



## Department of Energy

Washington, DC 20585

March 19, 2002

Mr. Robert A. Pedde  
[ ]  
Savannah River Site  
Building 703-A  
Road 1  
Aiken, SC 29808

EA-2002-01

Subject: Preliminary Notice of Violation

Dear Mr. Pedde:

During the period December 11-13, 2001, the Office of Price-Anderson Enforcement (OE) conducted an on-site investigation into the facts and circumstances surrounding ten events that were reported into the Noncompliance Tracking System (NTS) and/or the Occurrence Reporting and Processing System (ORPS) during 2001. These events included work control deficiencies that resulted in violations of your facility safety basis requirements, and As Low As Reasonably Achievable (ALARA) deficiencies that contributed to unplanned worker uptakes and the spread of contamination. A conference call among OE staff, representatives from the Department of Energy Savannah River Office (DOE-SR), and the Westinghouse Savannah River Company (WSRC) was also held on December 20, 2001, to further discuss issues developed during the on-site investigation. Our Investigation Summary Report is enclosed.

Based upon this investigation, DOE has concluded that violations of the Quality Assurance and Occupational Radiation Protection Rules have occurred. These violations are described in the enclosed Preliminary Notice of Violation.

Section I of the PNOV describes multiple breakdowns in your work processes related to maintaining the status and control of safety equipment and instruments in your nuclear facilities. These deficiencies resulted in violations of your Technical Safety Requirements (TSRs) which are part of your safety basis. Our review found similarities in several of these events which occurred at separate facilities. The similarities included inadequate documentation of safety significant equipment status, inadequate log keeping and shift turnover, and failure to adequately perform necessary tests prior to placing safety significant equipment back into operation following maintenance.

Section II of the PNOV describes several instances where modifications were performed incorrectly on safety significant or safety class equipment. In these

instances, the equipment was returned to service following the modification but was later found to be incapable of meeting its designed safety function. Associated work process deficiencies include inadequate knowledge of the equipment configuration prior to performing the modification, inadequate design and design reviews, and inadequate post modification testing.

Section III of the PNOV describes several events that resulted in the unplanned spread of contamination. One of the events also involved the unplanned uptake of radioactive material by several workers. Although the resulting worker exposures were below the regulatory limit, they are of concern and highlight deficiencies in radiological work planning and control. Other common deficiencies noted in the radiological events include failure to adhere to procedures and failure to implement effective ALARA controls.

In accordance with the General Statement of Enforcement Policy, 10 CFR Part 820, Appendix A, the violations described in the enclosed PNOV are classified as Severity Level III violations and no civil penalty is assessed. In determining the Severity Level of these violations, DOE considered the actual and potential safety significance of these violations as significant enough to have warranted a Severity Level II. However, consideration was given for your self-identification and reporting of the work process deficiencies, and for the event-specific corrective actions related to all of the deficiencies. Based upon this consideration, the violations were classified at the lower Severity Level III.

An additional area of concern was identified associated with the effectiveness of your Quality Improvement Process. OE review of the subject work process events identified several common deficiencies and/or causes occurring at more than one nuclear facility. These included inadequate documentation of safety significant equipment status, inadequate log keeping, and inadequate shift turnover practices. OE was unable to identify any similar crosscutting reviews by your staff intended to evaluate potential generic weaknesses that may be affecting other nuclear facilities. OE did review your process for monitoring facility performance related to TSR violations and found the information did not represent actual conditions. Specifically, your 12-month rolling total values for TSR violations under-represented the actual value by an average factor of three. Even after correction of the data, your staff indicated the new values would not trigger any review for common causes.

Despite the above concerns, our review did not determine that a specific citation against the Quality Improvement requirements was warranted. This determination was based in part upon recognition of your recently established event-driven performance trending program. In light of the concerns expressed above, however, we will continue to monitor this area and should these deficiencies continue to occur at the same or other nuclear facilities may decide further review is warranted.

