Department of Energy
National Nuclear Security Administration
Washington, DC 20585

June 21, 2004

Vice Admiral George P. Nanos
[ ]
Los Alamos National Laboratory
P.O. Box 1663
Los Alamos, NM 87545

EA-2004-05

Subject: Preliminary Notice of Violation and Proposed Civil Penalty $770,000
(Waived by Statute)

Dear Admiral Nanos:

This letter refers to the investigation by the Department of Energy's Office of Price-Anderson Enforcement (OE) of the August 5, 2003, [ ] multiple [ ] uptake event, the September 27, 2003, [ ] five worker exposure to toxic vapors, and programmatic issues in the radiological protection program at the Los Alamos National Laboratory (LANL).

An Investigation Summary Report describing the results of that review was issued to you on March 23, 2004. An Enforcement Conference was held on April 13-14, 2004, in Germantown, Maryland, with you and members of your staff to discuss these findings. An Enforcement Conference Summary is enclosed.

Based upon our evaluation of these issues and information presented by the LANL management during the Enforcement Conference, the National Nuclear Security Administration (NNSA) has concluded that violations of DOE's rules including *Quality Assurance Requirements* (10 CFR 830 Subpart A), *Safety Basis Requirements* (10 CFR 830 Subpart B), and *Occupational Radiation Protection* rule (10 CFR 835), have occurred. The violations are described in the enclosed Preliminary Notice of Violation (PNOV).

Section I of the PNOV describes the violations associated with occupational over-exposures from the pre-inventory material accountability activities conducted August 5, 2003, in [ ] at [ ]. During the material accountability activities, two LANL workers received uptakes of radioactive [material] that resulted in worker exposures exceeding the annual Federal limit of five rem total effective dose equivalent

(TEDE). The exposure violations that occurred would generally each be considered to represent a Severity Level II problem, based on the magnitude of the exposure received. However, due to the long-standing nature of the underlying problems that led to this event, each violation is being escalated to a Severity Level I problem.

Section II of the PNOV describes significant work control deficiencies that led to and contributed to the significance of the same event. These work control deficiencies included several examples of failure to comply with LANL's own established work controls as well as a number of examples of inadequate work control measures. The examples of failure to comply with work controls are collectively considered a Severity Level I problem due to their direct contribution to the event and the event's high potential safety consequence. For the same reasons, the examples of failure to develop adequate work controls collectively represent a Severity Level I problem.

Section III describes quality improvement violations involving (1) failure to correct known deficiencies in residue container design, (2) failure to initiate a Nonconformance Report or other corrective action documentation to evaluate and resolve [radioactive material] residue container packaging degradation when found in one container a few months before the August 5 exposure event, and (3) failure to identify and correct degraded storage cage seismic restraints. Collectively, these are considered a Severity Level I problem due to their direct contribution to an event that had a high potential safety consequence.

Section IV of the PNOV describes safety basis violations involving (1) failure to establish procedures to maintain seismic restraints, (2) failure to maintain storage cage seismic restraints in an operable condition, and (3) failure to store residue containers on the seismic rack, in violation of Technical Safety Requirements and DOE Safety Evaluation Report requirements. Collectively these safety basis violations would generally be considered a Severity Level II problem, but they are being escalated to a Severity Level I problem based on the long-standing nature of the underlying problems that led to the event.

Section V of the PNOV describes radiological control violations associated with the pre-inventory material accountability activities. Collectively, these radiological control violations would generally be considered a Severity Level II problem, but they are being escalated to a Severity Level I based on the long-standing nature of the underlying problems that led to the event.

OE also investigated potential violations associated with a toxic vapor release and personnel chemical exposure with worker injury although no radiological consequences occurred. Of concern is that the same work planning and control process that was used for this activity is also used for nuclear-related activities, and this event disclosed serious flaws in that process similar to conclusions for the [radioactive material] uptake event. No enforcement action is being taken for this event since the consequences were

non-radiological and the action for the [radioactive material] uptake event already cites programmatic deficiencies in the work planning and control process. However, the toxic vapor incident adds further impetus to the critical need to strengthen this process.

Additionally, OE investigated programmatic problems identified in a LANL assessment of the radiological control program. Since these problems were identified by LANL, reported into the Noncompliance Tracking System (NTS) and are being addressed in a timely manner, NNSA has exercised discretion and decided not to take any enforcement action for these issues.

I am concerned with the significance of the [radioactive material] uptake event, including the history of the problems with the degradation of [radioactive material] residue containers, the lack of LANL action to correct this condition, and the potential for the radiological uptake to have been significantly higher than what occurred. Although the worker exposures were on the order of 7.5 and 10 rem committed effective dose equivalent (CEDE), only a very small fraction of the material in the containers was released. Based on data in DOE's release fractions guidelines on what is feasible for various conditions, it is clear that the release could have been much larger by orders of magnitude, and the corresponding personnel exposure much larger as well.

Further, NNSA is concerned that the LANL processes for Management Assessment and Independent Assessment failed to identify the problems that led to the [radioactive material] uptake event, or to determine that the underlying work process, safety culture and safety basis implementation problems were continuing. Your attention to improve performance of these assessment activities appears to also be warranted.

