



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

April 25, 2003

Westinghouse Electric Corporation
ATTN: Mr. M. Fecteau, Manager
Columbia Plant
Commercial Nuclear Fuel Division
P. O. Box R
Columbia, SC 29250

SUBJECT: NRC INSPECTION REPORT NO. 70-1151/2003-002

Dear Mr. Fecteau:

This refers to the inspections conducted during March 3, 2003 through April 4, 2003, at the Columbia Plant. The inspections were conducted to determine whether activities authorized by the license were conducted safely and in accordance with NRC requirements.

Areas examined during the inspection are identified in the report. During the inspection period, your conduct of activities at the Westinghouse facility was generally characterized by safety-conscious operations, sound engineering and maintenance practices, and careful radiological work controls.

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

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

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

Sincerely,

/RA/

David A. Ayres, 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:

Sam McDonald, Manager
 Environment, Health and Safety
 Commercial Nuclear Fuel Division
 Westinghouse Electric Corporation
 P. O. Box R
 Columbia, SC 29250

Henry J. Porter, Director
 Div. of Radioactive Waste Mgmt.
 Dept. of Health and Environmental
 Control
 Electronic Mail Distribution

R. Mike Gandy
 Division of Radioactive Waste Mgmt.
 S. C. Department of Health and
 Environmental Control
 Electronic Mail Distribution

Distribution w/encl:

D. Ayres, RII
 D. Seymour, RII
 L. Roche, NMSS
 D. Stout, NMSS
 J. Muszkiewicz, NMSS
 K. O'Brien, RIII
 W. Britz, RIV
 B. Spitzberg, RIV
 PUBLIC

OFFICE	RII:DNMS					
SIGNATURE	/RA/					
NAME	AGooden					
DATE	4/18/2003	/	/2003	/	/2003	/ /2003
E-MAIL COPY?	YES	NO	YES	NO	YES	NO
PUBLIC DOCUMENT						

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 70-1151

License No.: SNM-1107

Report No.: 70-1151/2003-02

Licensee: Westinghouse Electric Corporation

Facility: Commercial Fuel Fabrication Facility

Location: Columbia, South Carolina

Dates: March 3 through April 4, 2003

Inspector: A. Gooden, Health Physicist

Accompanying Personnel: K. Ramsey, NMSS, Project Engineer
O. Smith, RII, Physical Security Specialist

Approved By: D. Ayres, Chief
Fuel Facilities Branch
Division of Nuclear Materials Safety

Enclosure

EXECUTIVE SUMMARY

Commercial Fuel Fabrication Facility NRC Inspection Report 70-1151/2003-002

During the inspection period, activities included the evaluation of the licensee's biennial emergency response exercise, and an unannounced inspection of the radiation protection program. The inspection included an observation of activities, a review of selected records, and interviews with plant personnel.

Emergency Preparedness

- The challenges posed by the scenario and the lack of details provided to plant management (regarding the exercise date, week, or scenario) presented an excellent test of the onsite response capability. The licensee's response demonstrated an effective interface between the onsite and offsite response organizations to protect site personnel and the public (Paragraph 2.a).

Radiation Protection

- The external exposure monitoring program was implemented in a manner to maintain doses as low as is reasonably achievable. Exposures were less than the occupational limits in 10 CFR 20.1201 (Paragraph 3.a).
- Internal exposures were significantly less than the limits in 10 CFR 20.1201. However, the site airborne activity steadily increased the last quarter of calendar year 2002 and through February 2003 (Paragraph 3.b).
- Poor storage practices involving the supplied air respirator hoses resulted in approximately 85 percent of the site locations being temporarily tagged out of service (Paragraph 3.c).
- The licensee's postings provided adequate controls to communicate to workers the potential hazard and/or protective equipment requirements for working in areas (Paragraph 3.d).
- The contamination survey program was appropriately implemented to protect workers, and identify potential work areas posing an internal or external radiation hazard to workers (Paragraph 3.e).
- Management controls for tracking and trending issues were in place to provide management with details for review and taking actions as appropriate to ensure compliance with license commitments and regulations (Paragraph 3.f).

Attachment:

Persons Contacted

Inspection Procedures

List of Items Opened, Closed, and Discussed

List of Acronyms

REPORT DETAILS

1. Summary of Plant Status

During the period, normal operations were observed with powder, pellet, fuel assembly production, and routine maintenance activities. The licensee was making preparations for the annual plant inventory. All lines were operating in conversion and pelleting.

