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

DEC 30 1992

Report No: 50-395/92-22

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

Docket No.: 50-395 License No.: NFP-12

Facility Name: V. C. Summer Nuclear Station

Inspection Conducted: November 30 - December 4, 1992

Inspector: Elizabeth B. Pharr 12/30/92
E. B. Pharr Date Signed

Accompanied by: D. B. Forbes

Approved by: FOR WHR 12/30/92
W. H. Rankin, Chief Date Signed
Facilities Radiation Protection Section
Radiological Protection and Emergency Preparedness Branch
Division of Radiation Safety and Safeguards

SUMMARY

Scope:

This routine, unannounced inspection was conducted in the area of occupational radiation safety and included an examination of organization and staffing, audits and appraisals, training and qualifications, external and internal exposure control, and maintaining occupational exposures ALARA. Additionally, the licensee's response to a previously identified inspection finding was reviewed.

Results:

Based on interviews with licensee management, supervision, personnel from station departments, and records review, the inspector found the health physics (HP) program to be managed adequately. The licensee's program for external and internal radiation exposure controls was effective and functioning adequately to protect the health and safety of occupational radiation workers. A previously identified Unresolved Item (URI) in the licensee's internal exposure control program for failure to provide timely assessments of potential internal exposures was identified as a non-cited violation (NCV) of 10 CFR 20.103(a)(3) requirements.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*W. Baehr, Manager, Chemistry and Health Physics (C&HP)
*J. Berley, Nuclear Licensing and Operating Experience (NL&OE)
*M. Browne, Manager, Design Engineering
*J. Dinkins, Supervisor, RAS
*M. Fowlkes, Manager, NL&OE
*G. Hall, Associate Manager, Health Physics (HP)
*G. Higginbothom, Supervisor, HP
*W. Higgins, Supervisor, LS&OE
*S. Hunt, Manager, Quality Systems
*A. Koon, NOD Project Coordinator
*C. McKinney, NL&OE
*K. Nettles, General Manager, Station Support
*M. Quinton, GMES
*J. Schafer, Supervisor, HP
*L. Shealy, ISEG
*R. Sweet, Supervisor, Quality Assurance
*G. Taylor, General Manager, Nuclear Plant Operations
*T. White, Nuclear Coordinator, SCPSA
*B. Williams, Manager, Operations

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

Nuclear Regulatory Commission

*T. Farnholtz, Intern
*B. Haag, Senior Resident Inspector
*L. Keller, Resident Inspector

*Attended December 4, 1992 Exit Meeting

2. Organization and Staffing (83750)

During the inspection, the licensee's HP organization and staffing levels were reviewed and discussed with licensee representatives. No changes were noted in the organizational structure since a previous inspection conducted March 9-13, 1992, and documented in Inspection Report (IR) 50-395/92-06. However, the inspector was informed that organizational changes would be implemented during 1993, as a result of an overall plan to optimize licensee personnel. The inspector informed licensee personnel that the organizational and personnel changes and the overall effectiveness of these changes would be reviewed during future inspections.

Additionally, the inspector was informed that since the previous inspection, ten long term contractors and a transfer from another work group had taken permanent HP technician positions. At the time of the onsite inspection, the total HP staff was comprised of 42 permanent employees.

Through discussions with licensee representatives and observation of job support, the inspector noted that the present HP organization and staffing was adequate for ongoing activities.

No violations or deviations were identified.

3. Audits and Appraisals (83750)

The inspector reviewed Station Administration Procedure (SAP)-500, Revision (Rev.) 6, dated July 22, 1991, which outlined the requirements for performing health physics audits. The inspector noted that both the Corporate HP and the Quality Assurance (QA) groups routinely audited the HP program. The audits were performed quarterly to assure compliance with regulatory and procedural requirements and to assure station-wide HP requirements and policies were being met. The licensee scheduled these audits to review each major discipline within the HP program. Audit report deficiencies were trended to determine significance, root cause, and required corrective actions. The inspector was informed that the licensee was planning to transfer all responsibility for quarterly HP audits to QA as part of an overall plan to optimize plant personnel. The licensee planned to assign experienced HP personnel to the QA group to support this transfer of responsibilities.

