

U.S. NUCLEAR REGULATORY COMMISSION
REGION II

Docket No.: 70-1151

License No.: SNM-1107

Report No.: 70-1151/96-03

Licensee: Westinghouse Electric Corporation

Facility: Commercial Nuclear Fuel Division
Columbia, SC 29250

Inspection Conducted: September 9-26 and October 4, 1996

Inspectors: W. Gloersen, Senior Radiation Specialist
A. Gooden, Radiation Specialist

Approved by: E. McAlpine, Chief
Fuel Facilities Branch
Division of Nuclear Materials Safety

Enclosure 2

9611150233 961101
PDR ADOCK 07001151
C PDR

EXECUTIVE SUMMARY

Commercial Nuclear Fuel Division

70-1151/96-03

RADIATION PROTECTION

- Improvements were made in overall house-keeping as evidenced by the reduction in collective doses for 1995 (Section R1.04).
- Smearable contamination was found on a badge rack located inside the men's change room (Section R1.08).
- Radiation protection training video required updating to reflect the current procedures addressing site accountability, and terminology changes in the revised 10 CFR Part 20 associated with an airborne area of radioactivity (Section R1.10).
- Respiratory protection training video required updating to reflect changes associated with the storage of used full-face cartridge type respirators (Section R1.06).

ENVIRONMENTAL PROTECTION

- Analytical results from the various environmental samples collected indicated that there was no radioactive material from plant operations accumulating or concentrating at the sample location. However, the timely review of certain environmental sample analysis data, specifically well water sample data, was not apparent (Section R2.02).
- Comparison of a liquid effluent sample indicated that the licensee's results were biased low (Section R2.05).

WASTE MANAGEMENT

- The annual offsite dose due to liquid and gaseous effluent releases in 1995 for individual members of the public was significantly below ten percent of the limit specified in 10 CFR 20.1301 indicating that the licensee's releases of radioactive material in effluents were ALARA (Sections R3.02 and R3.04).
- Documentation of the corrective actions taken or planned to be taken for exceeding the control concentration limit for gaseous effluents was less than adequate resulting in a non-cited violation (Section R3.04).
- The licensee's program for waste minimization continued to be successful. However, the licensee's review of an industry related incinerator fire event was less than adequate (Section R3.05).
- A non-cited violation was identified for failure to include the appropriate "LSA group notation" on the shipping papers for LLRW shipments as required on waste manifests (Section R3.08).

FACILITY SUPPORT

- A Violation was identified for failure to perform an annual independent audit of the emergency preparedness program during 1995 (Section F3.05).
- The revised emergency action levels (EALs) did not appear to meet the guidance in Regulatory Guide 3.67 (Section F3.01).
- The licensee will identify the minimum staffing for the EOC during off hours and periodically conduct drills demonstrating timely activation (Section F3.06).
- The training program for the emergency organization appeared to be well-organized (combination of classroom and performance training via drills) and effective in ensuring that personnel were familiar with their roles/responsibilities, and use of procedures (Section F3.03).

Attachment:

Persons Contacted and Exit Meeting
List of Items Opened, Closed, and Discussed
List of Acronyms
Criteria for Comparisons of Analytical Measurements

Report Details

III. Radiological Controls

R1 Radiation Protection (83822)

R1.03 Radiation Protection Program Equipment

a. Inspection Scope

The inspector toured the main process areas in addition to the outside controlled areas of the facility. Included were chemical conversion, powder preparation/pellet pressing, UF₆ cylinder recertification facility, low level waste storage, men change room, and the respiratory protection maintenance trailers.

b. Observations and Findings

Several survey instruments were checked at various locations for operability and calibration status. With two exceptions, the instruments were operable and within calibrations. Two examples were found where instruments over-responded due to mylar damage or detector cable problems. Prompt actions were taken by the licensee to replace equipment with an instrument that was both operational and within calibration. Fixed air sampling locations were examined and samplers were found operational and flow rates were within set points.

c. Conclusions

Based on the response of instruments and calibration dates, the administrative controls appeared to be effective in ensuring that instruments were operable and calibrated at the required frequency in accordance with license requirements and procedures.

R1.04 Exposure Control (Internal and External)

a. Inspection Scope

The inspector reviewed TLD results for CY 1995, monthly and quarterly ALARA results, and routine air sampling data to determine if exposures were in compliance with 10 CFR 20 limits.

b. Observations and Findings

The inspector reviewed documentation and discussed with a licensee representative CY 95 exposures and personnel exposures to date during 1996. During CY 95, badges were provided for over 600 individuals. The results were evaluated quarterly for males and monthly for females. According to the documentation, the highest TEDE assigned during 1995 was 3.62 Rem to an ADU Conversion employee. During CY 94, the maximum TEDE assigned was 3.84 Rem. In CY 95, fifty-six workers exceeded the TEDE ALARA goal of two Rem. During CY 94, sixty workers exceeded the two Rem ALARA goal. The collective dose for CY 95 was 374 person-rem as compared to 456 person-rem for 1994. Personnel assigned to ADU conversion were the maximally exposed with a collective dose of 125 person-rem, followed by personnel assigned to pelleting with a

collective dose of 98 person-rem. According to documentation, the 1994 person-rem exposures were 125 and 113 in the ADU conversion and pelleting areas respectively. The maximally exposed worker to date in 1996, assigned to conversion area, was 1.76 Rem. According to the licensee's projections, twenty-nine employees were on track to exceed the ALARA goal of 2 Rem for CY 96. From a total of 29 employees, 86.2 percent (25) were assigned to conversion and 13.8 percent (4) pelleting area.

A review of routine air sampling data, current as of July 31, 1996, revealed decreasing trends in the average airborne concentration in conversion and pelleting areas. Average airborne concentrations during 1995 for conversion was 47 percent of DAC, and pelleting was 26 percent. The average airborne concentrations during the period January 1, 1996 to August 31, 1996 were 37 percent DAC for conversion and 22 percent for pelleting. With the exception of containment, all other areas of the facility indicated average airborne concentrations for the year of less than 20 percent of the DAC. The inspector was informed by the licensee that the decreasing trend in airborne concentrations may be attributed to meetings held with workers in high airborne areas, regarding good housekeeping, and administrative controls to reduce exposure.

c. Conclusions

Based on the records review, the inspector determined that the licensee's exposure control program was adequate for evaluating and monitoring personnel exposures. The inspector also noted that all assigned exposures were within regulatory limits.

R1.06 Respiratory Protection

a. Inspection Scope

Respiratory protection training program was reviewed to determine if the program was adequate and implemented in accordance with 10 CFR 20.1703 and licensee procedures.

b. Observations and Findings

The inspector reviewed Regulatory Affairs Procedure RA-205 entitled "Respiratory Protection," Rev. 18, March 23, 1995. Procedure RA-205 contained the requirements for selection, fitting, maintenance, and training involving respiratory protection. The training was video-taped and approximately 30 minutes in length. Employees requiring respiratory certification were provided training during the initial orientation discussed in Section R1.10 below, with refresher training required biennially. During the biennial refresher training, respirator users were required to complete an examination with 70 percent correct. On an annual basis, medical certification and a-fit test were required. The inspector reviewed the training video and class attendance records for eleven individuals selected from the licensee's current personnel occupational exposure listing for verification that training was current and up to date.

c. Conclusions

The inspector took the exam at the conclusion of the training and

determined that the examination was challenging and appropriate to ensure an employee's knowledge of key training principles. Based on the records review and the details provided in the video (e.g. the types of respirators; respirator maintenance and storage; proper fitting and use; basis for using; etc.), the inspector resolved that the training was consistent with procedures and requirements. One minor discrepancy was noted between the training video and the licensee's current policy associated with the container or packaging used for the storage of used full-face cartridge type respirators. The licensee indicated that the training video would be revised by October 1996 to reflect the current policy. The video update was added to the licensee's tracking system for corrective actions.

