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

May 29, 2008

EA-08-165
NRC Event No. 43981

Mr. Cary Alstadt
Manager, Columbia Plant
Westinghouse Electric Company
Commercial Nuclear Fuel Division
Drawer R
Columbia, SC 29250

SUBJECT: NRC INSPECTION REPORT 70-1151/2008-002

Dear Mr. Alstadt:

This letter refers to a reactive inspection conducted on February 14-15, 2008, and a routine inspection conducted on February 25–28, 2008, at the Columbia Fuel Fabrication facility. The purpose of the reactive inspection was to assess the facts and circumstances surrounding an unauthorized removal of several vials of enriched uranium hexafluoride from a controlled area. In addition, a routine inspection was performed to review the radiation protection program to determine whether activities authorized by the license were conducted in accordance with NRC requirements.

The inspection consisted of an examination of activities conducted under the license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of the license. Areas examined during the inspection are identified in the enclosed report. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations of activities in progress, and interviews with personnel.

Based on the results of this inspection, the NRC has identified three apparent violations (AVs) of NRC requirements which are being considered for escalated enforcement action in accordance with the NRC Enforcement Policy. The current Enforcement Policy is located on the NRC's Web site at http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html. The apparent violations discussed in this report involved: (1) the failure to secure from unauthorized removal or access several P-10 vials of uranium hexafluoride that were stored in a controlled area, and failure to control and maintain constant surveillance of the samples vials when they were not in storage, as required by 10 CFR 20.1801 and 20.1802; (2) an individual failed to sign in ETAPS as an End User that he had read and acknowledged the procedure governing the disposal of empty shipping containers, as required by Columbia Plant Administrative Procedure CA-002; and (3) failure to log the tracking number along with the vendor name and carrier identification on a log sheet and failure to obtain a signature from the receiver of the package on the log sheet, and failure to confirm that the shipping container and shipping materials were

free of contamination before discarding cans containing several P-10 vials of uranium hexafluoride, as required by Product Storeroom Operating Procedure ST 005 and ST 011, and Quality Control Instructions QCI No. 119906. The circumstances surrounding these apparent violations, the significance of the issues, and our evaluation of your corrective actions were discussed with you and members of your staff on February 15 and 28, 2008, and by telephone on April 29, 2008.

Before the NRC makes its enforcement decision, we are providing you an opportunity to either: (1) respond to the apparent violations addressed in this inspection report within 30 days of the date of this letter, or (2) request a pre-decisional enforcement conference. If a conference is held, it will be open for public observation. The NRC will issue a press release to announce the conference. Please contact Daniel W. Rich (404-562-4721) or Richard Gibson, Jr. (404-562-4718) within seven days of the date of this letter to notify the NRC of your intended response.

If you choose to provide a written response, it should be clearly marked as a "Response to Apparent Violations in Inspection Report No. 70-1151/2008-002; EA-08-165" and should include for each apparent violation: (1) the reason for the apparent violation, or, if contested, the basis for disputing the apparent violation; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken to avoid further violations; and (4) the date when full compliance will be achieved. In presenting your corrective actions, you should be aware that the promptness and comprehensiveness of your actions will be considered in assessing any civil penalty for the apparent violations. The guidance from NRC Information Notice 96-28, "Suggested Guidance Relating to Development and Implementation of Corrective Action," may be helpful. Your response may reference or include previously docketed correspondence, if the correspondence adequately addresses the required response. If an adequate response is not received within the time specified or an extension of time has not been granted by the NRC, the NRC will proceed with its enforcement decision or schedule a predecisional enforcement conference.

In addition, please be advised that the number and characterization of apparent violations described in the enclosed inspection report may change as a result of further NRC review. You will be advised by separate correspondence of the results of our deliberations on this matter.

