



**Department of Energy**  
Washington, DC 20585

April 3, 2009

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

Dr. Persis Drell, Ph.D.  
Director  
SLAC National Accelerator Laboratory  
2575 Sand Hill Road  
Menlo Park, California 94025

WEA-2009-01

Dear Dr. Drell:

This letter refers to the Department of Energy's (DOE) Office of Health, Safety and Security's Office of Enforcement investigation into the facts and circumstances associated with the September 13, 2007, polyvinyl chloride (PVC) pipe explosion that occurred in Sector 30 of the linear accelerator facility at the SLAC National Accelerator Laboratory (SLAC). The results of the on-site investigation were provided in an Investigation Report dated July 23, 2008, and an enforcement conference was held on September 19, 2008, with you and members of your staff to discuss the report's findings. A summary of the conference is enclosed.

Based on our evaluation of the evidence in this matter, including information presented during the enforcement conference, DOE has concluded that violations of 10 C.F.R. Part 851, *Worker Safety and Health Program*, by Stanford University have occurred. Accordingly, DOE is issuing the enclosed Preliminary Notice of Violation (PNOV) with three Severity Level I violations. Although DOE is authorized to impose a civil penalty on Stanford University under 10 C.F.R. § 851.5(a) in this case, the imposition of a monetary penalty on a not-for-profit contractor that receives no fee under its contract with DOE contradicts the intent of Congress when it passed the Energy Policy Act of 2005. Therefore, DOE has elected not to impose a proposed civil penalty of \$210,000 for these violations.

DOE views this event as highly significant in that the explosion could have resulted in fatalities or severe injuries far exceeding the temporary hearing loss reported by one worker. These consequences were averted only by circumstance and timing. DOE is particularly concerned about Stanford University's role in this event because it was the failure of SLAC personnel to properly plan and design the underground utilities upgrade project to preclude hazardous conditions that ultimately put workers at risk of serious injury. This event could have been prevented had SLAC identified the need to pressure test

the piping system, install a pressure gauge, or perform specified testing procedures during the design and planning of the project. This event also could have been prevented had SLAC personnel stopped work on the project when the need to install the pressure gauge was recognized as a task that had not been previously planned.

DOE commends you for taking full responsibility for this event and was impressed by your personal commitment to establish “best-in-class” safety performance. Nonetheless, DOE remains concerned about SLAC’s ability to achieve and sustain fundamental and lasting improvement in its work planning and control process. DOE recognizes that you are committed to implementing a new process. This process, however, remains a work in progress despite the repeated identification of significant work planning and control deficiencies at SLAC over the past several years. As indicated in the Office of Enforcement’s Investigation Report, some of the key corrective actions related to requirements management and work planning and control, developed in response to the Fall 2006 DOE Office of Independent Oversight inspection, were completed before the pipe explosion but were not effective in preventing the incident. The Office of Enforcement further notes that the work planning and control corrective actions for the pipe explosion have been identified as complete although the new process has not yet been fully implemented.

DOE notes that corrective actions related to developing a communications program for subcontractors have also been completed (except those relating directly to University Technical Representatives and SLAC personnel overseeing construction). Nevertheless, during the enforcement conferences with the subcontractors involved in the pipe explosion, the Office of Enforcement observed that both subcontractors still lack a thorough understanding of SLAC’s expectations for safety and health performance and compliance. This raises questions about the effectiveness of the communications program in achieving its intended objectives. It also was not evident to the Office of Enforcement that SLAC has evaluated other subcontractors working at the laboratory to evaluate the extent of this condition. In addition, we observed that the piping subcontractor did not modify the welding safety rules in its revised Injury and Illness Prevention Program that was submitted to and reviewed by SLAC following the pipe explosion. This represented a missed opportunity for SLAC to ensure that the subcontractor was cognizant of applicable regulatory requirements and fully understood its responsibility to establish hazard controls and perform work according to those requirements.

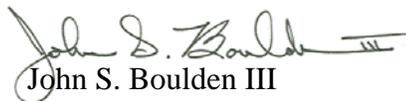
To gain perspectives on the effectiveness of corrective actions implemented at the activity level, the Office of Enforcement reviewed the new SLAC hot work permit system and revised hot work procedures. While the new system identifies multiple individuals and organizations authorized to approve permits, the procedures do not identify any training or qualification requirements for these individuals or entities.