R1.07 Postings, Labeling, and Control

a. Inspection Scope

The inspector toured the main process areas in addition to the outside controlled areas of the facility. Included were chemical conversion, powder preparation/pellet pressing, UF_6 cylinder recertification facility, low level waste storage, mens change room, and the respiratory protection maintenance trailers.

b. Observations and Findings

During tours, the inspector noted that access control to areas were properly posted. The main entrance into the restricted area was posted as required and containers of radioactive material were properly labeled. The inspector observed activities in progress which required donning respiratory protection equipment. Consistent with the area work activities, the inspector noted that the area was properly posted. Outside controlled areas posting appeared to be consistent with the regulations.

c. Conclusion

Based on tours and a review of activities in progress, the inspector did not identify any noncompliance in the licensee's posting of radiation areas and labeling of radioactive material containers. Area posting and labeling appeared to be adequate and in compliance with applicable regulations.

R1.08 Surveys

a. Inspection Scope

The licensee's contamination control survey program was reviewed to determine if the program was adequate and implemented in accordance with 10 CFR 20, license conditions, and procedures.

b. Observations and Findings

The inspector accompanied a Rad Control Technician during the performance of area surveys, and observed the collection of smear samples from several areas outside the restricted area. In addition, during the plant tour, the inspector collected independent smear samples from the following areas: drinking water fountain near the ADU Control Room; lighting fixtures near the dissolver platform and bulk container elevator; and the men's change room pelleting area badge storage rack. Slightly elevated results were obtained from each location with the exception of the water fountain. The maximum smearable activity for the lighting fixtures were 5679 dpm/100 cm² alpha, and 3811 dpm/100 cm² beta. The action limits for the referenced area was 5000 dpm/100 cm². The area of most concern however was the results from the men's change room of 2231 dpm/100 cm² alpha, and 1163 dpm/100 cm² beta. The licensee contact with responsibility in this area indicated that the badge rack would be cleaned up and placed on a periodic housekeeping schedule.

In addition to the above surveys performed during the inspection, data sheets for weekly, monthly, and/or daily contamination surveys covering the period of January-September 1996 were reviewed for selected areas. The documentation for randomly selected areas of surveys disclosed that the surveys were completed at the required frequency in accordance with procedures. Further, documentation showed that in the event area smear results exceeded the action limits, actions were taken to decontaminate area of smear to acceptable limits.

c. Conclusions

Based on personnel performance in the area of collecting, analysis, and documentation of results, the inspector determined that the licensee's survey program was adequate for identifying the presence of contamination, and survey procedures provided actions for ensuring that contamination was controlled. The presence of contamination on the badge storage rack indicated that additional actions were necessary by the licensee to ensure contamination is confined to the work areas.

R1.10 Implementation of ALARA Program

a. Inspection Scope

Radiological protection training was reviewed to determine if facility workers were informed of ALARA commitments and how radiation protection principles may help minimize the risk to radiation.

b. Observations and Findings

Based on procedural review and discussion with licensee representatives, all employees with work involving radioactive materials or frequenting any portion of a restricted area, were required to attend biennial refresher training. Employees attending the biennial training were required to demonstrate their competence by successful completion of an

examination with at least 70 percent correct. Training for new employees, involved an orientation to radiation protection initially and within six months of initial training, the employee received the biennial refresher training and were required to complete an examination with 70 percent correct. Employees who were unsuccessful in completing the examination were restricted from working with radioactive materials until they could demonstrate an adequate understanding of the training material by successfully completing the exam.

The inspector reviewed the training videos for both the initial orientation and the biennial refresher training. In addition, the examination for refresher training was reviewed for adequacy. Eleven names were randomly selected from the licensee's current personnel occupational exposure listing for verification that training was current and up to date.

In addition to the above training, the inspector reviewed documentation resulting from monthly audits of air sampling data, TLD data, and bioassay data for trending the exposure of workers and comparing with the ALARA goals.

c. Conclusions

The video training tapes provided an adequate level of training to employees regarding radiation protection and ALARA concepts in minimizing the exposure to radioactive material. The inspector also noted that on a monthly basis an engineer compared and summarized the monthly exposures to the ALARA goals and documented the results to the appropriate personnel with responsibility for implementation of the ALARA program. Two aspects of the training videos required updates. Regarding the initial training, an airborne area was defined using the old 10 CFR Part 20 terminology (MPC) rather than the revised 10 CFR 20 (DAC). In addition, no reference was made to the card reader system (COMET) used for site accountability purposes in the event of an emergency. The COMET system was also missing from the biennial refresher training video. In response to the needed updates, the licensee assigned the corrective actions to an internal tracking system referred to as the "CTS" for completion by October 1996. The training documentation (class attendance sheet and exam) for randomly selected employees were reviewed and all training was current and up to date.

R2 Environmental Protection (88045)

R2.01 Monitoring Program Implementation

a. Inspection Scope

Safety Condition S-1 of Materials License No. SNM-1107 authorized the use of licensed materials in accordance with statements, representations, and conditions contained in the License Application dated April 30, 1995 and approved supplements thereto.

Chapter 10, Section 10.4.1 of the License Application specified the minimum sampling and analytical requirements for the licensee's environmental monitoring program. Referenced tables and figures specified which media were to be sampled, sampling locations, sampling frequency, types of analysis, and analytical sensitivities.

b. Observations and Findings

The inspector reviewed the following procedures and determined that they included provisions for collecting and analyzing the environmental samples at the frequencies and locations specified in the License Application:

- ROP-06-001, NPDES Daily, Weekly, and Monthly Effluent Sample, Rev. 12, April 21, 1994
- ROP-06-003, Ambient Environmental Air Monitoring for Radioactivity, Rev. 7, March 14, 1996
- ROP-06-006, Collection of Routine Weekly and Monthly Environmental Samples, Rev. 6, August 8, 1996
- RO-06-007, Two Inch Well Sampling, Rev. 4, December 21, 1995

The inspector accompanied a technician and observed the collection of the four continuous ambient environmental air particulate samples, seven onsite surface water samples, three ground water samples, one vegetation, and one soil sample. The samples were collected in accordance with the guidance in ROP-06-006, "Collection of Routine Weekly and Monthly Environmental Samples." The inspector noted that the licensee had purchased four new SAIC Radeco environmental air samplers (Model HO-28/A) in 1996. The ambient environmental air sampling equipment was operational and all the flow meters had been calibrated on August 28, 1996.

During the collection of the surface water and ground water samples, the inspector noted that the technician used the same sample collector, which was basically a baler. Although the baler was rinsed with deionized water after each sample was collected, the inspector noted that the practice of using the same sampling equipment for the well water and surface water could lead to a cross contamination problem. In addition, the inspector noted that the technician had some difficulty in collecting a vegetation sample due to the lack of adequate sampling equipment, such as a pair of pruning shears or clippers. The licensee acknowledged both of the inspector's observations.

c. Conclusions

Based on the above reviews, it was concluded that the licensee had effectively implemented the required environmental monitoring program.

R2.02 Monitoring Program Results

a. Inspection Scope

Chapter 10, Section 10.4.1 of the License Application specified that action levels will be established by procedure for environmental samples. Figure 10-1 of the License Application specified gross alpha and beta concentration action levels for ground water and gross alpha concentration action levels for vegetation samples. Procedure RA-215, Unusual Incidents, Revision 9, dated February 22, 1996, specified the an action level for environmental air samples.

b. Observations and Findings

The inspector reviewed the analytical results for 1995 and the first and second quarters of 1996 of selected environmental sampling media, including: ambient air particulate samples; vegetation samples; soil samples; sediment samples; fish samples; and groundwater samples. The inspector determined that the environmental samples had been collected and analyzed in accordance with the applicable procedures.

