September 27, 2000

Dr. C. Bruce Tarter
[ ]
Lawrence Livermore National Laboratory
P.O. Box 808, L-005
Livermore, CA 94551-0808

EA 2000-12

Subject: Preliminary Notice of Violation

Dear Dr. Tarter:

This letter refers to the Department of Energy's (DOE) investigation of the facts and circumstances concerning Lawrence Livermore National Laboratory (LLNL) maintenance and adherence to documents, which form the Authorization Basis (AB) for the Laboratory's nuclear facilities.

The DOE Office of Enforcement and Investigation (EH-Enforcement), in coordination with DOE Oakland Operations Office (DOE Oakland), initiated an investigation into LLNL AB related issues in September 1999 and issued an Enforcement Letter on November 5, 1999, based on concerns of the existence of broader programmatic issues which required prompt attention by LLNL management. The Enforcement Letter indicated that EH-Enforcement would reevaluate LLNL progress in addressing these programmatic concerns in another 90 days. Between March 14-16, 2000, in conjunction with an LLNL Price-Anderson Amendments Act program review, EH-Enforcement gathered information from both DOE Oakland and LLNL on the progress that LLNL had made in addressing the issues stated in the Enforcement Letter. Our findings were provided to you in the Investigation Summary Report issued June 1, 2000. An Enforcement Conference was held with you and members of your staff on July 11, 2000, to discuss these findings. An Enforcement Conference Summary Report is enclosed.

Based on DOE's investigation and information that you provided during the Enforcement Conference, DOE has concluded that violations of 10 CFR 830.120 (Quality Assurance Rule) likely occurred. These violations are described in the enclosed Preliminary Notice of Violation (PNOV) and include (1) quality improvement violations related to LLNL inadequacy in acknowledgment and timely response to programmatic weaknesses in their AB processes and (2) Work Process violations

related to lack of adherence to the requirements contained in AB related documentation.

I am issuing the enclosed PNOV in response to these violations. LLNL is exempt from civil penalty by statute. However, because of the collective safety significance of these violations, DOE would have issued a Proposed Imposition of Civil Penalty in the amount of $82,500 ($41,250 for each of two Severity Level II violations).

The Severity Level II violations could have been assessed at $55,000 for each violation. In considering potential mitigation, DOE concluded that no mitigation was warranted for prompt identification and reporting of the noncompliances. DOE concluded that LLNL failed to self-identify many of the AB related problems and when their Assurance Review Office (ARO) did identify issues, LLNL management was slow to respond to ARO's findings. DOE Oakland has been aggressively pursuing nuclear safety issues at the Laboratory over the past 18 months. However, it has only been during the past few months that LLNL has acknowledged that programmatic deficiencies exist in their AB management processes. DOE did, however, conclude that partial mitigation, 25
per cent of the base civil penalty, was warranted for LLNL actions taken since January 2000. These actions were culminated in the issuance of the Nuclear Facility Authorization Basis Corrective Action Plan on June 28, 2000. In addition, DOE exercised enforcement discretion, in that the findings presented in the January 2000 ARO report on LLNL's implementation of Technical Safety Requirements and the Unreviewed Safety Question process were not used in preparing this PNOV. This ARO report, as well as the preceding two independent assessments on AB related issues, are viewed as quality products; and DOE did not want to impede future activities by LLNL and their ARO in performing such comprehensive efforts.

DOE believes that corrective actions contained in your June 28, 2000, Corrective Action Plan (CAP) appear to address the AB related problem areas; however, DOE would caution that several key elements are critical in order to achieve a substantial improvement in the safety culture for operations at LLNL. These critical elements include (1) effective management involvement, (2) full implementation of the corrective actions, and (3) appropriate monitoring of the effectiveness of these corrective actions. DOE will continue to monitor the timely implementation of this CAP and consider further enforcement action should LLNL fail to meet its obligations contained within the plan.