As a result of our concerns, no mitigation of the proposed civil penalty would have been provided for the corrective actions developed and implemented to date in response to this event. In that regard, DOE believes that SLAC’s follow-up effectiveness review scheduled for 2009 is of critical importance in evaluating the impact of your efforts to institutionalize

a work planning and control process that prevents accidents and fosters the desired safety culture. Further, no mitigation would have been provided for self-identification of the violations due to their self-disclosing nature following the pipe explosion.

Pursuant to 10 C.F.R. § 851.42, *Preliminary Notice of Violation*, you are obligated to submit a written reply within 30 calendar days of receipt of the enclosed PNOV, and to follow the instructions specified in the PNOV when preparing your response. If no reply is submitted within 30 days, in accordance with 10 C.F.R. § 851.42(d)(2), this PNOV will constitute a final order. After reviewing your response to the PNOV, including any proposed additional corrective actions entered into the Noncompliance Tracking System, DOE will determine whether further action is necessary to ensure compliance with DOE worker safety and health requirements. DOE will continue to monitor the completion of corrective actions until these matters are resolved.

Sincerely,



John S. Boulden III  
Acting Director  
Office of Enforcement  
Office of Health, Safety and Security

Enclosure

cc: Patricia Dehmer, SC-1  
Paul Golan, SSO  
Brian Sherin, SLAC  
Robert Todaro, SLAC  
Rachel Claus, SLAC  
Richard Azzaro, DNFSB

**Preliminary Notice of Violation**

Stanford University  
SLAC National Accelerator Laboratory

WEA-2009-01

As a result of the Department of Energy's (DOE) investigation into the facts and circumstances associated with the polyvinyl chloride (PVC) pipe explosion that occurred in Sector 30 of the linear accelerator facility at the SLAC National Accelerator Laboratory (SLAC) on September 13, 2007, multiple violations of DOE worker safety and health requirements by Stanford University were identified.

The violations involved deficiencies in construction safety, fire protection, and adherence to general requirements and procedures. The deficiencies have been grouped and categorized as three Severity Level I violations.

DOE is authorized to impose a civil penalty on Stanford University for these violations in accordance with 10 C.F.R. § 851.5(a). Although Stanford University receives no fee under its contract with DOE and, under § 851.5(d), the total amount of penalties "may not exceed the total amount of fees paid by DOE to that contractor in that fiscal year," Stanford University is not a contractor listed in subsection d. of section 234A of the Atomic Energy Act (AEA) that was applicable to the University under its contract with DOE at the time these violations occurred. However, it was not the intent of Congress, as evidenced by the Energy Policy Act of 2005 and subsequent revision of the AEA, to impose a monetary penalty on a not-for-profit contractor that receives no fee under its contract with DOE. Therefore, DOE has elected not to impose the proposed civil penalty of \$210,000 for these violations.

In accordance with 10 C.F.R. Part 851, Appendix B, *General Statement of Enforcement Policy*, the violations are listed below.

**VIOLATIONS**

I. Construction Safety

Title 10 C.F.R. § 851.24, *Functional areas*, requires that "[c]ontractors must have a structured approach to their worker safety and health program which at a minimum, include provisions for ... construction safety" and that "[c]ontractors must comply with the

applicable standards and provisions in Appendix A of this part, entitled ‘Worker Safety and Health Functional Areas’.”

Appendix A, Section 1, *Construction Safety*, states that “[f]or each separately definable construction activity (e.g., excavations, foundations, structural steel, roofing), the construction contractor must: [p]repare and have approved by the construction manager an activity hazard analysis prior to commencement of affected work. Such analyses must: [i]dentify foreseeable hazards and planned protective measures...” and “[e]nsure workers are aware of foreseeable hazards and the protective measures described within the activity analysis prior to beginning work on the affected activity.”

Appendix A, section 1(d) states that “[t]he construction contractor must prepare a written construction project safety and health plan to implement the requirements of this section and obtain approval of the plan by the construction manager prior to commencement of any work covered by the plan. In the plan, the contractor must designate the individual(s) responsible for on-site implementation of the plan, specify qualifications for those individuals, and provide a list of those project activities for which subsequent hazard analyses are to be performed.”