Just over a year ago, I issued an enforcement action against LANL for a series of events that collectively involved failures in the areas of work processes, radiological controls, safety basis compliance and quality improvement. Indeed, I stated that the radiological uptakes involved in one of those events were limited fortuitously and not by effective work controls. At that time based upon your commitments at a two-day enforcement conference that fundamental changes were being made to correct these deficiencies and strengthen the laboratory management processes, I decided not to escalate the quality improvement citations to a Severity Level I penalty. Several months later, additional events triggered an Enforcement Letter by the Director of the Office of Price-Anderson Enforcement. These events again involved deficiencies in work controls, radiological controls and safety basis compliance. In that letter, you were again accorded discretion, and formal enforcement action was withheld based upon your extensive commitments, the recent changes in Laboratory management, and the recognition that corrective actions had just recently been initiated to address systemic problems.

While NNSA recognizes the fundamental changes you are attempting to make to address the deficient safety culture at LANL, I cannot continue to mitigate enforcement citations when significant safety events continue to occur, and particularly when, once again, only good fortune prevented these exposures from being much higher.

Therefore, while I hope that the initiatives that you have begun will bear fruit in improving the nuclear safety culture at the Laboratory, no mitigation is provided for this enforcement action in light of the significance of the [radioactive material] uptake event and the lack of timely attention and actions to the underlying problems that caused it. In addition, as I warned in enforcement action EA-2003-02 dated April 10, 2003, I am escalating several of the citations in this action to Severity Level I that otherwise would have been classified as Severity Level II problems to emphasize LANL's failure to address the many systemic issues that contributed to this latest event despite the multiple opportunities over many years to do so.

In addition, I am also concerned about the other safety-related events discussed at the April 13-14, 2004, Enforcement Conference, which occurred subsequent to the OE onsite investigation of the [radioactive material] event. These events indicate that the underlying safety culture concerns are not only still present, but are continuing to lead to adverse safety events. While I recognize that safety culture change is a process that takes time, LANL's nuclear safety performance over the past year leads to the conclusion that there is still a long way to go to solve this problem. The [radioactive material] event has been specifically included in our FY-2003 laboratory evaluation and thus should have no factor into our FY-2004 evaluation. However this next laboratory evaluation will look to see if operational issues of a similar nature are enduring. In any case, although work processes are being improved, at least on paper, and your expectations of LANL employees with regard to safe operations have been clearly articulated, work planning, implementation and oversight continue at LANL with the acknowledged deficient safety culture. In this regard, it is crucial that while longer-term reforms in operations become institutionalized, compensatory measures must be put in place to act as a "safety net" to prevent significant safety events such as the [radioactive material] uptake. I am concerned that insufficient compensatory measures are in place for this purpose, and I encourage you to take a fresh look at this issue to determine what more needs to be done in the short term to assure safe operations.

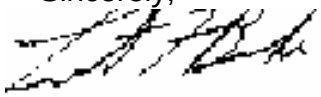
Additionally, discussions were held during the enforcement conference on other problem areas that have recently surfaced and are being addressed by LANL, such as welding problems, procurement program deficiencies, design control deficiencies, and training problems. These problem areas and the more recent events are not part of this enforcement action, but will continue to be monitored by NNSA and OE and could be the subject of further investigation efforts.

During the enforcement conference, you provided a summary of recent commitments you have made to address continuing safety issues. The summary entitled "Summary of LANL Commitments, April 13 and 14, 2004, PAAA Enforcement Conference" lists near-term and longer-term corrective actions for the identified issues. I expect timely and effective action by LANL on these measures, continued monthly reporting to the Manager, Los Alamos Site Operations, and quarterly reports to NNSA headquarters on progress on these actions and improvement in nuclear safety performance.

In accordance with the General Statement of Enforcement Policy, 10 CFR 820, Appendix A, the violations described in the sections of the PNOV have been classified according to severity level. Based on those Severity Levels and the decision to withhold any mitigation, DOE would have issued a Proposed Imposition of Civil Penalty in the amount of $770,000 in this case; however, this civil penalty is currently waived by statute for LANL.

You are required to respond to this letter and to 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 NTS. You should enter into the NTS (1) any additional actions you plan to take to prevent recurrence and (2) the anticipated completion dates of such actions. After reviewing your response to the PNOV, including your proposed corrective actions entered into NTS, NNSA will determine whether further enforcement action is necessary to ensure compliance with DOE nuclear safety requirements.

Sincerely,



Linton F. Brooks
Administrator
National Nuclear Security Administration

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

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

cc: J. Mangeno, NNSA
D. Minnema, NNSA PAAA Coordinator
E. Beckner, NA-10
T. Przybylek, NNSA-GC
H. Hatayama, UC
A. Elliott, LANL PAAA Coordinator
E. Wilmot, LASO
G. Schlapper, LASO PAAA Coordinator
R. Azzaro, DNFSB
D. Garman, S-3
A. Kindrick, EH-1
S. Sohinki, EH-6
S. Adamovitz, EH-6
Docket Clerk, EH-6

PRELIMINARY NOTICE OF VIOLATION

University of California
Los Alamos National Laboratory

EA 2004-05

As a result of a Department of Energy's (DOE) evaluation of the [ ] multiple [radioactive material] uptake event on August 5, 2003, several violations of DOE nuclear safety requirements were identified. In accordance with 10 CFR 820, Appendix A, "General Statement of Enforcement Policy," the violations are listed below.