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 additional actions you plan to prevent recurrence and (2) the target and completion dates of such actions. After reviewing your response to the PNOV, including your proposed corrective actions entered into the NTS and the results of future assessments

or inspections, I will determine whether further enforcement action is necessary to ensure compliance with DOE nuclear safety requirements.

Sincerely,

John A. Gordon
Administrator

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

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

cc: B. Costner, S-1
D. Michaels, EH-1
M. Zacchero, EH-1
S. Cary, EH-1
K. Christopher, EH-10
R. Day, EH-10
D. Stadler, EH-2
N. Goldenberg, EH-3
J. Fitzgerald, EH-5
M. Creedon, DP-1
D Miotla, DP-17
D. Minnema, DP-45
C. Yuan-Soo Hoo, DOE-OAK
M. Cornell, DOE-OAK
R. Kopenhaver, DOE-OAK
H. Hatayama, UCOP
A. Garcia, LLNL PAAA Coordinator
Docket Clerk, EH-10

Preliminary Notice of Violation

Lawrence Livermore National Laboratory (LLNL)
Site-Wide Nuclear Facilities

EA 2000-12

During a DOE investigation conducted on March 14-16, 2000, violations of DOE nuclear safety requirements were identified. In accordance with the "General Statement of Enforcement Policy," 10 CFR 820, Appendix A, the violations are listed below:

A. Quality Improvement

10 CFR 830.120 (c)(1)(iii) Quality Improvement requires that processes to detect and prevent quality problems shall be established and implemented. Items, services, and processes that do not meet established requirements shall be identified, controlled, and corrected according to the importance of the problem and work effected. Correction shall include identifying the causes of the problems and working to prevent recurrence.

Contrary to the above, between July 1997 and December 1999, LLNL processes to detect and prevent Authorization Basis (AB) related problems were inadequate in that–

1. LLNL did not adequately address in a complete and timely manner many of the nine conclusions drawn by the July 1997 LLNL Assurance Review Office (ARO) report entitled, "Review of the Safety Analysis Report (SAR) Development Process at LLNL." As a consequence, many of nine conclusions reflect similar causes to those identified in the LLNL March 2000 root cause analysis of AB issues at LLNL.

2. In November 1997, DOE issued an "Integrated Safety Management Evaluation of LLNL," which noted weaknesses in the implementation of the Unreviewed Safety Question (USQ) process and issues with scope of work in SARs. Since that time, LLNL has not adequately recognized and taken steps to correct the programmatic deficiencies in their AB processes despite numerous correspondences by DOE Oakland Operations Office (DOE Oakland) conveying AB compliance concerns, issues, expectations and opportunities for improvement.

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

B. Work Processes

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

Contrary to the above, between October 1998 and January 2000, LLNL work was not adequately performed to established standards and controls through the use of procedures. Examples include the following:

1. LLNL Mechanical Engineering Design Safety Standards (M012), revision 7, change 3, section C.4.3, dated September 1995, states, "LLNL requires a management-approved design analysis or Safety Note, when a piece of equipment presents a significant hazard and when the design does not conform to a prescribed standard or management-approved specification (see Chap 6.21, LLNL Health and Safety Manual)." LLNL Health and Safety Manual, Chapter 6.21, dated July 1990, states, "A Safety Note requires the signature of the originator, the person authorized by the Division to review Safety Notes, and the Division leader." In addition the [radioactive material] facility Quality Assurance Plan (QAP), M-078-20, revision 2, section 4.2, dated May 1994, states, "The adequacy of design products shall be verified or validated by qualified individuals other than those who performed the work. Verification and validation work shall be completed before approval and implementation of the design." Also, LLNL Quality Assurance Plan for Nuclear Facilities and Nuclear Facility Support Functions, M-078-NF, revision 4, section 5.1.4, dated March 1998, states "Documents shall be prepared, reviewed, approved, issued, used, and revised to prescribe processes, specify requirements, or establish design." Finally, section 5.2.2 of the LLNL QAP states, "Each facility design control system must be designed to ensure that documents and records are created, controlled, and retained. Design verification and validation must be completed by qualified persons other than those who did the design work. Verification and validation is done prior to approval and implementation of the design."

