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

JUN 22 1988

Report No.: 50-400/88-14

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

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

Facility Name: Harris 1

Inspection Conducted: May 23-27, 1988

Inspection at Harris site near New Hill, North Carolina

Inspector: C Bassett 6/13/88
C. H. Bassett Date Signed

Accompanying Personnel: R. Shortridge

Approved by: for Roy E Weddington 6/14/88
C. M. Hosey, Section Chief Date Signed
Division of Radiation Safety and Safeguards

SUMMARY

Scope: This routine, unannounced inspection was conducted in the area of the facility radiation protection program including: organization and management controls; training and qualifications; external exposure control; internal exposure control; control of radioactive materials and contamination, surveys and monitoring; the program to maintain exposures as low as reasonably achievable (ALARA) and followup on previous enforcement items and IE Notices.

Results: No violations or deviations were identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

R. Andrews, Senior Specialist, Corporate Health Physics
*L. Beidleman, Senior Specialist, Radiation Control ALARA
*R. Biggerstaff, Principal Engineer, Onsite Nuclear Safety
J. Collins, Manager, Operations
*D. Elkins, Radiation Control/Foreman, Rad Waste
J. Floyd, Radiation Control/Foreman, Operations
*J. Harness, Plant General Manager
*J. Johnson, Senior Specialist, Regulatory Compliance
*C. McKenzie, Principal Quality Assurance Engineer
J. O'Halloran, Radiation Control Foreman, Dosimetry
*A. Poland, Project Specialist, Radiation Control
F. Reck, Radiation Control Foreman, Support
*J. Sipp, Manager, Environmental and Radiation Control
*D. Tibbitts, Director, Regulatory Compliance

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

NRC Resident Inspectors

*G. Maxwell, Senior Resident Inspector

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on May 27, 1988, with those persons indicated in Paragraph 1. The inspector described the areas examined and discussed in detail the inspection findings. The licensee took no exception to the findings. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspector during this inspection.

3. Licensee Action On Previous Enforcement Matters

(Closed) Violation 50-400/87-14-02, Inadequate Start-up Shield Verification Radiation Survey.

The inspector reviewed the licensee's responses dated May 27, 1987 and September 11, 1987, and verified that the corrective actions stated therein had been implemented.

(Closed) Violation 50-400/87-22-01, Inadequate Evaluation of Exposure to Noble Gas.

The inspector reviewed the licensee's response dated August 21, 1987, September 30, 1987 and October 22, 1987, and verified that the corrective actions specified in the response had been implemented as stated.

4. Organization And Management Controls (83722)

a. Organization

The licensee is required by Technical Specification (TS) 6.2 to establish specific onsite and offsite organizations for unit operation and corporate management. The responsibility, authority and other management controls necessary for establishing and maintaining a health physics program for the facility are further outlined in Chapters 12 and 13 of the Final Safety Analysis Report (FSAR). TS 6.5.2 specifies the composition of the Plant Nuclear Safety Committee (PNSC) and delineates its functions and authority.

The inspector reviewed and discussed the radiation protection organization with the Environmental and Radiation Control (E&RC) Manager to determine the degree of support received from other members of management and the lines of communication and authority. It appeared that the support required to implement and maintain an effective radiation control program was in place and met the licensee's TS requirements.

b. Staffing

Technical Specification 6.2 also specifies the minimum staffing requirements for the facility. FASR Chapters 12 and 13 also outline further details on staffing. The inspector reviewed the health physics (HP) organization and staffing with the E&RC Manager. The use of contractor HP technicians, current staffing levels, staff qualifications and planned staffing for the upcoming outage were discussed. There is currently a staff of 62 personnel in the HP organization including 44 site and 18 contractor personnel. This total includes supervisors, foremen, specialists, technicians, personnel in training and clerks. The licensee plans to add 40 more contract personnel to the HP staff to have adequate support for job coverage during the outage scheduled to begin in mid-July. The decontamination personnel are no longer under E&RC administrative control but are still under E&RC functional control.

c. Management Controls

The inspector reviewed the licensee's system for identifying and documenting problems noted in the radiological controls area and the system to implement corrective actions. Radiation Safety Violations (RSVs) are written by either HP personnel or by anyone to document

problems that occur. Depending upon the nature of the problem, it is then assigned a severity level and routed to the responsible organization for resolution. Once a problem is addressed and corrected, the organization then submits a written response to the E&RC Manager, the Plant General Manager or the Site Vice President for review and approval depending upon the original severity level assigned. Procedural problems are addressed using a Procedure Activity Request form which is used to document the problem and focus attention on ways to correct the situation. The inspector reviewed the seven RSVs written to date for 1988 and determined that no significant problems had been identified.