The licensee had informally established an action/investigation level of 10 pCi/gram for the following sampling media: fish, soil, and sediment. For the time period noted above, samples of fish, vegetation, soil or sediment did not exceed the licensee's action level. A review of the sampling data for fish, vegetation, soil, and sediment indicated that there was no radioactive material accumulating or concentrating at the sample location.

Environmental airborne radioactivity concentrations were sampled continuously and collected weekly at four monitoring locations to verify that the plant gaseous effluents were ALARA. From 1995 to the first half of 1996, environmental airborne concentrations ranged from $1.0\text{E}-15$ to $2.8\text{E}-15$ $\mu\text{Ci}/\text{ml}$. In 1995, the licensee reported in its ALARA Report an average air concentration at the site boundary of 1.8 percent of the 10 CFR 20 effluent concentration limit which indicates that airborne releases to the environment had been minimal.

Ground water was collected quarterly from ten sampling wells onsite to comply with license application requirements. The inspector reviewed ground water gross alpha and gross beta analysis results for samples collected during the first and second quarters of 1996. Gross alpha concentrations ranged from <2 pCi/l to 117 pCi/l in the first half of 1996. Gross beta concentrations ranged from <3 pCi/l to 73 pCi/l for the same time period.

Figure 10-1 of the License Application specified that if the gross alpha concentration exceeds 15 pCi/l isotopic analyses for uranium will be conducted. In addition, if the gross beta concentration exceeds 50 pCi/liter, isotopic analyses will be performed. An additional action level specified that if a well sample exceeded a mean

concentration of 30 pCi/l of total uranium, then the result will be provided to cognizant NRC staff.

The licensee was aware of the apparent elevated results and was in the process of reviewing the data to develop an appropriate action plan, however the appropriate isotopic analyses were not performed. The licensee initiated a review of the first and second quarter analyses during the first week of September 1996. Most of the ten sampling wells were older wells which normally contained suspended solids due to the installation and screening methods used. If the suspended solids are not filtered from the sample, they can impact the radiological results. The licensee contacted its vendor laboratory to determine if the affected well water samples could be re-analyzed, however, the vendor had discarded the samples. The licensee elected to resample the wells which was completed during the last week of September 1996. To preclude a similar problem from occurring again, the licensee revised RO-06-07, Two Inch Well Sampling, Rev. 5, October 2, 1996 to include in the packing list instructions to the vendor to immediately initiate isotopic uranium and isotopic beta analyses if the appropriate action limits for gross alpha and beta concentrations are exceeded. The instructions to the vendor also included the specification to filter the samples to avoid interference from the suspended solids. The licensee discussed these items with the vendor. The inspector identified this issue as a violation of Safety Condition S-1, Sections 3.4 and 10.4.1 of the Application for failure to make the appropriate isotopic analyses of ten well samples that exceeded the action levels specified in Figure 10-1 of the Application and procedure RO-06-07 during the first half of 1996. However, this violation will not be subject to enforcement action because the licensee's efforts in identifying and correcting the violation met the criteria specified in Section VII.B of the NRC Enforcement Policy (NCV: 70-1151/96-03-01).

c. Conclusions

In general, the analytical results from the various environmental samples collected indicated that there was no radioactive material from plant operations accumulating or concentrating at the sample location. However, the timely review of certain environmental sample analysis data, specifically well water sample data, was not apparent.

R2.05 Independent Measurement Verification

a. Inspection Scope

10 CFR 20.1302 (a) required the licensee to perform surveys as necessary to evaluate the extent of radiation hazards.

b. Observations and Findings

In an effort to evaluate the licensee's analytical capabilities and effectiveness of the program, the inspector requested that a wet weather stream sediment sample and a Congaree River sediment sample be collected

and analyzed for radionuclide and/or gross alpha/beta concentrations, as appropriate, by the licensee and split with the NRC for confirmatory measurements purposes. The inspector accompanied a licensee representative to collect the samples. The licensee agreed to analyze the sample types noted above in a reasonable time period, in accordance with normal analytical procedures, and ship the samples to the NRC RII laboratory for confirmatory measurements purposes. The NRC will perform the same type of analysis as the licensee so that a comparison of the results can be made. This item will be tracked as an inspector followup item (IFI: 70-1151/96-03-02).

In addition, the inspector reviewed split liquid effluent sample results collected from the licensee in August 1995. This item was documented and tracked as IFI 70-1151/95-05-01. The licensee's results were transmitted to the NRC RII Office in a letter dated October 24, 1996. Table 1 provides a comparison of the licensee results to the NRC's results for the sample. The Attachment (Section 5) to this inspection report provides the criteria for assessing the agreement or disagreement between the analytical results. The gross alpha and gross beta results compared favorably. However, the isotopic uranium results did not compare as well. The results were all biased low and in disagreement. The differences could be due to the relatively high uncertainties associated with the measurements and/or a difference in the analytical techniques used by the licensee's contract laboratory and the NRC. The inspector noted that the licensee's quality assurance/quality control program for its contract laboratory should be reviewed to determine if any deficiencies exist.

Table 1: Comparison of NRC and Westinghouse Analytical Results of a Sample Collected in August, 1995

Type of Sample: Water (One-Liter Split Sample from the WWTF)
Units: $\mu\text{Ci/ml}$

<u>Analysis</u>	<u>Licensee's Value</u>	<u>NRC's Value</u>	<u>Resolution</u>	<u>Ratio</u>	<u>Comparison</u>
Gross α	1.15 E-7	(1.22 +/- 0.18)E-7	7	0.94	Agree
Gross β	4.70 E-8	(8.50 +/- 1.30)E-8	7	0.55	Agree
U-234	9.10 E-8	(1.58 +/- 0.12)E-7	13	0.58	Disagree
U-235	2.00 E-9	(8.30 +/- 1.60)E-9	5	0.24	Disagree
U-238	1.40 E-8	(2.83 +/- 0.31)E-8	-9	0.49	Disagree

c. Conclusions

As noted above, the licensee's results for gross alpha and gross beta were in agreement and biased low with the NRC's results. However, the isotopic uranium results were all biased low and in disagreement. In October 1993, a liquid effluent sample was split with the NRC which resulted in agreements with the isotopic uranium analyses, however the results were also biased low. Due to the relatively high uncertainty associated with the isotopic measurements, no conclusions can be made. However, the licensee's quality assurance/quality control program for its contract laboratory should be reviewed to determine if any deficiencies exist.

R3 Waste Management (84850 and 88035)

R3.02 Liquid Effluent Monitoring Results

a. Inspection Scope

Chapter 10, Section 10.2 of the License Application specified that a liquid waste treatment facility was provided and maintained to permit the holdup of liquid wastes for treatment, sampling, and analysis, and to permit their disposal in accordance with the provisions of 10 CFR 20.

b. Observations and Findings

The liquid effluent released to the Congaree River from the WWTF was required to be sampled continuously by a flow rate proportional sample collector. ROP-06-001, NPDES Daily, Weekly, and Monthly Effluent Sample Collection, specified the liquid effluent sample collection requirements. The licensee discharged approximately 130,000 gallons of liquid effluent per day. The licensee collected daily samples from the proportional sampler to monitor for NPDES chemical parameters and gross alpha activity. 30-day composite samples were required to be analyzed for gross alpha activity, gross beta activity, and isotopic uranium. The inspector noted that the monthly composite samples were sent to a vendor laboratory for the required analyses.

