

March 26, 1998

Mr. Henry Hatch
[]
Fluor Daniel Hanford Company
Richland, WA 99532

EA 98-02

Subject: Preliminary Notice of Violation and Proposed Imposition of Civil Penalty - \$140,625 (NTS-RL--PHMC-PFP-1997-0001, NTS-RL--PHMC-PFP-1997-0002, and NTS-RL--PHMC-PHMC GENL-1997-0002)

Dear Mr. Hatch:

This letter refers to the Department of Energy's (DOE) evaluation of the facts and circumstances surrounding criticality safety infractions and a violation of radiological controls which occurred between November 1996 and June 1997 at the Plutonium Finishing Plant (PFP), and an explosion that occurred in May 1997 at [a facility] of the PFP. The Office of Enforcement and Investigation, in coordination with the DOE Richland Operations Office (DOE RL), conducted investigations of these events and provided our Investigation Summary Reports to you in prior letters.

Multiple criticality safety infractions in the PFP Facility resulted in a curtailment of [radioactive] material movement which in part still remains in place until an Operations Readiness Review of the Transition Operations organization can be conducted. These violations and the violation of the radiological controls were found to be caused in part by management failure to adequately enforce procedural compliance. The explosion at the [facility] caused substantial damage to the facility, including an opening in the roof that serves as a confinement boundary to prevent radiological releases from the facility.

Response to the explosion disclosed a number of failures to follow the established facility and Site Emergency Plan and Procedures.

Based on our evaluation of these matters, DOE has concluded that violations of DOE's nuclear safety requirements involving the Quality Assurance (QA) Rule (10 CFR 830.120) likely occurred. Enforcement conferences were held with senior Fluor Daniel Hanford Company management and other members of your staff, as well as senior management of your subcontractors on January 14 and 15, 1998, to discuss the circumstances surrounding these incidents, their safety significance, and the status

of corrective actions. A follow-up conference was held on February 12, 1998, at the Department of Energy in Germantown, Maryland. Conference Summary Reports for these conferences are enclosed.

The violations described in Section I of the enclosed Preliminary Notice of Violation (PNOV) involve multiple and recurring violations of criticality safety procedures and posting limits at the PFP Facility in 1996 and 1997 which include the following: (1) placing containers of [radioactive] material in temporary storage in a Fixed Array Wagon and transporting the material in violation of criticality safety administrative controls; (2) multiple examples of subcontractor violations of a PFP criticality safety procedure (as it was applied to [a glovebox]) which requires all personnel to know and comply with criticality limits and postings; and (3) multiple examples of subcontractor failure to identify and correct criticality safety infractions.

Strict adherence to all administrative controls established to ensure adequate criticality safety is considered necessary to protect workers and the public, and violation of those administrative controls is a very significant safety concern to the DOE. In some cases these violations occurred when facility managers, after being informed by workers of the condition, failed to take appropriate action to correct the violation. Quality Improvement Processes at PFP failed to identify and correct these violations in a timely manner though monthly and semiannual inspections to assess compliance were required by criticality safety administrative controls.

The concern over the conduct of operations and procedure adherence at PFP led to a contractor imposed curtailment of [radioactive] material movement. DOE RL as a result of its line management review and Readiness Assessment review required a number of Improvement Plans including Criticality Safety. The curtailment of [radioactive] material movement within the Transition Operations organization of the plant will not be removed until an Operational Readiness Review demonstrates the performance improvement according to DOE RL.

The violations described in Section II of the enclosed PNOV include a number of work control failures that occurred shortly before or in response to the [facility] tank explosion in May 1997. These violations involved several examples of failure to comply with your approved operating procedures, and include (1) failure to perform surveillance of emergency breathing apparatus devices in accordance with your established surveillance frequency, (2) failures to make proper and timely notifications of the emergency condition, (3) not performing proper radiological surveys prior to personnel being released from the site, and (4) several instances of personnel failure to take cover when a "Take-Cover" condition was instituted. The actual nuclear consequence was low because the walls and doors to the adjacent rooms containing significant amounts of radioactive material were damaged but withstood the force of the blast. The preceding failures are of concern because of their breadth and the continuing nature of those work control problems.

