

July 18, 2000

Mr. Joseph J. Buggy, [ ]  
Westinghouse Savannah River Company  
Savannah River Site  
Building 703-A  
Road 1  
Aiken, SC 29808

EA-2000-08

Subject: Preliminary Notice of Violation and Proposed Imposition of Civil Penalty  
\$220,000

Dear Mr. Buggy:

This letter refers to the Department of Energy's (DOE) evaluation of violations of DOE's nuclear safety regulations associated with the September 1999 FB-Line worker contamination event. During that event, multiple workers were contaminated due to the handling of a [radioactive material] storage can with a defective weld. Eight workers received intakes of [radioactive material] as a result of the event; one worker received an exposure in excess of DOE regulatory limits.

During the week of April 24, 2000, the Office of Enforcement and Investigation (EH-Enforcement) conducted an onsite investigation of the event. On June 2, 2000, EH-Enforcement issued an Investigation Summary Report documenting the results of this investigation. On June 20, 2000, an Enforcement Conference to discuss this event was held with members of your staff. Based on our evaluation of this event, DOE has concluded that violations of the DOE Quality Assurance and Radiation Protection Rule occurred. The violations are described in the enclosed Preliminary Notice of Violation (PNOV).

Both your own review and DOE investigation of the event identified significant deficiencies in (1) quality assurance, (2) radiological work practices and controls, (3) procedural compliance, and (4) response to off-normal conditions. Effective quality processes were not in place to ensure weld integrity on [radioactive material] storage cans produced by the FB-Line bagless transfer system. Adequate radiological monitoring was not performed prior to and during vault work activities. Work and event response activities were not conducted in compliance with approved procedures. Similar deficiencies were identified in a prior 1996 event in which a worker received an exposure in excess of the regulatory limit. Subsequent assessments of the FB-Line Radiological Control program have identified continuing weaknesses, indicating that deficiencies have not been effectively addressed.

In accordance with the "General Statement of Enforcement Policy," 10 CFR 820, Appendix A, the violations described in the attached PNOV have been classified as Severity Level II violations with a proposed civil penalty in the amount of \$220,000.

The base civil penalty for these violations is \$275,000. In determining the civil penalty for these violations, DOE determined that no mitigation was warranted for prompt identification and reporting of violations, because they were identified as a result of a self-disclosing event. DOE has proposed 25% mitigation of civil penalty for four of the violations, based on your thorough investigation of the event and the broad scope of your corrective actions. In particular you focus on applying lessons learned from the event to sitewide facility activities. Mitigation of the specific violation relating to the personnel overexposure was not deemed appropriate.

You are required to respond to this letter and you should follow the instructions in the enclosed Notice when preparing your response. Your response should document any additional specific actions taken to date and planned to prevent recurrence. You are also requested to provide a copy of the upcoming Facility Evaluation Board review of the effectiveness of event corrective actions as described at the enforcement conference to Messrs. Jeffrey Allison and John Anderson of the DOE Savannah River Office upon completion of that review.

After reviewing your response to this Notice, DOE will determine whether further action is necessary to ensure compliance with applicable nuclear safety requirements.

Sincerely,



David Michaels, PhD, MPH  
Assistant Secretary  
Environment, Safety and Health

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

Enclosures:

Preliminary Notice of Violation and Proposed Imposition of Civil Penalty  
Enforcement Conference Summary  
List of Attendees

cc: B. Costner, S-1  
M. Zacchero, EH-1  
S. Cary, EH-1  
K. Christopher, EH-10  
T. Weadock, EH-10  
D. Stadler, EH-2  
F. Russo, EH-23  
N. Goldenberg, EH-3  
J. Fitzgerald, EH-5  
C. Huntoon, EM-1  
L. Vaughan, EM-10  
G. Rudy, DOE-SR  
C. Hansen, DOE-SR  
J. Anderson, DOE-SR  
J. Allison, DOE-SR  
C. McFall, DOE-SR  
M. Dayani, DOE-SR PAAA Coordinator  
K. Thames, DOE-SR PAAA Coordinator  
J. Pullen, DOE-SR PAAA Coordinator  
G. Bell, WSRC Contractor PAAA Coordinator  
R. Azzaro, DNFSB  
D. Thompson, DNFSB  
Docket Clerk, EH-10

**PRELIMINARY NOTICE OF VIOLATION  
AND  
PROPOSED IMPOSITION OF CIVIL PENALTY**

Westinghouse Savannah River Company  
Savannah River Site

EA 2000-08

As a result of a Department of Energy (DOE) evaluation of the unplanned exposure and resulting [radioactive material] intakes by eight FB-Line workers on September 1, 1999, violations of DOE requirements were identified. In accordance with 10 CFR 820, Appendix A, "General Statement of Enforcement Policy," DOE is issuing this Preliminary Notice of Violation and Proposed Imposition of Civil Penalty. The violations are described below.