The inspector also reviewed quarterly liquid effluent monitoring reports for the period 1995 to the second quarter 1996. The total monthly average gross alpha concentration from January 1996 to June 1996 was $0.25\text{E-}06 \mu\text{Ci/ml}$ and ranged from $0.5\text{E-}06$ to $0.1\text{E-}06 \mu\text{Ci/ml}$. For 1995, the monthly average gross alpha concentration was $0.35\text{E-}06 \mu\text{Ci/ml}$ and ranged from $0.1\text{E-}06$ to $1.0\text{E-}06 \mu\text{Ci/ml}$. The licensee had established a "goal" for liquid effluent discharges to the Congaree River of $3\text{E-}07 \mu\text{Ci/ml}$ which was specified in RA-401, Environmental Control Requirements Mandated by 10 CFR 20 and EPA 40 CFR 61. Although the monthly average concentration in 1995 slightly exceeded the licensee's goal and exceeded the effluent concentration limit (ECL) of $3\text{E-}07 \mu\text{Ci/ml}$ as specified in 10 CFR 20, Appendix B, Table 2, Column 2, 10 CFR 20.1302 allowed the licensee to demonstrate compliance with the annual dose

limit for individual members of the public specified in 10 CFR 20.1301 by calculating the total effective dose equivalent (TEDE) to the individual likely to receive the highest dose from the licensed operation. The licensee calculated the TEDE due to radioactive material released in liquid effluents to be less than 0.002 millirem per year for 1995.

In addition, the inspector reviewed the Semi-Annual Radiological Effluent Discharge Reports for January through December 1995 and January through June 1996. The reports were submitted within the required time frame. The inspector noted that the used the guidance specified in Regulatory Guide 4.16, Monitoring and Reporting Radioactivity in Releases of Radioactive Materials in Liquid and Gaseous Effluents From Nuclear Fuel Processing and Fabrication Plants and Uranium Hexafluoride Production Plants, Rev. 1, December 1985.

The quantities of radionuclides released in liquid effluents to unrestricted areas presented in Table 2 were derived from previous and present licensee semiannual effluent release reports.

Table 2: Summary of Liquid Effluent Releases for the Westinghouse-Columbia, S.C. Facility

Total Radioactivity Released (millicuries (mCi))

<u>Year</u>	<u>Liquid Effluents</u>
1985	246.20
1986	111.17
1987	57.16
1988	34.54
1989	53.93
1990	24.34
1991	38.00
1992	18.56
1993	36.03
1994	53.64
1995	47.03
1996 (1/2)	21.11

A slight decrease of uranium in the liquid effluent discharged to the Congaree River was noted in 1995 compared to the quantity discharged in 1994. During the years 1992 - 1994, there was an apparent increasing trend with a statistically uncertain confidence level identified. The licensee indicated that in 1994, a shift in the manufacturing operations which basically ceased the direct UF_6 to UO_2 powder conversion process and increased the use of the ADU conversion process. The ADU conversion process generated more liquid waste.

The inspector also reviewed unusual liquid waste release occurrences that occurred during the first six months of 1996. On March 16, 1996, the T1149 tank was overfilled and liquid was inadvertently pumped out of

the manway. Most of the liquid was contained and drained to the East Lagoon. A small quantity was contained in the "A" storm drain feeder system, but the liquid did not actually reach the end of the "A" system. The operator immediately terminated the water filling the tank and closed the storm drain valves. Upon inspection, the leak had not proceeded past the storm drain collector in the "A" system. The "C" valve was closed as a precautionary measure.

The liquid in the drain system was recovered, cleaned up, and drummed. The gross alpha concentration of the liquid in the storm drain was determined to be less than $3\text{E-}05 \mu\text{Ci/ml}$. Smear results at several locations near the vicinity of the spill were close to background levels. Approximately one drum of soil, gravel, and vegetation was removed from the immediate vicinity of the storm drain. The licensee did not note any discharges which would affect the NPDES reporting requirements.

c. Conclusions

There were no apparent problems noted with the licensee's liquid sampling and analysis program. One unusual liquid waste release occurred during the first six months of 1996 which did not result in any environmental consequences. In addition, the annual offsite dose due to liquid effluent releases in 1995 for individual members of the public was significantly below ten percent of the limit specified in 10 CFR 20.1301 indicating that the licensee's releases of radioactive material in liquid effluents were ALARA.

R3.04 Airborne Effluent Monitoring Results

a. Inspection Scope

Chapter 10, Section 10.1 of the License Application specified the sampling and analytical requirements for gaseous effluents. Continuous sampling was required during production operations for those operations which could result in exhausting radioactive materials to unrestricted areas. Collection and analysis of those samples was required to be performed on a daily basis during production operations. The adequacy of the gaseous effluent controls was required to be determined by representative stack sampling to demonstrate compliance with applicable regulations. In addition, if the radioactivity in the plant gaseous effluents exceeded 1500 microcuries per calendar quarter, a report was required to be submitted to the NRC which identified the cause for exceeding the limit and the corrective actions to be taken to reduce release rates.

b. Observations and Findings

The inspector reviewed procedure R0-06-002, Roof Effluent Air Sampling and Counting, Rev. 10, January 25, 1996, and noted that it included provisions for the daily collection of air particulate samples from 45

sampling locations and analysis after a 24-hour decay period and specified an action level (or control concentration limit) of $4\text{E-}12 \mu\text{Ci/ml}$. Procedure RA-401, Environmental Control Requirements Mandated by 10 CFR 20 and EPA 40 CFR 61, Rev. 7, October 20, 1995 specified the actions to take in the event a stack sample exceeded the control concentration limit specified in RO-06-002.

The inspector reviewed weekly gaseous effluent discharge reports for the period January 1, 1996 to August 25, 1996. The inspector noted that on nine occasions the gaseous effluent control concentration was exceeded. Based on interviews with the licensee, it appeared that the appropriate actions were taken as required by RA-401, however, the documentation of the corrective actions taken or planned to be taken was less than adequate.

In addition, the inspector reviewed the Semi-Annual Radiological Effluent Discharge Reports for January through December 1995 and January through June 1996. During the time period between July - December 1995, the gaseous effluents at the point of discharge from the stacks represented an average discharge concentration of approximately $2.3\text{E-}13 \mu\text{Ci/ml}$. This concentration was 379 percent of the 10 CFR 20, Appendix B, Table 2, Column 2 unrestricted release limit for Class "Y" material. However, it should be noted that this concentration would be diluted by a factor of at least 1000 at the site boundary using diffusion factors.

The quantities of radionuclides released in gaseous effluents to unrestricted areas presented in Table 3 were derived from previous and present licensee semiannual effluent release reports.

Table 3: Summary of Gaseous Effluent Releases for the Westinghouse-Columbia, S.C. Facility

Total Radioactivity Released (millicuries (mCi))

<u>Year</u>	<u>Gaseous Effluents</u>
1985	1.54
1986	1.51
1987	1.40
1988	1.44
1989	1.23
1990	1.23
1991	1.16
1992	0.99
1993	0.91
1994	0.48
1995	0.50
1996 (1/2)	0.22

The total gaseous radioactivity discharged during 1995, was 0.50 mCi of uranium, compared with 0.48 mCi during 1994. Since 1988 gaseous effluent discharges have indicated a continued decreasing trend. This decreasing level of gaseous effluent discharges had resulted from upgrading HP counting procedures and using revised sampling and counting methods for the entire 1994 calendar year. As indicated in Table 3 above, the annual totals for gaseous effluents since 1987 were significantly less than the license application limit of 1500 μ Ci per calendar quarter.