I. Occupational Exposure Violations

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

Contrary to the above, occupational exposures to general employees were not controlled such that–

A. During calendar year 2003, a Los Alamos National Laboratory (LANL) employee received an intake of [radioactive material] resulting in an estimated exposure of 10 rem, thereby exceeding the annual limit of five rem. The exposure was received as the result of a [radioactive material] release event on August 5, 2003.

   This violation is escalated to a Severity Level I problem.
   Civil Penalty $110,000 (Waived)

B. During calendar year 2003, a LANL employee received an intake of [ ] resulting in an estimated exposure of 7.5 rem, thereby exceeding the annual limit of five rem. The exposure was received as the result of a [radioactive material] release event on August 5, 2003.

   This violation is escalated to a Severity Level I problem.
   Civil Penalty $110,000 (Waived)

II. Work Control Deficiencies

10 CFR 830.122 (e), *Criterion 5 – Performance/Work Processes* requires that the Laboratory "(1) Perform work 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."

10 CFR 835.104 requires that… "Written procedures shall be developed and implemented as necessary to ensure compliance with this part, commensurate with the radiological hazard created by the activity and consistent with the education, training, and skills of the individuals exposed to those hazards."

Contrary to the above, work performed in conjunction with the August 5, 2003, pre-inventory activities in [ ] [ ] was not consistent with administrative controls including written procedures, or adequate work controls had not been developed nor implemented in that–

A. Failure to Implement Established Work Controls

1. LA-12177-M, Revision 2, [ ] *Safety Manual* requires workers in responding to a continuous air monitor (CAM) alarm in the laboratories to exit to a safe area, namely the main floor corridors. This action is reinforced in worker training by NMT-TRNG-55-002, *Emergency Procedures and Abnormal Conditions at [ ] (New Hire/Biennial)* and *(Annual)* dated May 1, 2001, *CAM Alarm Response*, which states "In a PF-4 – CAM Alarm…Alert others, and exit to the corridor (do not self-monitor)." However, the workers did not evacuate from [ ] to the corridor, but instead proceeded to the adjacent . At the time of the [radioactive material] release event, LANL had neither determined nor documented the airflow between [ ], and the worker movement to [ ] could have resulted in additional uptakes of radioactive material.

2. The *Operations Center Alarms Manual*, *CAM ALARMS* requires in the *Immediate Actions* section that the Operations Center "Announce in PF-4: (Twice) Attention, there is a local CAM alarm in Room _____, CAM____. (If multiple CAMs announce all room and CAM numbers)." The *Subsequent Actions* section of the instruction requires that notification be made to the On-Duty Supervisor and that the CAM counts per minute and disintegrations per minute data be logged. However, on August 5, 2003, Operations Center personnel announced the [ ] CAM alarm over the public address system but did not announce the CAM alarms that occurred for [ ] or [ ]. Additionally, although Operations Center personnel logged the [ ] CAM alarm, the CAM count data and the CAM alarms for [ ] and [ ] were not logged as required. Also, the On-Duty Supervisor was not notified by the Operations Center as required.

3. Procedure [ ]-WI-021, R0, *Nuclear Materials Packaging,* effective December 20, 2001, Section 1.3 requires that the package for material such as that used for the residue storage in [ ] shall be in a safe condition. LA-UR-01-2473, *Process Hazard Analysis, Source Fabrication and Dismantling, Residue Processing and Storage, and Liquid Scintillation Counting Activities,* dated May 11, 2001, Section 10 *Protective Features* states that protective features include "Containers designed with proper integrity to confine their contents." However, the National Nuclear Security Administration's (NNSA) Type B investigation concluded that the design of the [radioactive material] waste packages used for residue storage in [ ] had not been analyzed to determine if it would have proper integrity to confine the contents.

4. Procedure [ ]-RD-539, R1, *[ ] Waste Management Requirements*, effective January 22, 2002, Section 4.10.1, *Segregation and Certification of Solid TRU Routine, Nonroutine and Organic Liquid Waste to be Absorbed*, requires containers such as those used for the residue storage in [ ] to "be cross-taped to remain unsealed." However, some outer container lids of the packaged [radioactive material] waste were taped circumferentially, contrary to procedures that required cross-taping of lids to allow them to "remain unsealed." This resulted in the build-up of gas pressure from packaging degradation and then the dispersal of material from the outer container when it also degraded.

