



**Department of Energy**  
Washington, DC 20585

March 19, 2001

Mr. Philip O. Strawbridge  
Senior Vice President and Chief Operating Officer  
BNFL Inc.  
10306 Eaton Place  
Fairfax, VA 22030

EA 2001-02

Subject: Preliminary Notice of Violation and Proposed Imposition of Civil Penalty  
\$41,250

Dear Mr. Strawbridge:

This letter refers to the Department of Energy's (DOE) investigation of the facts and circumstances concerning quality assurance issues affecting nuclear safety surrounding the April 4, 2000, converter tube bundle fire at the K-33 Decontamination and Decommissioning Workshop.

The DOE Office of Price-Anderson Enforcement, in coordination with the DOE Oak Ridge Operations Office, conducted an investigation of this event in August 2000 including an onsite review at the East Tennessee Technology Park on November 14-15, 2000. The results of this investigation were provided to you in the Investigation Summary Report that was issued on January 23, 2001. An Enforcement Conference was held with you and members of your staff on February 21, 2001, to discuss these findings. A Conference Summary Report is enclosed.

Based on DOE's investigation and information that you provided during the Enforcement Conference and thereafter, DOE has concluded that violations of 10 CFR 830.120 (Quality Assurance Rule) likely occurred; these violations are described in the enclosed Preliminary Notice of Violation (PNOV).

The enclosed PNOV describes numerous violations with the nuclear safety requirements related to activities leading up to the tube bundle fire. The violations involve failure to (1) fully identify hazards associated with T-4 converter decontamination & decommissioning, (2) follow established procedures, and (3) identify and mitigate known operational deficiencies despite several opportunities to do so. Specifically, DOE is concerned that BNFL Inc. has failed to adequately address hazard analysis and work control issues that resulted from several incidents (e.g., Portable High Efficiency Particulate Air Filter Fire, Respirator Cartridge Ignition) that have occurred over the two years preceding the April 4, 2000, tube bundle fire.

In accordance with the General Statement of Enforcement Policy, 10 CFR 820, Appendix A, the violations described in the enclosed PNOV have been classified as one Severity Level II violation and one Severity Level III violation. In determining the Severity Level of these violations, DOE considered the actual and potential safety significance associated with the event under consideration, the programmatic and recurring nature of the problems, and other factors.

To emphasize the importance of maintaining a comprehensive quality program for DOE nuclear activities, I am issuing the enclosed PNOV and Proposed Imposition of Civil Penalty in the amount of \$41,250. DOE has determined that no mitigation is warranted for timely self-identification and reporting, given that the fire was a self-disclosing event. DOE also evaluated the adequacy of corrective actions identified and implemented by your organization. Our evaluation concluded that corrective actions taken to date appear to address the issues that led directly to the fire and that a 25% mitigation of the maximum Severity Level II civil penalty for violations of 10 CFR 830.120 (c)(2)(i) is appropriate. However, DOE remains concerned with those corrective actions yet to be taken and the long-term effectiveness of those corrective actions aimed at enhancing worker awareness of nuclear safety related issues. As such, DOE will be closely evaluating the closure of outstanding corrective actions and monitoring for indications in your operations which would suggest these corrective actions have been ineffective. In addition, DOE remains concerned with your commitment to your management assessment program and, as such, will be following your progress in improving both the timeliness and adequacy of the program. Finally, DOE commends your efforts to consolidate your command media and to streamline the process used to generate future command media. DOE encourages you to continue in this effort and to accelerate the process if at all possible.

You are required to respond to this letter and follow the instructions specified in the enclosed PNOV when preparing your response. Your response should document any additional specific actions taken to date. Corrective actions will be tracked in the Noncompliance Tracking System (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, including your proposed corrective actions entered into the NTS in addition to the results of future assessments or inspections, 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

Enclosures:

Preliminary Notice of Violation  
Enforcement Conference Summary Report  
List of Attendees

cc: S. Cary, EH-1  
M. Zacchero, EH-1  
R. Day, OE  
S. Zobel, OE  
D. Stadler, EH-2  
F. Russo, EH-3  
R. Jones, EH-5  
J. Owendoff, EM-1  
H. Himpler, EM-5  
E. Chitwood, EM-5  
G. Leah Dever, DOE-ORO  
R. Brown, DOE-ORO  
J. Howard, DOE-ORO  
M. McBride, DOE-ORO  
B. Hawks, DOE-ORO  
J. McAnally, BNFL Inc.  
M. Cooter, BNFL Inc.  
Docket Clerk, OE

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

BNFL Inc.  
East Tennessee Technology Park

EA-2001-02

During a Department of Energy (DOE) investigation conducted on November 14-15, 2000, 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 impose civil penalties pursuant to section 234A of the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2282.a., and 10 CFR 820. The particular violations and associated civil penalties are set forth below:

I. Work Processes

10 CFR 830.120 (c)(2)(i) Work Processes requires that work be performed to established technical standards and administrative controls using approved instructions, procedures, or other appropriate means.