The inspector also reviewed the licensee's calculations and input parameters to calculate offsite doses to the maximally exposed individual due to gaseous effluent releases using the EPA's COMPLY computer code. The COMPLY computer code was used for calculating the offsite TEDE to the individual likely to receive the highest dose from licensed operation to demonstrate compliance with 10 CFR 20.1301 and 20.1302 and with the national Emission Standards for Hazardous Air Pollutants (NESHAPS) in 40 CFR 61, Subpart I. The total effective dose equivalent for 1995 due to gaseous effluent releases was approximately 0.897 millirem per year (mrem/yr), which was well below the NESHAPS limit of ten mrem/yr and the reporting limit of one mrem/yr.

c. Conclusions

Documentation of the corrective actions taken or planned to be taken for exceeding the control concentration limit for gaseous effluents was less than adequate. This less than adequate performance would indicate that improvement was needed in this area. The annual offsite dose due to gaseous effluent releases in 1995 for individual members of the public was significantly below ten percent of the limit specified in 10 CFR 20.1301 indicating that the licensee's releases of radioactive material in gaseous effluents were ALARA.

R3.05 Solid Waste Processing

a. Inspection Scope

Section 10.3 of the License Application specified that facilities would be provided and maintained for the preparation, packaging, and transferring of solid radioactive wastes to a licensed disposal facility.

b. Observations and Findings

The inspector toured the licensee's solid radioactive waste processing and storage facilities and discussed their operations with cognizant licensee personnel. Combustible wastes were incinerated, acid leached, and processed through solvent extraction. The residues were packaged, stored, and eventually shipped for burial or shipped to a processing facility for compaction and then burial. The non-combustible "wastes" consisted mostly of contaminated metals. The metals were decontaminated by liquid honing when possible and released as scrap metal if survey

results indicated that the contamination had been removed or was below release limits. Metals which could not be sufficiently decontaminated for release were shredded, if possible, and disposed of in the same manner as combustible residues. The inspector noted, from observation of processing operations in progress at the time of the tour and the above discussions, that the facilities were adequate for preparation, packaging, and shipping solid radwaste and that the facilities had been adequately maintained.

The inspector briefly reviewed the licensee's incinerator operations and maintenance program. During the review, the inspector discussed with licensee representatives lessons-learned from the incinerator fire at the NFS, Inc. that occurred on April 2, 1996. Although the licensee representatives were aware of the basic events pertaining to the NFS, Inc. incinerator ductwork fire and indicated that the issues were not applicable to the Commercial Nuclear Fuel Division, the inspector noted that neither the engineering staff nor regulatory affairs personnel had a copy of the NRC Augmented Inspection Team (AIT) Report of the event. The inspector ensured the licensee was provided a copy of the AIT report of the NFS incinerator ductwork fire.

The incinerator maintenance program consisted of a formal preventative maintenance program for the safety significant systems identified on the incinerator and an informal preventative maintenance program on the non-safety significant systems. The inspector reviewed the formal preventative maintenance records from January to August 1996 and noted that maintenance was performed as required. The inspector noted, however, that the informal maintenance items, such as cleaning, inspections, checks, refurbishment and replacements were not well documented.

At the time of this inspection, the licensee had 49 trained incinerator operators. The State of South Carolina requires certification of incinerator operators. The certification process required participation in a three day course and passing a written examination by answering at least 80 percent of the questions correctly.

c. Conclusions

The licensee's program for waste minimization continued to be successful. The licensee's review of an industry related incinerator fire event was less than adequate.

R3.08 Solid Waste Shipping

a. Inspection Scope

Appendix F to 10 CFR Part 20 specifies the requirements for low-level radioactive waste (LLRW) transfer for disposal at land disposal facilities, including waste manifests, waste generator certification, and control and tracking.

b. Observations and Findings

From a review of the records for solid waste disposals made in 1996, it was noted that the licensee predominantly transferred its waste to a licensed waste processor. The licensee shipped the LLRW as a radioactive materials shipment to the waste processor, who subsequently segregated, processed, and reanalyzed the material to determine the appropriate quantities of radionuclides. The inspector verified that the licensee provided an acceptable level of information in the shipping papers to determine quantities of individual radionuclides shipped. From January to September 1996, there were no shipments of LLRW made directly to a licensed waste burial site. As of the end of August 1996, there were 13 shipments of uranium contaminated solid waste made to a licensed waste processor.

The inspector reviewed the licensee's procedures and shipping records to determine that a system had been established to verify that acknowledgement of receipt of the manifest from the waste processor had been received and that procedures were in place to effect an investigation in any instances wherein acknowledgement of receipt of the shipment had not been received within the time period specified in 10 CFR 20, Appendix F. For the 13 waste shipment records noted above, the inspector verified that the licensee had received an acknowledgement of receipt from the waste processor within the specified time frame. The licensee's records were orderly and well maintained.

The inspector reviewed manifest records of 13 shipments of radioactive waste made from January 1 to August 22, 1996. These waste shipments involved the transfer of radioactive materials to a licensed waste processor for treatment and repackaging. The manifests were complete and met the applicable requirements of the regulation except that the licensee omitted the appropriate "LSA group notation" on the shipping papers for LLRW shipments made between April 1 and August 15, 1996 as required per 49 CFR 172.203(11). The group notation requirement divided Low Specific Activity (LSA) material into three groups (LSA-I, LSA-II, and LSA-III) and required the shipping papers to display the appropriate group number. The licensee identified this omission through the knowledge gained during the annual Environmental Affairs radioactive materials transportation training conducted in early August 1996. The licensee took the following corrective actions to avoid recurrence: (1) the HAZMAT clerk was instructed to assure the notation appears on future shipping papers; (2) edits were made to the personal computer files used for shipping paper generation; and (3) initiated a revision to TR-207, Shipment of LLRW, to include the LSA group notation requirement. The failure to include the appropriate "LSA group notation" on the shipping papers for LLRW shipments was identified as a violation of 49 CFR 172.203(11). However, this violation will not be subject to enforcement action because the licensee's efforts in identifying and correcting the violation met the criteria specified in Section VII.B of the NRC Enforcement Policy (NCV: 70-1151/96-03-03).

c. Conclusions

Although a non-cited violation was identified for failure to include the appropriate "LSA group notation" on the shipping papers for LLRW shipments as required on waste manifests, the inspector concluded that the licensee's controls, procedures, and waste management program appeared acceptable and capable of accomplishing its safety objectives.

IV. Facility Support

F3 Emergency Preparedness (88050)

F3.01 Review of Program Changes

a. Inspection Scope

Changes to the licensee's SEP, organization, facilities, and equipment were reviewed to assess the impact on the effectiveness of the program; and to verify that changes met commitments, license conditions, and NRC requirements. Examine the adequacy of the emergency preparedness independent audit program.

b. Observations and Findings

Since the last routine inspection of this area (December 1994), the following changes were made:

- The day-to-day responsibility for emergency planning was reassigned effective January 1995. The newly assigned engineer attended training, entitled "Planning for Nuclear Emergencies", at the Harvard School of Public Health during June 1995. In addition, the beforementioned individual had responsibility for scenario development/coordination, training, and interface with offsite organizations (State, local, and federal) during the last biennial exercise conducted in September 1995. According to NRC Inspection Report No. 70-1151/95-06, no significant problems or inconsistencies were identified in the licensee's exercise preparation efforts.
- A replacement emergency vehicle was procured for use by the Emergency Brigade. During the facility tour, the inspector noted that the referenced vehicle was well equipped with hoses, SCBA equipment, turn out gear, and other equipment or supplies (e.g. medical emergency kit, pre-fire plan, SEP, etc.). In addition, a cascade system for the refilling of SCBA tanks was also available on board the vehicle.
- Since the December 1994 inspection, three revisions were made to the Plan (August 17, 1995, October 23, 1995, and the most recent dated July 10, 1996). Regarding the August and October 1995 changes, the changes were strictly administrative and merely Plan updates (e.g. phone or procedure number changes). By letter dated

February 23, 1996, the NRC granted approval for the August 17, and October 23, 1995 submittals. The changes were determined not to reduce the effectiveness of the SEP. During the most recent revision (dated July 10, 1996), significant changes were made to the SEP and implementing procedures. SEP changes involved the deletion of local emergency as a classifiable incident; various administrative changes; deleted references to CSEP procedures; and changes were made to Section 3 of the SEP addressing type of accidents and classifications. The most significant changes were to the EALs (particularly Alert) involving the deletion of criteria for certain emergency declarations as a function of time. For example:

Previous EAL

Fire which cannot be extinguished within approximately 15 minutes.