In evaluating the events leading up to the explosion in the [facility], DOE has concluded that in the eight months before the incident, a number of opportunities were available to identify and correct the conditions that led to the explosion. However, after considering the failures to adequately implement certain procedures before the incident and emergency procedures after the incident, coupled with the multiple examples involving failures to implement a number of work control procedures associated with the criticality safety infractions, DOE's overriding concern is the failure to conduct day-to-day facility operations in accordance with your established operating standards and procedures. Therefore, to assure proper focus on this overriding concern, it serves no regulatory or safety purpose to further pursue enforcement actions for potential violations involving identification of the explosive hazard prior to the explosion.

As described in the preceding discussion, a significant radiological release did not occur as a result of the [facility] tank explosion. However, safety at nuclear facilities is based on a defense-in-depth approach to prevent and mitigate the consequences of nuclear incidents to protect the health and safety of workers and the public. This defense-in-depth includes, among other barriers, administrative procedures and programs (e.g., Quality Assurance, Work Controls, and Lessons Learned), trained and qualified personnel, engineered safety features such as systems and confinement structures, and emergency response plans and procedures. The safety significance is greatest if all or a significant portion of these fail and an actual or high potential for a release or worker exposure occurs. However, even if such actual or high potential for a release or exposure does not occur, a degree of safety significance still applies if the violations cause a degradation of the layers of defense in depth. In the case of the explosion, substantial degradation of defense-in-depth occurred in two areas: (1) a breach of the facility confinement from the roof penetration resulting from the explosion, and (2) the multiple emergency response procedure noncompliances when attempting to implement the Emergency Plan during a declared Alert. Either of these areas alone are considered safety significant. The explosion of [the tank] demonstrated by their failures, the unreliability of the other various barriers in place to prevent such events.

DOE is particularly concerned that the rigor of the conduct of operations, especially the procedural violations in the criticality safety area, and [the facility] explosion related violations represented a continuing problem on the part of the contractor to establish and implement solid safety standards, and to ensure their employees and subcontractors conducted operations in accordance with those established standards and procedures. Additionally, DOE believes that sufficient opportunities existed to earlier identify these procedure adherence weaknesses and effect corrective actions. DOE recognizes that your subcontractors played key roles in these events with Babcock and Wilcox Hanford Company responsible for the day-to-day operations of the facility and DynCorp Tri-Cities Services, Inc., responsible for the implementation of the Emergency Response Plan. However, Fluor Daniel Hanford (FDH) is the Managing Contractor and must ensure its subcontractors are complying with the applicable QA Nuclear Safety Requirements and the DOE approved FDH QA Plan. Therefore, DOE has elected to hold FDH solely accountable for these violations.

In accordance with the "General Statement of Enforcement Policy," 10 CFR 820, Appendix A, the three violations described in Section I of the enclosed PNOV involving criticality safety infractions have each been classified as Severity Level II problems. Similarly, the violations described in Section II of the PNOV associated with the explosion in the [facility] have separately been classified as a Severity Level II problem. In determining the Severity Level of these violations, DOE considered the actual or potential exposure consequences, degradation of safety features or layers of criticality safety, and failure to properly implement emergency response procedures.

To emphasize the need to establish and adhere to appropriate safety standards and work controls, I am issuing the enclosed Preliminary Notice of Violation and Proposed Imposition of Civil Penalty in the amount of \$140,625 (\$37,500 for each of the violations in Section I of the PNOV, and \$28,125 for the violation in Section II of the PNOV).

DOE has determined that no mitigation is warranted for the violations described in Section I of the PNOV and proposed Civil Penalty involving criticality safety. Although the violations were identified by the contractor, the identification was neither timely nor resulted in adequate corrective actions. In both the Fixed Array Wagon and the [glovebox] events, PFP management was informed of the noncompliant condition by workers. PFP management failed to take appropriate action, at the time they were notified, which resulted in the noncompliant condition continuing to exist for more than a week in the Fixed Array Wagon event, and for more than four months in the [glovebox] event. In both events, additional similar violations occurred, after PFP management was notified, resulting from the failure to take timely and appropriate corrective actions.

