



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

AUG 07 1985

Report No.: 50-395/85-31

Licensee: South Carolina Electric and Gas Company  
Columbia, SC 29218

Docket No.: 50-395

License No.: NPF-12

Facility Name: Summer

Inspection Conducted: July 22-26, 1985

Inspector: W. T. Cooper

8/6/85  
Date Signed

Approved by: C. M. Hosey  
C. M. Hosey, Section Chief  
Division of Radiation Safety and Safeguards

8/6/85  
Date Signed

SUMMARY

Scope: This routine, unannounced inspection entailed 36 inspector-hours onsite in the areas of health physics organization and management controls, training and qualifications of the health physics staff, a review of the program to keep exposures as low as reasonably achievable (ALARA), 10 CFR Part 61 waste stream classification and analysis, internal and external exposure control and assessment.

Results: No violations or deviations were identified.

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## REPORT DETAILS

## 1. Persons Contacted

## Licensee Employees

- \*O. Bradham, Director, Nuclear Plant Operations
- \*M. Browne, Manager, Technical Support
- \*A. Paglia, Manager, Licensing
- \*D. Nauman, Director, Nuclear Services
- \*J. Barker, Senior Staff Health Physicist
- \*J. Proper, Quality Assurance Supervisor, Operations
- \*K. Woodward, Manager, Operations
- \*L. Blue, Manager, Support Services
- \*M. Quinton, Manager, Maintenance Services
- \*J. Connelly, Deputy Director, Operations and Maintenance
- \*G. Putt, Manager, Scheduling and Materials Management
- \*P. LaCoe, Nuclear Licensing Specialist
- \*R. Campbell, ISEG Engineer
- \*J. Dinkins, Corporate Health Physics
- \*G. Goudy, Staff Health Physicist
- \*J. Cox, Associate Manager, Health Physics
- \*M. Blue, Nuclear Licensing Engineer
- \*R. Foulkes, Regulatory Compliance
- \*A. Koon, Associate Manager, Regulatory Compliance
- P. Hughes, Health Physics Supervisor
- P. Shultz, Health Physics Supervisor
- R. Williams, Nuclear Licensing Specialist
- F. Zander, Manager, Nuclear Technology Education & Training
- J. Bellmore, Nuclear Technology Education & Training Instructor
- S. Hunt, Manager, Quality Assurance

Other licensee employees contacted included four technicians, and three office personnel.

## NRC Resident Inspector

- \*C. Hehl, Senior Resident Inspector
- \*P. Hopkins, Resident Inspector

\*Attended exit interview

## 2. Exit Interview

The inspection scope and findings were summarized on July 26, 1985, with those persons indicated in paragraph 1 above. Identification of defects in whole body counting computer software was discussed with licensee management

(paragraph 7). This was identified as an unresolved item\* pending review by the regional staff.

The licensee acknowledged the inspection findings and took no exceptions.

In a telephone conversation between Mr. Floyd Cantrell, Region II and Mr. O. S. Bradham, V. C. Summer on August 5, 1985, licensee management was informed that the unresolved item concerning a defect in whole body counting computer software would be closed and the licensee review of the health physics program for review of 10 CFR 21 reportability requirements would be tracked as an inspector followup item.

3. Licensee Action on Previous Enforcement Matters

This subject was not addressed in the inspection.

4. Organization and Management Controls (83722)

Technical Specification 6.2 describes the licensee's organization.

The inspector reviewed changes made to the licensee's organization, staffing levels and lines of authority as they related to radiation protection and radioactive material control, and verified that the changes had not adversely affected the licensee's ability to control radiation exposures and radioactive material.

The inspector reviewed the licensee's program for self-identification of weaknesses related to radiation protection, control of radioactive material and plant chemistry and the appropriateness of corrective action taken.

No violations or deviations were identified.

5. Training and Qualification (83723)

Technical Specification 6.3 required that each member of the facility staff meet or exceed the minimum qualifications of ANSI N18.1-1971 for comparable positions, except for the Associate Manager, Health Physics (Radiation Protection Manager) who shall meet or exceed the qualifications of Regulatory Guide 1.8, September 1975.

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\*An Unresolved Item is a matter about which more information is required to determine whether it is acceptable or may involve a violation or deviation.

