UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
62 FORSYTH STREET, SUITE 23T85
ATLANTA, GEORGIA 30303-8931

March 3, 2000

Westinghouse Electric Corporation
ATTN: Mr. J. B. Allen, Manager
Columbia Plant
Nuclear Fuel Business Unit
Drawer R
Columbia, SC 29250

SUBJECT: NRC INSPECTION REPORT NO. 70-1151/2000-01

Dear Mr. Allen:

This refers to the inspection conducted on January 31 - February 4, 2000, at the Columbia Fuel Fabrication Facility. The purpose of the inspection was to determine whether activities authorized by the license were conducted safely and in accordance with NRC requirements. At the conclusion of the inspection, the findings were discussed with those members of your staff identified in the enclosed report.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observation of activities in progress.

Within the scope of the inspection, violations or deviations were not cited.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room.

Should you have any questions concerning this letter, please contact us.

Sincerely,

/RA by William B. Gloersen
acting for/

Edward J. McAlpine, Chief
Fuel Facilities Branch
Division of Nuclear Materials Safety

Docket No. 70-1151
License No. SNM-1107

Enclosure: (See Page 2)

Enclosure: NRC Inspection Report

cc w/encl:
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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	70-1151
License No.:	SNM-1107
Report No.:	70-1151/2000-01
Licensee:	Westinghouse Electric Corporation
Facility:	Columbia Fuel Fabrication Facility Columbia, SC 29250
Inspection Conducted:	January 31 - February 4, 2000
Inspectors:	R. Swatzell, Fuel Facility Inspector
Approved by:	E. McAlpine, Chief, Fuel Facilities Branch Division of Nuclear Materials Safety

Enclosure

EXECUTIVE SUMMARY

Commercial Nuclear Fuel Division
NRC Inspection Report 70-1151/2000-01

The focus of this routine, unannounced inspection was the observation and evaluation of the licensee's programs for environmental protection and waste management. The inspection also included an evaluation of the licensee's response to a previously identified issue. The report includes inspection efforts of one regional inspector. The inspection identified the following aspects of the licensee programs as outlined below:

Environmental Protection

- The licensee's environmental monitoring program was implemented in accordance with the requirements of License SNM-1107. No significant radiological contamination was observed in environmental media (Section 1.a.2).

- Technetium activity levels in groundwater monitoring wells (7, 10, 15, and 32) for 1999 had subsided from the levels experienced in 1998. No further down gradient migration of the technetium contaminated groundwater plume was observed (Section 1.a.2).

- Audits performed for the environmental program were sufficient to ensure the quality of the environmental program (Section 1.a.2).

Waste Management

- The licensee met the performance and release criteria for liquid effluents in 10 CFR Part 20 and SNM-1107 (Section 2.a.2).

- Radiological activity in liquid effluents had increased approximately 21 percent during the first half of 1999 versus last half of 1998 levels. The licensee had formulated an action plan and had implemented corrective actions in order to reduce radioactivity in liquid effluents. Preliminary data indicated that activity concentrations had been reduced to acceptable levels by implementation of the licensee's corrective actions (Section 2.a.2).

- The licensee implemented the airborne effluents monitoring program in accordance with license SNM-1107 and 10 CFR Part 20 requirements. Calculated offsite doses due to airborne radiological emissions were significantly below as low as reasonably achievable (ALARA) constraint criteria in 10 CFR Part 20 (Section 2.b.2).

- Airborne effluent sampling lines (flow rotometer) for the calciner exhaust stacks were observed to contain condensate which affected the acquisition of representative samples. Licensee equipment modifications were being implemented to correct this problem (Section 2.b.2).

- Low Level Radioactive Waste (LLRW) shipments were performed in accordance with the requirements of 10 CFR Part 20, Appendix G, and 10 CFR Part 61 (Section 2.c.2).

- The licensee made substantial progress in LLRW processing operations and in the reduction of LLRW disposal volumes (Section 2.c.2).

- LLRW storage was orderly and performed in a manner as to prevent liquid ingress or area contamination (Section 2.c.2).

Attachment:
Persons Contacted
Lists of Items Opened, Closed, and Discussed
List of Acronyms

REPORT DETAILS

1. Environmental Protection (R2)

a. Monitoring Program Implementation, Results, and Management Audits (R2.01, R2.02, and R2.03)

(1) Inspection Scope

The licensee's environmental program was reviewed to ensure that monitoring requirements were implemented in accordance with the requirements of License SNM-1107 and to determine the extent of various environmental media (groundwater, soil, vegetation, surface water, etc.) radiological contamination as a result of plant operations. The licensee's documentation of audits performed for the environmental program and for vendor laboratories was reviewed to determine the quality of the audit program and to appraise the adequacy of corrective actions taken in response to audit findings.