   However, LLNL technical basis documents in support of their negative Unreviewed Safety Question Determination for the Building 332 legacy item, to include the (1) Estimated Pressure for B-332 Legacy Item Calculations, (2) Radiolysis of Organics, Intra-Laboratory Memorandum dated November 1, 1999, (3) Thermal Analysis of B-332 Legacy Item Calculation, (4) Finite Element Analyses of Container Strongback, and

(5) Estimate of Airborne Release Fraction for B-332 Legacy Item Calculations, each was found to be deficient in at least one of the following ways: (1) lack of preparer signature; (2) lack of evidence of independent review (signature and date); (3) lack of document completion and review dates; and (4) lack of document numbers and titles.

2. The LLNL Health and Safety Manual, Supplement 2.21, Implementation Guide for the Unreviewed Safety Question Process, section 4.5, dated April 13, 1999, states "A safety evaluation must provide a comprehensive justification for the USQ determination …… The explanation must be complete so that a qualified independent reviewer could draw the same conclusion from the evaluation." However, the technical basis documents (listed in item #1 above) were not maintained complete in that, LLNL continued to modify the safety evaluation technical basis documents after LLNL had determined that the USQ was negative on December 15, 1999. In addition, LLNL did not reevaluate the USQ evaluations to confirm that the original conclusions were still valid after the safety evaluation technical safety documents were subsequently revised.

3. The Atomic Vapor Laser Isotope Separation (AVLIS) Safety Analysis Document (SAD), *Safety Analysis Document for the Separator Demonstration Facilities Complex,* (UCRL-AR-106366), revision 1, page 4-37, dated January 1992, states, "No [ ] liquids are allowed in storage at Building 493 and only limited quantities of [ ] solids and gases are available to feed the [unanticipated event]." However, during a facility walk-through of Building 493 on June 23, 1999, DOE personnel noted that two [ ]-liquid storage cabinets contained about 20 gallons of [ ] solvents in various closed containers.

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

Pursuant to the provisions of 10 CFR 820.24, Lawrence Livermore National Laboratory is hereby required within 30 days of the date of the Preliminary Notice of Violation, to submit a written statement or explanation to the Director, Office of Enforcement and Investigation, Attention: Office of the Docketing Clerk, P.O. Box 2225, Germantown, MD 20875-2225. Copies should also be sent to the Manager, DOE Oakland, National Nuclear Security Administration Operations Office, and to the Cognizant Secretarial Offices at Headquarters for the facilities that are subjects of this notice. This reply should be clearly marked as a "Reply to a Preliminary Notice of Violation" and should include the following for each violation: (1) admission or denial of the alleged violations; (2) any facts set forth which are not correct; and (3) the reasons for the violations if admitted, or if denied, the basis for denial. Corrective actions that have been or will be taken to avoid violations will be delineated with target and completion dates in DOE's Noncompliance Tracking System. In the event the violations set forth in the Preliminary

Notice of Violation are admitted, this Notice will constitute a Final Notice of Violation in compliance with the requirements of 10 CFR 820.25.