5. Procedure [ ]-WI-021, R0, *Nuclear Materials Packaging,* effective December 20, 2001, Section 5.1, *Damaged or Leaking Container,* states that if "a secondary container appears to be bulging, has rust spots, corrosion, and/or a loose lid; or a secondary container appears to be severely dented or to have suffered other serious damage that renders it unusable or unsafe" then "immediately contact a radiological control technician (RCT); over-bag the container, if possible; and immediately notify your supervisor." However, the NNSA Type B Board identified several packages in [ ] with obvious external defects that were never addressed as required by this procedure.

Collectively, these violations constitute a Severity Level I problem.
Civil Penalty - $110,000 (waived)

B. <u>Inadequate Work Controls</u>

1. LANL did not develop and implement a procedure for inspection or surveillance of the [ ] storage containers' condition, even though the potential for container degradation had been noted in the 1996 Final Safety Analysis Report (FSAR) for [ ],Section 3.4.2.6.1.

2. LANL did not implement an adequate periodic check of [ ] conditions including safety features. LANL had established a Daily Checklist for [

], but this Checklist was not adequate since it did not identify any hazards or safety features associated with the [radioactive material] container storage.

3. LANL did not conduct a hazards analysis of the activities involved in performing the pre-inventory check. LANL failed to develop and implement a Hazard Control Plan (HCP) or other analysis for the pre-inventory check that specifically addressed the worker hazards associated with such handling of the packages.

4. LANL had not implemented formal procedures to authorize and release the [ ] pre-inventory check work activity that resulted in the August 5, 2003, [radioactive material] uptake event.

5. LANL had not established a formal procedure for conducting the pre-inventory checks, including such key work control steps as precautions, work instructions, and documentation requirements.

6. LANL did not have a comprehensive process hazards analysis (PrHA) in place for residue storage activities in [ ]. The approved PrHA, LA-UR-01-2473, *Process Hazards Analysis – Source Fabrication and Dismantling, Residue Processing and Storage, and Liquid Scintillation Counting Activities*, May 11, 2001, is intended to analyze the hazards associated with these activities. However, the analysis of residue storage in this PrHA did not consider container degradation although the mechanism for such degradation was previously identified in the FSAR, as referenced in item B.1 above.

7. LANL procedures inappropriately allowed certain work to be controlled using only an RWP. Laboratory Implementation Requirement (LIR) LIR402-700-01.1, *Occupational Radiation Protection Requirements,* Chapter 11 specifies that "RWPs shall authorize work specific to radiological hazards only." In the case of the pre-inventory check, a Radiological Work Permit (RWP) was the only work control document. However, such control is inappropriate for work in a nuclear facility since the RWP does not provide several key elements of work control, such as work authorization and release for a specific activity, precautions or limitations, or work instructions.

Collectively, these violations constitute a Severity Level I problem.
Civil Penalty - $110,000 (waived)

III. Quality Improvement Deficiencies

10 CFR 830.122 (c*) Criterion 3 – Management/Quality Improvement* requires that the contractor "(1) Establish and implement processes to detect and prevent quality problems. (2) Identify, control, and correct items, services, and processes that do not meet established requirements. (3) Identify the causes of problems and work to prevent recurrence as a part of correcting the problem."

Contrary to the above, LANL's processes to identify causes and correct quality problems were not effectively established and implemented in that–

A. Since 1996, [radioactive material] packages have been stored in [ ], and in that period significant deterioration and decomposition of the packaging has been occurring, with resulting gas generation. The NNSA Type B investigation identified the following:

1. The failure mechanisms associated with the deterioration of the packaging that led to the August 5, 2003, [radioactive material] release were known from previous [radioactive material] storage package failures at LANL and at other facilities in the DOE weapons complex.

2. These failure mechanisms had been recognized and analyzed, and the resulting information had been widely disseminated by DOE and the Defense Nuclear Facility Safety Board (Defense Board) as early as 1994. In fact the Defense Board Recommendation 94-1 raised concerns with packaging of [radioactive] materials, but LANL's response failed to address the adequacy of packaging for stored in [ ].

Additionally, the 1996 [ ] SAR noted in section 3.4.2.6.1 the potential for degradation of the metal and plastic "food-pack" container packages. In particular, the FSAR reported that "corrosion of metal contained in plastic may occur as a result of reaction with chemical species produced by alpha-particle-induced decomposition of organic compounds in plastic." DOE, in its *Safety Evaluation Report* (SER) of December 1996 conditionally approving the FSAR, noted in section 3.2.3 the potential for degradation of the containers and resulting radiological exposures, and concluded the need for LANL to expeditiously implement a more permanent solution to the storage of [radioactive material] metal waste.

However, despite the history of degradation problems in this type packaging, other notice of packaging problems by DOE and the Defense Board, recognition of the degradation problem in the FSAR, and notice by DOE in the SER to address this concern, no actions were taken by LANL to correct the design of the packaging for [radioactive material] material stored in [ ] over the several years that these deterioration problems were known.

B. LANL failed to properly initiate quality problem resolution documentation for a discrepant pre-cursor condition. Only a few months before the August 5, 2003, [radioactive material] uptake event, LANL personnel had discovered a package during processing activities in [ ] where the bottom of the inner can had rusted out completely, in the same manner as the inner can that failed in this event. LANL procedure NMT9-AP-QA-001-R01, *Nonconformances*, July 7, 1999, requires that an NCR be prepared for any nonconforming condition. However, no NCR or other quality problem documentation was initiated, only limited corrective actions

were taken, and no formal documentation of the problem evaluation, causal review, or corrective actions was prepared.

