



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

February 7, 2003

NMED Nos. 020622, 020843, 020896

Westinghouse Electric Company  
ATTN: Mr. M. Fecteau, Manager  
Columbia Plant  
Commercial Nuclear Fuel Division  
Drawer R  
Columbia, SC 29250

**SUBJECT: NRC INSPECTION REPORT NO. 70-1151/2003-001 AND NOTICE OF VIOLATION**

Dear Mr. Fecteau:

This refers to the inspections conducted on January 6-10, 2003, at the Columbia Nuclear Fuel Plant. The purpose of these inspections was to determine whether activities authorized by the licensee were conducted safely and in accordance with NRC requirements. At the conclusion of each of these inspections, 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, certain of your activities appeared to be in violation of NRC requirements, as specified in the enclosed Notice of Violation (Notice). The violation involved a failure to comply with posted nuclear criticality safety limits in the Integrated Fuel Burnable Absorber area. The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence is already adequately addressed on the docket in the enclosed inspection report. Therefore, you are not required to respond to this violation unless the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to provide additional information, you should follow the instructions specified in the enclosed Notice.

In accordance with 10 CFR 2.790 of NRC's "Rules of Practice," a copy of this letter and its enclosures will be available electronically for public inspection in NRC's 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 BY WILLIAM B. GLOERSEN  
ACTING FOR/**

David Ayres, Chief  
Fuel Facilities Branch  
Division of Nuclear Materials Safety

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

Enclosures: 1. Notice of Violation  
2. NRC Inspection Report

cc w/encls:  
Sam McDonald, Manager  
Environment, Health and Safety  
Commercial Nuclear Fuel Division  
Westinghouse Electric Corporation  
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## NOTICE OF VIOLATION

Westinghouse Electric Company, LLC  
Columbia, SC

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

During an NRC inspection conducted on January 6-10, 2003, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedures for NRC Enforcement Actions," NUREG-1600, the violation is listed below:

Safety Condition No. S-1 of Special Nuclear Material License No. 1107, requires that material be used in accordance with statements, representations, and conditions in the License Application dated April 30, 1995, and supplements thereto.

Section 3.4.1 of the License Application requires that operations to assure safe, compliant activities involving nuclear material will be conducted in accordance with approved procedures.

Section 4.1.B of the Environment, Health and Safety Criticality Procedure, RA-302, Revision 10, dated September 19, 2002, titled "Criticality Signs," requires compliance with criticality control parameters and instructions on criticality signs.

Nuclear Criticality Safety Posting No. IFB20, Revision 0, "Criticality Requirements 5-Gallon Can Storage Rack," states that a 5-gallon can maximum net weights shall not exceed 18.0 kg (kilograms).

Contrary to the above, on January 7, 2003, the licensee had stored in a storage rack posted with NCS Posting No. IFB20, a 5-gallon can with a maximum net weight (18.5 kilograms) that exceeded 18.0 kilograms.

This is a Severity Level IV violation (Supplement VI).

The NRC has concluded that the corrective actions taken to correct the violation are already adequately addressed on the docket in this Inspection Report. However, you are required to submit a written statement or explanation pursuant to 10 CFR 2.201 if the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to respond, clearly mark your response as a "Reply to a Notice of Violation," and send it to the U. S. Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, D.C. 20555 with a copy to the Regional Administrator, Region II, within 30 days of the date of the letter transmitting this Notice.

Because any response will be made 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), to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room). If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such

information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.790(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 7<sup>th</sup> day of February 2003 at Atlanta, Georgia.