However, subsequent to these events DOE RL has identified an improvement in the contractor's self identification and corrective actions for more recent events in the area of criticality safety. For example, several criticality safety violations were recently self identified, and corrective actions were timely and appropriate. Because of this more favorable performance and to encourage the desired actions by contractors, DOE will defer additional enforcement action on these recently identified criticality safety infractions. Our decision to defer enforcement action will be contingent on the successful and timely implementation of your corrective actions identified in response to this enforcement action.

The penalty adjustment factors set forth in the Enforcement Policy were also considered for the violations in Section II involving the PRF explosion and, given the facts of this case, partial mitigation of 25% of the base civil penalty was deemed appropriate for your corrective actions. Specifically, partial mitigation of 25% is based on comprehensive analysis and implementation of corrective actions to the site-wide Emergency Response Plan as demonstrated by the January 28, 1998, response to the discovery of [an explosive substance] at the Hanford 327 Facility. Full mitigation was

not considered appropriate because deficiencies in the Emergency Response Plan were known in 1997 prior to the explosion but were not fully corrected.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. After reviewing your response to this Notice, and the status of your corrective action plan, DOE will determine whether further action is necessary to ensure compliance with the applicable nuclear safety requirements.

Sincerely,



Peter N. Brush
Acting Assistant Secretary
Environment, Safety and Health

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Enclosures:

Preliminary Notice of Violation
and Proposed Imposition of Civil Penalty
Conference Summary Report - Criticality Safety Infractions
Conference Summary Report – [Facility] Tank Explosion
List of Attendees
List of Materials Provided at Enforcement Conferences
Record of Conversation

cc: M. Zacchero, EH-1
R. Keith Christopher, EH-10
S. Hurley, EH-10
R. Trevillian, EH-10
G. Podonsky, EH-2
O. Pearson, EH-3
J. Fitzgerald, EH-5
J. Owendoff, EM-1
L. Vaughan, EM-10
E. Fygi, GC-1
J. Wagoner, RL
S. Brechbill, RL
L. Piper, RL
P. Knollmeyer, RL
G. Bell, RL
B. Carosino, RL

P. Kruger, RL
B. Fiscus, RL
M. Yates, FDH

R. Sherman, FDH
D. Thompson, DNFSB
J. Lieberman, NRC
S. Petersen, Docket Clerk

PRELIMINARY NOTICE OF VIOLATION, AND PROPOSED IMPOSITION OF CIVIL PENALTY

Fluor Daniel Hanford Company
Plutonium Finishing Plant
[Facility]

EA 98-02

As a result of a Department of Energy (DOE) evaluation of activities associated with criticality safety infractions at the Plutonium Finishing Plant (PFP) that occurred between December 1996 and June 1997 and activities associated with an explosion in the [Facility] in May 1997, 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. 2282a., and 10 CFR 820. The particular violations and associated civil penalties are set forth below.

I. PFP Criticality Safety Infractions

A. 10 CFR 830.120 (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. Items shall be identified and controlled to ensure their proper use.

Contrary to the above, between December 24 and 31, 1996, a Fluor Daniel Hanford subcontractor, Babcock & Wilcox Hanford Company, placed containers of [radioactive] material in temporary storage and transported that material in violation of criticality safety administrative controls, in that:

1. PFP Operating Procedure ZO-200-028 requires the lid of the Fixed Array Wagon to be closed and latched whenever [radioactive] material is present and the wagon is unattended or in transit. Contrary to this procedure, on December 24, 1996, the Fixed Array Wagon was loaded with [radioactive material] and operators could not close and latch the lid. Subsequently the Fixed Array Wagon, loaded with [radioactive material] was left unattended from December 24 through 30, 1996, with the lid open and unsecured.

2. On December 30, 1996, a PFP Shift Manager moved this Fixed Array Wagon, still loaded with [radioactive material], without closing and latching the lid. The Fixed Array Wagon was first moved to a corridor, outside [a room], and left unattended for approximately one hour, then moved to [another room] where it was again left unattended.
3. PFP Criticality Prevention Specification, CPS-Z-165-80010, requires at least 3 feet of spacing be maintained between quantities of [radioactive material] greater than [a specified weight] and containers having undetermined amounts of [radioactive material]. Contrary to this procedure, on December 31, 1996, a PFP Solid Waste Operator entered [a room] and observed that a Fixed Array Wagon, with [a specified weight of radioactive material], was located less than three feet from a non-isolating wall. A [] storage waste box with an undetermined amount of [radioactive material] was on the other side of the wall. In addition, an isolated transport container with an undetermined amount of [radioactive material] was observed less than three feet from the Fixed Array Wagon.

