



Department of Energy
Washington, DC 20585

August 29, 2003

Mr. Edward S. Aromi
[]
CH2M Hill Hanford Group, Inc.
P.O. Box 1500
Richland, WA 99352

EA 2003-06

Subject: Preliminary Notice of Violation and Proposed Imposition of Civil Penalty
\$82,500

Dear Mr. Aromi:

This letter refers to the Department of Energy's Office of Price-Anderson Enforcement (OE) investigation of the facts and circumstances concerning quality assurance issues affecting nuclear safety at the Hanford Tank Farms. These issues involve the inadvertent deenergization of annulus leak detectors, dilution tank overfills, and dome loading control, over the period August 2002 to November 2002.

OE initiated an investigation of the issues noted above with a full review of relevant documentation. In addition, discussions that involved the Department of Energy (DOE) Office of River Protection (ORP) and CH2M Hill Hanford Group (CHG) personnel took place at the Hanford site on April 22-24, 2003. Our findings were provided to you in an Investigation Summary Report dated June 12, 2003. An Enforcement Conference was held with you and members of your staff on July 29, 2003, to discuss these findings and to ascertain the CHG response to identified potential noncompliances. An Enforcement Conference Summary is enclosed.

Based on our evaluation of the facts and information that you provided during the Enforcement Conference, DOE has concluded that violations of 10 CFR 830 Subpart A (Quality Assurance Requirements) occurred. These violations are described in the enclosed Preliminary Notice of Violation (PNOV).

The enclosed PNOV describes numerous violations of nuclear safety requirements related to your operations at the Tank Farms. Of particular concern is the longstanding nature of the types of nuclear safety compliance violations as evidenced by the fact that my office had previously issued both an Enforcement Letter and Special Report Order citing similar issues as those observed in all three of the events that were under investigation. Specifically, noncompliances were identified in the areas of (1) quality

improvement, for which compensatory and/or longer term corrective actions identified and implemented by CHG failed to correct known quality problems, (2) management and independent assessments which lacked both the frequency and depth of review that would be expected from an effective management or independent assessment program, (3) work processes which demonstrated numerous failures to follow established procedure, and (4) organizational behavior in which some CHG personnel demonstrated a profound inattention to detail, reluctance to report events, and attempts to conceal saltwell overfills.

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 three Severity Level II violations. In determining the Severity Level of these violations, DOE considered the actual and potential safety significance associated with the quality assurance noncompliances, the 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 Civil Penalty in the amount of \$82,500. DOE evaluated the CHG actions in timely identifying and promptly reporting the potential noncompliances. Although CHG did promptly report the potential noncompliances associated with the three events that were under investigation, OE views the specific occurrences to be either self-disclosing or DOE identified. Thus, no mitigation for self-identification and reporting is deemed appropriate. DOE also evaluated the adequacy of corrective actions taken by CHG in response to the three events that were under investigation. Although CHG was initially slow to adequately address known weaknesses in their operations, recent corrective actions have been both aggressive and comprehensive. A review of CHG operational information from November 2002 to present has shown marked improvement in the management processes by which CHG controls its dome loading activities and there have been no additional saltwell overfill events. Changes in CHG senior management over the past year have had a positive effect on the overall nuclear safety mindset at the Tank Farms as demonstrated by improved operational performance. Thus, DOE has determined that 50% mitigation for all three severity level three violations is warranted for corrective actions taken.

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, in addition to the results of future assessments or inspections, DOE will determine whether future enforcement action is necessary to ensure compliance with DOE nuclear safety requirements.