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 70-1151

License No.: SNM-1107

Report No.: 70-1151/2003-01

Licensee: Westinghouse Electric Corporation

Facility: Commercial Nuclear Fuel Plant

Location: Columbia, South Carolina

Dates: January 6-10, 2003

Inspectors: M. Crespo, Fuel Facility Inspector  
D. Seymour, Senior Fuel Facility Inspector  
N. Rivera, Fuel Facility Inspector (Trainee)

Accompanying  
Personnel: D. Ayres, Chief, Fuel Facilities Branch

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

## EXECUTIVE SUMMARY

### Commercial Nuclear Fuel Division NRC Inspection Report 70-1151/2003-01

This routine unannounced inspection was conducted in the areas of plant operations, maintenance and operator training. The inspection identified the following aspects of the licensee programs as outlined below:

#### **Plant Operations**

- The licensee's safety analysis for the ventilation and facility exhaust system adequately identified safety controls and assumptions (Paragraph 2.a).
- A violation was identified for the failure of the licensee to follow a nuclear criticality safety posting for storage of material in the Integrated Fuel Burnable Absorber area. The licensee's planned corrective actions to address this issue appeared adequate (Paragraph 2.b).
- Modifications of procedures and configuration control involving the ventilation system were adequately reviewed by the licensee (Paragraph 2.c).
- The three events involving ventilation duct work were adequately addressed by the licensee (Paragraph 2.d).

#### **Maintenance**

- The licensee was performing periodic maintenance and testing of the emergency electrical generators and the nuclear criticality detectors as required by their license application. The upgrade of the hydrofluoric acid spiking station and the maintenance in the pelleting area was adequately performed by knowledgeable and qualified individuals (Paragraph 3.a).

#### **Operator Training**

- The general employee training and the general training check list requirements satisfied the safety topics requirements of 10 CFR 19.12 (Paragraph 4.a).
- Documentation of on the job training and procedure training records were adequate (Paragraph 4.b).

## REPORT DETAILS

### **1. Summary of Plant Status**

This report covered the period of January 6 - 10, 2003. Powder, pellet, and fuel assembly production proceeded at normal rates. There were no unusual plant operational events during the onsite inspection. On January 9 and 10, David Ayres, Chief of the Fuel Facilities Branch, in the Division of Nuclear Materials Safety, Region II, met with senior site management and toured the facility.

### **2. Plant Operations (Inspection Procedure (IP) 88020)**

#### a. Safety Function (O3.02)

##### (1) Inspection Scope

The inspectors reviewed the safety analyses for the ventilation and facility exhaust system to verify that they identified safety controls, provided for double contingency, and specified limits for controlled parameters.

##### (2) Observations and Findings

The inspectors noted that the safety analysis for the ventilation and facility exhaust system stated that nuclear criticality safety (NCS) was maintained through the prevention of the material buildup in the lines through the use of high efficiency filters. The licensee also routinely surveyed the lines to detect possible buildups of material. The inspectors questioned the criticality safety team to verify the assumptions (such as the moisture content in certain vent lines) were justified for the NCS analysis. The primary assumption for the system was that uranium material in the vent lines would have to completely fill the [up to] 24 inch ventilation lines and be moderated greater than 10 weight percent to achieve the potential to go critical. The inspectors found no issues with the safety analysis.

##### (3) Conclusions

The licensee's safety analysis for the ventilation and facility exhaust system adequately identified safety controls and assumptions.

#### b. Plant Activities (O3.03), Audits (O3.09)

##### (1) Inspection Scope

The inspectors observed operations occurring in the conversion area and interviewed operators about the tasks that they were performing to verify that activities were performed according to approved plant procedures. The inspectors also reviewed the most recent Regulatory Affairs Audit report.



(2) Observations and Findings

The inspectors questioned the operators regarding the significance and possible safety impacts of several warning lights and horns in connection with the fitzmill and the bulk powder loading area. The inspectors found that the operators were knowledgeable of the areas they worked.

The inspectors noted that the Regulatory Affairs Audit report, which covers NCS, safeguards, radiation protection, and industrial safety, had multiple findings in the Integrated Fuel Burnable Absorber (IFBA) and erbia areas. No NCS issues were identified; most of the issues involved industrial safety. The report contained sufficient detail on the findings and listed the corrective actions for each finding.