Additionally, the inspector reviewed audits performed by internal HP personnel, including plant walkdowns and radiological job observations performed by C&HP managers. The observation categories included: Prejob Briefings, Work Authorizations, Procedural Use, Work Methods, Communication, Housekeeping, Safety, Fire, ALARA, Chemical Use, Supervisory Involvement, Job Planning, Documentation (including survey review), and Training. These job observations and walkdowns were forwarded to the plant manager for review. HP supervisors and specialists also were responsible for reviewing activities in the Radiation Control Area. These reviews basically consisted of review of survey records, postings, labelling, radiation work permits, and periodic observation of selected work activities. The inspector also reviewed Health Physics Problem Reports (HPPRs) which were utilized to identify, track, and trend any poor radiological work practices or violations of HP procedures. Corrective actions to these problems were identified in the reports.

In general, the audits were found to be well planned and documented and contained items of substance relating to the radiation protection program. Corrective actions to audit findings were being accomplished in a timely manner.

No violations or deviations were identified.

4. Training and Qualifications (83750)

10 CFR 19.12 requires, in part, that the licensee instruct all individuals working in or frequenting any portions 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.

Technical Specification (TS) 6.4.1 requires a retraining and replacement training program for the unit staff to be maintained and to meet or exceed the requirements and recommendations of Sections 5.2 and 5.5 of ANSI 3.1-1981 and 10 CFR 55.59, as committed to in Appendix 3A of the Final Safety Analysis Report (FSAR).

The inspector noted that in accordance with SAP-105, Statement of Responsibilities for Chemistry and Health Physics (C&HP), managers and associate managers were required to complete Nuclear Training for Technical Staff and Managers (NTT), Curriculum A, as well as NTT continuing training. The NTT program, Curriculum A, provided a four week instruction aimed at development of a broad understanding of overall plant operations to all managers, associate managers, engineers, and engineer supervisors. The NTT continuing training program consisted of a quarterly required reading that summarized plant modifications, plant and industry operating events, and significant procedure/program changes.

The inspector reviewed training records in association with NTT training for the HP Associate Manager and HP supervisors. The inspector noted that all had completed the NTT program's required quarterly readings for second and third quarter, 1992. The inspector noted that summaries of plant and industry events, regulatory activities, plant modifications, and plant procedure changes were included in the quarterly readings. During discussions with licensee representatives, the inspector was informed that neither the HP nor Chemistry Associate Managers had completed NTT, Curriculum A training. However, the inspector was informed that both were scheduled for Curriculum A training during early 1993.

Additionally, the inspector was informed that the licensee had provided training on 10 CFR Part 20 revisions to HP technicians during continuing training sessions. The inspector also noted that during ALARA briefings provided quarterly to facility work groups, the ALARA Coordinator had informed the groups of the extent of the revisions and how such revisions would affect the radiation protection program.

Based on a review of training records and discussions with licensee personnel during the inspection, the inspector noted that the licensee's training program was adequate and conducted in accordance with regulatory and TS requirements.

No violations or deviations were identified.

5. External Exposure Control (83750)

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

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

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

The inspector reviewed and discussed the licensee's dosimetry program with Corporate and site personnel. The inspector was informed that the licensee utilized the Panasonic UD-802 thermoluminescent dosimetry (TLD) system. The TLDs consisted of two lithium borate elements with density thicknesses of 14 mg/cm^2 and 350 mg/cm^2 and two calcium sulfate elements with density thicknesses of 350 mg/cm^2 and 1000 mg/cm^2. The inspector was informed that a TLD analysis algorithm, based on energy levels detected, corrected the measured values to report deep and shallow dose at 1000 mg/cm^2 and 7 mg/cm^2, respectively. Algorithms were also used to measure neutron exposure. The TLDs were processed onsite by the dosimetry group, and the inspector noted that the licensee was NVLAP accredited in all eight dosimetry categories. The licensee's normal frequency for reading TLDs was quarterly. The minimum TLD sensitivity for measured gamma and neutron whole body dose was 10 millirem.