Sincerely,

Stephen M. Sohinki
Director
Office of Price-Anderson Enforcement

Enclosures:
Preliminary Notice of Violation
Enforcement Conference Summary Report
List of Attendees

cc: R. Schepens, ORP
P. Carier, ORP PAAA Coordinator
S. Vega, ORP PAAA Coordinator
B. Smoot, CHG PAAA Coordinator
J. Roberson, EM-1
S. Johnson, EM-5
L. Vaughan, EM-5
A. Acton, IG-33
B. Cook, EH-1
A. Kendrick, EH-1
R. Day, OE
P. Rodrik, OE
Docket Clerk, OE

**Preliminary Notice of Violation
and
Proposed Imposition of Civil Penalty**

CH2M Hill Hanford Group, Inc.
Hanford Tank Farms

EA-2003-06

In April 2003, the Office of Price-Anderson Enforcement (OE) conducted an investigation and reviewed pertinent documentation concerning the inadvertent deenergization of annulus leak detectors, dilution tank overfills, and dome loading control, over the period August 2002 to November 2002. Following an Enforcement Conference held on July 29, 2003, DOE concluded that violations of DOE nuclear safety requirements have occurred. They are set forth below with the associated civil penalties. In accordance with 10 CFR 820, Appendix A, "General Statement of Enforcement Policy," DOE issues this Preliminary Notice of Violation (PNOV), with proposed civil penalty, pursuant to section 234a of the Atomic Energy Act of 1954, as amended, 42 USC 2282a, and 10 CFR 820.

I. Violation Pertaining to Work Processes

10 CFR 830.122(e)(1) requires that work be performed consistent with technical standards, administrative controls, and other hazard controls adopted to meet regulatory or contract requirements by using approved instructions, procedures, or other appropriate means.

Contrary to the above, between August 2002 and November 2002, work was not performed consistent with technical standards, administrative controls, and other hazard controls adopted to meet regulatory or contract requirements, using approved instructions, procedures, or other appropriate means. Examples include the following:

- A. HNF-IP-0842, Volume 2, Section 4.2.1, Revision 1q, "Shift Routines and Operating Practices," subsection 2.6.3, dated June 4, 2002, states operations personnel have the responsibility for "identifying operating parameters outside specified limits and their cause (if known)." Subsection 2.6.4 states operating personnel are to "notify the shift manager of significant changes in readings, out-of-limit conditions, difficulties in performing tasks, or unexpected situations." However, on August 22, 2002, a lockout/tagout of [] inadvertently deenergized the AN Tank Farm leak detectors. Operations personnel taking rounds on both the night shift and day shift on August 23, 2002, failed to identify and communicate the inoperability of the annulus leak detectors and to act on that information.

- B. HNF-SD-WM-TSR-006, "Primary Leak Detection Systems," Revision 2, Limiting Condition of Operation (LCO) 3.2.6 requires that one of the two primary tank leak detection systems be operable at all times. However, on August 23, 2002, a Technical Safety Requirement (TSR) violation occurred when both primary tank leak detection systems associated with two tanks were inoperable and CHG personnel failed to take action required by the LCO.
- C. HNF-IP-0842, Volume 2, Section 4.2.1, Revision 1q, "Shift Routines and Operating Practices," subsection 3.7, paragraph, 6(b), dated June 4, 2002, states, "Operations personnel shall only undertake the number of concurrent activities that can be safely and effectively controlled and monitored. NOTE: If the number of activities is large enough to impair safety or effectiveness, notify the shift manager." However, operations personnel responsible for taking rounds on both the night shift and day shift on August 23, 2002, were very busy and were distracted by other responsibilities, and they failed to effectively control and monitor Tank Farm operating parameters. In addition, both operators failed to notify their shift manager of their increased level of activity and the potential that this might impair their job performance.
- D. TFC-OPS-MAINT-C-01, Revision A, "Tank Farm Contractor Work Control," Section 4.12.1.3, dated July 22, 2002, states that approval from the appropriate organization is required if the change affects the work performance described in the work package and that this approval is to be recorded in the work record of the work package. However, on August 22, 2002, work package 2E-01-0851 was changed from energized to deenergized work without any record of appropriate organizational approval.
- E. RPP-DI-SE-002, Section 3.0, Revision 2, "Use of Technical Safety Requirement Applicability Review Matrix To Review Work Packages Desk Instruction," dated October 2, 2001, requires that if a work package is revised, a new TSR Applicability Review Matrix must be generated or the existing one revised. However, the TSR Applicability Review Matrix was not revised when work package 2E-01-0851 was revised on August 22, 2002, from energized to deenergized work.
- F. HNF-IP-0842, Volume 2, Section 4.9.1, Revision 7h, "Lockout/Tagout Program," subsection 5.2.11, dated May 22, 2002, requires that the lockout/tagout administrator "evaluate the impact of the isolating boundaries with respect to work scope, personnel safety, facility operability, configuration control, public and environmental protection, and compliance with other safety requirements." However, on August 22, 2002, the lockout/tagout administrator failed to identify that the lockout/tagout of [] would adversely impact facility operability of AN Tank Farm annulus leak detectors.
- G. TO-410-101, Section 5.12.8, Revision A-7, "Perform 241-S-101 Saltwell Pumping," dated September 26, 2002, states, "**WHEN** the water level in the site