On January 7, 2003, the inspectors observed the improper storage of a 5-gallon can during a tour in the IFBA area. The criticality safety posting for this storage rack stated that the maximum net weight of 5-gallon cans shall not exceed 18.0 kilograms (kg). The inspectors observed that, contrary to the nuclear criticality posting, this container's net weight was 18.5 kg. This issue was brought to the attention of an operator. The initial response of the operator was that exceeding the criticality safety limit mass limit by a small amount was not a concern. However, shortly thereafter, the operator corrected the issue by removing some of the material from the 5-gallon can. The inspectors noted that the can had been in storage for approximately six months. Within that time frame, two licensee audits performed in area failed to identify the posting violation. During this inspection, the licensee identified several additional cans over the 18 kg limit.

The licensee's initial corrective actions were to retrain their operators on the importance of following procedures and criticality postings. The training also covered the safety significance of the criticality postings. The licensee conducted a formal root cause investigation on the issue and captured the finding in their Corrective Action Process (CAP). The CAP investigation concluded that the licensee would initiate several corrective actions to address the issue. First, the software for generating can labels would be modified to limit the potential storage maximum. The management of the IFBA area would be evaluated in an attempt to improve oversight of the area. The licensee would also perform a detailed evaluation of the training and auditing procedures to improve their effectiveness. Finally, the licensee would also evaluate potential storage problems in other areas of the plant. The inspectors noted no significant issues with the licensee's planned corrective actions. The failure to maintain the weight of storage cans in the IFBA area below the 18 kg limit was identified as Violation (VIO) 70-1151/2003-01-01, Failure to Follow a Criticality Safety Posting.

(3) Conclusions

A violation was identified for the failure of the licensee to follow an NCS posting for storage of material in the IFBA area. The licensee's planned corrective actions to address this issue appear to be adequate.

c. Configuration Control (O3.04), Change Control (O3.05), Operating Procedures (O3.06)

(1) Inspection Scope

The inspectors reviewed the newly modified procedures for the surveying of the ventilation system duct work and observed their use in the process area. The inspectors also reviewed the records for the modification of the ventilation system for the 8A scrubber to verify the appropriate approvals and reviews were performed.

(2) Observations and Findings

The inspectors noted that the procedure modifications were properly signed and approved. Following the review of the ventilation system duct work survey procedures, the inspector observed an operator properly perform several surveys. The inspectors also noted the use of the appropriate instrument for the survey. The inspectors reviewed the results for previous surveys and verified that the appropriate actions were taken for survey results above the actions levels. The inspectors also noted that the licensee had appropriately resolved the issue by cleaning out the ventilation lines.

The inspectors noted that the work requests for the modifications to the ventilation ducts for the 8A scrubber were approved by the appropriate individuals from the safety disciplines. No issues were noted.

(3) Conclusions

Modifications of procedures and configuration control involving the ventilation system were adequately reviewed by the licensee.

d. Review of Previous Events (O3.12)

(1) Inspection Scope

Corrective actions for the following events were reviewed to determine the adequacy of licensee response actions:

- NRC Event No. 39016 (Nuclear Materials Event Database (NMED) No. 020622), Damp Material Detected in Ventilation Duct Work.
- NRC Event No. 39170 (NMED No. 020843), Build up of Material Detected in Ventilation Duct Work.
- NRC Event No. 39214 (NMED No. 020896), Ventilation Duct Work Was Improperly Stacked.

(2) Observations and Findings

The inspectors reviewed the licensee's corrective actions for a reportable event involving moisture build up in the ventilation lines due to unusually high humidity in the plant and un-insulated vent lines (NRC Event No. 39016, NMED No. 020622). The

corrective actions consisted of applying insulating material to the exterior of most of the ventilation lines, focusing on areas where the ventilation lines were inadvertently cooled by an adjacent air-conditioning unit.

The inspectors reviewed another reportable event involving the excessive build up of material in the ventilation lines leading to the 8A Scrubber (NRC Event No. 39170, NMED No. 020843). The licensee's corrective actions for the area involved procedural changes and configuration changes. The procedural changes involved the use of a more sensitive detection device for the routine surveys of the duct work. Also, Redbook items were now to be written if survey results exceeded the action level. The configuration change involved the removal of duct work that was greater than 24 inches in diameter. Sudden expansions in duct work provide a mechanism for material to drop out of the air stream and collect. The duct work leading to the 8A scrubber now had a maximum diameter of 24 inches (as well as maintaining a more consistent diameter), minimizing the dropout potential.