C. The NNSA Type B Investigation Board, when inspecting the room where the multiple uptake event occurred in August 2003, found that some of the storage cage seismic restraints were damaged or dislodged, and thus inoperable. It is not known how long these may have been in a degraded condition. During a seismic event, the cages may have failed without the cages being adequately attached and allowed the [radioactive material] containing cans to fall to the floor and release their contents. Such a failure could have resulted in [radioactive material] releases exceeding those analyzed in the facility's accident analysis for potential releases from a [radioactive material] container, with significant uptake by workers in the area. However, LANL failed to detect and correct this improper condition prior to the problem being discovered by the NNSA Type B Investigation Board.

Collectively, these violations constitute a Severity Level I problem.
Civil Penalty - $110,000 (waived)

IV. Safety Basis Deficiencies

10 CFR 830.201, *Performance of Work*, requires that "A contractor must perform work in accordance with the safety basis for a hazard category 1, 2, or 3 DOE nuclear facility and, in particular, with the hazard controls that ensure adequate protection of workers, the public, and the environment."

Contrary to the above, LANL failed to perform work in accordance with the safety basis for nuclear facility [ ] or operate and maintain the facility in accordance with the approved safety basis in that–

A. Section 5.6.4 of the Technical Safety Requirements (TSR) requires development of controls to maintain Design Features. DOE's SER of December 1996 provided conditional approval of LANL's 1996 FSAR. The SER required LANL, among other things, to seismically qualify the storage racks in room. Based on this SER requirement, Appendix B of the TSRs lists the [ ] cage seismic restraints as Design Features. However, no such maintenance controls were established by LANL to ensure the operability and condition of the seismic restraints for these storage racks in violation of the TSR, and thus not assuring that the SER conditions for approval were met.

B. The DOE December 1996 SER conditionally approving the 1996 FSAR included in the Conditions of Approval a requirement that degraded containers be placed in the seismically qualified storage racks. However, the NNSA Type B investigation team found several [radioactive material] packages that were stored on the floor of [ ], and not located in one of the seismically-designed storage cages. Some of these containers were found by the Type B investigation team to be degraded.

C. Several seismic restraints were found by the NNSA Type B investigation team to be damaged or dislodged. These conditions did not comply with the TSR and SER requirements to provide seismic restraint capability for storage of [radioactive material] waste containers in [ ].

Collectively, these violations are escalated to a Severity Level I problem.
Civil Penalty - $110,000 (waived)

V. Radiological Control Deficiencies

10 CFR 835.1001(a) requires that "Measures shall be taken to maintain radiation exposure in controlled areas As Low As is 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 the above, measures were not taken to maintain radiation exposures ALARA through the effective use of physical design features or administrative controls for the August 5, 2003, pre-inventory activities in [ ] [ ] in that:

A. Radiation Work Permit (RWP) 02-55-201B-2 was used for the pre-inventory activities and required that workers sign the RWP to confirm they: (1) had received a pre-job briefing; (2) had read and understood the RWP requirements, and (3) would abide by them. Additionally, [ ]-RD-555, R1.1, [ ]*Radiation Protection Requirements*, Section 4.11.2 required that "For work performed intermittently, the pre-job briefing must be held again after periods of inactivity (30 calendar days or more)." For the pre-inventory check, one worker involved in the pre-inventory had not signed in on the RWP pre-job briefing log as required, and the other worker did not sign in within the previous 30 days as required. Additionally, the NNSA Type B investigation found that other workers who previously had performed the inventory work in [ ] had similarly not signed in on the RWP.

B. RWP 02-55-201B-2 required Level 1 protective clothing which included coveralls, two pair anti-c gloves, and booties. The RWP also required continuous radiological control technician (RCT) coverage when moving shielding surrounding a high radiation area. Training course *Radiological Work Coverage*, dated June 24, 2002, section *Types of Job Coverage* states that for continuous job coverage, "the technician covers only one job and remains at the job site while work is being performed." However, during the pre-inventory activities, one worker did not comply with the protective clothing requirements and wore only one pair of gloves. Additionally, the RCT did not provide continuous coverage as required when the workers were moving the shielding.

C. The ALARA review for this work, documented in the RWP, was inadequate in that the ALARA requirements section of the RWP was not completed with the estimated measured working dose rates, estimated collective dose, or estimates of person-hours for the job even, though the pre-inventory work required access to a high radiation area.