The inspector also reviewed the licensee's program for evaluating beta dose to the skin. The licensee stated that the TLD algorithm included beta correction factors for adjusting measured values between deep and shallow dose elements. The TLD minimum sensitivity for beta dose was 50 millirem.

Additionally, the inspector reviewed 1992 second and third quarter exposure records for individuals signed on RWP 92-08 associated with routine mechanical maintenance activities and RWPs 92-96,-97,-98, and

-104 associated with entries into the reactor building, both at power and shutdown, to locate, investigate, and repair a leak on the secondary side of "B" steam generator. During review of the RWPs, surveys, and dosimetry records associated with the entries, the inspector verified that the licensee was implementing appropriate radiological surveillances and was calculating and recording individual's gamma, beta, and neutron doses appropriately.

The inspector concluded that for those selected records reviewed, the licensee monitored external exposures adequately and all were within 10 CFR Part 20 limits.

No violations or deviations were identified.

6. Internal Exposure Control (83750)

a. Program Implementation

10 CFR 20.103(a)(1) states that no licensee shall possess, use, or transfer licensed material in such a manner as to permit any individual in a restricted area to inhale a quantity of radioactive material in any period of one calendar quarter greater than the quantity which would result from inhalation for 40 hours per week for 13 weeks at uniform concentrations of radioactive material in air specified in Appendix B, Table 1, Column 1.

10 CFR 20.103(a)(3) requires, in part, that the licensee, as appropriate, use measurements of radioactivity in the body, measurements of radioactivity excreted from the body, or any combination of such measurements as may be necessary for timely detection and assessment of individual intakes of radioactivity by exposed individuals.

Health Physics Procedure (HPP)-155, Control of Airborne Radiation Exposure (MPC-hrs), Rev. 7, dated August 20, 1990, was currently under revision to add guidance for performing intake assessments and for providing subsequent Maximum Permissible Concentration - hours (MPC-hrs) accountability if bioassay analyses indicated an intake that was not documented based on airborne radioactivity sampling. Additionally, the revised procedure would require timely assessments, as required by 10 CFR 20.103(a)(3).

HPP-515, Interpretation of Bioassay Analyses, Rev. 7, dated October 20, 1992, had been revised to specifically state that the standup counter was normally used for screening counts and any positive indications should be verified and quantified using the chair counter. The procedure also stated that if the chair counter was not operational Corporate HP should be notified and an appropriate alternative bioassay should be performed. Additionally, subsequent to positive analyses, intake assessments must be performed in a timely manner to determine compliance with

10 CFR 20.103(a)(3). All records of whole body count results were to be reviewed by an HP supervisor as well as the person performing the count, with those count results maintained in the individual's exposure records.

Licensee representatives informed the inspector that in response to URI 92-06-01, HPP-115, and HPP-515 had been revised to clarify guidance regarding usage of whole body counting instrumentation and subsequent followup assessments and documentation of positive indications so as to meet the intent of 10 CFR 20.103(a)(3) requirements. The URI was issued regarding potential failure by the licensee to provide appropriate assessments of internal exposures in a timely manner. The issue was pending further review of the licensee's evaluation of internal exposures for certain individuals involved in Fall 1991 outage activities. Based on inspection activities conducted during March 9-13, 1992 and documented in IR 50-395/92-06, and followup review by the licensee of exposure record files from January 1991 to March 1992, nine indications of internal exposures during fourth quarter 1991 with no followup assessments were identified.

