated to approximately 3.8 percent of the RCA recoverable space. The licensee's 1993 goal for contaminated square footage was 2000 ft^2. According to licensee representatives, for 1992, the average contaminated surface area was approximately 2300 ft^2.

The inspector noted that during March 1993, the contaminated area increased to approximately 11,000 ft^2. The licensee stated that the sharp increase was due to the CPEAs reclamation project. The CPEAs originally encompassed approximately 15,000 ft^2 of plant area in which equipment and structures were considered contaminated; however, the floors were to be maintained clean. For the seven week project, the licensee utilized 4 contractor personnel, and all the areas were decontaminated with the exception of those related to Modification-1104. The licensee expended approximately 2.8 person-rem of exposure on the project. This overall effort was considered a positive initiative.

For 1992, the licensee had 177 PCEs as compared to a goal of 130 events. The licensee also documented an additional five clothing contamination events associated with the operations staff. The rate of PCE occurrence in 1992 was 1.031 per 1000 RWP entries. Due to the increasing trend in PCEs, particularly during Refueling Outage 14 (RFO-14), the licensee conducted an investigation to determine the causes and needed corrective actions. The licensee determined that one source of the PCEs appeared to be associated with protective clothing cross contamination; however, a specific work group was also identified who had a majority of the occurrences. The following specific actions were implemented: (1) the licensee requested that the vendor lower the laundry monitoring setpoint from 31,500 dpm/100 cm^2 to 20,000 dpm/100 cm^2 for all Robinson protective clothing; (2) representatives met with the management of the work group with the elevated number of PCEs to address methods to improve worker practices; (3) specific work unit PCE goals were established; (4) the CPEAs were eliminated as discussed above; (5) Procedure

ERC-13 was modified to require supervisory review of employee PCEs; and (6) the use of paper protective clothing (PC) either over cloth PCs or alone, depending upon the particular work situation, was implemented.

Year to date in 1993, the licensee had had 26 contaminated events which equated to approximately 0.74 events per 1000 RWP entries. Overall, the licensee's evaluation and corrective action appeared appropriate, and the inspector noted an improving trending. On-going efforts in this area will be monitored during future inspections.

No violations or deviations were identified.

c. Surveys

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

Licensee Procedure, HPP-001, Radiation Control Area Surveillance Program, Rev. 40, dated June 3, 1993, establishes the licensee's program for conducting routine surveys and monitoring of various plant locations. Review of the licensee's current survey requirements noted that an appropriate system for the conduct of daily, weekly, and quarterly surveys had been established consistent with the level of radiation hazards present. The inspector reviewed selected surveys conducted during the second quarter 1993, and determined that dose rate and contamination surveys were being conducted at the required frequency and were reviewed by the appropriate level of supervision.

During facility tours, the inspector independently verified radiation and contamination levels during tours of various Auxiliary Building locations and other areas of the radiologically controlled area (RCA). The inspector noted that all containers, material, and areas were properly labeled, posted, and/or safeguarded in accordance with the radiation hazard present with one noted exception. During the performance of gross contamination surveys in the Charging Pump Room, the inspector identified the presence of contamination adjacent to the posted contamination area and in the vicinity of a small oil leak around the base of the "A" Charging Pump. Upon identification, the licensee performed a thorough survey of the area. The survey results indicated one location with levels of 1151 disintegrations per minute per 100 square centimeters (dpm/100 cm^2). The licensee

took prompt actions to extend the contaminated area boundary to include the area in question. No other discrepancies were identified. Overall, licensee radioactive material control and housekeeping practices were considered appropriate.

No violations or deviations were identified.

d. Radiation Detection Instrumentation

During tours of the facility, the inspector noted that in-use survey instruments and continuous air monitors within the RCA were operable and displayed current calibration stickers. In addition, background radiation levels at survey locations were observed to be within an acceptable range.

No violations or deviations were identified.

8. Program for Maintaining Exposures As Low As Reasonably Achievable (ALARA) (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 as low as reasonably achievable (ALARA).

The inspector reviewed and discussed with cognizant licensee representatives ALARA program implementation and initiatives for RFO-14 and routine operations. For the year 1992, the site collective dose was approximately 352 person-rem, slightly above the licensee's stretch goal of 350 person-rem. Major contributors to this collective dose included approximately 298 person-rem expended for RFO-14 and approximately 10 person-rem expended for two forced outages. As stated in the 1992 ALARA Annual Report, approximately 44 person-rem of exposure occurred during routine power operations which equated to an average of 181 mrem per day.