You are required to respond to this letter and follow the instruction specified in the enclosed PNOV when preparing your response. Your response should document any

additional specific actions taken to date. Corrective actions should also be tracked in the NTS. You should enter into the NTS (1) any actions that have been or will be taken to prevent recurrence and (2) the target and completion dates of such actions. After reviewing your response to the PNOV and your proposed corrective actions, DOE will determine whether further enforcement action is necessary to ensure compliance with DOE nuclear safety requirements.

Sincerely,



R. Keith Christopher

Director

Office of Price-Anderson Enforcement

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

Enclosure:

Preliminary Notice of Violation  
Investigation Summary Report

cc: B. Cook, EH-1  
M. Zacchero, EH-1  
J. Roberson, EM-1  
H. Himpler, EM-5  
S. Johnson, EM-5  
G. Rudy, DOE-SR  
J. Crenshaw, DOE-SR PAAA Coordinator  
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D. Landis, WSRC PAAA Coordinator  
R. Azzaro, DNFSB  
T. Weadock, OE  
Docket Clerk, OE

## PRELIMINARY NOTICE OF VIOLATION

Westinghouse Savannah River Company  
Savannah River Site

EA-2002-01

During a Department of Energy (DOE) investigation conducted on December 11 through 13, 2001, violations of DOE nuclear safety requirements were identified. In accordance with the "General Statement of Enforcement Policy," 10 CFR 820, Appendix A, DOE proposes to issue this Preliminary Notice of Violation, without civil penalty, pursuant to Section 234A of the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2282a. The particular violations are set forth below.

### **I. Inadequate Status and Control of Safety Related Equipment**

10 CFR 830.122(e)(Criterion 5)(1) requires that contractors "...Perform work consistent with technical standards, administrative controls, and other hazard controls adapted to meet regulatory or contract requirements, using approved instructions, procedures, or other appropriate means."

Contrary to this, WSRC has identified and reported multiple instances of failure to comply with facility Technical Safety Requirements (TSR) at their nuclear facilities. These deficiencies were the result of numerous instances where facility personnel and management failed to comply with procedures and administrative requirements. These deficiencies are listed below:

- A. A violation of TSR 3.7.1 was discovered on February 6, 2001, at the Vitrification Facility when facility management failed to have a minimum of three ventilation fans in an operable condition. One of the ventilation fans had maintenance performed and the required post maintenance tests were not completed. The facility management did not maintain an accurate status of this equipment and subsequently when a second ventilation fan was shut down, facility management did not implement necessary Limiting Condition of Operation (LCO) actions, resulting in a TSR violation.

Associated work control deficiencies included the failure to implement an Equipment/System Deviation Form required by 2S Manual, Procedure 5.5; the failure to perform an Operability Assessment required by Standing Order SO-97-09 and Procedure CO 8-08; and the failure to maintain the Shift Manager Turnover Checklist and the Control Room Supervisor Checklist current and accurate as required by 2S Manual Procedure 4.1.

- B. A violation of TSR LCO 3.2.5 was discovered on February 9, 2001, at the Defense Waste Processing Facility (DWPF). On February 9, WSRC workers initiated a waste transfer to Tank 22 without instrumentation (High Liquid-Level Conductivity Probe) required by the TSR to be in an operable condition. Following maintenance on this instrumentation, the required post maintenance surveillance was not fully completed and the instrumentation was not restored to an operable condition. The facility management failed to maintain the status of this equipment and was not aware of the condition when the waste transfer was made.

Prior to initiating the waste transfer, the facility Shift Manager failed to verify that no active LCO was in effect as required by Manual SW9.1-WTS although the procedure step was signed as completed. Manual 2S, Procedure 5.5 requires the Shift Manager to control configuration changes resulting from maintenance, modifications, and testing activities, and to communicate these changes from shift to shift through the shift turnover process. The status of this equipment was not included in the shift turnover Status Tracking Sheet or in the Status Tracking Log. In addition, the facility Status Board did not reflect the current status of this equipment. Finally, the Shift Manager failed to verify acceptable results of the completed surveillance procedures prior to initiating the waste transfer as required by Procedure WM-AP-3015.