The inspectors also reviewed the licensee's corrective actions to address the event where ventilation duct work (containing SNM) was improperly stacked by contractors (NRC Event No. 39214, NMED No. 020896). Contractor personnel were trained on the procedure for the floor storage of SNM in the controlled areas, which was added to the contractors training checklist requirements. The contractor personnel were also retrained on the regulatory requirements for maintenance and procedures. Emphasis on the radiation control work permit was given to the contractor personnel in order to ensure safety performance on their jobs. The inspectors reviewed the training records of the contractors and no issues were noted.

(3) Conclusions

The three events involving ventilation duct work were adequately addressed by the licensee.

e. Follow up on Previously Identified Issues (O3.13)

- (1) (Closed) IFI 70-1151/2002-01-01: Corrective Actions for Failure of Hydrogen Fluoride (HF) Spiking Station Dike.

To address the possibility of a dike failure, the licensee had written an annual functional test of the HF spiking stations' dikes. An inspector's initial review of the functional test procedure, during an earlier inspection, found the instructions to be vague. During this inspection the inspectors reviewed the procedure, determined it was rewritten, and that more detailed instructions were added. This item is closed.

- (2) (Closed) IFI 70-1151/2002-06-02: Corrective Actions for Communication Error on the Functional Test Results on an NCS Calciner Valve.

To address the communication error issue, the licensee wrote a procedure to ensure that information, such as failures to pass a functional test, got relayed to the appropriate supervisors. Also, the licensee began switching out the valves on the calciners with

indicating valves, allowing more accurate determination of the position of the valves during tests. Based on these corrective actions, this item is closed.

### 3. **Maintenance (IP 88025)**

#### a. Conduct of Maintenance (F1.01), Qualifications of Maintenance Personnel (F1.04), Surveillance Testing (F1.06), Calibrations of Equipment (F1.07)

##### (1) Inspection Scope

The conduct of maintenance on safety significant equipment and qualification of maintenance personnel were reviewed to verify maintenance was performed by knowledgeable individuals according to approved procedures. Surveillance testing and calibration of engineered safety controls were reviewed to verify that tests were performed at the frequency established to ensure availability and reliability of the controls and equipment.

##### (2) Observations and Findings

The inspectors reviewed maintenance and calibration records for the emergency electrical generators and the nuclear criticality detectors. The inspectors noted that required periodic maintenance was performed at the intervals specified by the licensee's maintenance program. The inspectors also reviewed the records of surveillance tests performed for the emergency electrical generators and the nuclear criticality detectors. The inspectors concluded that the surveillance tests and calibrations were performed at the designated intervals.

The inspectors observed an upgrade of the hydrofluoric acid spiking station and maintenance in the pelleting area. The inspectors interviewed the staff performing the work. The inspectors noted that the staff was knowledgeable of the equipment, and of the maintenance procedures. The inspectors' review included verifications that appropriate radiation work permits and hot work permits were utilized, and that appropriate training on job hazards was provided to the workers. The inspectors also reviewed the change control forms and the Regulatory Affairs change authorization for the maintenance.

##### (3) Conclusions

The licensee was performing periodic maintenance and testing of the emergency electrical generators and the nuclear criticality detectors as required by their license application. The upgrade of the hydrofluoric acid spiking station and the maintenance in the pelleting area was adequately performed by knowledgeable and qualified individuals.

#### 4. **Operator Training (IP 88010)**

##### a. 10 CFR 19.12 Training (F2.01), General Nuclear Criticality Safety Training (F2.02), General Radiological Safety Training (F2.03), General Emergency Training (F2.04)

###### (1) Inspection Scope

General employee training (GET) and the general training check list requirements for employees transferred from a non-control work area to controlled work area were reviewed to verify that proper instruction was given to operators on required safety topics.