In each of these nine cases exit whole body counts using the standup whole body counter indicated the presence of radioisotopes. In one incident, which occurred on October 16, 1991, the licensee performed followup whole body counts using the chair whole body counter in order to verify and quantify the internally deposited radioisotopes but did not calculate the individual's internal exposure until February 1992 and did not assign the individual the calculated exposure of 6.3 MPC-hrs until March 1992. For the remaining eight cases, at the time that the positive results were detected, the chair counter was inoperable, so that the positive results could not be verified nor quantified. Due to the nature of the individuals' work activities (decontamination activities) and the sensitivity of the standup counter, the licensee suspected that the positive indications were based on very low levels of external contamination. Therefore internal assessments were not performed and documented at that time. In response to the URI and inspector concerns regarding the validity of the licensee's assumptions, the licensee reviewed RWPs, associated surveys and air sample data, exposure records, and personnel contamination events associated with the activities in which the eight individuals were involved. Based on this detailed review, the licensee did not believe that the positive count results represented true intakes of radioactive material. However, since the licensee could not assuredly disprove that the positive count results were indicative of internal exposures, internal assessments were performed, the maximum being 12.8 MPC-hrs, and exposure records were adjusted accordingly during March and April 1992. The inspector informed the licensee that the previously identified URI would be considered a violation of 10 CFR 20.103(a)(3) for failure to provide timely assessments of apparent internal intakes (50-395/92-22-01). Due to the limited

safety significance of the incidents, when considering that these assessments were conservatively based on the assumption that each intake occurred following initial RCA access and the maximum calculated exposure was 12.8 MPC-hrs, and corrective actions were taken to provide better procedural guidance for followup actions in response to positive whole body count results, the inspector informed the licensee that this NRC-identified violation was not being cited because criteria specified in Section VII.B. of the enforcement policy was met.

The inspector reviewed selected records of internal exposure results for both licensee and contract employees involved in the noted incidents as well as routine activities. The inspector verified that no exposures in excess of the 40 MPC-hr weekly control measure had occurred since January 1, 1992.

The inspector reviewed and discussed with licensee representatives, semiannual energy calibrations and efficiency determinations and daily quality assurance checks performed on the in-vivo counting equipment. The inspector noted that the 1992 calibrations and quality checks were performed within the time limits as prescribed by the applicable procedures. The inspector also noted that the licensee participated in a quarterly cross check comparison program with a vendor laboratory. The inspector reviewed the results from 1992 first, second, and third quarter cross checks and determined that the licensee successfully participated in the intercomparison program with the vendor.

One NCV of 10 CFR 20.103(a)(3) for failure to provide appropriate assessments of internal exposures in a timely manner was identified.

b. Respiratory Protection Program

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

The inspector reviewed and discussed the respirator protection program training, fit-testing, and medical qualification status for selected personnel using respiratory protective equipment at the facility. The inspector reviewed the respiratory protection section of General Employee Training (GET) and noted that the training material was appropriately inclusive and met the requirements of 10 CFR 20.103(c). The inspector also reviewed the licensee's fit-testing program. The inspector noted that the

licensee used a PortaCount fit-testing device which was calibrated quarterly by a certified vendor. The inspector noted that the licensee used fit-testing methods as described in NUREG-0041, "Manual of Respiratory Protection Against Airborne Radioactive Materials." The inspector was informed that although the regulatory established acceptance criteria for fit factors when using the PortaCount device was 10 times the protection factor, 50 for a negative-pressure mask, the licensee required a fit factor of 1000. Additionally, the inspector reviewed the procedural guidance for medical qualifications and noted that physicals were conducted annually for personnel requiring respirator usage. Based on a physician's review, including a review of current and past respiratory, cardiovascular, and endocrinal disorders and diseases, the physician qualified or disqualified the worker for respirator usage. As part of the site access requirements for contracted work performed at the site, contractors were required to provide certification signed by a licensed physician within the past twelve months that the individual was medically qualified to wear respiratory protection.

The inspector reviewed records for selected employees signed in on RWPs associated with containment building entries at power. The inspector verified that for records reviewed each worker was trained to use respiratory protective equipment, fit-tested, and medically qualified in accordance with appropriate requirements.