In accordance with 10 CFR 2.390 of NRC's "Rules of Practice," a copy of this letter and its enclosure will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agency-Wide Document Access and Management System (ADAMS) on the Internet at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, if you choose to respond, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

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

Sincerely,

/RA/ M. Layton for

Joseph W. Shea, Director
Division of Fuel Facility Inspection

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

Enclosure: NRC Inspection Report 70-1151/2008-002

cc w/encl:
Marc Rosser, Manager
Environment, Health and Safety
Commercial Nuclear Fuel Division
Electronic Mail Distribution

Susan Jenkins, Section Leader
Division of Waste Management
Bureau of Land and Waste Management
Electronic Mail Distribution

Distribution w/encl:
D. Rich, RII
R. Gibson, RII
C. Evans, RII
P. Habighorst, NMSS
N. Rivera, NMSS
M. Adams, NMSS
OE Mail
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*see previous concurrence

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ADAMS: X Yes ACCESSION NUMBER:_____

OFFICE	RII:DFFI	RII:DFFI	RII:EICS				
SIGNATURE	DR 5/29/08	RG 5/27/08	CE 5/29/08				
NAME	DRich	RGibson*	CEvans*				
DATE	05/ /2008	05/ /2008	05/ 2008	05/ /2008			
E-MAIL COPY?	YES	YES	YES	YES	YESNO	YESNO	YESNO

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	70-1151
License No.:	SNM-1107
Report No.:	70-1151/2008-002
Licensee:	Westinghouse Electric Company
Facility:	Columbia Fuel Fabrication Facility
Location:	Drawer R Columbia, SC 29250
Date:	February 14-15 and February 22- 28, 2008
Inspectors:	Richard Gibson, Jr., Senior Fuel Facility Inspector Nick Peterka, Student Engineer
Approved by:	Daniel W. Rich Chief Fuel Facility Inspection Branch 3 Division of Fuel Facility Inspection

Enclosure

EXECUTIVE SUMMARY

Commercial Nuclear Fuel Division
NRC Inspection Report 70-1151/2008-02

A reactive inspection was conducted at the Westinghouse Columbia facility to assess the facts and circumstances surrounding an unauthorized removal of several vials of enriched uranium hexafluoride from a controlled area. Additionally, a routine, announced inspection was conducted in the area of radiation protection. The inspections involved observation of work activities, a review of selected records and procedures, and interviews with plant personnel.

Unauthorized Removal of UF6 Vials Event Description

- On February 11, 2008, the licensee discovered that 16 P-10 sample vials of uranium hexafluoride (UF6) could not be located. The samples were received by the licensee on February 4, 2008. A search did not locate the samples on site, at a scrap metal yard, or at a local landfill (Paragraph 2.b.).

- Three apparent violations (AVs) were identified related to the unauthorized removal of several P-10 vials of uranium hexafluoride from a controlled area. The AVs involved the following: (1) the failure to secure from unauthorized removal or access several P-10 vials of uranium hexafluoride that were stored in a controlled area, and failure to control and maintain constant surveillance of the samples vials when they were not in storage; (2) the failure of an individual to sign in ETAPS as an End User that he has read and acknowledged the procedure governing the disposal of cans containing several P-10 vials of uranium hexafluoride; and (3) the failure to log the tracking number along with the vendor name, and carrier identification on the log sheet and failed to obtain a signature from the receiver of the package on the log sheet, and failure to confirm that the shipping container and shipping materials were free of contamination before discarding shipping containers (Paragraph 2.a.).

Radiation Protection

- The external and internal exposure monitoring program was implemented in a manner that maintained doses as low as reasonably achievable (ALARA) and within the limits of 10 CFR 20.1201. The licensee determined that there was a 20% reduction in exposure from calendar year 2006 to calendar year 2007 (Paragraph 3.a.).

- Radiation protection program self-assessments and procedure changes were implemented in accordance with the license requirements (Paragraph 3.b.).

- Respiratory protection equipment issuance, maintenance, and training had been adequately implemented (Paragraph 3.c.).

- Radiological control practices such as posting, radiation work permits (RWPs) and labels were adequate and generally met regulatory requirements (Paragraph 3.d.).