These examples collectively represent a Severity Level II problem, with a civil penalty of \$37,500.

- B. 10 CFR 830.120 (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. Items shall be identified and controlled to ensure their proper use.

Contrary to the above between November 8, 1996, and December 30, 1996, a Fluor Daniel Hanford subcontractor violated PFP Criticality Prevention Specification CPS-Z-165-80627 (which establishes two sets of unit mass storage limits based upon Moderator to Mass [] ratios and prohibits the storage of containers with mixed unit mass limits for the glovebox) and Criticality Safety Procedure HNF-CM-5-8 (which requires all personnel to know and comply with criticality limits and postings), in that:

1. On November 8, 1996, PFP Operators placed a container of [radioactive material] into [a glovebox] which violated the criticality safety posting limits on this glovebox.
2. On December 20, 1996, a PFP Nuclear Process Operator identified to a shift manager the presence of poly jars in [a glovebox] labeled with [Moderator to Mass] ratios greater than [a specified amount] in violation of Criticality Safety Specification CPS-Z-165-80627. The Shift Manager failed to identify the noncompliance condition and failed to halt operations in the glovebox, also in violation of Criticality Safety Specification CPS-Z-165-80627.

3. On December 23, 1996, PFP Operators placed four containers of [radioactive material] into [a glovebox] which violated the criticality safety posting limits for this glovebox.
4. On December 30, 1996, PFP Operators placed two containers of [radioactive material] into [a glovebox] which violated the criticality safety posting limits for this glovebox.

These examples collectively represent a Severity Level II problem, with a civil penalty of \$37,500.

C. 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 problems and working to prevent recurrence.

Contrary to the above, between November 1996 and June 1997 a Fluor Daniel Hanford subcontractor failed to identify, control and correct items that did not meet established criticality safety requirements, in that:

1. On December 24, 1996, PFP Operators notified their Shift Manager they could not close and latch the lid on a Fixed Array Wagon (described in Violation A above) which was loaded with [radioactive material]. The Shift Manager failed to take control and correct this condition which did not meet the requirements of PFP Operating Procedure ZO-200-028. Subsequently, the Fixed Array Wagon was left unattended in this noncompliant condition until December 30, 1996.
2. On December 20, 1996, PFP Operators notified their Shift Manager of a violation of the criticality safety posting limits on [a glovebox] (described in Violation B above). The Shift Manager failed to control and correct this violation which continued to exist until April 21, 1997. Subsequent to the notification of the Shift Manager, additional violations of the Criticality Safety Posting of [a glovebox] occurred on December 23 and 30, 1996.
3. Between November 8, 1996, and April 21, 1997, PFP personnel failed to identify, control, and correct Criticality Safety Posting violation in [a glovebox]. Nuclear Criticality Safety Internal Inspection Procedure WHC-CM-5-8, dated August 1, 1996, requires the content of [the glovebox] be inspected monthly for compliance with the Criticality Safety Posting. Contrary to this procedure, from November 8, 1996, through April 21, 1997, the content of [the glovebox] was not in compliance with the Criticality Safety Posting. Monthly inspections

during this period did not identify, control, or correct this violation of the Criticality Safety Posting.

4. On June 13, 1997, BWHC workers discovered six items in [a PFP vault] that did not comply with the Criticality Safety Posting for this Vault. Criticality Safety Procedure HNF-CM-5-8, requires semi-annual criticality safety inspections of vaults. Contrary to this procedure, BWHC identified that no criticality safety inspection had been performed in the prior 18 months.

These examples collectively represent a Severity Level II problem, with a civil penalty of \$37,500.

II. Tank [] Explosion in the [Facility]

10 CFR 830.120 (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. Items shall be identified and controlled to ensure their proper use.