No violations or deviations were identified.

5. Training And Qualification (83723)

a. Technical Specification 6.4 requires that each member of the E&RC or HP staff meet or exceed the minimum qualifications of ANSI 3.1-1979 with several exceptions listed in the FSAR. The inspector reviewed records of selected HP foremen and noted that their qualifications and experience level appeared to be commensurate with their job assignments and responsibilities, and that they met the requirements of ANSI 3.1 (1979).

b. Contractor Health Physics Technician Training and Qualification

As noted in Paragraph 4, the licensee augmentes the HP staff of 44 individuals with 18 contract HP technicians. The contract HP technician must satisfactorily pass General Employee Training prior to participating in on-the-job specific HP training. Prior to assignments of job coverage, the contractor HP technicians must satisfactorily demonstrate their knowledge and skills by performing the same job tasks required of licensee technicians. The checkout of a contractor technician, in selected tasks, is monitored by a person previously qualified on that task. Upon successful completion of the task, the instructor signs off the contractor technician's job performance on the name qualification card required of licensee HP technicians. After completion of on-the-job training and qualification, the contractor technician is assigned radiological job coverage responsibilities.

6. External Exposure Control And Dosimetry (83724)

a. Personnel Monitoring Devices

10 CFR 20.202 requires each licensee to supply appropriate personnel monitoring devices to specific individuals and require the use of such equipment. During tours of the Reactor Auxiliary Building (RAB) and other areas of the Radiation Control Area (RCA), the inspector observed workers wearing appropriate personnel monitoring devices.

b. Radiologically Controlled Areas

10 CFR 20.203 specifies posting and control requirements for radiation areas, high radiation areas, airborne radioactivity areas, and radioactive material areas.

During plant tours, the inspector observed the licensee's posting and control of radiation, high radiation, airborne radioactivity and radioactive material areas. The inspector also verified that various locked high radiation areas in the Reactor Auxiliary Building (RAB) were being maintained locked as required.

c. Personnel Exposure Control

The licensee is required by 10 CFR 20.101 and 102 to maintain workers' doses below specified levels. The inspector reviewed selected occupational exposure histories of contractor and licensee personnel and verified that the licensee was requiring a completed Form NRC-4 or its equivalent to be maintained on file in case the licensee needed to permit an individual to exceed the limits specified in 10 CFR 20.101(a). The inspector also reviewed the Form NRC-5 equivalent printout for the plant and determined that the radiation exposures recorded were well below quarterly limits specified above.

d. Dosimetry Reports

The inspector reviewed selected Self-Reading Pocket Dosimeter (SRPD) and Thermoluminescent Dosimeter (TLD) Discrepancy Reports and Lost, Offscale or Abnormal TLD/SRPD Reports. The reports and subsequent dose assignments made following appropriate investigations of the occurrences, when applicable, appeared adequate. No overexposure investigations had been performed since the preceding inspection because no exposures exceeding local administrative levels or regulatory limits had occurred.

e. Radiation Work Permit (RWP) Program

Health Physics Procedure, HPP-020, Revision 4, Radiation Work Permits, dated January 7, 1988, contains instructions for implementation of the RWP program. It specifies the requirements for issuing reviewing, controlling, revising, extending and terminating Special Radiation Work Permits (SRWPs) and General Radiation Work Permits (GRWPs).

The inspector reviewed selected SRWPs controlling work on specific jobs in specific locations and selected GRWPs which were used to control routine, repetitive entries for such functions as inspections, surveys, security tours and routine minor maintenance. The requirements for radiation monitoring, protective clothing,

radiation and contamination surveys, airborne monitoring and dosimetry appeared adequate.

No violations or deviations were identified.

7. Internal Exposure Control and Assessment (83725)

10 CFR 20.103(a) establishes the limits for exposure of individuals to concentrations of radioactive materials in air in restricted areas. This section also requires that appropriate bioassays be performed to detect and assess intakes of radioactivity. FSAR Chapter 12 outlines the licensee's bioassay program and commitment to meet the intent of ANSI Standard N343-1987. Regulatory Guide 8.26, Application of Bioassay for Fission and Activation Products, further outlines the requirements of an acceptable bioassay program.