2. Emergency Preparedness (88050) (F3)

a. Drills and Exercises (F3.05)

(1) Inspection Scope

Section 7.4 of the Emergency Plan required that biennially an emergency exercise be conducted. The exercise scenario and objectives were reviewed for adequacy in testing the onsite response capability. The licensee's performance in responding to the simulated emergency and the critique to self identify areas of improvement were examined.

(2) Observations and Findings

The challenges posed by the scenario and the confidentiality employed in the performance of the exercise provided an effective tool for assessing the capability of the onsite response organization to establish a unified command with offsite agencies to manage a simulated security incident and release of radioactive materials. The licensee's performance in the scenario development and coordination with offsite participants was considered a program strength. Minor problems were noted with the exercise messages and the controller organization but did not detract from the performance of the emergency response organization.

Offsite exercise participants included Richland County Sheriff, State of South Carolina (Law Enforcement Division, Department of Health and Environmental Control, Emergency Management, and Department of Natural Resources), Columbia City Fire Department, and Palmetto-Richland Medical Center (which included air transport of a simulated injured victim by helicopter). The licensee's response to the postulated accident resulted in a prompt and effective interface between the onsite and offsite response organizations to protect site personnel and the public, and was considered a successful demonstration of an emergency response program maintained in a state of operational readiness. No program weaknesses were identified, but several observations were provided to the licensee for consideration as improvement items. One area discussed as requiring corrective actions was the lack of health physics support to the fire brigade response in the immediate area of the simulated fire/explosion, and for dose assessment in the alternate Emergency Operations Center (AEOC). The licensee described plans to conduct additional training for health physics operations personnel regarding emergency response activation, roles and responsibilities, and to revise the response activation procedures. The inspector informed the licensee that the corrective actions taken in response to the lack of health physics support to the fire brigade and AEOC would be tracked as an inspector follow up item (IFI 70-1151/2003-002-01). The licensee conducted a critique following the exercise which afforded players, controllers,

evaluators, and observers an opportunity to provide comments. The critique was a candid assessment of the response and several items were identified by the licensee for program improvement.

(3) Conclusions

The challenges posed by the scenario and the lack of details provided to plant management (regarding the exercise date, week, or scenario) presented an excellent test of the onsite response capability. The licensee's response demonstrated an effective interface between the onsite and offsite response organizations to protect site personnel and the public.

b. Follow up on Previously Identified Issues (F3.07)

(1) Inspection Scope

The inspector reviewed the licensee's tracking system for items requiring corrective actions and reviewed the corrective actions taken by the licensee in response to previous issues to determine if actions were adequate for closing the items.

(2) Observations and Findings

(Closed) IFI 70-1151/2001-09-01: Verify the adequacy of the licensee's corrective actions to resolve the weaknesses identified during the exercise.

The licensee conducted drills during July and September 2002 to determine if previous weaknesses were resolved. Based on licensee evaluations no problems were noted. Further, during the NRC evaluated exercise held on March 4, 2003, no examples of previous weaknesses were identified.

(Closed) IFI 70-1151/2002-06-01: Verify corrective actions to review and update the pre-fire plan.

The inspector interviewed the manager with responsibility for the pre-fire plan and reviewed revisions to show that the updates were done. The inspector found that the updated plan was a significant improvement over previous versions and adequately depicted information needed to assist fire brigade personnel in responding to incidents.

(3) Conclusions

The licensee actively maintained a system known as Corrective Actions Process (CAPs) for follow up on corrective action commitments. Based on corrective actions completed or implemented, the inspector determined that adequate actions were taken for closure of the above items.

3. Radiation Protection (83822) (R1)

a. External Exposure Control (R1.04)

(1) Inspection Scope

The inspector reviewed radiation protection procedures, and discussed with licensee representatives personnel exposure data to determine if exposures were in compliance with 10 CFR Part 20.1201 limits, and if controls were in place to maintain occupational doses As Low As Reasonably Achievable (ALARA).

(2) Observations and Findings

Based on interviews, procedural reviews, and observations of plant personnel inside radiation control areas, the licensee's monitoring program was consistent with requirements in 10 CFR Part 20. Table 1 below displays the maximum assigned exposure data for calendar years (CY) 2001 and 2002. The maximum assigned deep dose was reduced approximately 38 percent; however, the maximum assigned extremity dose increased approximately 45 percent, and the plant average external exposure increased slightly (0.272 rem to 0.286 rem) for CY 2002 when compared to CY 2001. The licensee attributed the increase in external exposures to the following factors which were under review: the sensitivity of the optically stimulated luminescent dosimeter, badge storage practices, and material handling by workers. Several actions were being considered by the ALARA committee to ensure that exposures subsequent to CY 2002 will be less than 1.50 rem annually.