- tube is near the top of the tank. **CLOSE** valve SALW-V-D1604 **AND NOTIFY** MBD operator that manual fill of the dilution tank has been secured.” However, on October 13, 2002, an operator performing a fill of the S-101 dilution tank failed to visually observe the water level in the site tube resulting in an overflow of the tank.
- H. TO-420-100, Section 5.20.11, Revision G-7, “Dip Tube Flushing,” dated October 8, 2002, states, “Open valve(s) from water supply. “ However, this step in the procedure does not explicitly state which valves are to be manipulated and which water source should be used to perform the dip tube flush. On October 14, 2002, an operator performing the dip tube flush inadvertently opened the valve to the dilution tank in addition to the valve to the dip tube resulting in an overflow of the dilution tank.
- I. HNF-IP-0842, Volume 2, Section 4.6.2, Revision 6h, “Occurrence Reporting and Processing of Operations Information,” subsection 3.0, states, “If any event or condition is observed that could have an adverse effect on safety, health, quality assurance, safeguards and security, operations, or the environment, then immediately notify management.” However, dilution tank overfills that occurred on October 13-14, 2002, were not reported when the spill occurred but rather were discovered shortly thereafter by CHG personnel not directly associated with the spills.
- J. HNF-SD-WM-TSR-006, Revision 2-F, “Tank Farm Technical Safety Requirements,” Section 5.16.2(b), “Dome Loading Controls,” requires that a program be established and implemented to manage soil and concentrated loads and that the program provide for discrete load limits for each tank and vehicular access control to the tanks. However, on November 13, 2002, a water truck that was used to fill a dilution tank entered a tank exclusion zone exceeding the allowable load limits for the tank, resulting in a TSR violation.
- K. Survey markers called “feathers” are used in the Tank Farms to mark both the tank perimeter (green) and the exclusion zone (yellow). The use of “feathers” was established in response to previous dome control issues where the tank perimeter and exclusion zones were not marked, and it was left to the CHG personnel to know and visualize the exclusion areas. However, the use of “feathers” was not proceduralized, the meaning of the feathers was not universally understood by CHG workers who would have a need to know, and the application of “feathers” to exclusion zones outside of the tank farm fences was not effectively communicated.
- L. HNF-IP-0842, Volume 2, Section 4.1.1, Revision 7, “Operations Organization and Administration,” subsection 2.5, states that the Field Work Supervisor is required to communicate directly with the shift manager for equipment changes, facility configuration changes, and the authorization basis control. However, on April 16, 2002, 12,000 pounds were added to the dome of []. This additional weight

was not recorded on the tank dome log and there was no entry in the Central Command and Control log that a call was made.

Collectively, these violations constitute a Severity Level II problem.
Civil Penalty - \$27,500

II. Violation Pertaining to Quality Improvement

10 CFR 830.122(c)(2) requires the identification, control, and correction of items, services, and processes that do not meet established requirements.