Contrary to these requirements, Stanford University failed to ensure that Western Allied Mechanical, Inc. (Western Allied) developed a construction project safety and health plan and activity hazard analysis to effectively implement the requirements of appendix A, section 1. The site-specific safety plan (SSSP) and job safety analysis (JSA) prepared by Western Allied did not adequately identify and assess the hazards associated with the piping replacement work being conducted in Sector 30 of the linear accelerator facility or establish controls necessary to eliminate or abate those hazards to protect workers. Specific examples are listed below:

- A. The “Sub Contractor Site Specific Health & Safety Plan Form” for the “SLAC Underground Utilities Upgrade” project that was prepared and submitted by Western Allied and approved by the SLAC project manager did not identify any project activities for which subsequent hazard analyses would be performed. The form contained only generic information about the scope of work to be performed and the associated hazards and hazard controls to be implemented by Western Allied. The form also did not specify the qualifications of the competent person designated on the form by Western Allied as responsible for oversight of specific and daily operations conducted under the plan.
- B. The JSA prepared by Western Allied for the piping replacement work, “CTW Piping Replacement – Sectors 21 thru 30,” dated September 4, 2007, did not identify foreseeable hazards and appropriate protective measures for the work to be performed.
  - Stanford University representatives, including the project manager and university technical representative (UTR), periodically signed the JSA as part of daily sign-in expectations, but Stanford University, as construction manager, did not formally approve the JSA.

- The JSA identified “solvents & cements” as potential hazards and “PVC solvent/cement” as a hazardous material that would be used at the job site. The JSA failed to identify the following properties and precautions for use of those materials as identified on (1) the material safety data sheet (MSDS) for IPS Weld-On solvent cement for PVC plastic pipe, dated April 2007; (2) the MSDS for IPS Weld-On adhesive primer for plastic, dated June 2007; and (3) the IPS Weld-On PVC 2711 plastic pipe cement product label:
  - A flammability rating of 3
  - Keep away from heat, sparks, open flame, and other sources of ignition
  - Vapors may ignite explosively
  - Use with adequate ventilation.
- The JSA listed “cutting and torching of bolts” as a phase of work/job step and “static electricity and sparks” as potential hazards. The analysis failed to consider the potentially explosive conditions created by the combination of ignitable vapors from the PVC primer and cement, an enclosed space (i.e., sealed piping system), and the application of heat to the carbon steel piping attached to the PVC piping. The work documents and SSSP for the project did not identify the need to install a pressure gauge in the piping system so that required pressure testing could be performed. The JSA did not identify the task of cutting into and welding on the newly installed carbon steel piping to install a pressure gauge.

Collectively, these deficiencies constitute a Severity Level I violation. As explained in 10 C.F.R. Part 851, Appendix B, Section VI(b)(1), *Severity of Violations*, “[a] Severity Level I violation is a serious violation. A serious violation shall be deemed to exist in a place of employment if there is a potential that death or serious physical harm could result from a condition which exists, or from one or more practices, means, methods, operations, or processes which have been adopted or are in use, in such place of employment.”

Proposed Civil Penalty - \$70,000 (waived)

## II. Fire Protection

Title 10 C.F.R. § 851.23, *Safety and health standards*, requires compliance with 29 C.F.R. Part 1926, *Safety and Health Regulations for Construction*. Section 1926.352(i) states that “[d]rums, containers, or hollow structures which have contained toxic or flammable substances shall, before welding, cutting, or heating is undertaken on them, either be filled with water or thoroughly cleaned of such substances and ventilated and tested.”

Title 10 C.F.R. § 851.24, *Functional areas*, requires that “[c]ontractors must have a structured approach to their worker safety and health program which at a minimum, include provisions for ...fire protection” and that “[c]ontractors must comply with the applicable standards and provisions in Appendix A of this part, entitled ‘Worker Safety and Health Functional Areas’.” Appendix A, Section 2, *Fire Protection*, states that “[c]ontractors must implement a comprehensive fire safety and emergency response program to protect

workers commensurate with the nature of the work that is performed,” and that “[a]n acceptable fire protection program...includes meeting applicable building codes and National Fire Protection Association [NFPA] codes and standards.”