UF₆ or toxic gas release, where the energy causing the release cannot be isolated within approximately 15 minutes, the source is not confined or escalation of the release is probable.

Ongoing security intrusions lasting greater than approximately 15 minutes.

Hazardous material release where the energy causing the release cannot be isolated within approximately 15 minutes, the source is not confined or escalation of the release is probable.

Revised EAL

Fire which cannot be extinguished quickly.

UF₆ or toxic gas release, where the energy causing the release cannot be quickly isolated, the source is not confined or escalation of the release is probable.

Ongoing security intrusions which are not controllable.

Hazardous material release where the energy causing the release cannot be quickly isolated, the source is not confined or escalation of the release is probable.

In response to the above changes, the inspector informed the licensee contact that the changes appeared to reduce the effectiveness of the EALs by removal of a measurable indicator (15 minutes) for determining when the conditions for the emergency declaration had been met. The inspector discussed the combination of conditions as a function of time as providing unambiguous indication that actions (emergency classification, activation of ERO, etc.) must be taken. The revised EALs appeared to increase the potential for human errors and delays in event classification, due to the ambiguity associated with the word "quickly" replacing a specified time period of 15 minutes. The licensee contact indicated the following: "the change was made to provide the ED/EC an adequate opportunity to fully assess the incident before making the emergency classification; the previous time criteria (15 minutes) for

classifying an event impacted the focus of the ED/EC on fully assessing the accident." The licensee representative stated further the intent to make the event declaration as quickly as possible, but based on good information rather than a 15 minute clock. The inspector informed the licensee that the revised EALs were not consistent with the intent of federal guidance regarding EALs providing unambiguous, measurable, and/or observable indicators to ensure prompt and correct emergency classifications. Consequently, the changes were considered a reduction in the effectiveness of the Plan. The licensee took prompt action to revise the EAL associated with Ongoing security intrusions which are not controllable, to read "Ongoing security intrusions(greater than 15 minutes)." The referenced change appeared to meet the intent of guidance in RG 3.67, Appendix A. However, the remaining changes were discussed with the licensee as a potential violation for failure to obtain NRC approval prior to implementation of changes that decrease the effectiveness of the approved emergency plan.

To assess the effectiveness of training on revised EALs, the inspector conducted walkthroughs with two individuals assigned to the ERO with responsibility in the area of event classification. Interviewees were presented accident scenarios that required event classification, and asked to respond as appropriate, including the basis for their decision-making. No significant problems were noted. Both interviewees were familiar with the use of procedures containing EALs. The term quickly was briefly discussed following interviews. The inspector informed the licensee that an additional review and discussion of this matter with the NMSS licensing contact and regional management would determine the impact of the EAL changes on the effectiveness of the Plan.

Changes were made to the licensee's implementing procedures since the last inspection and are discussed below in Section F3.02. Several site locations (e.g. EOC, Main Security Station, etc.) were checked and verified as having current copies of the SEP available for use.

Section 7.8 of the SEP required an annual independent audit of the emergency preparedness program including the SEP and implementing procedures, training activities, emergency facilities, equipment, supplies, records, etc. Accordingly, this area was reviewed to determine if the licensee had performed the independent review or audit, and verify that the licensee had evaluated any significant changes on the emergency preparedness program. The inspector reviewed audit documentation and interviewed the Lead Auditor for the CY 95 audit conducted on September 28, 1995. Based on the documentation and interview, the inspector determined that the audit was not conducted as required by the SEP. The licensee's audit consisted of the CY 95 exercise only. No evaluations were performed within the areas of training, emergency facilities, equipment, supplies, records, or the SEP and implementing procedures. The SEP stated that the auditor shall have knowledge of emergency preparedness. The inspector questioned the lead auditor regarding what, if any, prior experience in emergency preparedness. The inspector was informed that no prior emergency preparedness experience had been obtained by the auditor. Rather,

previous audits were performed in safeguards, housekeeping, and special nuclear material. The failure to conduct an independent audit in accordance with the SEP was identified as a violation.

Violation 70-1151/96-03-04: Failure to perform an independent audit of the emergency preparedness program in accordance with Section 7.8 of the SEP.

c. Conclusions

On October 4, 1996, the inspector informed the Manager of Regulatory Affairs via a teleconference call, that based on further review of the inspection details with Region II management, the EAL changes did not result in a violation. However, the proposed EALs removal of a measurable indicator (15 minutes) for determining when the conditions for the emergency declaration had been met, did not provide equivalent guidance to the ED/EC as the previous approved EALs. Subsequently, the change did not appear to meet the intent of guidance in RG 3.67, regarding establish specific initiating conditions relative to particular events or changes in instrument sensors. The inspector informed the licensee that corrective actions to ensure EALs meet federal guidance and obtain NMSS approval for the EALs would be tracked as an IFI.

IFI 70-1151/96-03-05: Verify that EAL changes meet guidance in RG 3.67 and are approved by NMSS.

Based on interviews and documentation, it appears that improvements are needed in the area of program assessments to verify that changes meet commitments, license conditions, and NRC requirements. One violation and an IFI were identified.

F3.02 Implementing Procedures

a. Inspection Scope

A small sample of licensee implementing procedures were reviewed for adequacy in SEP implementation.

b. Observations and Findings

Changes were made to the licensee's implementing procedures since the last inspection. According to a licensee contact, the procedures were completely revised for simplicity and ease of use. The licensee's SEP implementing documents consisted of ten procedures for each postulated accident (UF₆ release, fire control, criticality, explosion, etc.). The procedures were revised to include a check-list format and a new reference or numbering system was implemented. Procedures were grouped according to the area of use. For example, A-Administrative (used for notification, evacuation, accountability, etc); AG-Administrative Guide; B-Brigade; C-ED/EC Procedures (C1 - C10) which were written as a check-list of actions to be taken in response to the specific incident;

H-Hazardous Materials and BMP; M-Medical; R-Regulatory; and S-Security. Based on a review of selected procedures and an interview with members of the licensee's ERO, the revised procedures appeared to be more user-friendly. Walkthroughs/interviews with individuals responsible for event classification were successful in demonstrating that personnel could use procedures for correct classification. Both interviewees initially reviewed the incorrect section of procedures for assessing the initiating conditions. A detailed review of the circumstances and contributing factors revealed a need to relocate the Incident Scenario Category Chart from implementing procedure A-08 to A-04. In response, the licensee issued CTS No. 436 and assigned the corrective action for completion by October 31, 1996. Additional items requiring licensee attention involved a revision to the Incident Scenario Category Chart, and the Classification Logic Flow Chart, pending NRC approval of EALs, for consistency with the SEP. The corrective actions associated with the EALs will be reviewed during a subsequent inspection.

Several site locations (e.g. EOC, Main Security Station, etc.) were checked and verified as having current copies of the Emergency Telephone Directory, notification roster, the SEP and implementing procedures available for use.

c. Conclusions

With the exception of the implementing procedures associated with the revised EALs, procedures that were selected for review were adequate in the areas of accident notification and coordination, evacuation, and accountability.