Contrary to the above, prior to and in responding to a May 14, 1997, explosion in the [facility], contractor personnel failed to comply with established document change, surveillance, emergency response, and radiological control procedures, in that:

1. Procedure WHC-CM-1-11/WKH 15, *Industrial Hygiene - Respiratory Protection Program* required that respirators be inspected and tested every two years. However, a number of PFP/[] respirators that exceeded the two-year inspection interval were left in service from January 1997 through the day of the accident in May 1997. In addition, the contractor did not follow established management controls to obtain a waiver from the Respiratory Protection Program procedure in accordance with procedure WHC-CM-1-3, Section 2.21, *Requesting and Processing Waivers to Controlled Manuals*, Rev.1, which provides the process for obtaining a waiver and a caution not to deviate from established procedures until a waiver is obtained.
2. Procedure DOE-0223, RLEP 3.5, *Operating the Hanford Incident Command Center*, Section 2.1, requires that, among other things: offsite agencies be notified within 15 minutes of declaring an emergency; the Incident Command Post (ICP) Coordinator prepare an Incident Notification Form, obtain the Building Emergency Director's (BED) signature, and forward the signed form to the Patrol Operations Center (POC) within 10 minutes of declaring an emergency so that timely offsite notifications can be made. This procedure is part of the PFP emergency Plan. However, on May 14, 1997, following the tank explosion in the [facility] and the declaration of an Alert level emergency, the POC did not receive a fax of the Notification Form or a notification call from the BED or ICP Communicator, and all required offsite notifications did not occur until one hour after the emergency was declared.

3. Procedure WHC-IP-0263-PFP, *Building Emergency Plan for Plutonium Finishing Plant Complex*, Rev. 3, and Procedure WHC-IP-1054-PFP, *Plutonium Finishing Plant, Emergency Response Guides*, Rev. 1, both require that if a "Take-Cover" alarm is activated, personnel are to take cover in the nearest trailer or building. However, on May 14, 1997, following the [facility] tank explosion several instances occurred of personnel moving outside, without any personnel respiratory protection, and not complying with the Take-Cover requirement.
4. Procedure HNF-IP-0718, *Health Physics Technical Practices and Procedures - Personnel Decontamination*, Section 1.7, Rev. 0, provides the contractor approved method of performing nasal smears for the purpose of conducting a radiological survey of an individual suspected of receiving contamination uptake. This procedure requires use of a "Whatman" type filter for conducting the nasal smear. However, on May 14, 1997, following the [facility] tank explosion, nasal smears of several workers were performed using gauze pads rather than the required "Whatman" filters.

These examples collectively represent a Severity Level II problem, with a civil penalty of \$28,125.

Pursuant to 10 CFR 820.24, Fluor Daniel Hanford, Inc., is hereby required within 30 days of the date of this Notice and Proposed Imposition of Civil Penalty, to submit a written statement or explanation to the Director, Office of Enforcement and Investigation, Office of the Assistant Secretary for Environment, Safety and Health, U.S. Department of Energy, P.O. Box 2225, Germantown, MD 20874-2225, Attention: Office of the Docketing Clerk, with copies to the Manager, DOE Richland Field 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 Proposed Civil Penalty" and should include the following for each violation: (1) admission or denial of the alleged violations, (2) the facts set forth above which are not correct and the reasons for the violations if admitted, and if denied, the reasons they are not correct, (3) the corrective steps that have been taken and the results achieved, (4) the corrective steps that will be taken to avoid further violations, and (5) the date when full compliance will be achieved.

Any request for remission or mitigation of civil penalties must be accompanied by a substantive justification demonstrating extenuating circumstances or other reasons why the assessed penalties should not be imposed in full. Unless the violations are denied, or remission or mitigation is requested within the 30 days after the issuance of the Preliminary Notice of Violation and Civil Penalty, Fluor Daniel Hanford, Inc., shall pay the civil penalties totaling \$140,625 (imposed under Section 234A of the Act) by check, draft or money order payable to the Treasurer of the United States (Account Number 891099) mailed to the Director, Office of Enforcement and Investigation, U.S. Department of Energy. Should the contractor fail to answer within the time specified, an order imposing the civil penalty will be issued.

If requesting mitigation of the proposed penalty, Fluor Daniel Hanford Company should address the adjustment factors described in Section VIII.C. of 10 CFR 820, Appendix A.

A black rectangular box containing a white handwritten signature, which appears to be "Peter N. Brush".

Peter N. Brush

Assistant Secretary
Environment, Safety and Health

Dated at Washington, D.C.
this 26th day of March 1998