No violations or deviations were identified.

c. Breathing Air Quality

10 CFR 20, Appendix A, Footnote (d), requires adequate respirable air of the quality and quantity in accordance with NIOSH/MSHA certification described in 30 CFR Part 11 to be provided for the atmosphere-supplying respirators.

30 CFR 11.121 requires that compressed, gaseous breathing air meet the applicable minimum grade requirements for Type 1 gaseous air set forth in the Compressed Gas Association (CGA) Commodity Specification for Air, G-7.1 (Grade D or higher quality).

The inspector reviewed 1992 first, second, and third quarter breathing air sampling records and verified that the licensee was appropriately sampling the compressor system on a semiannual basis. All sample results met ANSI/CGA G7.1-1989 Grade D air quality criteria following sampling. The inspector also noted that in addition to the routine and post-maintenance sampling program, the licensee had breathing air monitors in the control room and the HP lab to indicate use of the breathing air system. Additionally, this monitoring system was equipped with carbon monoxide (CO), low pressure, and high temperature alarms.

No violations or deviations were identified.

7. Facility Tours (83750)

During tours of the facility, the inspector observed the licensee's posting and control of radiation areas, high radiation areas, contamination areas, radioactive materials areas, and labeling of radioactive material and noted no apparent problems. During these tours the inspector observed a generally clean and tidy facility. In addition, the inspector noted that survey and monitoring equipment was operable and calibrated on a semiannual frequency.

No violations or deviations were identified.

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

10 CFR 20.1(c) states that persons engaged in activities under licenses issued by the NRC should make every reasonable effort to maintain radiation exposures as low as reasonably achievable.

During discussions with licensee representatives, the inspector was informed that as of November 30, the total collective radiation exposure for 1992 was 25.2 person-rem. The licensee's original collective radiation exposure goal for 1992 was 20 person-rem. However, following an added work scope, which encompassed approximately three weeks and 46 containment building entries at power, to repair a steam generator secondary side manway leak, the licensee revised the annual goal to 28.8 person-rem. During the work associated with the repair of the manway leak, the licensee received an unanticipated and unplanned total neutron and gamma whole body exposure of approximately 9 person-rem. Licensee representatives also informed the inspector that preparatory work for modification of the Spent Resin Storage Tank level indicator was currently ongoing but they anticipated meeting their annual exposure goal.

The inspector also noted that the licensee had initiated planning for the upcoming refueling outage. The projected 65 day outage was currently scheduled to begin during March 1993. The initial projected dose estimate for the outage was approximately 400 person-rem. The inspector was informed that this estimate was based on a 10-year inservice inspection (ISI) on the lower internals, and numerous non-routine work projects, including preparatory work for the steam generator replacement project (SGRP) which was scheduled for the 1994 fall outage. The inspector was also informed that planning for the SGRP was currently ongoing with weekly planning meetings involving the lead engineers, schedulers, and ALARA representatives. Additionally, the inspector was informed that an action items list had been initiated based on lessons learned from other plants.

The inspector informed licensee representatives that their program to maintain worker exposures ALARA was effective.

No violations or deviations were identified.

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

(Closed) 50-395/92-06-01 Potential failure by the licensee to provide appropriate assessments of internal exposures in a timely manner, in accordance with 10 CFR 20.103(a)(3).

Results of the inspector's review and resolution of the issue is documented in Paragraph 6.a of this report. The inspector informed licensee representatives that this item would be considered closed, with a resulting NCV, based on their resolution of the identified incidents and appropriateness of their corrective actions to clarify procedural guidance.

10. Exit Meeting

The inspector met with licensee representatives, denoted in Paragraph 1, at the conclusion of the inspection on December 4, 1992. The inspector summarized the scope and findings of the inspection, including the NCV. The inspector also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. No dissenting comments were received from the licensee. The licensee did not identify any such documents or processes as proprietary.

Item Number	Description and Reference
50-395/92-22-01	NCV - Failure to provide appropriate assessments of internal exposures in a timely manner (Paragraph 6.a).