- I. 10 CFR 835.202(a)(1) requires that the occupational exposure to general employees resulting from DOE activities be controlled so that the employee's Total Effective Dose Equivalent (TEDE) does not exceed the annual limit of 5 rems.

Contrary to the above, during 1999 a Westinghouse Savannah River Company (WSRC) employee received an exposure in excess of the annual limit (6.719 rems TEDE). The exposure was received as a result of a [radioactive material] contamination event occurring on September 1, 1999. Seven additional employees received intakes in conjunction with the event.

This is a Severity Level II problem.  
Civil Penalty - \$55,000

- II. 10 CFR 830.120(c)(1)(iii), Quality Improvement, requires that "...Processes to detect and prevent quality problems shall be established and implemented. Items, services, and processes that do not meet established requirements shall be identified, controlled, and corrected according to the importance of the problem and the work affected. Correction shall include identifying the causes of the problems and working to prevent recurrence. Item characteristics, process implementation, and other quality-related information shall be reviewed and the data analyzed to identify items, services, and processes needing improvement."

Contrary to the above, processes to detect and correct quality problems were not effectively established and implemented in that—

- A. Processes to ensure weld (seal) integrity on [radioactive material] storage cans produced by the FB-Line bagless transfer system were not effective. On July 14,

1998, a bagless [radioactive material] storage can (FBL-BC-00279) was loaded with [radioactive material] and was welded; subsequent weld integrity testing failed to identify the presence of an approximate 0.1-inch diameter weld defect. The subsequent [radioactive material] release from the defective can on September 1, 1999, resulted in the unplanned exposure of eight workers.

WSRC production controls on the welded cans included visual inspection by the operator and performance of two leak tests (non-helium volumetric gross leak test and helium leak test). The following deficiencies were identified in association with these controls:

1. Operators responsible for performing the visual inspection were not qualified as weld inspectors, and they received no formal training in weld inspection techniques.
2. The inspections were performed at a point in the process in which the operator's field of view of the weld was limited, due to the position of the can in the welding machine. Operators also conducted the inspection wearing air-fed hoods, which may have affected their ability to visually inspect the weld.
3. Weld leak check equipment and instrumentation had not been calibrated since its initial introduction into the bagless transfer system.

Subsequent investigation identified that five bagless cans had exhibited weld production problems prior to the production of can FBL-BC-00279. In each case there was no formal analysis of the defects, thereby representing a missed opportunity to identify potential process improvements.

B. Management processes were not effectively implemented to correct identified and long-standing deficiencies in radiological control program implementation. Review of prior events and assessments identified that over the past several years the FB-Line Facility has experienced recurring problems similar to those associated with the September 1, 1999 event. As noted in the DOE Type B Investigation Report of the subject event, indicators of existing problems were available to management for a considerable period of time, and should have enabled them to implement effective corrective actions. Specific examples include the following:

1. In 1996, the F-Canyon Facility experienced multiple compliance issues with radiological work control procedures. These deficiencies resulted in the unplanned intake/overexposure of a worker and also resulted in an enforcement action by DOE (EA-97-12).
2. The DOE Type B investigation of the September 1999 event acknowledged the similarities between the 1999 and late 1996 events. The Type B report

- identified the following common performance failures: failure to adequately characterize workplace conditions, failure to ensure verbatim compliance with procedures, and failure to properly post and control radiological boundaries.
3. The WSRC internal investigation of the September 1999 event also identified common deficiencies between the late 1996 and 1999 events. These included lack of effective boundary controls, lack of understanding of potential hazards, and weak casualty response.
  4. WSRC Facility Evaluation Board assessments of FB-Line performed during 1997, 1998, and 2000 consistently rated the area of Radiological Controls as "below average"

Collectively, these violations constitute a Severity Level II problem.  
Civil Penalty - \$41,250

- III. 10 CFR 835.401(a) requires that monitoring of individuals and areas shall be performed to... (2) document radiological conditions in the workplace; (3) detect changes in radiological conditions; and (5) verify the effectiveness of engineering and process controls in containing radioactive material and reducing radiation exposure. 10 CFR 835.2 defines *monitoring* as actions intended to detect and quantify radiological conditions.