The inspector reviewed Health Physics Dosimetry Procedures, DP-103, Revision 2, Personnel Whole Body Counting dated March 3, 1987. Although the in-vivo counting system is called a whole body counter, it is designed to measure the radioactivity present in the lungs, intestines and thyroid. The procedure outlined responsibilities, precautions and limitations, quality control checks, personnel whole body count (WBC) frequencies and operation of the system. The procedure also specified requirements for review and further action if a WBC indicated activity in an organ exceeding five percent (5%) of the Maximum Permissible Organ Burden (MPOB).

The licensee uses a vendor-supplied three detector chair in-vivo monitoring system for quantifying internal radioactivity in the lungs, intestines or thyroid of individuals. A quality control check of the system is performed daily, after maintenance or after a power loss. The check consists of using a Europium 152 (Eu-152) bar check source, background check and a source check with a Phantom containing National Bureau of Standards (NBS) traceable activity in the form of bottles of Cobalt 60 (Co-60) and Cesium 137 (Cs-137). In addition to the daily quality control checks, the licensee corporate health physics organization performs an annual calibration of the WBC system with efficiency checks on each chair.

After completion of an acceptable quality control check, personnel WBCs are performed. Whole body counts are performed with the following frequencies: 1) upon initial entry for work in or access the RCA, 2) at least annually for all personnel issued a permanent TLD, 3) upon termination of employment or discontinuance of permanent badging at the site, 4) at the discretion of RC supervisor or 5) to check on the effectiveness of the radiological control measures employed at the facility. The latter is accomplished by sampling (whole body counting) ten percent (10%) of all users per month who are allowed to wear respiratory protection devices or 25 individuals per month whichever is less.

The inspector reviewed the latest annual WBC system calibration, selected recent daily quality control checks and selected personnel exposure records for 1988 which included WBC results. The inspector verified that the majority of the WBC results indicated no internal contamination. The few positive WBCs resulted from external contamination or were attributable to medical sources. No uptakes were noted and the annual calibration and quality controls checks appeared adequate.

The inspector discussed the nuclide identification library of the whole body counting system with licensee representatives and the variability of Potassium-40 (K-40) activity reported in WBC results. The licensee indicated that the K-40 results reported from a chair WBC cannot readily be compared with the actual amount of K-40 in the total body due to specific positioning of the three detectors; the actual K-40 activity in the whole body would probably be significantly greater than that recorded in a "WBC". In order to measure accurately the amount of K-40 in the body, it would be necessary to calibrate a chair in-vivo monitoring system for whole body counting individuals specifically for K-40. The K-40 results will vary due to the positioning of the three detectors with respect to the subject and the amount of K-40 in the photomultipler tubes. Licensee representatives stated that since K-40 was naturally occurring and not a fission or activation product, they did not quantify K-40 content in routine whole body counts. Additionally, K-40 is not included in ANSI N343-1987, Table 1, Radionuclides of Potential Significance in Internal Exposure, thus the licensee's system is not calibrated to measure accurately the amount of K-40 in the body.

No violations or deviations were noted.

8. Control Of Radioactive Material And Contamination, Surveys, And Monitoring (83726)

The licensee is required by 10 CFR 20.201(b), 20.401 and 20.403 to perform surveys and to maintain records of such surveys necessary to show compliance with regulatory limits. Survey methods and instrumentation are outlined in Chapter 12 of the FSAR and TS 6.8 provides the requirements for adherence to written procedures.

a. Plant Surveys

During plant tours, the inspector reviewed radiation level and contamination survey results posted outside various areas and cubicles. The inspector verified these radiation levels using NRC instrumentation. The inspector also accompanied a licensee HP technician during a weekly survey of selected areas of the Reactor Auxiliary Building (RAB) on the 236 foot elevation. The radiation level and contamination surveys were performed in accordance with plant procedures and good radiological and ALARA work practices.

b. Personnel and Material Release Surveys

During tours of the facility, the inspector observed the exit of workers and the movement of material from contamination control to clean areas to determine if proper frisking was performed by workers and if proper direct and removable contamination surveys were performed on materials. The inspector determined that frisking and material release surveys were adequate.

c. Instrumentation

During plant tours, the inspector observed the use of survey instruments by other plant staff. The inspector examined the calibration stickers on radiation protection instruments in use by licensee personnel and at various areas throughout the plant. All instruments examined were within the dates of calibration as indicated on the calibration strickers. There appeared to be an adequate supply of instruments which were being maintained properly.

d. Caution Signs, Labels and Controls

10 CFR 20.203(f) requires that each container of licensed radioactive material bear a durable, clearly visible label identifying the contents and contain such information as the radiation levels of the container. During tours of the various plant areas, the inspector verified that containers of radioactive material were properly labeled and that areas were properly posted.