- The radiation survey program was adequately implemented (Paragraph 3.e.).

Attachment:
Partial Listing of Persons Contacted
List of Items Opened, Closed and Discussed
Inspection Procedures Used

REPORT DETAILS

1. Summary of Plant Status

The Westinghouse Facility fabricates low-enriched uranium fuel into fuel assemblies for use in both pressurized and boiling water reactors. This report describes a loss of custody of a small amount of special nuclear material. During the inspection period, there were no plant upsets or other unusual operational occurrences.

2. Event Description

a. Loss of Special Nuclear Material

(1) Scope and Observations

On February 11, 2008, during preparation of receipt transaction documentation, Westinghouse Electric Company Environmental, Health & Safety (EH&S) personnel discovered that sixteen P-10 sample vials of uranium hexafluoride (UF6) could not be located. A search could not locate the vials and/or the shipping containers in the Chemical laboratory or onsite. Westinghouse, on February 12, 2008, notified the NRC, the SC Department of Health and Environmental Control, and the Richland County Emergency Center. The vials contained a total of 128 grams (about 4.5 ounces) of uranium, enriched to 4.95 wt%, of which 6 grams were uranium 235. The total activity was calculated to be approximately 409.4 micro-curies.

It was determined that at approximately 11:45 a.m. on February 4, 2008, Shipping and Receiving (S/R) received several UF6 samples. The samples were shipped in three containers, two of which were 5 gallon cans and the other was a box containing a five gallon can. One of the can's lids was damaged and had a broken seal. The S/R clerk then called Health Physics (HP) to survey the cans and the box, which is standard procedure for any cans or boxes containing samples.

An HP technician surveyed the cans at approximately 12:00 noon and released the packages for delivery to the Chemical laboratory after notifying the EH&S Operations Manager. The EH&S Manager informed the chemical laboratory of the damaged can. An S/R clerk delivered the samples to the lab between 1:00 p.m. and 2:00 p.m. but was unable to obtain a receipt signature as required by the procedure because no one was in the lab at the time. The cans and the box were placed in the lab office area across from the Chemists' cubicles. Product Storeroom Operating Procedure ST 005, Section 1.7A and ST 011, Rev. 3, Section 1.8 required the tracking number, the vendor name, carrier identification, and any pertinent information to be logged on CF-ST-001 (log sheet), and to obtain a receipt signature from the receiver of the package. The failure to follow the procedures by the S/R clerk was identified as an Apparent Violation (AV) (AV 70-1151/2008-002-01).

Sometime after 2:00 p.m., on February 4, 2008, one of the Chemists stated that he spoke with the first shift Team Manager (TM) about the samples when he overheard the TM handling the cans. His intent was to caution the TM about the cans and convey the EH&S Manager concern about the damaged can and to be careful when opening it. The

TM assured the Chemist that every thing was okay. Because of this assurance, the Chemist did not question the TM any further. The first shift TM saw the broken seals on the cans in the office area and decided to remove the cans on his next trip out of the lab. The TM removed the lid of the undamaged can, looked inside of it, and saw the packing material but did not frisk the inside of that can as required by the procedure. He then frisked the outside of the damaged can, but he did not remove the damaged can's lid. Quality Control Instructions, QCI No. 119906, Rev. 11, Section 1.A.6, requires the performer to confirm the shipping container and shipping materials are free of contamination by surveying the inside and the outside of the shipping container before discarding. The failure of the TM to confirm the shipping container and material were free of contamination before discarding was identified as a second example of AV (AV 70-1151/2008-002-01).

Sometime between 2:00 p.m. and 4:10 p.m., on February 4, 2008, the TM surveyed one of the cans, removed the labels and transferred the two cans from the lab office area to dock #11 behind the cafeteria for disposal with normal trash. He did not remove the adjacent box that contained another set of samples. One of the Chemists saw the damaged can on dock #11 that same day. He noticed the damaged can's broken seal. According to the licensee, there were no additional sightings of the cans since. At 11:19 a.m. on February 4, 2008, the third shift Chemical lab TM arrived for work. He stated there were no cans in the lab when he arrived for work that night. 10 CFR Parts 20.1801 and 20.1802 require the licensee to secure from unauthorized removal or access licensed materials and to control and maintain constant surveillance of licensed material. The failure to secure from unauthorized removal and to control and maintain constant surveillance of licensed material was identified as an AV (AV 70-1151/2008-002-02).