F3.03 Training and Staffing of Emergency Organization

a. Inspection Scope

Emergency response training was reviewed to determine if the licensee had provided training to response personnel in accordance with Section 7.2 of the SEP.

b. Observations and Findings

Although scheduled, CY 1996 ERO training had not been conducted at the time of the inspection. Accordingly, the inspector requested CY 95 ERO training documentation for randomly selected personnel from Table I of CSEP-0013, Rev. 10, dated June 10, 1995, and the current notification roster dated July 10, 1996. Training review included the following components of the ERO: Emergency Director, Emergency Coordinator, Emergency Monitoring Team, Medical Response Team, Emergency Brigade, and Security. Regarding Emergency Brigade Team training, the inspector selected several names from the September 6, 1996 Emergency Brigade Active Roster. Based on the review of documentation and interviews with personnel assigned the responsibility for training and/or tracking training, required training was current for brigade members and ERO

training was current with plans for conducting the CY 96 ERO training during the fourth quarter of 1996.

Offsite support training was reviewed for CY 95 and 96. According to documentation, CY 95 training was provided to both State (SC-EPD and SC-DHEC) and local organizations (Richland County EPD, Richland Sheriff Office, and Columbia Fire Department). By letter dated August 28, 1996, offsite support organizations were contacted regarding CY 96 training to be provided during October 1996.

As discussed above in Section F3.01, the inspector conducted walkthroughs with two individuals assigned to the ERO with responsibility in the area of event classification. Interviewees were presented accident scenarios that required event classification, and asked to respond as appropriate, including the basis for their decision-making. Postulated accidents included a fire, airplane crash onsite, and severe weather (tornado). No performance related problems were noted. In addition to the walkthroughs, the inspector observed SCBA training which was provided to fourteen individuals assigned to the chemical processing area. The referenced training involved both instructions (provided by the instructor) and performance (students demonstrate individually the proper donning and use of equipment).

c. Conclusions

The licensee's training program was effectively managed to ensure emergency personnel were properly trained and capable of responding to various occurrences. Personnel performance during walkthroughs demonstrated that the training provided was adequate in accident assessment and classification. Based on training documentation, the number of trained personnel for staffing key ERO positions appeared to be adequate.

F3.04 Offsite Support

a. Inspection Scope

Licensee activity in the areas of training, agreements, and exercises, was reviewed to determine if the licensee was properly coordinating with offsite authorities.

b. Observations and Findings

Discussions were held with a member of the licensee's staff regarding the coordination of emergency planning with offsite support agencies. The inspector reviewed the status of agreement letters with offsite support agencies, and noted that with two exceptions, current agreements were available. The exceptions involved the absence of current agreements with SC-DHEC and Richland Memorial Hospital. When questioned regarding the availability of current agreements, the licensee contact provided the inspector with documentation to show that SC-DHEC and Richland Memorial Hospital were contacted by telephone during June 1996.

regarding the necessity for agreement updates. Section 4.4 of the SEP required that agreements be reviewed annually and renewed at least every four years or more frequently if needed.

Section 7.2.6 of the SEP required the licensee to offer annual training to offsite groups. The inspector reviewed documentation to show that Columbia Fire Department during October 1995 and Richland County Sheriff Office during February 1996 participated in a site familiarization tour. In addition to the aforementioned site familiarization training, CY 95 training was provided to both State (SC-EPD and SC-DHEC) and local organizations (Richland County EPD, Richland Sheriff Office, and Columbia Fire Department) in accordance with SEP commitments. Although CY 96 training had not been conducted at the time of the inspection, by letter dated August 28, 1996, offsite support organizations were contacted regarding training to be provided during October 1996. The licensee's last biennial exercise, conducted on September 28, 1995, involved offsite support agencies and the NRC.

On a quarterly basis, the licensee was contacting offsite support organizations to verify that the phone numbers and contacts list remain current and up-to-date.

c. Conclusions

Based on interviews with licensee representatives and documentation to show offsite support periodic training, drill participation, and site familiarization tours, the inspector concluded that the licensee's interface with offsite support agencies was effective in assuring that the offsite authorities were familiar with their role, responsibilities, and the licensee's concept of operations during an emergency.

F3.05 Drills and Exercises

a. Inspection Scope

The SEP required that drills be performed biennially on each shift in the years in which exercises are not required. In addition, the licensee was required to perform a biennial full-scale test involving the entire emergency response organization; and offsite organizations shall be invited to participate.

b. Observations and Findings

The last full-scale NRC observed exercise was conducted on September 28, 1995 and involved participation by offsite support agencies including NRC. The next NRC observed exercise will be conducted during CY 97. Consequently, the CY 97 exercise would satisfy the requirements in Section 7.4 of the Plan regarding a biennial exercise. Regarding periodic drills, the inspector reviewed documentation to verify that in 1996, only one of the required drills had been conducted thus far. According to the licensee contact with responsibility in this area, remaining shift drills will be conducted before the end of the year.

c. Conclusions

Based on the review (critique sheets and scenario package) and interviews, the inspector determined that the drills were effective in maintaining the proficiency of response personnel. Items identified as requiring corrective actions during exercises or drills were tracked via the commitment tracking system pending verification that corrective actions were completed.

F3.06 Emergency Equipment and Facilities

a. Inspection Scope

Facilities and equipment were inspected to determine whether the licensee's EOC, emergency response equipment, instrumentation, and supplies were maintained in a state of operational readiness.

b. Observations and Findings

The operational readiness status of equipment and facilities were examined via documentation (in support of maintenance, periodic tests and/or surveillances), facility walk-down, inventory, and operability checks. The inspector examined the following locations for readiness: EOC, health physics emergency cabinets (main office building and south assembly point), external emergency safety cabinet, emergency vehicle, and main guard station. Radiation survey instruments were calibrated and responded properly to both battery and radioactive source checks. Selected inventory items were located and available for use. Air tanks were examined for SCBA units stored onboard the emergency vehicle and determined to be full and ready for use. One additional aspect of assessment equipment observed by the inspector as operational and within calibration was the onsite meteorological monitoring equipment located in the south assembly area guard house. All documents (SEP, procedures, pre-fire plan, notification roster, etc.) were current and up-to-date. During the period of the inspection, the inspector observed an audibility test of the criticality/fire alarm system (referred to as the voice communication system). No problems were noted with audibility and clarity. However, the inspector discussed with a licensee contact for improving the test procedure, that personnel performing the test acknowledge via voice communication system when testing is completed. An announcement would alleviate potential confusion regarding the need to evacuate or continue working in case an actual event occurred almost immediately after the system test.

The inspector discussed with a licensee contact the notification system for activating the ERO during off-hours for effectiveness in staffing the EOC. Based on the discussion, during off-hours, ERO personnel are contacted by security via pager and/or telephone. The inspector questioned the licensee contact if periodically drills were conducted to demonstrate that minimum staffing levels could be achieved in a timely and efficient manner. The licensee contact indicated that minimum staffing for the EOC had not been identified; and a drill determining the availability of ERO staff during off-hours and an estimated time of

arrival had not been recently performed. Consequently, the inspector discussed with the licensee contact the benefits of a periodic off-hours communications drill, testing the operability of pagers and the availability of ERO staff to ensure that the administrative and physical mechanisms are adequate for timely and appropriate staffing of the EOC. In response to the inspector's comments, the licensee contact indicated that the minimum staffing level for the EOC would be identified and a drill conducted prior to the end of CY 96. The referenced drill would involve contacting the appropriate response personnel and requesting an estimated time of arrival to the site. The inspector informed the licensee that the actions to identify minimum staffing levels and ensure the timely and effective activation and staffing of the EOC was considered an IFI for review during a subsequent inspection.

IFI 70-1151/96-03-06: Verify the actions to ensure timely activation and staffing of the EOC.

c. Conclusions

The SEP and procedures were maintained current and up to date. Emergency response facilities and equipment was adequately maintained and appeared to be operationally ready for responding to various types of accidents.