National Fire Protection Association (NFPA) 51B, *Standard for Fire Prevention During Welding, Cutting, and Other Hot Work*, 2003 edition, establishes the following provisions:

- Section 3.3.5 defines the permit authorizing individual (PAI) as “[t]he individual designated by management to authorize hot work.”
- Section 4.1 states that “[m]anagement or a designated agent shall be responsible for the safe operations of hot work activity.”
- Section 4.1.2 states that “[m]anagement shall designate a [PAI].”
- Section 4.1.6 states that “[m]anagement shall ensure that all individuals involved in the hot work operations, including contractors, are familiar with the provisions of [NFPA 51B].”
- Section 4.1.6.2 states that “[i]ndividuals involved in hot work operations shall have an awareness of the inherent risks involved...”
- Section 4.1.7 states that “[m]anagement shall advise all contractors about site-specific flammable materials, hazardous processes or conditions, or other potential fire hazards.”
- Section 4.2.1 states that “[t]he PAI shall determine site-specific flammable materials, hazardous processes, or other potential fire hazards that are present or likely to be present in the work location.”
- Section 5.1.1 states that “[h]ot work shall be permitted only in areas that are or have been made fire safe.”
- Section 5.2(4) states that “[h]ot work shall not be permitted...[i]n the presence of uncleaned or improperly prepared drums, tanks, or other containers and equipment that have previously contained materials that could develop explosive atmospheres.”
- Section 5.3.1 states that “[b]efore hot work operations begin in a nondesignated location, a written hot work permit by the [PAI] shall be required.”
- Section 5.3.4 states that “[t]he area shall be inspected by the PAI at least once per day while the hot work permit is in effect to ensure that it is a fire-safe area.”

Section 1.1.2 of NFPA 51B requires compliance with American National Standards Institute (ANSI) Z49.1, *Safety in Welding, Cutting, and Allied Processes*. ANSI Z49.1, 2005 edition, establishes the following provisions:

- Section 3.2.1.2 states that “[m]anagement shall assure that hazards and safety precautions are communicated to workers and understood by workers prior to the start of work.” The explanatory information for section 3.2.1.2 states that “hazards which may be involved in welding are communicated to users through manufacturers instructions, material safety data sheets, and product labeling.”
- Section 3.2.1.3 states that “[m]anagement shall designate approved areas, and establish procedures for safe welding and cutting.” This section also states that “[a] designated management representative shall be responsible for authorizing welding and cutting operations in areas not specifically designated or approved for such processes” and that “[m]anagement shall assure that the individual is aware of the hazards involved and familiar with the provisions of [ANSI Z49.1].”
- Section 3.2.1.5 states that “[m]anagement shall select contractors to perform welding who...have an awareness of the risks involved.” and that “[m]anagement shall advise contractors about flammable materials or hazardous conditions that are specific to the job site.”
- Section 3.2.3.1 states that “[w]elders shall understand the hazards of the operation to be performed and the procedures being used to control hazardous conditions.”
- Section 3.2.3.3 states that “[w]elders shall cut or weld only where all safety precautions have been met.”
- Section 6.3 states that “[b]efore welding or cutting is begun in a location not designed for such purposes, inspection and authorization by a designated management representative shall be required.”
- Section 6.4 states that “[w]elding or cutting work shall not be started until the container has been prepared for hot work.”

Contrary to these requirements, Stanford University failed to implement proper hot work procedures and fire prevention measures, and failed to ensure that Western Allied implemented welding and cutting fire safety control measures. Furthermore, Stanford University failed to ensure that Pacific Underground Construction, Inc. (Pacific Underground) and Western Allied adequately trained their employees on the safety standards and requirements applicable to welding under 10 C.F.R. Part 851 and on potential hazards associated with the piping replacement project. Specific examples are listed below:

- A. Stanford University did not designate a PAI to authorize hot work. During the Office of Enforcement’s investigation, however, the SLAC fire marshal indicated that he fulfilled the functions of the PAI for hot work performed at SLAC.