For 1993, the licensee had established a stretch goal of 275 person-rem. As of July 1, 1993, the licensee's collective dose for the year was 35.861 person-rem, by self-reading pocket dosimeter (SPRD), which was below the projected dose for that point in the year. The inspector discussed in detail on-going Modification-1104 activities which was a significant contributor to the current collective dose. Originally, the licensee had estimated about 15 person-rem to complete this job evolution; however, the current estimate was approximately 40-50 person-rem. Licensee representatives stated that the scope of work and number of hangers requiring modification continue to change based on the results of walk-downs and inspection activities. In the pipe alley, general area dose rates were ranging from 80 to 100 mrem/hour with the primary source being the RHR piping. Discussions with the licensee noted that appropriate ALARA measures such as shielding, use of cameras, line flushing, and minimization of reactor coolant drain tank pump

operation during work periods were employed to the extent practical. Through June 30, 1993, approximately 9.5 person-rem had been expended thus far on this project. Based on the inspector discussions with licensee ALARA representatives, review of associated documentation and ALARA job reports, and attendance at a work progess meeting, the inspector concluded that ALARA personnel were appropriately monitoring job progression and considering dose reduction methodologies.

For 1993, other major does contributors included approximately 1.7 person-rem to work a leak on the "A" steam generator secondary manway, 2.770 person-rem for the CPEA reclamation project, and 2.370 person-rem for the material upgrade for the Charging Pump Room. Regarding the latter, the licensee was in the process of planning for additional material upgrade projects which are anticipated to be a significant contributor to future collective dose. Overall, the inspector concluded that the licensee's collective dose for the year was consistent with the scope of work.

At the time of the onsite inspection, the licensee was developing a long-term dose reduction plan to achieve best quartile dose performance by 1996. Review of initiatives being considered included installation of permanent penetrations for camera usage in high dose areas of the Auxiliary Building, ALARA training for engineers, chemical decontamination of the RHR system and the spent fuel cooling system, cobalt valve replacement, and continued use of controlled shutdown/early boration. The inspector noted actions have been taken on several of the items, and others are being actively studied. The licensee was encouraged to continue active pursuit of these initiatives.

Based on the above, the inspector informed licensee representatives that the ALARA program continued to be effective in controlling exposures.

No violations or deviations were identified.

9. Licensee Actions on Previously Identified Inspector Findings (92701 and 92702)

a. (Closed) Violation (VIO) 50-261/92-17-01: The failure to follow procedures for requiring work to be performed in the RCA be performed under the appropriate RWP as well as for servicing contaminated HEPA vacuum cleaners.

During the onsite inspection, the inspector evaluated the effectiveness of licensee corrective actions in response to the previously identified violation of licensee procedures for improperly servicing a contaminated HEPA vacuum cleaner under an inappropriate RWP. The inspector noted that the licensee promptly initiated an Adverse Condition Report (ACR) following the inspector-identified deficiency. The licensee identified the causal factors as being inappropriate work practices and training/qualifications. Initial corrective actions included counseling the involved individuals and training RC personnel and

deconners on the breakdowns which led to the incident. To prevent recurrence, the inspector verified that the licensee added Procedure HPP-112, Use of HEPA Filtration Units and HEPA Vacuums Cleaners, in the lesson plan of the training and qualification program for transient personnel. Additionally, the inspector noted that the licensee revised their method of RWP implementation so that during the upcoming fall outage, all general and routine special RWPs, to include the changeout of vacuum cleaners in containment, would be activated with an assigned outage number at the start of the outage, rather than being activated as requested or as deemed necessary upon review of a work schedule.

Based on these changes in the licensee's program for contractor training and RWP control of HEPA vacuum cleaner changeout, the inspector informed licensee representatives that this item would be considered closed.

b. (Closed) VIO 50-261/92-17-02: Failure to follow procedures for requiring individuals exiting a highly contaminated area to perform a whole body frisk at the nearest frisking station.

The inspector evaluated and verified implementation of corrective actions stated in Carolina Power and Light's response to the Notice of Violation, dated August 19, 1992. During review of the RSV and ACR, which documented the event, root causes, and corrective actions to prevent recurrence, and the inspector noted that the licensee determined that the causal factor for the failure to frisk in accordance with the appropriate procedure was personnel error. Review of General Employee Training material by the inspector determined that personnel monitoring requirements and frisking methods were appropriately included with the subjects being addressed in both the classroom lecture and self-study portions of the course. In addition, employees were required to demonstrate proper frisking techniques in the RCA mock-up practical exercise. During the onsite inspection, no additional concerns were noted regarding employee compliance with personal frisking requirements.