###### (2) Observations and Findings

The inspectors found that the GET computer course and the general training requirements adequately covered the safety topics required by 10 CFR 19.12 and the commitments made in the facility license application. A technical trainer was interviewed about the general training requirements needed for an operator transferred into the controlled work areas. The technical trainer explained to the inspectors that the operators have a training checklist that needs to be completed before going into the controlled area. Also, the technical trainer mentioned that the operator can easily access procedures needed to perform a job.

The inspectors attended training activities given to operators transferring from the non-controlled to the controlled area. The training included a training checklist with the procedures required before going into the controlled area. The training checklist included safety topics such as respiratory protection, Material Safety Data Sheets (MSDS), safety procedures, radiation protection, and an orientation package which included familiarization with the areas. The training documents for the transferred operators were adequate and no compliance issues were identified.

###### (3) Conclusions

The GET and the general training check list requirements satisfied the safety topics requirements of 10 CFR 19.12.

##### b. Operating Procedure Training (F2.05), On-the-job Training (F2.06)

###### (1) Inspection Scope

On the job training (OJT) documents of new employees, employees that were re-certified, and employees that were transferred from the non-controlled to the controlled area were reviewed.

(2) Observations and Findings

Other than minor documentation discrepancies (which were brought to the licensee's attention and entered into their corrective action program), no compliance issues were noted with training records. The inspectors reviewed the furnace operation procedure and questioned the new operator about the safety controls for the furnace and how to respond to alarms. The operator demonstrated adequate knowledge of the safety system and the capability to perform the job with minimum supervision.

(3) Conclusions

Documentation of OJT and procedure training records were adequate.

**5. Exit Meetings**

The inspection scope and results were summarized on January 10, 2003, with the licensee. The inspectors described the areas inspected and discussed in detail the inspection results, including the violation for the failure to follow an NCS posting. 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. **LIST OF PERSONS CONTACTED**

#### Licensee

M. Connelly, Nuclear Criticality Safety Engineer  
M. Fecteau, Plant Manger  
R. Fischer, Senior Engineer, Regulatory Engineering and Operations  
D. Graham, Technician, Environment, Health and Safety  
D. Harris, Manger, Rod Manufacturing and Integral Fuel Burnable Absorber  
J. Heath, Manager, Integrated Safety Engineering  
S. McDonald, Manager, Environment, Health and Safety  
G. Page, Manager, Maintenance  
C. Perkins, Manager, Human Performance Improvement  
W. Seibel, Trainer, Human Resources  
C. Snyder, Nuclear Criticality Safety Engineer  
E. Steck, Nuclear Criticality Safety Engineer

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

### 2. **INSPECTION PROCEDURES USED**

IP 88010	Operator Training
IP 88025	Regional Nuclear Criticality Safety Inspection Program
IP 88005	Maintenance/Surveillance

### 3. **LIST OF ITEMS OPENED AND CLOSED**

#### Opened

70-1151/2003-01-01	VIO	Failure to Follow a Criticality Safety Posting (Paragraph 2.b)
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#### Closed

70-1151/2002-01-01	IFI	Corrective Actions for Failure of HF Spiking Station Dike (Paragraph 5.i)
70-1151/2002-06-02	IFI	Corrective Actions for Communication Error on the Functional Test Results on an NCS Calcliner Valve (Paragraph 5.e)
70-1151/2003-01-01	VIO	Failure to Follow a Criticality Safety Posting (Paragraph 2.b)

**4. LIST OF ACRONYMS USED**

CAP	Corrective Action Process
CFR	Code of Federal Regulation
GET	General Employee Training
EHS	Environmental Health and Safety
HF	Hydrogen Fluoride
IFBA	Integrated Fuel Burnable Absorber
IFI	Inspection Follow up Item
IP	Inspection Procedure
kg	Kilograms
MSDS	Material Safety Data Sheets
NCS	Nuclear Criticality Safety
NMED	Nuclear Materials Event Database
NOV	Notice of Violation
NRC	Nuclear Regulatory Commission
OJT	On the Job Training
PARS	Publicly Available Records
SNM	Special Nuclear Material
VIO	Violation