John A. Gordon
Administrator

Dated at Washington, DC
this day of 2000

ENFORCEMENT CONFERENCE SUMMARY

NTS-OAK- -LLNL-LLNL-1999-0004
NTS-OAK- -LLNL-LLNL-1999-0007
NTS-OAK- -LLNL-LLNL-2000-0002
NTS-OAK- -LLNL-LLNL-2000-0005

The Office of Enforcement and Investigation (EH-Enforcement) held an Enforcement Conference with the representatives of Lawrence Livermore National Laboratory (LLNL) on July 11, 2000, at Germantown, Maryland. EH-Enforcement held the meeting to discuss the facts, circumstances, and corrective actions pertaining to inadequacies in the processes LLNL uses to maintain and adhere to documents which form the Authorization Basis (AB) for the Laboratory's nuclear facilities. An Investigation Summary Report describing the Department's evaluation of these inadequacies was transmitted to LLNL on June 1, 2000, as an enclosure to the letter requesting this conference. The inadequacies described in the Investigation Summary Report included (1) quality improvement problems whereby LLNL did not aggressively pursue in a timely manner known programmatic deficiencies in their AB processes, (2) failures to meet agreed to AB related milestones and to fully complete AB required documentation, and (3) failures to follow AB related requirements during the conduct of work processes.

The conference was called to order by Susan Adamovitz, Acting Director, Office of Enforcement and Investigation. A list of attendees is attached. Information provided by LLNL and key areas discussed at the conference is summarized below.

Howard Hatayama, [ ] for the University of California [ ], stated that the University considers the issues pertinent to this conference to be very important. Mr. Hatayama said that LLNL has a good program in place for establishing and institutionalizing a focus on AB processes.

Robert Kuckuck, [ ], stated that senior LLNL management is fully aware of the LLNL problems relative to their AB processes.
Dr. Kuckuck then outlined several process that were in place at the laboratory to enhance safety to include Integrated Safety Management (ISM), redesign of the ES&H manual, cyber physical security, integrated safeguards and security program, and an enhanced AB effort site-wide for all facilities. Dr. Kuckuck requested that EH-Enforcement recognize for potential mitigation that, at the time of the issuance of the

Enforcement Letter, the Laboratory had several other efforts underway to include ISM verification, “Go Green,” and Y2K preparation.

Michael Anastasio, [ ] reiterated LLNL’s commitment to safety and stated that many of the LLNL AB issues paralleled some of the previously identified [nuclear] safety issues. Mr. Anastasio outlined several initiatives that have been taken to address some of the AB concerns to include (1) the formation of the Nuclear Materials Technology Program, increasing the number of safety professionals, and (2) a closer working relationship with DOE Oakland Operations Office (e.g., weekly meeting between Mr. Sefcik and Mr. Hooper).

Dennis Fisher, [ ], presented the LLNL Authorization Basis Corrective Action Plan (CAP). Mr. Fisher opened the discussion by covering the background of events which led to the formation of the LLNL AB Working Group, actions taken to strengthen the LLNL AB process, and the root cause analysis performed. A matrix was then presented which cross-referenced the causal factors against the 13 corrective actions identified in the CAP. Mr. Fisher then covered each of the 13 corrective actions addressing the required actions, status, cost, and schedule for each corrective action. Mr. Fisher then presented a table depicting the incremental costs for each of the 13 corrective actions over the fiscal years 2000, 2001, and 2002. Mr. Fisher then concluded his presentation by outlining the compensatory measures LLNL is taking while the CAP is being implemented.

After a question and answer period, Mrs. Adamovitz adjourned the conference.

Lawrence Livermore National Laboratory

Enforcement Conference
List of Attendees

DOE Office of Enforcement and Investigation

Susan Adamovitz, Acting Director
Richard Day, Enforcement Specialist
Hank George (Synergy), Technical Advisor

DOE Office of Oversight

Frank Russo, EH-2 Liaison to EH-10

DOE Office of Defense Programs

Kim Loll, DP-17
Jim Winter, DP-45

DOE Office of Policy and Standards

Richard Englehart, EH-31

DOE Oakland Operations Office

Ray Corey
Andrew De La Paz

Lawrence Livermore National Laboratory

Robert Kuckuck, [ ]
Dennis Fisher, [ ]
Michael Anastasio, [ ]
Joe Sefcik, [ ]
Abel Garcia, [ ]
Garry Holman, [ ]

University of California [ ]

Howard Hatayama, [ ]