- B. Permit # 00-2396, dated September 6, 2007, which was issued for the utilities upgrade hot work to be performed by Western Allied, was not signed or otherwise approved by the PAI (i.e., SLAC fire marshal).
- C. Stanford University did not identify flammable hazards associated with the utilities upgrade work performed by Western Allied as part of the hot work permit process. Permit # 00-2396 identified burning, brazing, cutting, grinding, soldering and welding as the work to be completed by the subcontractor, and identified the location as “LINAC Sec 21 – 30 Mech Alcove.” The permit did not provide any information specific to the locations where the hot work would be performed or any equipment, materials, or processes that might be involved in or affected by the hot work activities. The PAI did not evaluate the hot work activity prior to the commencement of operations by Western Allied to determine the extent of the welding process, the condition of the worksite, the potential for flammable and explosive hazards introduced by the PVC primer and cement, or special precautions or mitigations to be followed, such as purging and monitoring for vapor buildup.
- D. The PAI did not inspect the Sector 30 mechanical alcove work area before Western Allied was provided a hot work permit or before hot work was conducted. The PAI did not visit the hot work area on a daily basis after permit issuance to ensure that hot work performed by Western Allied complied with the provisions of NFPA 51B. The permit issuance process failed to effectively evaluate and identify hazards associated with Western Allied’s hot work.
- E. Stanford University, as construction manager, failed to ensure worker protection from flammable and explosion hazards through the adoption of work control measures such as purging or cleaning the pipes and monitoring for vapor buildup to verify the absence of a potentially explosive atmosphere.
- F. Stanford University did not establish effective procedures to ensure that welding and cutting would be performed safely. Chapter 12, *Fire and Life Safety* (dated May 21, 2007) of the SLAC Environment, Safety, and Health Manual requires that a fire prevention hot work permit be obtained from the fire department before performing hot work, but does not identify any other requirements pertaining to the planning, control, or conduct of hot work. An exhibit related to chapter 12 establishes “Fire and Life Safety: Fire Prevention Hot Work Guidelines” including a guideline that states “do not perform hot work in areas where flammable liquids, or vapors, lint, dust or combustible storage is at risk of ignition” and other important controls for ensuring the safe performance of hot work. There is no requirement for SLAC personnel or subcontractors to follow these guidelines or to incorporate these controls into the hot work permit.
- G. Stanford University did not ensure that Pacific Underground and Western Allied employees were trained in and familiar with the provisions of NFPA 51B and ANSI Z49.1. Pacific Underground and Western Allied employees interviewed during the Office of Enforcement’s investigation were unfamiliar with these standards and the

requirements contained therein. Stanford University also failed to ensure that Western Allied employees were informed of the hazards and protective measures associated with performing hot work on piping that could contain ignitable vapors. Western Allied employees have performed pipefitting work with carbon steel at SLAC previously. The welder performing the hot work on September 13, 2007, however, had no experience working with a piping configuration comprised of different materials (ductile iron, PVC, and steel) such as the one used in the underground utilities upgrade in Sector 30. The welder did not consider the potential flammable and explosion hazards associated with usage of PVC primer and cement in a closed pipe system based on a review of applicable MSDSs and product labels before welding.

Collectively, these deficiencies constitute a Severity Level I violation.  
Proposed Civil Penalty - \$ 70,000 (waived)

### III. General Requirements

Title 10 C.F.R. § 851.10, *General requirements*, states that “the contractor must: [e]nsure that work is performed in accordance with: (i) [a]ll applicable requirements of [Part 851]; and (ii) [w]ith [sic] the worker safety and health program for that workplace.” The *SLAC Worker Safety and Health Program Description* (SLAC-I-720-0A21B-001-R000), dated February 2007, incorporates by reference the latest version of Chapter 42, *Subcontractor Construction Safety*, of the *SLAC Environment, Safety, and Health Manual*. The following refers to requirements in chapter 42 dated June 1, 2007.