The licensee reviewed the first shift TM's training record and determined that he had not signed off in ETAPS as an End User qualifying him to conduct surveys and discard the cans in accordance with procedures. Columbia Plant Administrative Procedure, CA-002, Rev. 33, Section 3.13 requires ETAPS End Users must read and then acknowledge procedures governing their job responsibilities in ETAPS before performing work. The failure of the TM to read and acknowledge procedures governing the disposal of empty shipping containers was identified as an AV (AV 70-1151/2008-002-03).

(2) Conclusion

Three AVs were identified in the following areas: failure to follow procedures for custody of licensed material, and failure to confirm shipping containers were free of contamination prior to discard; failure to prevent unauthorized removal of licensed material from a controlled area, and failure to control and maintain constant surveillance of licensed material; and failure to read and sign procedures for handling and disposal of shipping containers.

b. Event Response and Root Cause Evaluation

(1) Scope and Observations

On the morning of February 12, 2008, after determining that the samples could not be located, Westinghouse initiated an effort to locate the missing samples. The Nuclear Material Control Technician went to Transportation to obtain the equivalent of a tracking number, and she sent the EH&S trainee to S/R to look for the samples. There were no samples at S/R. They then went to Transportation to get confirmation that the samples had arrived. They were told that samples had come in on February 4, 2008. They then went to the Chemical laboratory and talked with one of the Chemists and the Lab Technician who generally handles the UF6 samples, and determined that the samples never made it to the lab area where they are normally processed.

On February 12 and 13, 2008, Westinghouse dispatched EH&S HP personnel for an all out search through out the plant for the samples. The search also continued at a scrap metal recycling facility in Columbia, SC, a metal shredding facility in Spartanburg, SC, and a Waste Management landfill (Richland Landfill) in Elgin, SC. The EH&S HP conducted a visual search and a radiation survey of the scrap metal yard, the shredding facility and the waste landfill and did not detect radiation or radioactivity at those sites.

On February 14 and 15, 2008, the NRC staff from the Region II Division of Fuel Facility Inspection and the SC Department of Health and Environmental Control conducted a walk through, and interviewed workers and managers at the shipping and receiving area, the Chemical laboratory and personnel handling the laundry near the cafeteria and dock #11. It was determined from review of records, discussions with licensee's staff and from the tour of the plant that the samples were surveyed by HP at S/R and delivered from shipping and receiving to the office area of the chemical laboratory. There were no evidences that the samples were transferred from the office area into the processing area of the lab. The NRC staff toured the scrap metal yard in Columbia and the waste landfill in Elgin, interviewed workers and yard managers who stated that they had not identified any containers matching the samples' containers. A visual inspection and a radiation survey of the areas by the inspector did not detect radiation or radioactivity at those sites. The SC Department of Health and Environmental Control will determine if the landfill must be subject to additional search or remediation.

The licensee employed a contractor to perform a risk assessment of leaving the material in place. The contractor concluded that if the UF6 sample tubes were improperly disposed of in the Richland County Landfill the potential radiation and chemical exposure risks posed by the UF6 sample tubes would be small when compared to exposure guidelines and natural background radiation levels. NRC staff concurred with the evaluation.

The staff reviewed the licensee's root cause evaluation of the cause of the event. The licensee determined that the root cause was that the chemistry lab TM was not qualified and was careless when he performed the task of disposing of the cans. Corrective

actions to prevent recurrence of the event included several actions to strengthen procedures for disposal of shipping containers. Also, a plant wide management stand down on procedure compliance was conducted, followed by a stand down with all qualified employees outlining expectations for handling UF6 sample cans and procedural compliance. Additionally, procedures for signature receipt for internal transfer of licensed material and verification of tamper seal condition upon receipt were revised. The NRC staff concurred with the licensee's root cause evaluation.