10 CFR 830.122(c)(3) requires the identification of causes of problems and work to prevent recurrence as a part of correcting the problem.

Contrary to the above, between November 2000 and October 2002, the identification, control, and correction of items, services, and processes that do not meet established requirements, as well as the identification of causes of problems and work to prevent recurrence as a part of correcting the problem did not occur, in that CHG failed to adequately implement or sustain corrective actions directed at preventing recurrence of known operational deficiencies, as indicated by the following:

- A. Prior to May 1, 2001, Tank Farm contractors were procedurally allowed to fill tanks until water overflowed the vent valve opening, thus allowing a small amount of water to spill onto contaminated soil. As long as the overflow did not exceed 60 gallons and was not due to operational error, the overflow did not constitute a State of Washington permit violation. In May of 2001, an initial notification was made to the State of Washington concerning historical violations caused by dilution tank overfills. On March 1, 2002, and again on April 21, 2002, CHG experienced two dilution tank overflow events which were attributed to failure of the automatic fill system. A decision was made shortly thereafter by CHG to suspend future filling of dilution tanks by the automated system and move to a manual fill process as an interim measure. In response to a manual fill spill event in May 2002, CHG identified an adverse trend in dilution tank overflow events. Following two additional dilution tank spill events, on October 3, 2002, an Office of River Protection (ORP) assessment identified inadequacies in the CHG causal analysis associated with the series of spills. Over a five-day period in October 2002, there were three additional dilution tank overflow events.

Despite recognition of a repetitive problem related to its dilution tank filling operations, CHG did not control and correct the problems and prevent recurrence of the dilution tank overfills.

- B. Since June 2001, 77 Problem Evaluation Requests (PERs) have been written to address dome loading control related issues. Typically, these PERs have involved problems in the area of dome load log keeping, supporting engineering documentation, and identification and control of tank exclusion zones. Of these

77 PERs, four were categorized as “significant” and required a formal root cause analysis with associated corrective action identification and implementation. Further, 43 were categorized as “with resolution”, which is similar to what is required for “significant” PERs but using a graded approach to causal analysis and corrective action identification and implementation. A review of these PERs and other operational information indicates that DOE-ORP Facility Representative surveillances were one of the primary means by which dome loading issues were identified. Following the A-417 catch tank incident in November 2002, DOE-ORP Facility Representatives conducted a review of CHG progress in controlling dome access to catch tanks and Inactive Miscellaneous Underground Storage Tanks (IMUST) and concluded that the following issues were not identified by CHG in their evaluation of the event: (1) none of the catch tanks and IMUSTs outside the Tank Farm boundary have barriers in place to restrict access to exclusion zones and (2) the IMUSTs inside the Tank Farm boundary do not have controls implemented to track and control access to the tank exclusion zone. These observations indicate that CHG’s extent of condition review following the event was not comprehensive. An NTS report submitted by CHG in May 2002 documented a programmatic breakdown in dome loading controls. Problems with dome loading control continued at Tank Farms after recognition of this problem, indicating that interim corrective actions were not effective.

CHG was slow to respond in controlling and correcting known problems in the area of dome loading control. Effective CHG causal analysis, corrective action identification, and corrective action implementation were only undertaken upon repeated intervention by DOE-ORP Facility Representatives.

- C. The primary means by which CHG conducts its management assessments is through the Management Observation Process and completion of Management Observation Checklists. The focus of these assessments has been largely on observation of work activity and the associated compliance with established procedure or protocol. It does not appear the CHG management assessment program, as it relates to dilution tank operations and dome loading control, addressed the assessment of management systems and processes as described in their Quality Assurance Program Description. Further, many of the management assessments performed lacked the depth of analysis expected from a management assessment. The ineffectiveness of the CHG management assessment program hindered its ability to identify quality-related problems in a proactive manner.
- D. CHG has not performed any independent assessments relative to dilution tank operations or dome loading control over a two-year period. Given the history of these issues over this time period, CHG should have conducted some independent assessment activity in these areas of their operations. The ineffectiveness of the CHG independent assessment program hinders its ability to identify quality related problems in a proactive manner.