Paragraph 4.5.2 of ANSI N18.1 required that technicians in responsible positions shall have a minimum of two years of working experience in their speciality. The inspector reviewed the experience and training records for selected Health Physics (HP) technicians currently working at the station. The inspector discussed radiological controls for specific jobs with two technicians.

Paragraph 4.3.2 of ANSI N18.1 required that supervisors not requiring a license shall have a minimum of four years experience in the craft or discipline supervised. The inspector reviewed the experience and training records for two newly appointed HP supervisors.

Regulatory Guide 1.8, September 1975 required the Radiation Protection Manager to have a bachelor's degree or the equivalent in a science or engineering subject, including some formal training in radiation protection and at least five years of the professional experience in applied radiation protection. At least three years of the professional experience should be in applied radiation protection work in a nuclear facility dealing with radiological problems similar to those encountered in nuclear power plants. The inspector reviewed the qualifications of the radiation protection manager and verified he met the requirements of Regulatory Guide 1.8-1975.

10 CFR 19.12 requires the licensee to instruct all individuals working in or frequenting any portion of the restricted area in the health protection problems associated with exposure to radioactive material or radiation, in precautions or procedures to minimize exposures, and in the purpose and functions of protective devices employed, applicable provisions of Commission regulations, individual responsibilities and the availability of radiation exposure data.

Plant Procedure HPP-160, Control and Posting of Radiation Control Zones, establishes the program for implementing the requirement to instruct each individual entering the restricted area.

The inspector discussed the radiation protection aspects of the general employee training program with licensee representatives and selectively reviewed the training records of personnel from various plant organizations.

The inspector reviewed changes in the licensee's training policies, goals, program and methods related to radiation protection, radioactive material control and plant chemistry, discussed the changes with licensee representatives and verified that the changes should not adversely affect the licensee's program.

Technical Specification 6.4 requires that a retraining and replacement training program for the facility staff shall be in accordance with ANSI N18.1-1971. Paragraph 5.5 of ANSI N18.1 requires that a training program shall be established which maintains the proficiency of the operating organization through periodic training exercises, instruction periods and reviews.

Plant Procedure SAP-500, Health Physics Manual, establishes the training/retraining program for HP personnel.

The inspector discussed the replacement and refresher training program for HP personnel with licensee representatives and reviewed selected training records.

No violations or deviations were identified.

6. External Exposure Control and Personal Dosimetry (83724)

10 CFR 20.101 specifies the applicable radiation dose standards. The inspector reviewed the computer printouts (NRC Form 5 equivalent) for 1985 and verified that the radiation doses recorded for plant personnel were well within the quarterly limits of 20.101(a).

10 CFR 20.202 requires each licensee to supply appropriate personnel monitoring equipment to specific individuals and require the use of such equipment. During tours of the plant, the inspector observed workers wearing appropriate personnel monitoring devices.

The inspector reviewed the following plant procedures which established the licensee's program for personnel monitoring of external dose in accordance with 10 CFR 20.202:

Health Physics Procedure (HPP)-150, Requirement for Issuance and Use of Personnel Dosimetry

HPP-153, Administrative Exposure Limits

HPP-160, Control and Posting of Radiation Control Zones

HPP-162, Reactor Building Entry and Neutron Exposure Accountability

HPP-401, Issue, Termination and Use of RWP's and SWRP's

HPP-411, Monitoring Exposure with Extremity and Multiple Badging

HPP-505, Issuance and Termination of Personnel Dosimetry

HPP-509, Leak Test and Calibration of Pocket Dosimeters

HPP-516, Dosimetry Deficiency Report

HPP-517, Multiple Whole Body and Extremity Badging Exposure Calculations

Technical Specification 6.11 requires the licensee to have written radiation protection procedures, including the use of radiation work permits. The inspector reviewed plant procedure HPP-151, Use of Radiation Work Permit (RWP) and Standing Radiation Work Permit (SRWP), which provided detailed

instructions on the preparation and processing of Radiation Work Permits (RWPs).

The inspector reviewed selected active RWPs for appropriateness of the radiation protection requirements based on work scope, location, and conditions.

The inspector discussed the Fall 1984 outage with licensee representatives. Specific areas discussed included increased staffing, special training, equipment and supplies, health physics involvement in outage planning, licensee control over contractor health physics technicians, dose reduction methods to be employed and radioactive waste reduction activities. The inspector reviewed the Health Physics ALARA report for the first refueling outage and discussed the report details with licensee representatives.