(2) Conclusion

On February 11, 2008, the licensee discovered that 16 P-10 sample vials of UF6 could not be located. The samples were received by the licensee on February 4, 2008. A search on February 12 and 13, 2008, did not locate the samples onsite, at a scrap metal yard, or at a local landfill.

3. Radiation Protection

a. Internal/External Exposure Control

(1) Scope and Observations

The inspector reviewed personnel exposure data to verify that exposures were maintained as low as reasonably achievable (ALARA) and within the limits of 10 CFR 20.1201. Table 1 displays the maximum assigned exposure data for calendar years (CYs) 2006 and 2007. The doses were well below the regulatory limits requiring monitoring. The licensee continued to experience reduction in exposures at the plant, and attributed the reduction to engineering controls, frequent oversight by EH&S, awareness training, and better lighting and housekeeping. The maximum total effective dose equivalent (TEDE) for 2007 was 0.891 rem. The inspector reviewed the program for monitoring exposures and determined that the exposure control program was adequately implemented.

The inspectors observed individuals throughout the chemical areas wearing the appropriate dosimeters and personal protective equipment (PPE). The inspector reviewed the licensee's bioassay program and concluded that it was effectively maintained to control internal exposure. The inspector noted that the internal exposure to personnel was less than ten percent of the occupational limits in 10 CFR 20.1201 at the facility.

Table 1. Maximum Annual Dose Data

Year/Facility Location		Deep Dose Equivalent (DDE)-rem	Shallow Dose Extremity (SDE)-rem	Total Effective Dose Equivalent (TEDE)-rem	Collective TEDE (person-rem)	Committed Effective Dose Equivalent (CEDE) – rem
2006	WEC Chem Area	0.762	5.365	1.141	218	0.813
2007*	WEC Chem Area	0.679	4.384	0.891	180	0.699

Reporting period from1/1/07 through 12/31/07, the data for 2007 was current at the time of the inspection.

(2) Conclusions

The external and internal exposure monitoring program was implemented in a manner that maintained doses ALARA. Exposures were less than the occupational limits in 10 CFR 20.1201.

b. Radiation Protection Program Audits

(1) Scope and Observations

The inspector reviewed the Radiation Protection (RP) program self-assessments. Self-assessment findings were captured and tracked in the licensee corrective action program system. Quarterly observations and management audits were provided to the ALARA Committee. The inspector reviewed operating procedures for the HP technicians and noted that changes to the procedures were up to date, and the changes were included in the employee training.

(2) Conclusions

RP program self-assessments and procedure changes were implemented in accordance with the license requirements

c. Respiratory Protection

(1) Scope and Observations

Respiratory protection equipment issuance and training were examined and determined adequate to ensure respiratory protection equipment was only obtained by certified users. The inspector reviewed RWPs, observed radiological surveys, and noted

radiological precautions, and general work practices during plant walk downs. The inspector reviewed medical evaluations, fit-testing, training, cleaning and respirator storage records. The inspector determined that the licensee maintained appropriate records and controls to demonstrate adequate implementation of the program.

The licensee staff discussed the respirator issuance process and demonstrated how a fit test would be performed on individuals before assigning respirators. During a tour of the facility, the inspector observed several individuals at various plant locations using respirators as required by the RWP or operating procedure for the areas. The inspector examined several storage locations and determined that respirators were adequately stored and maintained.