Table 1. Annual Exposures

Year	Deep Dose Equivalent (DDE)	Maximum Dose Extremity (MDE)	Total Effective Dose Equivalent (TEDE)	Collective TEDE (person-rem)	Committed Effective Dose Equivalent (CEDE)
2001	1.41 rem	10.31 rem	1.82 rem	343 person-rem	0.788 rem
2002	1.03 rem	18.73 rem	1.57 rem	279 person-rem	0.771 rem

(3) Conclusions

The external exposure monitoring program was implemented in a manner to maintain doses ALARA. Exposures were less than the occupational limits in 10 CFR 20.1201.

b. Internal Exposure Control (R1.05)

(1) Inspection Scope

The inspector reviewed licensee procedures for assessing internal exposure to determine if controls were in place to monitor occupational doses, and verify that the administrative limits were established to control occupational dose ALARA. Exposure data was examined to determine if exposures resulting from various plant operations exceeded limits in 10 CFR Part 20.

(2) Observations and Findings

Since the last inspection, the licensee was granted a license amendment from NRC to use the annual limit on intake (ALI) and derived air concentration (DAC) values based on dose coefficients adopted by the International Commission on Radiological Protection (ICRP) as published in ICRP Publication 68. The ICRP 68 methodology was implemented in January 2002. The results shown above in Table 1 were calculated based on ICRP 68. The maximum assigned TEDE was reduced approximately 14 percent; but only a slight reduction in the maximum assigned CEDE (0.788 rem to 0.771 rem) for CY 2002 when compared to CY 2001. The procedures contained action limits which were set below federal limits to ensure personnel exposures did not exceed occupational limits in 10 CFR 20.1201. Table 1 above presents the maximum assigned committed effective dose equivalent (CEDE). The inspector informed the licensee that although exposure results indicated a reduction in CY 2002, the site airborne activity remained a significant challenge in that the average percent of DAC steadily increased the last quarter of CY 2002 and thus far in 2003 (as of February). The licensee attributed the increase to potential operator errors or equipment malfunctions, and discussed several improvements (engineered features, administrative controls, etc.) planned for CY 2003 to reduce the airborne activity.

(3) Conclusions

Internal exposures were significantly less than the limits in 10 CFR Part 20.1201. However, the site airborne activity steadily increased the last quarter of CY 2002 and through February 2003.

c. Respiratory Protection (R1.06)

(1) Inspection Scope

Respiratory protection equipment issuance, storage, maintenance, and training verification was examined for adequacy in assuring that equipment was being adequately maintained and obtained by certified users only.

(2) Observations and Findings

Interviews with operators and engineers disclosed that software enhancements to the electronic training and procedure system (ETAPS) improved both the capability for

assigning dose based on respirator use and the tracking and verification of respirator training qualification for authorized users. No examples were observed of unauthorized use of equipment by untrained personnel or workers with expired training. An example was noted where poor health physics practices associated with the storage of a supplied air respirator hose may have resulted in low level contamination of the free end of hose. The inspector noted that a hose was left lying on a potentially contaminated floor inside the bulk blending area, and requested that the licensee smear the free end of the hose for removable contamination. In response, the licensee took prompt actions to survey free ends of supplied air hoses plant wide. From a total of 100 locations surveyed, approximately 85 percent exceeded the limits for removable contamination and required decon. All locations were temporarily tagged out of service for cleaning and/or replacement of the hose couplings and protective end caps. As corrective actions, the licensee discussed training users on the proper storage of air-line hose and performing periodic contamination surveys of the free end of hoses. Based on the exposure data, the presence of removable contamination did not have significant impact on exposures.

(3) Conclusions

Poor storage practices involving the supplied air respirator hoses resulted in approximately 85 percent of the site locations being temporarily tagged out of service.

d. Postings, Labeling, Control (R1.07)

(1) Inspection Scope

The inspector reviewed the licensee's program for posting as required by 10 CFR 19.11 to determine if documents were posted in sufficient places to permit individuals engaged in licensed activity to observe them. Several work locations were examined to determine if radioactive containers were properly labeled and to assess the adequacy of contamination control barriers and posting of radiation areas as required by 10 CFR 20.1902. Radiation Chemical Work Permits (RCWP) were reviewed to determine the adequacy of the requirements posted for worker protection and the degree to which those requirements were being implemented.

(2) Observations and Findings

Bulletin boards were posted such that workers may observe documents or obtain details as to where documents may be examined.