Contrary to the above, during initial processing of the T-4 converters in March 2000, work was not performed to established standards and controls through the use of procedures. Examples include the following:

- A. A Field Change Notice (FCN) was issued to add step 2.2.3.d to the Enhanced Work Plan (EWP) Task Plan, Phase 2 – Work Plan Meeting, section 2.0, to include plasma arc cutting of the tube sheets after the tubes have been removed. In addition, verbal direction was given to direct the plasma torch away from the tubes while the tube sheet was being cut. However, cutting of the tube sheets occurred with the tubes in place and the torch directed towards the tubes.
- B. MS-IS-007, Rev 3, *Hot Work*, section 3.17, dated June 30, 1998, states, "The area supervisor shall ensure that the *Permit for Cutting And Welding With Portable Gas Or Arc Equipment* has been properly completed on a daily basis." However, the Hot Work Permit in effect at the time of the tube bundle fire on

April 4, 2000, had not been completed on a daily basis (i.e., completion date and time not entered, Final Check not signed).

- C. In September 1999, BNFL Inc. (BNFL) began converter disassembly operations in the Decontamination & Decommissioning (D&D) Workshop. By April 2000, BNFL had processed 57 T-1A converters. The "*D&D Workshop Fire Hazard Analysis, K-33 Building*," dated June 4, 1999, contains many recommendations to improve fire protection and life safety in the workshop. Some of these recommendations have been acted upon by BNFL. On page 1 of the Executive Summary of the Fire Hazard Analysis (FHA), a statement is made that "Following commencement of D&D Workshop operations, the information contained in the FHA will be updated." However, the FHA had not been updated prior to the April 4, 2000, tube bundle fire.
- D. PR-RO-005, "*Enhanced Work Planning*," section 3.12, dated February 14, 2000, states that the Supervisor/General Foreman confirm "readiness at the task level by verifying and validating the EWP Task Plan generated during the EWP process to give assurance that the documents are accurate." However, the EWP Task Plan in effect at the time of the tube bundle fire contained numerous inaccuracies (e.g., applicable check boxes not checked, work hazards not completely identified, training requirements not completely identified)
- E. PR-RO-005, section 3.14, states that the Supervisor/General Foreman will ensure "performance of the pre-job brief and signing the EWP Pre-Job Brief Sheet to indicate having given the brief." However, the Supervisor or General Foreman did not sign the EWP Pre-Job Brief Sheet.
- F. PR-RO-005, section 3.19, states that the Work Team will stop work when hazards are "determined to be outside the bounds of those defined in the current EWP Task Plan." However, when new hazards were introduced as a result of the FCN that directed hot cutting of the tube sheets, work was not stopped.
- G. IIG-RC-020, "*Nuclear Criticality Safety Approvals/Evaluations*," section 4.1, dated March 31, 1998, states that Area Supervisor should, "Notify NCS personnel and request evaluation of a proposed new operation or a proposed modification to a previously approved operation by completing the NCSA Request Form (Appendix B) prior to initiating the new or modified operation." However, the NCSA Request Form was not completed to evaluate the nuclear safety implications introduced when the EWP Task Plan was modified by the FCN to allow hot cutting of the tube sheet after the tubes have been removed.
- H. PO-CS-005, "*Safety Evaluations/Unreviewed Safety Question Determinations*," section 4.1, dated February 15, 2000, states "Safety Evaluations will be performed for temporary or permanent changes in the facilities or documentation as described in the safety analysis, for tests and experiments not described in the safety analysis, and for potential inadequacies found in the safety analysis."

The BNFL approach to converter D&D operations is described as an “R&D approach” whereby a number of tests/experiments are performed to determine the best methodology by which to proceed. However, these tests/experiments were not subjected to an Unreviewed Safety Question (USQ) screen or USQ evaluation.

- I. PR-CS-005, “Safety Evaluations/Unreviewed Safety Question Determinations,” section 3.4, dated February 17, 2000, states, “ Group Managers ensure that proposed tests or experiments not described in the safety analyses are reviewed by Regulatory Compliance.” However, tests/experiments performed during the D&D activities associated with the converters were not reviewed by Regulatory Compliance.

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

## II. Quality Improvement

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 work affected.