10 CFR 20.203 specifies the posting, labeling and control requirements for radiation areas, high radiation areas, airborne radioactivity areas and radioactive material. Additional requirements for control of high radiation areas are contained in Technical Specification 6.12.

During tours of the plant, the inspector reviewed the licensee's posting and control of radiation areas, high radiation areas, airborne radioactivity areas, contamination areas, radioactive material areas and the labeling of radioactive material.

10 CFR 19.11 requires that each licensee post current copies of 10 CFR 19 and 10 CFR 20, the license or license conditions, applicable operating procedures and NRC Form 3, or if posting of the documents is not practicable, the licensee may post a notice which describes the document and states where it may be examined. 10 CFR 19.11 further requires that copies of any Notice of Violation involving radiological working conditions be conspicuously posted within two working days after receipt of the documents from the Commission. The inspector observed the posting of notices required by 10 CFR 19.11 during tours of the plant.

No violations or deviations were identified.

#### 7. Internal Exposure Control (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 suitable measurements of concentrations of radioactive materials in air be performed to detect and evaluate the airborne radioactivity in restricted areas and that appropriate bioassays be performed to detect and assess individual intakes of radioactivity.

The inspector reviewed selected results of general in-plant air samples taken during the period October - December 1984 and the results of air samples taken to support work authorized by specific radiation work permits.

10 CFR 20.103(b) requires the licensee to use process or other engineering controls, to the extent practicable, to limit concentrations of radioactive materials in air to levels below that specified in Part 20, Appendix B, Table I, Column 1 or limit concentrations, when averaged over the number of hours in any week during which individuals are in the area, to less than 25 percent of the specified concentrations.

The use of process and engineering controls to limit airborne radioactivity concentrations in the plant was discussed with licensee representatives.

10 CFR 20.103(b) requires that when it is impracticable to apply process or engineering controls to limit concentrations of radioactive material in air below 25% of the concentrations specified in Appendix B, Table 1, Column 1, other precautionary measures should be used to maintain the intake of radioactive material by any individual within seven consecutive days as far below 40 MPC-hours as is reasonably achievable. By review of records, observations and discussions with licensee representatives, the inspector evaluated the licensee's respiratory protection program, including training, fit-testing, MPC-hour controls, quality of breathing air, and the issue, use, decontamination, repair and storage of respirators.

The inspector discussed with licensee representatives an apparent defect in the whole body counter computer software which was identified by the licensee in June 1985. The defect concerned the conversion of whole body count bioassay measurements to maximum permissible organ burden (MPOB). The licensee's whole body count system generated a report for each bioassay performed. Individual uptakes of various isotopes were listed on the report in nanocurie quantities, and a conversion to MPOB was performed to delineate various levels of action required by the licensee. When the MPOB value exceeded set limits, an indicator (flag) was printed on the report, alerting the licensee that attention was needed on that isotope. The defect occurred in the conversion of nanocuries to MPOB. The licensee evaluated this defect for 10 CFR 21 reporting requirements. The evaluation was performed internally by the Health Physics Department and included a manual calculation of all whole body counts since the system was put into use in 1981. The results of the calculations indicated that no personnel had exceeded any plant administrative exposure limits. Licensee personnel stated that a second flag, identified as measured or "mea," appears on a whole body count printout when detected isotopic values are greater than the lower level of detection but are less than one percent of a maximum permissible organ burden. This additional flag would cause the dosimetry technician to check the measured nanocuries for the isotope of interest.

The licensee has made changes in the computer software to correct the defect and has made an evaluation of the software change to insure that the changes made were correct and that the system was operating correctly.

At the time of the inspection, the licensee was unable to determine if the software defect was present when the system was purchased in 1978, or if the defect occurred as a result of a programming error made while the system was being tested at the licensee's facility prior to startup in 1981.

During the exit interview on July 26, 1985, licensee management committed to a review of the Health Physics program for identification of 10 CFR 21 reportability items and also to revise the program to incorporate 10 CFR 21 requirements if the review indicated that such revisions were necessary.

The inspector identified this item as an unresolved item pending review by the regional staff. Upon subsequent review by the regional staff, it was determined that no violation or deviation had occurred. Therefore, the unresolved item is closed. However, the licensee's review of the Health Physics 10 CFR 21 program and any actions taken as a result of that review will be reviewed during future inspections. (IFI 50-395/85-31-01)

No violations or deviations were identified.