(2) Observations and Findings

The inspector reviewed the gross alpha, gross beta, and uranium isotopic results for annual sediment and fish samples and observed that the total uranium activities reported for the fish (0.198 picocuries/gram (ρCi/g)) and sediment (1.30 ρCi/g) samples were below the licensee action level of 10 ρCi/g. In addition, semi-annual soil and vegetation sample analyses indicated that the uranium activity levels were consistently lower than the licensee's action level of 10 ρCi/g for all four sampling locations. The inspector also noted that 1999 gross alpha activities for monthly and quarterly surface water and Congaree River samples were below the licensee's action level of 300 pCi/l. In addition, environmental air station sampling data showed that weekly activity concentrations were consistently less than the licensee's action level of 5.00E-15 microcurie per milliliter (µCi/ml). The inspector reviewed the licensee's 1999 quarterly (first three quarters) groundwater sampling results and observed that the gross beta activity levels in monitoring wells 7,10,15, 30, and 32 had exceeded the licensee's action level of 50 picocuries per liiter (pCi/l) due to a suspected technetium source term originating from the vicinity of the cylinder recertification building (CRB). As noted in a previous inspection, the licensee had performed corrective actions (CRB equipment modifications) in order to eliminate suspected leakage of solutions containing technetium from the CRB. The inspector did note that 1999 gross beta activity levels in wells 7 (571 ρCi/l), 10 (109 ρCi/l), 15 (244 ρCi/l), and 32 (1045 pCi/l) were below the average gross beta values seen in 1998. In addition, per additional groundwater data reviewed for available downgradient groundwater monitoring wells (26 and 3A), the inspector observed that the data did not indicate continued downgradient migration of the technetium contaminated groundwater plume as the beta activity levels were below the licensee action level for the monitored downgradient wells. The inspector also noted that gross alpha and gross beta activity levels in groundwater monitoring well 30 (in the vicinity of the water treatment facilities (WTFs)) had exceeded the licensee action levels of 15 ρCi/l (57 ρCi/l average alpha) and 50 ρCi/l (79 ρCi/l average beta) during the first three quarters of 1999. Well 30 has had historical contamination problems as observed

in previous inspections due to leakages from the water treatment processing area. The inspector also observed the acquisition of surface water and environmental air samples and noted that sampling equipment was well maintained and operating properly. In addition, instrument calibrations had been performed within the required time constraints (annual).

The inspector also reviewed the licensee's 1998 annual internal audit of the environmental program and the 1998 biennial audit of vendor analytical laboratories. The inspector observed that these audits were thorough, well documented, and that appropriate technical and quality assurance issues were addressed.

(3) Conclusions

The licensee's environmental monitoring program was implemented in accordance with the requirements of License SNM-1107. No significant radiological contamination was observed in environmental media. Technetium activity levels in groundwater monitoring wells (7, 10, 15, and 32) for 1999 had subsided from the levels experienced in 1998. No further down gradient migration of the technetium contaminated groundwater plume was observed. Audits performed for the environmental program were sufficient to ensure the quality of the environmental program.

2. Waste Management (R3)

a. Liquid Effluent Monitoring Results (R3.02)

(1) Inspection Scope

The inspector reviewed the licensee's liquid effluents monitoring program to verify that implementation and release criteria requirements of 10 CFR 20 and License SNM-1107 were met.

(2) Observations and Findings

Table 1 contains semi-annual liquid effluent release data for the first half of 1999 and the last half of 1998.

Table 1: Liquid Effluent Isotopic and Total Activity Released During the First Half of 1999 and the Last Half of 1998

ISOTOPE	LAST HALF OF 1998 (µCi)	FIRST HALF OF 1999 (µCi)
U-234	18,500.2	22,348.6
U-235	902.4	1,090.2
U-238	3158.6	3815.6
TOTALS	22,561.2	27254.4

As shown by the data in Table 1, the total activity released during the first half of 1999 had increased approximately 21 percent over last half of 1998 totals. In addition, the

inspector noted that liquid effluent concentrations during the first three quarters of 1999 had averaged approximately 5.0 E-07 (µCi/ml) in comparison to the unrestricted release limit goal of 3.0 E-07 µCi/ml. The licensee stated that one major reason suspected for this increase in liquid effluent concentrations was increased solubility of uranium in effluents due to acidic conditions in the East Pond. The licensee had formulated an action plan to minimize uranium activity in liquid effluents and had instituted corrective actions. The inspector noted that the October liquid effluent activity concentration had decreased to approximately 2.6 E-07 µCi/ml after completion of the licensee's corrective action of neutralization of acidic drainage to the East Pond from the de-Ionized WTF cation regeneration process. The inspector also noted that calculated offsite doses as a result of radioactivity in liquid effluents was very low (0.002 millirem/year (mRem/yr)).