(2) Conclusions

Respiratory protection equipment issuance, maintenance, and training were adequately implemented.

d. Postings, Labeling and Control

(1) Scope and Observations

The radiological posting program was reviewed and radiation work was observed in accordance with RWPs and operating procedures. Equipment and devices used to confine and contain radioactive contamination and airborne radioactivity were in proper working condition, and PPE and dosimetry were properly worn as required by the RWPs. Several work locations were examined to determine if radioactive containers were properly labeled, and to assess the adequacy of the licensee's compliance with 10 CFR 20.1902, Posting Requirements

(2) Conclusions

Radiological control practices such as posting, RWPs and labels were adequate and generally met regulatory requirements.

e. Surveys, Instruments and ALARA Program

(1) Scope and Observations

The inspector reviewed survey documentation and observed technicians performing surveys in accordance with the procedures. During tours of the plant, the inspector observed radiation technicians conducting job coverage of posted RWPs and collecting fixed air samples for analysis. The inspector reviewed survey documentation and observed technicians performing surveys in accordance with the procedures.

Instruments observed by the inspector were operable and their calibrations were current. The inspector reviewed the licensee's CAPs system and interviewed staff members regarding their use of the system. The inspector verified the licensee took immediate and effective actions for radiation and contamination control problems identified in CAPs.

The ALARA program was reviewed and implemented in accordance with the license. The 2006 ALARA annual report was reviewed by management, and included detailed ALARA goals and exposure summaries to identify undesirable exposure trends.

(2) Conclusions

The contamination survey, radiation instrumentation calibration and maintenance, and the ALARA programs were adequately implemented to protect workers.

4. Follow-up Items

(a) IFI 70-1151/2005-08-02

This item involved the inability to clearly hear the voice communication system (VCS) in the conversion area during normal operation. During discussion with the licensee, the licensee indicated that modifications were made to the VCS, in that, it was clearer in the conversion area. The licensee performed sound and ambient noise studies of existing plant speaker system and identified areas requiring improvement. New speakers were installed and successfully passed audible tests. This IFI is considered closed.

(b) VIO 70-1151/2007-02-01

This item involved the failure to wear adequate PPE while working in a potential HF environment. The glove sleeve length to the containment was not long enough to protect the coveralls which left the forearm exposed to HF. Management and operators did not know PPE was inadequate because PPE had always been adequate for the task the operators were performing. The licensee implemented the use of adequate shoulder length gloves that adhere to the sleeve. This VIO is considered closed.

5. Exit Meeting Summary

The inspection scope and results were summarized on February 15 and 28, 2008, and discussed with the licensee in a telephone exit on April 29, 2008. The inspector described the areas inspected and discussed the inspection results in detail. Although proprietary documents and processes were reviewed during this inspection, the proprietary nature of these documents or processes is not included in this report. No dissenting comments were received from the licensee.

ATTACHMENT

1. PARTIAL LIST OF PERSONS CONTACTED

Cary Alstadt, Plant Manager
Marc Rosser, Manager, Environment, Health and Safety
Jim Heath, Health Physicist, EH&S
Gerard Couture, Environment, Health and Safety
Ralph Winiarski, Manager, Nuclear Criticality Safety Engineer
Tommy Shannon, Supervisor, EH&S
Dane Graham, Criticality Technician, EH&S
Bruce Phillips, Manager, Conversion
Dave Precht, Manager, Operations
Phill Stroud, Security Manager
Tommy Gregg, Manager, URRS

2. INSPECTION PROCEDURES USED

IP 88030	Radiation Protection
IP 88003	Reactive Inspection For Events at Fuel Cycle Facilities Program

3. ITEMS OPENED, CLOSED, AND DISCUSSED

Item Number	Status	Type	Description
70-1151/2007-02-01	Closed	VIO	Failure to wear adequate PPE while working in a potential HF environment
70-1151/2005-08-02	Closed	IFI	Inability to Clearly Hear the VCS in the Conversion Area During Normal Operation
70-1151/2008-02-01	Opened	AV	Failure to conduct transfer of SNM samples as required by procedure, and failure to conduct required surveys of empty shipping containers
70-1151/2008-02-02	Opened	AV	Failure to prevent unauthorized removal and failure to control and maintain surveillance of licensed material
70-1151/2008-02-03	Opened	AV	Failure to read and acknowledge procedures governing job responsibilities