Based on the inspector's observations and documentation review, licensee representatives were informed that this issue would be considered closed.

c. (Closed) IFI 50-261/92-17-03: Evaluate the licensee's analysis of ring TLD and wrist TLD comparison data.

During the period from January 1991 to June 1992, the licensee performed extremity monitoring, in accordance with licensee procedures, to determine whether a ring or wrist dosimeter was appropriate as a monitoring device. The comparison data was gathered for workers wearing whole body dosimetry, and extremity dosimetry on the wrist and finger of both hands during high exposure RWP jobs during both routine operations and a refueling

outage. Based on this comparison study the licensee determined that extremity monitoring was rarely needed, based on the criteria specified in the RC&PM and none of the monitored individuals exceeded the regulatory extremity monitoring threshold (4.687 rem per quarter). However, when extremity monitoring was required, the data indicated that the use of finger rings would normally be more appropriate than wrist badges.

The inspector reviewed the licensee's implementing procedure and verified that the licensee required a finger ring TLD badge when upper extremity monitoring was required. The procedure did also give the flexibility, however, for the use of wrist badges if safety concerns or an evaluation of the specific task to be performed and the local radiation exposure conditions would warrant their use rather than finger rings.

Based on the results of the licensee's study and followup changes made to the extremity monitoring program, the inspector informed licensee representatives that this item would be considered closed.

d. (Open) IFI 50-261/92-03-03: Evaluate the effectiveness of licensee corrective action to prevent recurrence of an improperly latched control rod event during RFO-13.

On February 8, 1991, following reactor vessel head removal, the control rod drive shaft at core location C-7 was found not to be latched to its control assembly. ACR 91-099 was written to document the event and to determine adequate corrective actions. The event was radiologically significant due to the exposure to radiation in resolving the problem.

The inspector reviewed the ACR and noted that the licensee determined the casual factor for the latching failure to be personnel failure to obtain full "button down" position which was undetected because the licensee did not have appropriate actions in place to verify the button position. Numerous corrective actions were initiated, with many being effectively implemented by the time of a subsequent outage, RFO-14 conducted during the period from April to June 1992. These included procedural revisions to verify the qualifications and outage experience of the refueling team, pre-job briefings with the team to discuss and review the procedural revisions to obtain and verify the "button down" position. During discussions with licensee representatives, the inspector was informed that refueling operations were effectively performed during RFO-14, with the corrective actions in response to the inadequate latching incident being effectively implemented. However, the inspector noted that at the time of the onsite inspection, ACR 91-099 was still open due to two corrective actions to prevent future partial latching incidents not yet being completed. These included further, and extensive, procedural revisions to verify that the control rod drive shaft is properly

latched to its control rod assembly, and investigation of the feasibility and benefits of obtaining a refueling tool maintenance contract.

Based on the fact that the licensee had not yet closed ACR 91-099 due to corrective actions not being complete, the inspector informed licensee representatives that this item would remain open and final analysis of resolution of the two outstanding corrective actions would be reviewed during a future inspection.

10. Exit Meeting (83750, 92701, 92702)

The inspection scope and results were summarized on July 2, 1993, with those persons indicated in Paragraph 1 above. The general program areas reviewed and the inspection finding listed below were discussed in detail. In addition, the licensee was informed that three of the four previously identified inspection findings reviewed during the inspection were considered closed. Subsequent to the onsite inspection, the licensee was informed that the unresolved item associated with the qualification of RC technicians (Paragraph 3.b) would be a non-cited violation based on the licensee's self-identification and initiation of appropriate corrective actions. Licensee representatives acknowledged the inspector's comments, and no dissenting comments were received. The licensee did not identify as proprietary any of the material reviewed by the inspector.

Item Number	Description and Reference
50-261/93-16-01	NCV - Violation of TS 6.5.1.1.1(a) for the failure to follow procedures associated with initial RC technician qualification (Paragraph 3.b).
50-261/93-16-02	NCV - Violation of TS 6.11 for the failure to follow procedures for the assessment and assignment of skin doses due to contamination (Paragraph 5.b).