- Section 5.1.2.4 states that “[s]ubcontractors are required to submit a site-specific safety plan (SSSP)” and that “[t]he SSSP must describe the work to be performed, outline the hazards anticipated to be encountered with each task, and the specific mitigation.” The SSSP must also “[d]escribe the system used to ensure personnel will comply with safe and healthy work practices, including [s]afety indoctrination and safety meetings, [w]orker training in hazard recognition, [d]isciplinary policy, and [d]escribe the system used to communicate with personnel, including notification of hazards.” This section also states “SSSPs are approved by the [project manager].”
- Section 5.1.2.5 states that “JSAs must be prepared and reviewed at the start of any on-site work and any new phase or task and will be reviewed daily.” This section also states that “UTRs must also review the JSAs.”
- Section 5.1.3.3 requires that “SLAC [project managers] and/or UTRs, the construction safety program manager, and subcontractors must perform daily inspections of activities and work sites relevant to the work being performed that day to ensure that the subcontractor is working within identified controls and has effectively controlled identified hazards.” This section further states that “[a]ll inspections, findings, and corrective measures must be documented and be available for review” and that “daily inspection records must be kept at the job site.”

Contrary to these requirements, Stanford University failed to perform work in accordance with SLAC's approved Worker Safety and Health Program and associated implementing procedures. Specific examples include the following:

- A. Stanford University did not document the results of safety inspections of the work performed by Pacific Underground or Western Allied in Sector 30 of the linear accelerator facility.
- B. Stanford University failed to ensure that the safety plans submitted by Western Allied complied with SLAC's project planning requirements. The SSSP submitted by Western Allied and approved by the SLAC project manager did not address the required elements of chapter 42, section 5.1.2.4 described above. The SSSP did not address the task of fabricating new piping using mixed materials, usage of PVC adhesive primer and cement in assembling the piping, or identify the hazards associated with those activities and materials. The SSSP also did not describe the system that would be used by Western Allied to ensure worker compliance with safe and healthy work practices.
- C. The need to install a pressure gauge was not identified in the SSSP, JSA, or installation drawings for the new piping to be installed by Western Allied. Although installation of the pressure gauge was reportedly discussed during a tailgate meeting on the day of the explosion, the SLAC UTR failed to ensure that a new JSA was prepared or that the existing JSA was modified to reflect this new task.

Collectively, these deficiencies constitute a Severity Level I violation.  
Proposed Civil Penalty - \$70,000 (waived)

## **REPLY**

Pursuant to the provisions of 10 C.F.R. § 851.42, Stanford University is hereby obligated, within 30 calendar days of receipt of this Preliminary Notice of Violation (PNOV), to submit a written reply. Please send such reply by overnight carrier to the following address:

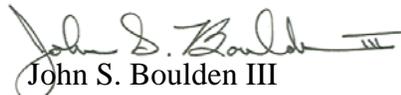
Director, Office of Enforcement  
Attention: Office of the Docketing Clerk  
U.S. Department of Energy  
19901 Germantown Road  
Germantown, MD 20874-1290

Copies should also be sent to the Under Secretary for Science and the Manager of the SLAC Site Office. This reply should be clearly marked as a "Reply to the Preliminary Notice of Violation" and must include the following for each violation: (1) any facts, explanations and arguments that support a denial that the violation has occurred as alleged, and (2) a discussion of the relevant authorities that support the position asserted, including rulings, regulations, interpretations, and previous decisions issued by DOE. Copies of all relevant documents shall be submitted with the reply. Corrective actions that have been or

will be taken to avoid further violations should be delineated with target and completion dates in DOE's Noncompliance Tracking System.

Pursuant to 10 C.F.R. § 851.42(d), if Stanford University does not submit a written reply within 30 calendar days of receipt of this PNOV, Stanford University relinquishes any right to appeal any matter in this Notice and this PNOV will constitute a final order. If Stanford University waives the right to contest the PNOV, this PNOV will constitute a final order upon the filing of the reply.

You may be required to post a copy of this Notice in accordance with 10 C.F.R. § 851.42(e).



John S. Boulden III  
Acting Director  
Office of Enforcement  
Office of Health, Safety and Security

Washington, DC  
this 3<sup>rd</sup> day of April 2009

**Stanford University**  
**SLAC National Accelerator Laboratory Polyvinyl Chloride Pipe Explosion**

**Enforcement Conference Summary**

On September 19, 2008, the Department of Energy's (DOE) Office of Health, Safety and Security's Office of Enforcement held an enforcement conference with senior management from the SLAC National Accelerator Laboratory (SLAC) in Menlo Park, California. The conference was held to discuss potential violations identified in an Office of Enforcement Investigation Report issued to the Laboratory Director on July 23, 2008, involving the September 13, 2007, polyvinyl chloride (PVC) pipe explosion that occurred at SLAC.