No violations or deviations were identified.

9. Program For Maintaining Exposures As Low As Reasonably Achievable (ALARA)(83728)

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 exposure ALARA. The recommended elements of an ALARA program are contained in Regulatory Guides 8.8, Information Relevant to Ensuring that Occupational Radiation Exposure at Nuclear Power Stations will be ALARA, and 8.10, Operating Philosophy for Maintaining Occupational Radiation Exposure ALARA.

The inspector discussed the facility's ALARA Program with licensee representatives. During calendar year 1987, the collective exposure was 33 person-rem. The collective exposure goal for 1988 is 360 person-rem with 200 person-rem planned for a 56 day refueling outage in July and August. In the first 6 months of 1988, approximately 7 person-rem had been expended. The ALARA specialists were conducting pre-job ALARA reviews for jobs projected greater than 1 person-rem as outage work was identified. The licensee had experienced 39 personnel contaminations through May 15, 1988, including 29 clothing and 10 skin contaminations.

10. Inspector Followup Items (92701)

(Closed) Inspector Followup Item 50-400/87-14-03, Shielding of Seal Table Room Doorway. Because there was no shielding at the doorway of the Seal Table Room, the licensee was asked to reevaluate the need for such shielding to reduce radiation streaming in that area. The licensee concluded that the administrative controls contained in Operating Procedure, OP-106, Revision 1, Incore Movable Detector dated March 25, 1988, were adequate and no shielding was necessary. The procedure requires the RC Foreman to verify that all personnel are outside of the Reactor Containment Building (RCB) during movement of incore detector. The inspector noted that procedural controls had been established but indicated that these were less desirable than physical shielding that would reduce the radiation levels in the doorway and in the areas immediately outside the Seal Table Room during incore detector movement. This item will be closed based upon the licensee's evaluation and option not to add a shield wall in the Seal Table Room.

11. Followup On IE Information Notice (92717)

The inspector determined that the following NRC Information Notices (IN) had been received by the licensee, reviewed for applicability, distributed to appropriate personnel and that actions, as appropriate were taken or scheduled.

IN 87-39: Control of Hot Particle Contamination at Nuclear Power Plants

IN 88-08: Chemical Reactions with Radioactive Waste Solidification Agents

12. Allegation Followup (99014)

a. Allegation RII-87-A-0104

The alleger began work at the plant on September 9, 1986, as a contract decontamination worker (deconner). Due to an illness in March 1987 the alleger did not get a medical examination authorizing him to wear a respirator. The alleger continued to work as a deconner for one contractor until September 12, 1987 when another contractor took over the decontamination contract. Since the alleger did not have a medical qualification to wear a respirator, he was told that he would have to work as a Utility 1 (janitorial) worker. The alleger contends that the second decon contractor hired people with no previous decontamination experience to become deconners instead of allowing him to obtain a physical examination and continue as a deconner. The alleger also alleged that there were health physics personnel who were not respirator qualified.

b. Discussion

The inspector talked by phone with the alleger and reviewed licensee records and procedures related to the allegation. As a result of the

phone conversation and the records review, the following was determined:

(1) The alleger accessed three different radiation work permits (RWPs) between September 9, 1986 and September 21, 1987, his hire date and the allegation date respectively. During this time he made 127 entires under RWPs 86-0012, 86-0110 and 87-0005. RWP 86-0110 and 86-0012 were issued for training purposes as fuel load had not taken place thus there were no contaminated areas to be decontaminated. RWP 87-005 was issued for general decon of radiologically controlled areas but instructed that no entry into airborne radioactivity areas was allowed.

(2) In a telephone conversation between the alleger, the USNRC Region II Allegation Coordinator and the inspector, the alleger clarified his concern about the qualifications of the second contractor's personnel. The alleger indicated that the workers were qualified in that they attended general employee training and were respirator qualified but that they had no previous experience in decontamination of radioactive material.

(3) The inspector examined the Health Physics Training, Fit Testing and Medical records for all health physics supervisors, foremen and technicians.

c. Findings

(1) The alleger, as determined by a review of licensee records, was not required to work in or enter an area where respiratory protection devices were required.

(2) All health physics supervisors, foremen and technicians were qualified to wear respiratory devices in accordance with plan procedures.

(3) The alleger was given respirator training and a fit test on three different types of respiratory protection devices on March 6, 1987, but due to an illness was not given a medical examination at that time. He was subsequently given a medical examination on September 24, 1987.

Conclusions

The allegation was not substantiated.

No violations or deviations were identified.