All observed work areas involving radioactive material or potentially contaminated material were properly posted and containers labeled. One area discussed with the licensee regarding posting was the vicinity surrounding the Uranium Hexafluoride (UF₆) cylinders shipping dock platform. Documentation from a quarterly gamma radiation survey in November 2002, indicated that radiation levels measured were equivalent to levels for posting as a radiation area. During the inspection, the inspector interviewed the technician who performed the survey and discussed taking surveys to determine the radiation level at the time of the inspection. The results were again equivalent to levels for posting as a radiation area. In response, the licensee posted the area as a potential

radiation area based on the impact from the cylinder inventory. Randomly selected active and closed RCWP were reviewed for adequacy in providing the appropriate level of protection to workers. No problems were noted.

(3) Conclusions

The licensee's posting provided adequate controls to communicate to workers the potential hazard and/or protective equipment requirements for working in areas.

e. Surveys (R1.08)

(1) Inspection Scope

The contamination control survey program was reviewed to determine if surveys were effective in the identification of contamination and performed in accordance with procedures.

(2) Observations and Findings

The results disclosed that the routine surveys were adequate in the identification of potentially contaminated areas. During plant tours, the inspector noted examples of poor housekeeping as evidenced by visual gross contamination on an equipment cart, and as discussed above regarding the inappropriate storage of the supplied air respirator airline hose.

(3) Conclusions

The contamination survey program was appropriately implemented to protect workers, and identify potential work areas posing an internal or external radiation hazard to workers.

f. Management Oversight of Program (R1.11)

(1) Inspection Scope

The inspector reviewed the adequacy of management controls for tracking and trending issues.

(2) Observations and Findings

The inspector determined that NRC and licensee identified issues were tracked via a plant-wide system known as the Corrective Action Process (CAPs). CAPs printouts were provided to plant management for review to ensure the appropriate priority was being assigned to items.

(3) Conclusions

Management controls for tracking and trending issues were in place to provide management with details for review and taking actions as appropriate to ensure compliance with license commitments and regulations.

3. Exit Interview

The biennial exercise results were discussed on March 4, 2003, and the scope and results for the radiation protection inspection were summarized on April 4, 2003, with those persons indicated in the Attachment. Although proprietary documents and processes were occasionally reviewed during this inspection, the proprietary nature of these documents or processes has been deleted from this report. No dissenting comments were received from the licensee.

ATTACHMENT

1. LIST OF PERSONS CONTACTED

Licensee

C. Aguilar, Senior Engineer, Environmental Health and Safety
D. Allison, Quality Assurance Engineer, Environmental Health and Safety
J. Campbell, Manager, Human Resources
W. Dougherty, Manager, TMP/HH Group
M. Fecteau, Plant Manager
D. Gadberry, Supervisor, Security
J. Heath, Project Manager, Environmental Health and Safety
M. Linder, Team Manager, Conversion
S. McDonald, Manager, Environmental Health and Safety
R. Monley, Manager, Operations
G. Page, Manager, Maintenance
C. Perkins, Manager, Continuous Improvement
T. Shannon, Operations Manager, Environmental Health and Safety
P. Stroud, Manager, Security

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

Other Organizations

B. Huckins, South Carolina Emergency Management
R. Kinney, South Carolina Department of Health and Environmental Control
S. Threatt, South Carolina Department of Health and Environmental Control

2. INSPECTION PROCEDURES USED

IP 83822 Radiation Protection
IP 88050 Emergency Preparedness

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Item Number</u>	<u>Status</u>	<u>Description</u>
70-1151/2001-09-01	Closed	IFI - Verify the adequacy of the licensee's corrective actions to resolve the weaknesses identified during the exercise (Paragraph 2.b).
70-1151/2002-06-01	Closed	IFI - Verify corrective actions to review and update the pre-fire plan (Paragraph 2.b).

<u>Item Number</u> (cont'd)	<u>Status</u>	<u>Description</u>
70-1151/2003-02-01	Open	IFI - Verify corrective actions taken in response to the lack of health physics support to the fire brigade and AEOC. (Paragraph 2.a).

4. LIST OF ACRONYMS USED

AEOC	Alternate Emergency Operations Center
ALARA	As Low As Reasonably Achievable
ALI	Annual Limit On Intake
CAP	Corrective Action Process
CEDE	Committed Effective Dose Equivalent
CFR	Code of Federal Regulation
CY	Calendar Year
DAC	Derived Air Concentration
DDE	Deep Dose Equivalent
ETAPS	Electronic Training and Procedure System
ICRP	International Commission on Radiological Protection
IFI	Inspector Followup Item
MDE	Maximum Dose Extremity
RCWP	Radiation Chemical Work Permit
TEDE	Total Effective Dose Equivalent
UF ₆	Uranium Hexafluoride
VIO	Violation