- C. A violation of the Operational Safety Limits (OSR) LCO 3.2.11 was discovered on July 17, 2001, at the H Tank facility. A required surveillance, Procedure SW16.6-SR3.2.1, was performed on safety significant instrumentation on July 2, 2001, and logged an out-of-tolerance condition. The procedure requires several additional actions to be performed when an out-of-tolerance condition is recorded. These requirements include notification of management, the preparation of a Installed Process Instrumentation (IPI) Out of Calibration Notice OSR 28-17, and performance of Procedure HLWM 14509. These actions were not performed as required.

This out-of-tolerance condition made the instrumentation inoperable and the OSR required certain actions to be completed. The facility management failed to recognize this out-of-tolerance condition and failed to implement the required actions resulting in a noncompliance with the OSR requirements. Several WSRC personnel and management reviewed the surveillance results and signed the completed surveillance procedure without recognizing the out-of-tolerance condition.

- D. A violation of TSR Surveillance Requirement SR 4.4.3.4 was discovered on October 18, 2001 at the Vitrification Facility. The violation occurred when the facility management failed to complete a required weekly surveillance. The surveillance was missed when an out-of-date surveillance plan was used to schedule the next week's work. Facility management failed to provide valid, up-to-date shift work schedules as required by Manual 2S, Procedure 4.2.

Collectively, these violations constitute a Severity Level III problem.

## **II. Inadequate Configuration Control of Safety Related Equipment**

10 CFR 830.122(e)(Criterion 5)(1) requires that contractors "...Perform work consistent with technical standards, administrative controls, and other hazard controls adapted to meet regulatory or contract requirements, using approved instructions, procedures, or other appropriate means."

Contrary to this, WSRC performed various modifications to or maintenance on safety-class or safety-related equipment that degraded that equipment's safety function as established and described in the facility Authorization Basis (AB). These deficiencies are listed below:

- A. On October 9, 2001, WSRC discovered that a completed temporary modification to a safety class system at the H Tank facility would not provide a low temperature alarm at the required temperature to the facility Control Room. This resulted in the degradation of the safety function of this equipment. WSRC investigation determined the temporary modification was installed and the system placed into operation without adequate post modification testing to ensure proper operation. In addition, the WSRC causal analysis identified that inadequate design and design reviews contributed to this deficiency.
- B. On December 30, 2001, WSRC discovered that a completed modification to safety significant equipment at the ITP facility was installed incorrectly, resulting in a loss of the intended safety function of the modification. The modification, performed to comply with a change in the facility AB, was intended to prevent oxygen from being introduced into the inert atmosphere of the Tank 49 headspace. The modification was performed on the wrong piping, which resulted in the continued introduction of a small amount of oxygen back into Tank 49. This modification was performed on May 15, 2000, but the error was not recognized by WSRC until December 30, 2000.
- C. On February 28, 2001, WSRC workers performed a surveillance procedure on the wrong safety significant equipment at the S235 facility. The surveillance was intended to calibrate a pressure transmitter for one of the building exhaust fans. The workers failed to identify the correct pressure transmitter because the fan

identification covers had been switched during earlier work and they failed to verify additional information that could have identified the correct pressure transmitter. In addition, WSRC personnel failed to follow requirements in the calibration procedure, MAINT W-794032, to obtain the IPI Baseline Data Sheet for the transmitter. The IPI Baseline Data Sheet, FU-144, required the pressure transmitter be placed in the "manual" mode prior to calibration. The workers left the transmitter in the "auto" mode during the calibration process, which caused a loss of function of the equipment. A backup system automatically started, so the facility safety function was not lost and no actual AB violation resulted from this incident.

Collectively, these violations constitute a Severity Level III problem.

### III. Radiological Control

10 CFR 835.1001(a) requires that "...Measures shall be taken to maintain radiation exposure in controlled areas As Low As Reasonably Achievable (ALARA) through physical design features and administrative control. The primary methods used shall be physical design features (e.g., confinement, ventilation, remote handling, and shielding). Administrative controls shall be employed only as supplemental methods to control radiation exposure."