Collectively, these violations constitute a Severity Level II problem.
Civil Penalty - \$27,500

III. Violation Pertaining to Information Requirements

10 CFR 820.11(a) requires that any information pertaining to a nuclear activity provided to DOE by any person or maintained by any person for inspection by DOE shall be complete and accurate in all material respects.

10 CFR 820.11(b) states that no person involved in a DOE nuclear activity shall conceal or destroy any information concerning a violation of a DOE Nuclear Safety Requirement, a Nuclear Statute, or the Act.

Contrary to the above, between August 2002 and November 2002, CHG personnel either failed to assure that information pertaining to a nuclear activity was accurate or efforts were made to conceal information concerning a violation of a DOE nuclear safety requirement, as indicated by the following:

- A. Operators conducting rounds on two consecutive shifts indicated on the round sheets that the AN Tank Farm annulus leak detectors were operable when, in fact, they had been inadvertently deenergized the previous day.
- B. Interim Stabilization operators on two consecutive days overfilled saltwell dilution tanks and consciously decided not to report the spills and were not forthcoming in post-event investigations.
- C. The S Tank Farm shift manager, performing a required weekly "Tickler" to assure actual dome loads were consistent with those recorded in the dome load log, failed to recognize the load discrepancy on [] on two consecutive occasions.

Collectively, these violations constitute a Severity Level II problem.
Civil Penalty - \$27,500

Pursuant to the provisions of 10 CFR 820.24, CHG 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 one of the following addresses:

(if sent by U.S. Postal Service):

Director, Office of Price-Anderson Enforcement
Attention: Office of the Docketing Clerk
EH-10, 270 Corporate Square Building
U.S. Department of Energy
1000 Independence Avenue, SW
Washington DC 20585-0270

(if sent by overnight carrier):

Director, Office of Price-Anderson Enforcement
Attention: Office of the Docketing Clerk
EH-10, 270 Corporate Square Building
U.S. Department of Energy
19901 Germantown Road
Germantown, MD 20874-1290

Copies should also be sent to the Manager, DOE Office of River Protection. 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 in this PNOV which you believe 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 future violations should be delineated with target and completion dates in OE's Noncompliance Tracking System. In the event the violations set forth in the Preliminary Notice of Violation are admitted, this PNOV will constitute a Final Order in compliance with the requirements of 10 CFR 820.24.

Any request for remission or further 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 PNOV and civil penalty, unless the violations are denied, or remission or additional mitigation is requested, CHG shall pay the civil penalty of \$82,500 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 Price-Anderson Enforcement Attention: Office of the Docketing Clerk, at one of the above addresses. If CHG should fail to answer within the time specified, the contractor will be issued an order imposing the civil penalty. Should additional mitigation of the proposed civil penalty be requested, CHG should address the adjustment factors described in section IX of 10 CFR 820, Appendix A.

Stephen M. Sohinki
Director
Office of Price-Anderson Enforcement

Dated at Washington, DC
this 29th day of August, 2003

ENFORCEMENT CONFERENCE SUMMARY

Inadvertent Deenergization of Annulus Leak Detectors Dilution Tank Overfills Dome Loading Control (NTS-RP-CHG-TANKFARM-2002-0008) (NTS-RP-CHG-TANKFARM-2002-0009) (NTS-RP-CHG-TANKFARM- 2002-0005)