(3) Conclusions

The licensee had met the performance and release criteria requirements for liquid effluents in 10 CFR Part 20 and SNM-1107. Radiological activity in liquid effluents had increased approximately 21 percent during the first half of 1999 versus last half of 1998 levels. The licensee had formulated an action plan and had implemented corrective actions in order to reduce radioactivity in liquid effluents. Preliminary data indicated that activity concentrations had been reduced to acceptable levels by implementation of the licensee's corrective actions.

b. Airborne Effluents Control, Procedures, Instrumentation, and Results (R3.03 and R3.04)

(1) Inspection Scope

The inspector reviewed the licensee's airborne effluents monitoring program to verify that the implementation and release criteria requirements of 10 CFR 20 and License SNM-1107 were met. The inspector also performed a walkdown of the licensee's various stack sampling equipment and observed the acquisition of airborne emission samples.

(2) Observations and Findings

The inspector observed that the licensee had experienced a 30 percent decrease in activity quantities in airborne effluents reported for the first half of 1999 (200.7 µCi) in comparison with total uranium (gross alpha) values reported for the last half of 1998 (292.5 µCi). The inspector reviewed the airborne effluent concentration values reported for the third quarter of 1999 in relation to the values reported during the first half of 1999 and observed consistent trending in exhaust stack concentrations. Several instances were observed where the action level concentration (approximately 3 E-12 µCi/ml) were exceeded. In each case, the licensee made appropriate corrective actions (High Efficiency Particulate Air (HEPA) filter change, etc.) in order that the concentration was adequately reduced to a small percentage (typically less than 20 percent) of the action level concentration. Doses to offsite receptors (taken at site boundary) from radiological emissions in airborne effluents were calculated to be approximately 0.01 mRem/yr for the first half of 1999 using the EPA COMPLY code. This is significantly below ALARA constraint criteria in 10 CFR 20.1101 (10 mRem/yr). The inspector also observed the

acquisition of airborne effluent particulate samples at several of the exhaust stack sampling stations. The inspector noted that the sample lines and flow rotometers from the calciner exhaust stacks had an accumulation of condensate which resulted in reduced/erratic flow through the particulate filter which could compromise sample representativeness (non-isokinetic/reduced flow) during upset conditions. The licensee stated that this problem would be investigated and corrected. This will be tracked as Inspector Followup Item (IFI) 00-01-01.

(3) Conclusions

The licensee had implemented the airborne effluents monitoring program in accordance with license SNM-1107 and 10 CFR Part 20 requirements. Calculated offsite doses due to airborne radiological emissions were significantly below ALARA constraint criteria in 10 CFR Part 20. Airborne effluent sampling lines for the calciner exhaust stacks were observed to contain condensate which caused erratic/reduced sample line flow thereby effecting the acquisition of representative samples. Licensee equipment modifications were to be made in order to correct this situation.

c. Waste Classification, Shipping, Tracking, and Storage (R3.05, 3.06, 3.08, and 3.09)

(1) Inspection Scope

The inspector reviewed the licensee's LLRW shipping program to determine if the requirements of 10 CFR Part 20, Appendix G, and 10 CFR Part 61 were met. The inspector also reviewed the licensee's waste shipping procedures for adequacy and also toured the LLRW processing and storage areas.

(2) Observations and Findings

The inspector reviewed three recent LLRW shipping manifests and noted that the shipping manifests contained the appropriate information and that wastes were properly classified in accordance with 10 CFR Part 20, Appendix G, and 10 CFR Part 61 requirements. The inspector did note that the annual audit of the LLRW program had identified that an initial error had been made in the installation of the plant uranium isotopic activity ratio (based on enrichment factor) into the Low Trac program used in the generation of waste shipping manifests. The licensee had corrected this minor error which did not impact waste shipment classification. The inspector also observed that the licensee had performed and received the appropriate notifications of shipment and receipt per LLRW shipment tracking regulatory requirements. In addition, the inspector toured the LLRW processing and storage facilities and observed that waste storage and operations were orderly and that waste inventories had been significantly reduced. The inspector observed that waste containers were appropriately labeled and no significant degradation was observed. In addition, the waste containers were stored in an acceptable environmentally controlled area and waste containers were stored in a stable configuration to prevent inadvertent breakage. The inspector also noted that the licensee had made significant progress in reducing the disposal volume of LLRW (currently 500 cubic feet per year) and that further improvements were being accomplished in the waste processing area such as an improved sponge honing system to increase the efficiency of metallic scrap decontamination and to decrease operator

exposure. The inspector also reviewed the licensee's LLRW processing and disposal procedures and noted that the procedures contained appropriate instructions for the handling, processing, disposing, and shipping of LLRW.