Contrary to this, the following instances were identified where measures were not taken to maintain radiation exposures ALARA through the effective use of physical design features or administrative controls. Specifically—

- A. On March 29, 2001, workers caused a release of airborne radioactivity while determining the configuration of instrument lines for a liquid level transmitter in the Multi-Purpose Processing Facility. Hazards associated with the work activity (which involved making line breaks and introducing pressurized air into potentially contaminated instrument lines) were not adequately recognized during work planning and consequently no effective design measures or administrative controls were implemented. Worker protective equipment was limited to rubber gloves and safety glasses.

Additional deficiencies included the failure to include radiological control personnel in the pre-job briefing as required by 8Q procedure 35, *Work Clearance and Authorization*, and the failure to conduct radiological surveys at each of the line breaks as required by 5Q1.2 procedure 133, *Radiological Surveys*. As a result, the four workers received unplanned uptakes of radioactive material due to the airborne radioactivity release. The resulting doses ranged from approximately 10 to 600 millirem.

- B. On May 23, 2001, sump pump replacement activities in the F Area Pump Tank Pit 1 resulted in the uncontrolled spread of contamination to surrounding areas and the

contamination of a uninvolved worker. The work involved the retrieval of a pump discharge plug from the highly contaminated pit. The work activity was being conducted in a containment tent over the pit and the involved workers were wearing protective clothing and respiratory protection.

The work activity was conducted without the use of two ALARA control measures that were available and had been used for similar work activities at the pit. Specifically, no flushing of the highly contaminated pump discharge plug was performed as the plug was pulled up into the work area, although such flushing was routinely performed for equipment being removed from the pit. The applicable work order for the work failed to specifically require flushing of the discharge plug. Additionally, the roof for the tent was not in place during retrieval of the plug, in anticipation of later use of the crane through the top of the tent. This created an open pathway for spread of contamination out of the tent. As a result, radioactive contamination was spread out of the tent to an approximate 1500 square yard area surrounding the work area. A worker transiting this work area also received contamination on his clothing.

- C. During November 2000 - January 2001, procedural controls established to address recognized hazards associated with the leakage of contaminated process liquids through expansion joints were not effectively implemented at the 221-F Canyon facility. During the subject period, process liquid inside the 9 Hot (9H) cell overflowed the 9H sump and eventually rose in the cell to the level of the expansion joint. Facility operating personnel were aware of the increasing sump levels, but failed to implement response actions for increasing or high sump levels as required by Abnormal Operating Procedure (AOP) 221-F-90611, *Response to Increasing Canyon Sump Level*. This procedure formally describes the potential hazard of liquid leakage into radiologically clean areas through defective expansion joints. Response actions required by the procedure include stopping liquid transfers that may have caused sump increases and directing the inspection of piping in the affected area.

Due to availability concerns with the cranes that would be used for the inspections, these response actions were not taken, and the facility continued to address the situation through intermittent liquid transfers and operation of the applicable process system. No additional compensatory radiological measures, such as supplemental radiological surveys, were instituted in recognition of the developing challenge to the expansion joint. As a result of the subsequent leakage through the expansion joint, significant levels of radioactive contamination were identified in a localized area in the adjoining corridor. Fifteen workers experienced shoe contaminations due to the leakage into the corridor.

Collectively, these violations constitute a Severity Level III problem.



Pursuant to the provisions of 10 CFR 820.24, the Westinghouse Savannah River Company is hereby required within 30 days of the date of this Preliminary Notice of Violation (PNOV) to submit a written statement or explanation to the Director, Office of Price-Anderson Enforcement, Attention: Office of the Docketing Clerk, EH-10/270CC, 19901 Germantown Road, Germantown, MD 20874-1290. Copies should also be sent to the Manager, DOE Savannah River Office, and to the Cognizant DOE Secretarial Office for the facilities that are 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.



R. Keith Christopher  
Director  
Office of Price-Anderson Enforcement

Dated at Germantown, MD  
this 19th day of March, 2002