On July 29, 2003, the Office of Price-Anderson Enforcement (OE) held an Enforcement Conference with CH2M Hill Hanford Group (CHG), in Germantown Maryland. The meeting was called to discuss the facts, circumstances, and corrective actions pertaining to nuclear safety issues associated with the (1) Inadvertent Deenergization of Annulus Leak Detectors, (2) Dilution Tank Overfills, and (3) Dome Loading Control over the period August 2002 through November 2002. Mr. Stephen Sohinki, Director of the Office of Price-Anderson Enforcement, called the meeting to order. Mr. Sohinki stated that OE had convened the meeting to (1) address issues noted in the June 12, 2003, Investigation Summary Report, (2) discuss corrective actions taken to prevent recurrence, and (3) discuss mitigation factors for OE consideration. Information and key areas discussed at the conference are summarized below, and material provided by CHG during the conference was incorporated into the docket.

Mr. Edward Aromi, President and General Manager of CHG began the CHG presentation by recognizing the important programmatic implications of the three issues under investigation. He emphasized the recent improvement initiatives fostered by the new management team to correct these programmatic issues. Mr. Aromi closed his initial remarks by reiterating CHG's commitment to continued improvement and stated that the resolution of these issues is integral to CHG's corporate success. Mr. David Amerine, Deputy General Manager, provided an overview of the Tank Farm complex. Mr. Kevin Dorwick, Deputy for Closure Projects, addressed the specific issues associated with the June 12, 2003, Investigation Summary Report. Mr. Dorwick addressed each of the three issues under investigation by first discussing the relevant operational history. He then addressed the details of events. His discussion concluded by addressing CHG efforts in identifying deficiencies, understanding underlying causes, corrective actions taken, and the safety significance of the issues. Mr. Amerine then discussed the impact that the issues presented in the Investigation Summary Report had on the CHG nuclear safety program. He concluded that CHG needs to (1) enhance formality of work control processes, (2) perform comprehensive causal analysis, (3) identify and implement corrective action that address root causes, (4) develop a more comprehensive self-assessment process, and (5) instill a questioning attitude in

the CHG work force. Several CHG personnel then presented improvement initiatives directed in the areas of the following: (1) work processes, (2) management assessments, (3) quality improvement, and (4) nuclear safety culture. Mr. Amerine continued by presenting for OE consideration, several areas for potential enforcement mitigation to include (1) identification and reporting of dilution tank overfill events, (2) identification and reporting of dome loading control issues, (3) identified and implemented corrective actions associated with the dilution tank overfill events, (4) identified and implemented corrective actions associated with the dome loading control issues, and (5) improvement initiatives directed at broader more programmatic issues (e.g., work process control, self-assessment, quality improvement, corrective action management, nuclear safety culture). Mr. Aromi then closed the CHG presentation stating, in part, that the issues cited in the Investigation Summary Report have been resolved in a manner reflective of the CHG sustained improvement initiative, the ongoing initiatives have shown demonstrable success, and CHG is committed to bringing this level of achievement to all other aspects of its nuclear safety program.

Mr. Sohinki stated that OE would consider the information presented by CHG together with the entire record when OE undertakes its enforcement deliberations. Mr. Sohinki then adjourned the conference.

July 29, 2003

**Inadvertent Deenergization of Annulus Leak Detectors
Dilution Tank Overfills
Dome Loading Control**

Enforcement Conference List of Attendees

DOE – Office of Price-Anderson Enforcement

Stephen M. Sohinki, []
Roy Gibbs, Enforcement Specialist
Richard Day, Enforcement Specialist
Peter Rodrik, Enforcement Specialist
Howard Wilchins, Senior Litigator

DOE – Office of Environmental Management

Terry Krietz, Safety Liaison

DOE - Office of River Protection

Roy Schepens, []
John Swailes, []
Patrick Carier, PAAA Coordinator

CH2M Hill Hanford Group

Edward Aromi, []
David Amerine, []
Kevin Dorwick, Deputy Closure Projects
Craig Anderson, Assessments Manager
William Smoot, PAAA Program Manager
Stan Bensussa, General Counsel