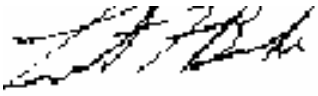
Collectively, these violations are escalated to a Severity Level I problem.
Civil Penalty - $110,000 (waived)

Pursuant to the provisions of 10 CFR 820.24, Los Alamos National Laboratory is hereby required within 30 days of the date of the Preliminary Notice of Violation (PNOV) to submit to the Office of Price-Anderson Enforcement 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-6, 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-6, 270 Corporate Square Building
U.S. Department of Energy
19901 Germantown Road
Germantown, MD 20874-1290

Copies of the reply should also be sent to the Manager, Los Alamos Site Office as well as my office. 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 further violations should be identified with proposed completion dates entered in DOE's Noncompliance Tracking System. If violations are admitted, this PNOV will constitute a Final Order in compliance with the requirements of 10 CFR 820.24(d).



Linton F. Brooks
Administrator
National Nuclear Security Administration

Dated at Washington, DC,
this 19 day of June 2004

Enforcement Conference Summary

[ ] Multiple [ ] Uptake Event,
Five Worker Exposure to Toxic Vapors,
and Radiological Protection Program Issues

On April 13 and 14, 2004, representatives with the Department of Energy's (DOE) Office of Price-Anderson Enforcement (OE) and the National Nuclear Security Administration (NNSA) held an informal enforcement conference with representatives from the University of California (UC) and the Los Alamos National Laboratory (LANL). This conference was held to discuss potential noncompliances identified in the OE Investigation Summary Report provided to LANL on March 23, 2004. Specific events reviewed as part of the OE investigation and discussed in the Investigation Summary Report included a [ ] multiple [radioactive material] uptake event, a [ ] five worker exposure to toxic vapors event, and radiological protection program issues. Additionally in the enforcement conference notification letter, OE requested that further information be presented on the following events and/or issues:

1. Occurrence Reporting and Processing System (ORPS) Report ALO-LA-LANL-WASTEMGT-2004-0001 "Potential Concern: Confusion Regarding Walk-down Requirements of the Integrated Work Management Process"
2. ORPS Report ALO-LA-LANL-FIRNGHELAB-2004-0001 "Near miss to a fatality; crane strikes 13.2 kV overhead power line during transport"
3. ORPS Report ALO-LA-LANL-CMR-2004-0001 "Contamination Detected on Worker's Face"
4. ORPS Report ALO-LA-LANL-ACCCOMPLEX-2004-0002 "Unanticipated Low Neutron Dose Due to Inadequate Work Controls"
5. "Design Review of the [ ]Los Alamos Critical Experimental Facility In-Core Temperature Measurement System" submitted by Albert MacDougall, dated February 19, 2004

A list of the conference attendees is attached.

The conference was opened by Mr. Stephen Sohinki, Director, Office of Price-Anderson Enforcement, who provided introductions and an overview of the conference's purpose and objectives. Documentation provided by LANL during the conference was incorporated into the docket file.

LANL's presentations were opened by Admiral George P. Nanos, Director, Los Alamos National Laboratory, who provided introductory remarks and a high-level overview of the LANL institutional changes to improve nuclear safety performance. Admiral Nanos re-iterated his fundamental goals of ensuring safety of all LANL operations and restoring confidence in the University of California's ability to effectively manage LANL. He further stated that, as evidenced by recent events, improving the LANL safety culture continues to be one of the laboratory's single greatest challenges.

Mr. Steve Yarbro, Nuclear Materials Technology Division Leader, discussed the facility-specific analysis of the two [ ] events, namely the [radioactive material] uptakes and the workers' exposure to toxic vapors. LANL's analysis of the [ ]events identified the following deficiencies with the integrated safety management process:

- Poor analysis and identification of the work scope and resource planning
- Inadequate hazards' analysis identification and recognition during planning and implementation of the work
- Inadequate work controls due to inadequate identification of hazards
- Failure to follow established procedures
- Inadequate feedback between supervision and workers

Mr. Yarbro then discussed the following measures that LANL is taking to improve the safety culture in the Nuclear Materials Technology (NMT) Division:

- Strengthening the Integrated Work Management (IWM) Process
- Using the job task analysis as a tool for people to define their responsibilities and authorities
- Critiquing sub-Occurrence Reporting and Processing System (ORPS) events for lessons-learned
- Implementing "nested safety committees"
- Conducting independent reviews and strengthening self-assessments
- Measuring management and worker behavior to support a strong safety culture

Mr. Yarbro outlined the current status of the NMT Type B [radioactive material] Corrective Action Plan (CAP). The CAP identifies 26 actions to respond to the Type B Justification of Need. To date, six actions have been completed and three actions are behind schedule. The CAP for the NMT five-worker exposure identifies 35 corrective actions. To date, 20 actions are complete and nine actions are behind schedule or the due date has been extended. Mr. Yarbro also responded to questions related to issues identified in the OE Investigation Summary Report.