Contrary to the above, monitoring of individuals and areas was not performed as required in that—

- A. A contamination survey was not performed prior to operator handling and removal of five bagless cans from an FB-Line vault on September 1, 1999. The Radiation Work Permit (RWP) controlling this activity required all vault items to be surveyed prior to handling; however, a contamination survey was not performed until after the bagless cans were removed from the vault and placed just inside the vestibule area. As a result, the potential opportunity to identify the defective bagless can was missed, ultimately contributing to the unplanned exposure of eight workers.
- B. Personnel contamination surveys were not immediately performed on the operator exiting the FB-Line vault subsequent to the Continuous Air Monitor Alarm (CAM) on September 1, 1999. Procedure AOP-FBL-1.009 requires such surveys be performed after evacuation from an area due to a CAM alarm. As a result, no controls were established to prevent the spread of contamination from the highly contaminated operator to other workers.

Collectively, these violations constitute a Severity Level II problem.  
Civil Penalty - \$41,250

- IV. 10 CFR 830 (c)(2)(I), Work Processes, requires that "...Work shall be performed to established technical standards and administrative controls using approved instructions, procedures, or other appropriate means."

Contrary to the above, work activities associated with the removal of bagless cans from an FB-Line vault on September 1, 1999, were not performed in accordance with approved procedures. Specifically:

- A. RWP 99-FBL-216 establishes a transferable contamination suspension guide limit of 2000 dpm alpha/100cm<sup>2</sup> for work in Contamination Areas (CA). Contrary to this limit, work was not suspended subsequent to the identification of removable alpha contamination levels of 2000 dpm/100 cm<sup>2</sup> on a bagless can located in the vestibule (a posted CA).
- B. RWP 99-FBL-216 required a dedicated timekeeper for work in a High Radiation Area (HRA). Contrary to this requirement, during the subject activity work was conducted in the vault (a posted HRA) without the assignment of a dedicated timekeeper.
- C. Procedure SOP 221-FB-1186-H-NS, *Packaging Fissile Material in a 30-Gallon 6M Shipping Container for Shipment to Building 235-F*, requires notification of the Shift Operations Manager and the Radiological Control Organization (RCO) First Line Supervisor if measurable contamination is identified. Contrary to this requirement, during the subject activity neither the Shift Operations Manager nor the RCO First Line Supervisor were notified upon the identification of 2000 dpm/100 cm<sup>2</sup> of removable contamination on a bagless can.
- D. Procedure WSRC 5Q 1.2-130, *Continuous Air Monitor – Particulate Airborne Activity Alarm Immediate Action*, requires RCO supervision to approve re-entry into the affected area(s) under the existing RWP. Contrary to this requirement, during the subject activity a worker re-entered an affected area (the vault) after a CAM alarm without receiving RCO supervision approval.

Collectively, these violations constitute a Severity Level II problem.  
Civil Penalty - \$41,250

- V. 10 CFR 835.1001(a) requires that measures shall be taken to maintain radiation exposure in controlled areas as low as is reasonably achievable through facility and equipment design and administrative control. The primary methods used shall be physical design features (e.g. confinement, ventilation, remote handling, and shielding). Administrative controls and procedural requirements shall be employed only as supplemental methods to control radiation exposures.

Contrary to the above, WSRC management did not ensure that effective physical design features (i.e., ventilation) were in place to maintain exposures ALARA in conjunction with vault activities. Due to restricted supply airflow to the

vault/vestibule area, ventilation airflow from the vestibule into the vault was severely degraded and near stagnant when the vault door was open. This condition was identified in contractor airflow studies performed in 1994 and 1998 but was not corrected due to funding issues.

Administrative controls associated with vault work activities were not revised to reflect the existing condition. Requirements for posting for Airborne Radioactivity and respiratory protection were established at the vault door, although it was known airflow into the vault at this location was degraded. Personnel involved in the September 1, 1999, event indicated they had received no formal information or briefing on the degraded airflow condition, and felt the vestibule represented a distinct and separate airspace from the vault.