VI. Management Meetings

M1 Exit Interview

On September 12 and 25, 1996, the inspection scope and results were summarized with licensee representatives. The inspector discussed in detail the routine program areas inspected, and the findings, including the non-cited violations and the violation for failure to conduct an independent audit of the emergency preparedness program. The inspector discussed the EAL changes as a potential violation for reducing the effectiveness of the Emergency Plan, but would require further review with Region II management and the NMSS Licensing Project Manager. Dissenting comments were expressed by the Manager, Regulatory Affairs in response to the characterization of changes decreasing the effectiveness of the Plan.

The licensee did not identify any of the materials provided during the inspection as proprietary.

M2. Teleconference Exit Interview

On October 4, 1996, the inspector informed members of the licensee's staff identified below, that following further review of this finding and criteria in the NRC Enforcement Policy (NUREG-1600), a violation had not occurred. However, the proposed EAL changes do not appear to provide the equivalent guidance as the previous EALs. Therefore, the item will be tracked as an IFI to verify that the EALs are revised to meet the guidance in RG 3.67 and obtain NMSS approval for changes. There were no dissenting comments expressed by the licensee.

ATTACHMENT

1. PERSONS CONTACTED

Licensee Personnel

K. Bartsch, Technician, Regulatory Engineering
*#J. Bush, Manager, Manufacturing
*W. Dougherty, Team Manager, WSS
*J. Fici, Plant Manager
*#S. Gantt, Senior Regulatory Engineer
*#M. Goddard, Team Manager, URRS
*D. Goldbach, Manager, Chemical Process Engineering
*#W. Goodwin, Manager, Regulatory Affairs
H. Green, Technician, Regulatory Engineering
*#J. Heath, Manager, Regulatory Engineering and Operations
*#J. Hooper, Senior Regulatory Engineer
#R. Likes, Senior Regulatory Engineer
*M. Lindler, Team Manager, Chemical Operation
*S. McDonald, Manager, Technical Services
E. Reitler, Fellow Engineer
*D. Trevett, Manager, Component Services
*#W. Ward, Manager, Chemical Manufacturing
*#R. Williams, Advisory Engineer

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

*Denotes those present at the exit meeting on September 12, 1996

#Denotes those present at the exit meeting on September 25, 1996

+Participated in teleconference exit on October 4, 1996

2. INSPECTION PROCEDURES USED

IP 83822 Radiation Protection
IP 84850 Radioactive Solid Waste Management
IP 88035 Radioactive Waste Management
IP 88045 Environmental Protection
IP 88050 Emergency Preparedness

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

3.1 Opened

70-1151/96-03-01 NCV Failure to make the appropriate isotopic analyses of ten well samples that exceeded the action levels specified in Figure 10-1 of the Application and procedure RO-06-07.

- 70-1151/96-03-02 IFI Compare analytical results of a split wet weather stream sediment sample and a Congaree River sediment sample for gross alpha/beta and/or radionuclide concentrations as appropriate.
- 70-1151/96-03-03 NCV Failure to include the appropriate "LSA group notation" on the shipping papers for LLRW shipments as required on waste manifests.
- 70-1151/96-03-04 VIO Failure to conduct an independent audit in accordance with Section 7.8 of the SEP.
- 70-1151/96-03-05 IFI Verify that EAL changes meet guidance in RG 3.67 and are approved by NMSS.
- 70-1151/96-03-06 IFI Verify the actions to ensure timely activation and staffing of the EOC.

3.2 Closed

- 70-1151/94-05-01 IFI Resolve lack of correlation between assigned shallow dose equivalent (SDE) and deep dose equivalent (DDE).

Several actions had been taken by the licensee as documented in previous inspection reports (94-05, 95-01, 95-04, and 95-10) to reduce the skin to deep dose ratios. Since the last review of this open item, the licensee re-evaluated the ratio by conducting a radiation survey in IFBA similar to surveys performed for conversion, pelleting, and URRS during May 1995. According to licensee documentation and a discussion with a member of the licensee's staff, the survey results disclosed that several jobs in IFBA involved exposures to pellets which resulted in high SDE to DDE ratios. The re-evaluation was performed to recalculate ratios that may be expected in each functional area rather than assigning all areas a trigger value of >5 SDE/DDE. According to the licensee contact, based on the results of the re-evaluation, the SDE/DDE ratios appear to be more realistic of what the operators were exposed to. The skin doses were consistently 10 percent below the limits. As a result of the revised criteria, the inspector noted a significant reduction in the number of exposures greater than the trigger point. During the first quarter 1996, ten individuals (all male employees) exceeded the

SDE/DDE ratio; and during the second quarter 1996, eighteen employees (one female and seventeen males) exceeded the ratio. Based on the licensee's actions and significant reduction in exposures, this item is considered closed.

70-1151/95-05-01 IFI Compare the analytical results for gross alpha, gross beta, and isotopic uranium of a composite liquid waste sample collected in August 1995.

For a discussion of this item, refer to Section R2.05 of this inspection report. This item will be closed.

4 LIST OF ACRONYMS

ALARA As Low as is Reasonably Achievable
 ADU Ammonium Diuranate
 BMP Best Management Practices Plan
 CM² Centimeters Square
 CSEP Columbia Site Emergency Procedures
 CTS Commitment Tracking System
 CY Calendar Year
 DAC Derived Air Concentration
 DDE Deep Dose Equivalent
 DHEC Division Health and Environmental Control
 DOE Department of Energy
 DPM Disintegrations Per Minute
 EC Emergency Coordinator
 ED Emergency Director
 EPD Emergency Preparedness Division
 ERO Emergency Response Organization
 IFBA Integrated Fuel Burnable Absorber
 LLRW Low Level Radioactive Waste
 LSA Low Specific Activity
 MPC Maximum Permissible Concentration
 NMSS Nuclear Material Safety and Safeguards
 NRC Nuclear Regulatory Commission
 RG Regulatory Guide
 SC South Carolina
 SCBA Self-Contained Breathing Apparatus
 SDE Shallow Dose Equivalent
 SEP Site Emergency Plan
 SRS Savannah River Site
 TEDE Total Effective Dose Equivalent
 TLD Thermoluminescent Dosimeter
 UF₆ Uranium Hexafluoride
 URRS Uranium Recycle and Recovery Services

5. CRITERIA FOR COMPARISONS OF ANALYTICAL MEASUREMENTS

This attachment provides criteria for the comparison of results of analytical radioactivity measurements. These criteria are based on empirical relationships which combine prior experience in comparing radioactivity emission, and the accuracy needs of this program.

In these criteria, the "Comparison Ratio Limits"¹ denoting agreement or disagreement between licensee and NRC results are variable. This variability is a function of the ratio of the NRC's analytical value relative to its associated statistical and analytical uncertainty, referred to in this program as "Resolution".²

For comparison purposes, a ratio between the licensee's analytical value and the NRC's analytical value is computed for each radionuclide present in a given sample. The computed ratios are then evaluated for agreement or disagreement bases on "Resolution." The corresponding values for "Resolution" and the "Comparison Ratio Limits" are listed in the Table below. Ratio values which are either above or below the "Comparison Ratio Limits" are considered to be in disagreement, while ratio values within or encompassed by the "Comparison Ratio Limits" are considered to be in agreement.

TABLE

NRC Confirmatory Measurements Acceptance Criteria
Resolution vs. Comparison Ratio Limits

<u>Resolution</u>	<u>Comparison Ratio Limits for Agreement</u>
< 4	0.4 - 2.5
4 - 7	0.5 - 2.0
8 - 15	0.6 - 1.66
16 - 50	0.75 - 1.33
51 - 200	0.80 - 1.25
> 200	0.85 - 1.18

$$^1\text{Comparison Ratio} = \frac{\text{Licensee Value}}{\text{NRC Reference Value}}$$

$$^2\text{Resolution} = \frac{\text{NRC Reference Value}}{\text{Associated Uncertainty}}$$