Contrary to the above, between September 1999 and April 2000, processes to detect and prevent quality problems were inadequate in that—

- A. The D&D Workshop Fire Hazard Analysis, section 6.7, dated June 4, 1999, states, “The fire department pre-plan needs to be updated again to include emergency response strategies for the D&D Workshop.” When the fire department arrived on scene to respond to the April 4, 2000, tube bundle fire, they were not aware that they were responding to a metal fire and were not prepared to fight a metal fire and had to request Class D fire extinguishing material from ORNL and Y-12 to fight the fire. Had the fire pre-plan been updated to include emergency response strategies to metal fires, the fire department may have been better prepared to respond to the tube bundle fire.
- B. Hazards and characteristics from previous events involving similar, but self-extinguishing, tube bundle fires during converter disassembly operations were not analyzed to identify and correct the potential quality problems and deficiencies associated with fires caused by hot cutting operations. As a result, adequate processes were not in place to control the April 4, 2000 fire when it did not self-extinguish.

Collectively, these violations constitute a Severity Level III problem.

Pursuant to the provisions of 10 CFR 820.24, BNFL is hereby required within 30 days of the date of the Preliminary Notice of Violation and Proposed Imposition of Civil Penalty, to submit a written statement or explanation to the Director, Office of Price-Anderson Enforcement, Attention: Office of the Docketing Clerk, P.O. Box 2225, Germantown, MD 20875-2225. Copies should also be sent to the Manager, DOE Oak Ridge Operations Office, and to the Cognizant Secretarial Offices at Headquarters for the facilities that are subjects 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 denial. Corrective actions that have been or will be taken to avoid violations will be delineated with target and completion dates in DOE's Noncompliance Tracking System. In the event the violations set forth in the Preliminary Notice of Violation 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 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 the 30 days after the issuance of the Notice and Civil Penalty, unless the violations are denied, or remission or mitigation is requested, BNFL shall pay the civil penalty of \$41,250 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 BNFL fail to answer within the time specified, the contractor will be issued an order imposing the civil penalty. In requesting mitigation of the proposed civil penalty, BNFL should address the adjustment factors described in section VIII of 10 CFR 820, Appendix A.

Sincerely,

A handwritten signature in cursive script that reads "R. Keith Christopher". The signature is written in black ink and is positioned to the left of a vertical red line.

R. Keith Christopher  
Director  
Office of Price-Anderson Enforcement

Dated at Washington, DC  
this 19<sup>th</sup> day of March 2001

**Enforcement Conference Summary  
(NTS-ORO--BNFL-K33-2000-0002)**

The Department of Energy's (DOE) Office of Price-Anderson Enforcement (OE) held an Enforcement Conference with BNFL Inc., personnel on February 21, 2001, in Germantown, Maryland. The OE held the meeting to discuss the facts, circumstances, and corrective actions pertaining to a metal fire/oxidation reaction (the event) that occurred during the dismantlement of a T-4 converter. The conference was called to order by R. Keith Christopher, Director, Office of Price-Anderson Enforcement. A list of attendees is attached. Information and key areas discussed at the conference are summarized below, and material provided by BNFL during the conference was incorporated into the docket file.

Mr. Philip Strawbridge, Sr. Vice President, BNFL, began the presentation by explaining BNFL's corporate structure, stated that BNFL acknowledged the significance of the deficiencies identified by DOE, and therefore BNFL management accepted responsibility for the conditions that led to the event. Mr. James McAnally, Vice President, BNFL Oak Ridge Operations, then provided an overview of the gaseous diffusion dismantlement operations, his managerial and operational improvements made since his August 1999 arrival, and summarized the event's cause and analysis as well as deficiencies identified and corrective actions developed. Additional detailed information was explained by Mr. Ricky Miles, Deputy General Manager, regarding the event's evolution and the ensuing investigation's findings; and by Ms. Vicky Hutton, Compliance Support Manager, concerning quality improvement issues. Mr. McAnally concluded BNFL's presentation by confirming BNFL's commitment to ensuring necessary improvements will be achieved, especially for formality of operations, hazard identification, and adequacy of procedures.

Mr. Christopher indicated that DOE would consider the information presented by BNFL when DOE undertakes its enforcement deliberations. Mr. Christopher then adjourned the conference.



**February 21, 2001**

**BNFL Inc.  
Decontamination and Decommissioning Workshop Tube Bundle Fire**

**Enforcement Conference List of Attendees**

Office of Price-Anderson Enforcement

R. Keith Christopher, Director  
Richard Day, Enforcement Officer  
Steve Zobel, Enforcement Officer  
Howard Wilchins, Senior Litigator

DOE Oak Ridge

Robert Brown, Assistant Manager for Assets Utilization  
Jack Howard, DOE Project Manager  
Brenda Hawks, DOE-ORO PAAA Coordinator

Office of Environmental Management

Ellen Chitwood, DOE PAAA Coordinator

BNFL Inc.

Philip Strawbridge, Senior Vice President and Chief Operating Office  
Jim McAnally, Vice President Oak Ridge Operations Office  
Ricky Miles, Deputy General Manager  
Vicky Hutton, Compliance Manager  
Margaret Cooter, Manager (QA)  
Alex Karlin, Associate General Counsel  
Marian Boussios, Attorney