This violation constitutes a Severity Level II problem.  
Civil Penalty - \$41,250

Pursuant to the provisions of 10 CFR 820.24, Westinghouse Savannah River Company is hereby required within 30 days of the date of this Preliminary Notice of Violation (PNOV) and Proposed Imposition of Civil Penalty, to submit a written statement or explanation to the Director, Office of Enforcement and Investigation, Attention: Office of the Docketing Clerk, EH-10, P.O. Box 2225, Germantown, MD 20874-2225. Copies should also be sent to the Manager, DOE Savannah River Operations Office, and to the Cognizant DOE Secretarial Office for the facility that is the subject of this Notice. This reply should be clearly marked as a "Reply to a Preliminary Notice of Violation" and should include the following for each violation: (1) admission or denial of the alleged violations; (2) any facts set forth which are not correct; and (3) the reasons for the violations if admitted, or if denied, the basis for the denial. Corrective actions that have been or will be taken to avoid further violations will be delineated with target and completion dates in DOE's Noncompliance Tracking System. In the event the violations set forth in this PNOV are admitted, this Notice will constitute a Final Notice of Violation in compliance with the requirements of 10 CFR 820.25.

Any request for remission or mitigation of the civil penalty must be accompanied by a substantive justification demonstrating extenuating circumstances or other reasons why the assessed penalty should not be paid in full. Within 30 days after issuance of this Notice and Civil Penalty, unless the violations are denied, or remission or mitigation is requested, Westinghouse Savannah River Company shall pay the civil penalty of \$220,000 imposed under Section 234A of the Act by check, draft, or money order payable to the Treasurer of the United States (Account 891099) mailed to the Director, Office of Enforcement and Investigation, Attention: Office of the Docketing Clerk at the above address. Should Westinghouse Savannah River Company fail to answer within the time specified, the contractor will be issued an order imposing the civil penalty.

If requesting mitigation of the proposed civil penalty, Westinghouse Savannah River Company should address the adjustment factors described in Section VIII of 10 CFR 820, Appendix A.

A handwritten signature in black ink, appearing to read 'D. Michaels', written in a cursive style.

David Michaels, PhD, MPH  
Assistant Secretary  
Environment, Safety and Health

Dated at Washington, DC,  
this 18th day of July 2000

## **ENFORCEMENT CONFERENCE SUMMARY**

### **QUALITY ASSURANCE and RADIATION SAFETY DEFICIENCIES at FB-LINE**

On June 20, 2000, the Department of Energy's (DOE) Office of Enforcement and Investigation (EH-Enforcement) held an informal enforcement conference with Westinghouse Savannah River Corporation (WSRC). This conference was held to discuss concerns identified in the Noncompliance Tracking System (NTS) report identified above and in the DOE Investigation Summary Report issued to WSRC on June 2, 2000. Attached to this conference summary is a listing of the conference participants and attendees.

The NTS report and enforcement conference concerned apparent radiation safety, quality assurance, and radiological work control deficiencies at the FB-Line, Savannah River Site. These deficiencies were evidenced by a failed weld on a bagless transfer can that was not detected by leak testing or visual inspection, inadequate radiological monitoring, and an improper response to an alarming radiological air monitor. Eight employees subsequently received intakes of [radioactive material], one of whom received an estimated dose in excess of regulatory limits.

R. Keith Christopher, Director, EH-Enforcement, opened the conference by providing an overview of the conference's purpose. EH-Enforcement staff then summarized the 10 CFR 830 and 10 CFR 835 concerns derived from the June 2, 2000, Investigation Summary Report.

WSRC provided an overview of the event and the conditions that led to it, and concluded with a discussion of corrective actions pertinent to the incident itself as well as those that could be applied to other facilities. DOE representatives asked several questions regarding corrective actions and the application of lessons-learned to the Savannah River site. WSRC assured DOE that it was applying site-wide corrective actions.

Mr. Christopher concluded the conference and stated that DOE would consider the information presented by WSRC in its enforcement deliberations.

**June 20, 2000**

**Westinghouse Savannah River  
September 1999 FB-Line Personnel Contamination Incident**

**List of Attendees**

DOE-Office of Enforcement and Investigation

R. Keith Christopher, Director  
Tony Weadock, Enforcement Specialist  
Steve Zobel, Enforcement Specialist  
Steven Hosford, Technical Advisor

DOE-Environmental Manager (EM)

Dave Bivans, Engineer

DOE-Savannah River Operations Office

John Anderson, Acting Assistant Manager for Materials and Facility Stabilization  
Jeffrey Allison, Assistant Manager for Health, Safety, & Technical Support  
Carroll McFall, DOE Facility Representative

Westinghouse Savannah River Company

Fran Williams, [ ]  
Bob Pedde, [ ]  
Frank Jordan, [ ]  
Mark Schmitz, [ ]  
Bill Lloyd, [ ]  
John Bozeman, [ ]  
Greg Bell, [ ]