Ms. Martha Thompson, Acting Director, Office of Enforcement, presided over the conference. Following introductions by DOE and SLAC representatives in attendance, Ms. Thompson provided an overview of the conference's purpose and objectives.

Dr. Persis Drell, Laboratory Director, led the discussion by addressing SLAC's performance dating back to a 2003 Type B Ladder Accident Investigation and citing a history of SLAC management inactions that contributed to the PVC pipe explosion. Dr. Drell cited SLAC's poor use of feedback from previous events and reviews, inadequate communications with subcontractors, and a mission-before-safety culture, stating that many of the existing problems were endemic to the laboratory.

Dr. Drell acknowledged that the severity of the PVC pipe explosion required an immediate response. The sequence of events that led to the explosion, the PVC Incident Analysis Board's root and contributing causes, and SLAC's organizational and programmatic response were discussed. Dr. Drell emphasized SLAC's commitment to establish a strong partnership with DOE, instill a culture where management efficiently and effectively supports laboratory activities, and develop a first-class safety organization. Dr. Drell concluded her presentation by taking full responsibility for the pipe explosion.

Mr. Craig Ferguson, Environment, Safety and Health Division Director, continued the presentation by providing an overview of SLAC's ten-point noncompliance tracking system corrective action plan that was established in response to Incident Analysis Board's findings. Work planning and control issues and subcontractor oversight deficiencies were discussed. Mr. Ferguson noted most of the subcontractors hired to perform work at the laboratory are from the local area and are unfamiliar with DOE requirements; a factor that was not fully considered by SLAC management. Mr. Ferguson concurred with the facts stated in the Office of Enforcement's Investigation Report.

Mr. Liam Robinson, Acting Department Head for Facilities, then provided a more detailed explanation of SLAC's ongoing corrective actions as identified in the NTS. As part of corrective action number 10, Integrated Safety and Environmental Management System (ISEMS) Communication and Training of Subcontractors, SLAC developed two handouts entitled "Subcontractor Construction Safety Tailgate Meeting Guide" and "ISEMS Summary for Construction Subcontractors" that were provided to the attendees. These handouts are intended to assist contractors with the transition to DOE work by providing information about site-specific work process responsibilities, requirements, and expectations.

Dr. William Madia, Vice President for SLAC, stated that an effectiveness review is scheduled to be performed in 2009 to evaluate improvements resulting from SLAC's corrective actions. A question and answer session then followed SLAC's presentation.

Ms. Kathy McCarty, Director, Office of Worker Safety and Health Enforcement, summarized the enforcement deliberation process. Ms. Thompson then adjourned the conference.

**Stanford University**  
**SLAC National Accelerator Laboratory Polyvinyl Chloride Pipe Explosion**

**Enforcement Conference List of Attendees**

**September 19, 2008**

DOE – Office of Enforcement

Martha Thompson, Acting Director  
Kathy McCarty, Director, Office of Worker Safety and Health Enforcement  
Leslie Bermudez, Enforcement Officer  
Richard Day, Enforcement Officer  
Raul Bhat, Legal Advisor

DOE – SLAC Site Office

Paul Golan, Manager  
Thomas Rizzi, Safety Team Lead  
Donald Wilhelm, Safety Engineer

SLAC National Accelerator Laboratory

Persis Drell, Director  
Craig Ferguson, Director, Environment, Safety and Health Division  
Liam Robinson, Acting Department Head, Facilities  
Brian Sherin, Department Head, Chemical and General Safety  
Alexander Merola, Chief Operating Officer  
Rachel Claus, Laboratory Counsel  
Karen Fant, Acting Associate Laboratory Director, Engineering and Technical Support  
Directorate

Stanford University

William Madia, Vice President for SLAC  
Larry Gibbs, Associate Vice Provost for Environment, Health and Safety