8. ALARA Program (83728)

10 CFR 20.1c stated that persons engaged in activities under licenses issued by the NRC should make every reasonable effort to maintain radiation exposure as low as reasonably achievable (ALARA). The recommended elements of an ALARA program are contained in Regulatory Guide 8.8, Information Relevant to Ensuring that Occupational Radiation Exposure at Nuclear Power Stations will be ALARA, and Regulatory Guide 8.10, Operating Philosophy for Maintaining Occupational Radiation Exposures ALARA.

The inspector reviewed the Corporate ALARA Manual which established the program for keeping occupational exposures ALARA and discussed the administrative aspects of the program with licensee representatives.

The inspector discussed the ALARA goals and objectives for the current year with licensee representatives and reviewed the man-rem estimates and results for the current year.

As of July 22, 1985, the actual collective exposure for the calendar year was 42 man-rem, which represented 21 percent of the estimated exposure for the year.

The inspector reviewed the ALARA evaluation for several major jobs performed during the period of October - December, 1984.

No violations or deviations were identified.

9. Licensee Audits and Surveillances (83722, 83723, 83724, 83725, 83726, 83728, 84722, and 86721)

The inspector discussed the audit and surveillance program related to radiation protection, radioactive waste management and transportation of radioactive material with licensee representatives. The inspector reviewed the following audits and surveillances:

Audits by the Corporate Health Physics Staff conducted in January and April, 1985

Licensee Quality Assurance Audits conducted in October, November, and December, 1984 and June and July, 1985

No violations or deviations were identified.

10. Solid Waste (84722)

10 CFR 20.311 requires a licensee who transfers radioactive waste to a land disposal facility to prepare all waste so that the waste is classified in accordance with 10 CFR 61.55 and meets the waste characteristics requirements of 10 CFR 61.56. It further establishes specific requirements for conducting a quality control program and for maintaining a manifest tracking system for all shipments.

The inspector reviewed the methods used by the licensee to assure that waste was properly classified, met the waste forms and characteristics required by 10 CFR 61 and met the disposal site license conditions and discussed the use of these methods with licensee representatives.

Technical Specification 6.13 requires the licensee to prepare waste for burial in accordance with a Process Control Program (PCP). The inspector discussed the provisions of the PCP with licensee representatives and during tours of the plant, observed the processing, control and storage of solid waste.

No violations or deviations were identified.

11. Inspector Followup Items (92701)

- a. (Closed) Inspector Followup Item (IFI) 84-27-03: Clogged Resin Lines. The licensee has scheduled plant modification No. 20402 to replace diaphragm valves in resin lines for completion after the third refueling outage in December 1987. The licensee is controlling the areas during times of resin transfer by performing area surveys and posting guards to restrict access to areas where radiation levels require restricted access.
- b. (Closed) IFI 84-27-04: Locked Gates for High Radiation Areas. Locked gates or ladder guards have been installed in areas that could become high radiation areas due to changes in plant operating conditions. Plant Modification 10177 was completed September 17, 1984, for gates and ladder guards installed in the Auxiliary Building at the following GRID locations: 436-39, 426-01, 426-08, 426-10, 426-11, 426-12, 426-13, 426-16, 447-01, 526-15.

12. IE Information Notices (92717)

The following IE Information Notices were reviewed to ensure receipt and review by appropriate licensee management:

IN-84-55 Seal Table Leaks at PWRs

- IN-84-56 Respirator Users Notice: Certain Five Minute Emergency Escape Self-Contained Breathing Apparatus
- IN-84-59 Deliberate Circumventing of Station Health Physics Procedures
- IN-84-60 Failure of Air-Purifying Respirator Filters to Meet Efficiency Requirement
- IN-84-61 Overexposure of Diver in Pressurized Water Reactor (PWR) Refueling Cavity
- IN-84-72 Clarification of Conditions for Waste Shipments Subject to Hydrogen Gas Generation
- IN-84-75 Calibration Problems - Eberline Instrument Model 6112B Analog Telectectors
- IN-84-82 Guidance for Posting Radiation Areas
- IN-85-42 Loose Phosphor in Panasonic 800 Series Badge Thermoluminescent Dosimeter (TLD) Elements
- IN-85-48 Respirators Users Notice: Defective Self-Contained Breathing Apparatus Air Cylinders