Mr. James Angelo, Performance Surety Division Leader, provided an overview of the institutional corrective actions in response to the two [ ] events. The corrective action plan was approved by the Nuclear Safety Executive Board (NSEB) on April 2, 2004, and would be submitted to NNSA Los Alamos Site Office (LASO) for approval. Mr. Angelo then discussed the institutional issues identified in the NNSA

Type B report and LANL's corrective actions to address each issue. The institutional issues included the following:

- LANL has not always incorporated lessons-learned from prior events into the work control process.
- LANL failed to identify all packages that should have been included in the program execution plan for DNFSB Recommendation 2000-1.
- LANL failed to adequately oversee the cradle-to-grave management of nuclear and non-nuclear high hazard operations.
- The personal protection equipment for the task did not prevent an uptake.
- LANL needs to look at all hazardous material containments and containers, to ensure engineering design requirements are met.
- The LANL Institutional management assessment program lacks maturity and discipline.
- Radiological work permits are used inconsistently as work authorizing documents.
- Some employees remain reluctant to stop work.
- All hazards associated with the Material Control and Accountability activity were not identified.
- The Operations Center did not take all of the appropriate actions for this event.

Mr. Angelo also responded to facility and event-specific questions related to issues identified in the OE Investigation Summary Report. Mr. Angelo stated that the NSEB will ensure field validation and verification for completion of corrective actions.

Mr. Lee McAtee, Health, Safety, and Radiation Protection Division Leader, provided an overview of the Radiological Protection Program (RPP) assessment including a summary of assessment findings, the causes, interim compensatory measures and corrective actions. The assessment findings identified deficiencies in the training program including the failure to maintain qualifications of RPP training instructors, incomplete training records and the lack of information regarding employee rights and responsibilities. The second finding identified a deficiency in consistently communicating work hazards and controls. Mr. McAtee described interim compensatory measures and corrective actions for these problems.

Mr. Jim Holt, Associate Director for Operations and Mr. McAtee discussed the LANL work control improvements. As a result of several hazardous events at LANL, the Laboratory Director identified work controls as his most important issue. The implementation of the IWM process was then accelerated as directed by the Laboratory Director and the LASO Manager with the deadline to begin implementation by October 31, 2003. Key areas for work control improvement included the following:

- Consolidation of work tasks, hazards and controls into a single user-friendly set
- Identification of a single person-in-charge
- Oversight by a responsible division leader,

- Field validation walkdown of work control documents and
- Clearly defined work release and change control

Currently LANL is in phase II of the implementation of work control improvement which addresses longer-term improvements and the completion date is scheduled for September 30, 2004.

Mr. McAtee then covered the causes and lessons-learned from the events 1-4 listed on page 1 of this summary, plus an additional event which involved underground utility lines being struck during demolition. The primary cause of several of the events was the failure to implement and/or adhere to the IWM process. Human error, lack of effective communication, and human factors associated with poor workstation setup were other identified causes. Mr. McAtee then summarized LANL's actions to drive the work control improvements, and he further indicated that "success will be demonstrated by eliminating repeat causes and reducing the frequency and severity of events."

Mr. Sohinki closed the conference for the day.

Mr. Sohinki resumed the conference on April 14, 2004, and Admiral Nanos stated that the focus of the second day would be the various aspects of the quality program.

Mr. Angelo provided analysis and actions taken for the following quality program and safety management areas being addressed by LANL: quality management, management assessment, issues management, and safety basis. Mr. Angelo's presentation for each area included problem identification, actions taken, results achieved, actions to be taken and measuring success. The quality management problem involved a non-compliant Institutional Quality Management Program (IQMP). Although individual LANL facility/division quality assurance programs (QAP) were in place, they were not always consistently developed or supported by institutional programs. LANL's goal was to obtain NNSA approval of a performance-based QAP by December 2005. Mr. Angelo further outlined the quality assurance program improvement actions that have been taken from the IQMP, which was approved by NNSA in April 2003. Actions taken include formation of a senior-level Quality Steering Group, creating a Quality Working Group, establishing a Quality Policy Office, hiring a Quality Group Leader from outside LANL, establishing a new position of Quality Improvement Manager, forming a site-wide Quality Network, and conducting baseline quality management assessments in areas of higher risk. The baseline management assessments included the areas of institutional training, weapons engineering and manufacturing, site support services contractor including site-wide welding program, and software quality implementation. Mr. Angelo described several indicators or examples that performance is improving in these areas.

The management assessment problems identified by LANL at the conference included weaknesses in the following: identification of adverse trends, senior management engagement, line manager training, coordination of multiple assessment results and integration/prioritization of new initiatives. LANL's actions taken involve implementation

of a new management assessment process where the process is owned at the Assistant Director level, establishing clear, measurable assessment focus areas with performance indicators, and integrating line and functional manager assessments into one program. Mr. Angelo outlined near-term and longer-term actions to be taken to further improve this area.

The issues management problem identified by LANL at the conference included weaknesses in the following areas: institutional issue identification and senior management "ownership" of the process, integration of institutional issues in a single database, applying formal causal analysis to a broader base of events, and corrective action identification and timely closure. Selected significant LANL actions taken involved the (1) establishment of an official Laboratory-wide tracking tool, (2) designation of issue coordinators at the Associate Director/Division Leader levels, (3) establishment of an institutional issue coordinator to provide oversight of the issues management program, (4) establishment of an Issues Review Board led by the Deputy Director and chartered to serve as an advisory body to the Laboratory Director, and (5) implementation of a process for independent review and verification of effectiveness of corrective actions and issue closure. The independent review and verification process involves the Nuclear Safety Executive Board, the Director's Central Safety and Security Committee, and the Price-Anderson Coordinators' Working Group (PAAWG). Mr. Angelo noted improvements that have been achieved at this stage, as well as the near-term and longer-term actions to further improve performance in this area.