(3) Conclusions

The licensee was executing the LLRW shipment and tracking program in accordance with the requirements of 10 CFR Part 20, Appendix G, and 10 CFR Part 61. The licensee had made substantial progress in LLRW processing and in the reduction of LLRW disposal volumes. LLRW storage was orderly and performed in a manner as to prevent area contamination. Processing and storage procedures were adequate for control of LLRW operations.

d. Follow-up on Previously Identified Issues (R3.12)

(1) Inspection Scope

The inspector reviewed the licensee's progress on resolution of IFI 99-01-04 involving observed liquid effluent release criteria discrepancies between licensee procedures and License SNM-1107. Specifically, the discrepancies included: (1) Procedure COP-811601 stated that a limit of 24 ppm U was used as guidance for suspension of discharges to the WTF from the main chemical processing areas. The limit of 24 ppm U, or 5.5E-5 µCi/ml based on four percent U-235 content, exceeded the criteria of 3.0E-5 µCi/ml as stated in license SNM-1107. In addition, procedure RA-401 stated that a setpoint of 3.6E-5 µCi/ml for the online gamma spectroscopy system was used to automatically divert flow from the WTF to diversion tanks; and (2) Procedure COP-830509 specified that discharges from the WTF should be less than 0.2 ppm U which exceeded the license criteria of 0.05 ppm U. Per personnel, the license requirement of 0.05 ppm U was a typographical error which should have read 0.5 ppm U.

(2) Observations and Findings

The inspector noted that the licensee had submitted license amendments which: (1) changed the release criteria of 3.0 E-05 µCi/ml to "nominally less than 30 ppm uranium (7.2 E-05 µCi/ml)" for discharges to the WTF from the main chemical processing areas and (2) changed the release criteria from 0.05 ppm uranium to a "nominal limit of 0.50 ppm uranium (1.2 E-06 µCi/ml)" from the WTF. The inspector was informed that discussions were held with the NRC Fuel Cycle Licensing Branch (FCLB) concerning these license amendments. The inspector also reviewed documentation of a telephone conference in which preliminary approval to the license amendments was granted by NRC.

(3) Conclusions

The licensee had submitted appropriate license amendments to correct the procedural and license discrepancies noted in IFI-99-01-04. Tentative NRC HQ licensing approval of the license amendments have been documented by licensee personnel. IFI 99-01-04 is closed.

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee Personnel

*J. B. Allen, Vice President, US Manufacturing
*D. Goldbach, Manager, Environmental Health, and Safety
*J. Heath, Manager, Integrated Safety Engineer
J. McCormac , Waste Management
*W. Goodwin, Manager, Regulatory Affairs
*N. Parr, Manager, Chemical Process Engineering
*R. Fischer, Senior Engineer, Regulatory Engineering and Operations
E. Reitler, Fellow Engineer, Regulatory Engineering and Operations

0ther Licensee employees contacted included engineers, technicians, security and office personnel.

*Attended exit meeting on February 4, 2000.

INSPECTION PROCEDURES USED

IP 84850	Radioactive Waste Management-Inspection of Waste Generator Requirements
IP 88035	Radioactive Waste Management
IP 88045	Environmental Protection
IP 92701	Follow-up on Inspector Problems

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

IFI	00-01-01	Eliminate condensate in calcincer exhaust stack sample lines.

Closed

IFI	99-01-04	Review licensee action to correct procedural and license discrepancies involving liquid effluent release criteria. Licensee corrective actions involve the submission of license amendments to modify license liquid effluent release criteria (Section 2.d.(2)).

LIST OF ACRONYMS USED

ALARA	As Low As Reasonably Achievable
CFR	Code of Federal Regulations
CRB	Cylinder Recertification Building
HEPA	High Efficiency Particulate Air
IFI	Inspector Follow-up Item
IP	Inspection Procedure
LLRW	Low Level Radioactive Waste
µCi/ml	microcurie per milliliter
mCi	millicurie
mRem/yr	millirem/year
NRC	Nuclear Regulatory Commission
ρCi/g	picocuries per gram
ρCi/l	picocuries per liter
ppm	parts per million
SNM	Special Nuclear Material
U	Uranium
U-235	(Uranium-235)
WTF	Water Treatment Facility