The safety basis program deficiencies identified by LANL at the conference included the lack of standardization and quality of safety basis documents, inconsistent compliance and implementation of safety basis documents, and excessive time to develop and approve the Documented Safety Analyses. Mr. Angelo described actions that have been taken in this area, including consolidation of the nuclear safety program ownership into one group, the Safety Basis Office of Institutional Coordination. This newly established function would be the focal point to develop, upgrade and change technical safety requirements (TSR) and documented safety analyses, implementation support, policy development, and regulatory interface. Other steps include line management involvement in development of the safety basis, Unreviewed Safety Question (USQ) process improvements, TSR/USQ lessons-learned workshops, assessments of TSR implementation effectiveness and USQ process performance, and development of a Safety Basis Academy. Mr. Angelo outlined improvements that have been observed, as well as near-term and longer-term actions to further improve this area.

Mr. Angelo then discussed the modification, design and procurement of the [ ] critical assembly in-core temperature monitoring systems (ITMS). Two reviews, one conducted by the Defense Nuclear Facilities Safety Board (DNFSB) in July 2003 and the second conducted by the NNSA/Service Center in December 2003 identified deficiencies with the design, review, and procurement of the ITMS. Additionally, a LASO/LANL assessment conducted in March 2004 found that LANL procurement performance was an institutional issue. LANL's near-term corrective actions will include the establishment of an external design review process and development of a

Laboratory Implementing Requirement for the design process. Further actions will be detailed in two forthcoming noncompliance reports.

Mr. John Bretzke, Division Leader for Supply Chain Management, provided an overview of institutional procurement problems that have been noted by LANL, partly resulting from the above DNFSB, NNSA, and LASO/LANL reviews of the [ ] ITMS. These include deficiencies in management oversight, procedural adherence, documentation quality, and identification of requirements to buyers. Corrective actions were outlined and included initiatives of three committees, the Senior Management Procurement Council, the Subcontractor Consortium, and the LANL Business Advisory Council. The Senior Management Procurement Council was comprised of senior managers within LANL and would focus corporate attention on institutional acquisition. The Subcontractor Consortium would develop a broader northern New Mexico supplier base, and the LANL Business Advisory Council would strengthen LANL/supplier business relationships. Mr. Bretzke further outlined corrective actions being taken in the Procurement Improvement Process, which was focused on enhancing the conduct of operations in the procurement process.

Mr. Al Elliott, the LANL Price-Anderson Amendments Act (PAAA) Program Coordinator, discussed ongoing improvements in the LANL PAAA Program including the establishment of a PAAA Working Group and the Nuclear Safety Executive Board. Mr. Elliott presented LANL's opinions regarding potential mitigating factors associated with the subject events and issues. Mr. Elliott also provided a summary of the various commitments made by LANL through the course of the Enforcement Conference.

Mr. Howard Hatayama, representing the UC Office of the President, discussed the University's oversight of LANL's nuclear safety activities and contributions to institutional performance improvement.

With respect to the factual accuracy of the OE Investigation Summary Report, LANL management indicated they had no substantive disagreement with the conclusions of the report.

During his closing remarks, Admiral Nanos reiterated LANL's single greatest challenge was enhancing the nuclear safety culture. He then outlined LANL's approach which included understanding the extent and specifics of the culture problem, defining and communicating management expectations, increasing the formality and improving training, and emphasizing accountability at all levels.

Mr. Sohinki concluded the conference by indicating that DOE and NNSA would consider the information and recommendations presented by LANL in their enforcement deliberations. Mr. Sohinki then adjourned the conference.

Los Alamos National Laboratory
Enforcement Conference
List of Attendees

April 13 &14, 2004

Office of Price-Anderson Enforcement

Stephen M. Sohinki, Director
Susan Adamovitz, Senior Enforcement Officer
Hank George, Technical Advisor

Headquarters-National Nuclear Security Administration

Doug Minnema, Price-Anderson Amendments Act Coordinator
Richard Crowe, Environment, Safety and Health Department Director*
Sujita Pierpoint, Los Alamos National Laboratory Site Lead
Dave Jonas, Deputy General Counsel**

National Nuclear Security Administration-Los Alamos Site Office

Gerry Schlapper, PAAA Coordinator

University of California Los Alamos National Laboratory

Howard Hatayama, Director, Environment, Safety and Health

Los Alamos National Laboratory

Pete Nanos, Director
Jim Holt, Associate Director for Operations
Lee McAtee, Division Leader, Health, Safety, and Radiation Protection
Jim Angelo, Division Leader, Performance Surety Division
Steve Yarbro, Division Leader, Nuclear Materials Technology Division*
John Bretzke, Division Leader, Supply Chain Management
Phil Wardell, Attorney, LANL Counsel
Al Elliott, Price-Anderson Amendments Act Coordinator

** Attended on the 13th only*
***Attended on the 14th only*