EXECUTIVE SUMMARY

One function of the Office of the Chief of Defense Nuclear Safety (CDNS) is to provide feedback to National Nuclear Security Administration (NNSA) management on the safety of nuclear operations. To that end, the CDNS conducts biennial reviews to evaluate site nuclear safety performance. This report documents the CDNS biennial review of the Los Alamos Site Office (LASO), conducted from July 30 through August 9, 2007. The review was performed in accordance with the principles of the *Biennial Review of Site Nuclear Safety Performance Protocol.*

The objective of the review was to provide credible, objective, value-added information to NNSA line managers related to the status of Site Office nuclear safety oversight and implementation of nuclear safety requirements. The performance review is also intended as a catalyst to promote behavioral change to facilitate continuous improvement in:

- Implementation and maintenance of nuclear safety requirements of the Nuclear Safety Rule, 10 CFR 830;
- The implementation and institutionalization of Integrated Safety Management Systems that affect the implementation and maintenance of nuclear safety requirements; and,
- The Federal oversight processes for the protection of workers, the public, and the environment.

Los Alamos National Laboratory (LANL) is a multi-disciplinary national security laboratory with a core mission to ensure that the nation's nuclear weapons remain safe, secure, and reliable and to prevent the spread and use of weapons of mass destruction worldwide. LANL operates and manages numerous nuclear facilities and operations. Activities include plutonium, uranium and tritium processing; research and development operations with special nuclear material; high-energy radiography; radiation measurement; packaging and transportation of nuclear materials; and, radioactive and hazardous waste management. Numerous LANL nuclear facilities are classified as either Hazard Category 2 or 3 nuclear facilities. LANL is operated by the Los Alamos National Security, LLC (LANS); NNSA oversight is provided by the Los Alamos Site Office (LASO).

Prior to the review, LASO conducted a management self-assessment using criteria similar to those used by the CDNS review team. Following the review, LASO initiated corrective actions for a number of the identified gaps. Although additional gaps and findings were identified during the CDNS review, the overall results of the CDNS review were generally consistent with the LASO management self-assessment. In general, the CDNS review found that Site Office performance of a management self-assessment is of benefit and should be institutionalized as part of a feedback and continuous improvement program.

The LASO oversight and assessment processes that are intended to ensure implementation and maintenance of the Nuclear Safety Management rule at LANL are not implemented effectively. Significant concerns were identified regarding the processes and procedures that ensure compliance with many of the safety management programs that are required by documented safety analyses. These concerns are aggravated by the immaturity of the training and qualification program for Site Office employees, which, if effective, should ensure that the staff understand the requirements and know how to perform effective oversight.

LASO has improved its performance in recent months. This review concluded that four of the fourteen LASO nuclear safety oversight and assessment processes reviewed met expectations. One of these areas was Criticality Safety, which had been identified as an area of weakness in previous reviews. However, this review identified the need for additional improvement in ten critical functional areas affecting nuclear safety.

Under the protocol for conducting biennial reviews, a management concern is defined as "a significant issue or several similar issues that indicate a systemic problem." Of the issues identified during the review, the following rose to the level of management concerns.

- LASO requires continued improvement in most functional areas. Of particular concern are the areas of contractor training and qualification, conduct of engineering, and maintenance. The Site Office does not have effective oversight in the areas of contractor training and maintenance. In the area of conduct of engineering, LASO has not established and appears to have no plan to establish a safety system oversight program that meets the requirements of DOE M 426.1-1A.

- LANS has identified significant gaps in meeting NNSA requirements in the areas of formality of operations, formality of engineering, maintenance, training, quality assurance, and safety basis. Specific LASO oversight of the LANS effort to identify the gaps, develop appropriate corrective actions and compensatory measures, and validate closure of corrective actions varies across functional areas. In a few areas, such as safety basis, LASO appears aware and involved in oversight of the LANS efforts. In most other areas, such as formality of operations and maintenance, there is no evidence that LASO is reviewing proposed corrective actions and formalizing any required compensatory measures until the identified gaps are closed. For these areas, there is no evidence that LASO and NNSA have considered whether the corrective actions identified by LANS will be effective at closing the gaps and whether LANS has adequate resources to execute the proposed corrective actions.

- Although LASO has more federal employees than most NNSA Site Offices, staffing in several key areas appears inadequate. These areas include conduct of engineering, contractor training and qualification, safety basis, facility

representatives, maintenance and fire protection. At a minimum, there is an issue with the allocation of resources within the Site Office.

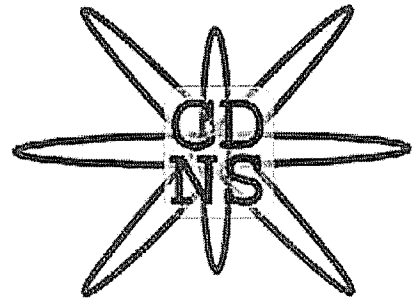
- Over the past couple of years, LASO has undergone a self-described personnel "churn." Numerous employees have left and the Site Office has reorganized several times. During this time period, key positions such as the Manager, Deputy Technical Manager, Assistant Manager for Safety Operations, and Safety Basis Team Leader were filled by acting personnel. Although most vacancies within the Site Office have now been filled, at least on an acting basis, almost no one was qualified in their position when LASO entered calendar year 2006. Eight months later, the Site Office continues to struggle with ensuring that federal personnel are trained and qualified. Key positions in the areas of safety basis, quality assurance, startup and restart, criticality safety, maintenance, and the facility representative program are filled by personnel who have not completed their qualification program.

- For the major institutional gaps identified by LANS (in areas such as formality of operations, formality of engineering, training, etc), NNSA has not conducted an assessment to determine why federal oversight failed to ensure adequate implementation of nuclear safety requirements at the laboratory.

The aggregate of the above concerns represents a significant weakness in the LASO capability to accomplish its mission.

The lack of adequate numbers of qualified staff in key functional areas may well have contributed to the findings and weaknesses identified during the LASO self-assessment and during this review. Additional concerns raised in several functional areas with the accuracy and flow down of the LASO FRAM appear to reflect an underlying weakness with the clarity of roles and responsibilities within the site office. LASO has been in a state of reorganization for some time, and this appears to have impacted staffing levels, completion of required qualifications by key staff, and employee understanding of roles, responsibilities and priorities.

To resolve the findings and weaknesses identified in the LASO self-assessment and in this review, the team believes that LASO management requires external assistance. The number and significance of the identified issues are of particular concern given the current state of flux within LASO. The Manager was recently selected, several key positions are in an acting status, and numerous staff functions are understaffed. Although significant support has been received from the NNSA Service Center and this support is expected to continue, LASO success will require use of additional NNSA resources to help execute any improvement plans developed. The team recommends that LASO provide proposed corrective actions for the management concerns to the NNSA Administrator and Deputy Administrator for Defense Programs. The team also recommends that LASO work with NNSA executive leadership to identify resource requirements for resolution of the identified findings.



Chief, Defense Nuclear Safety

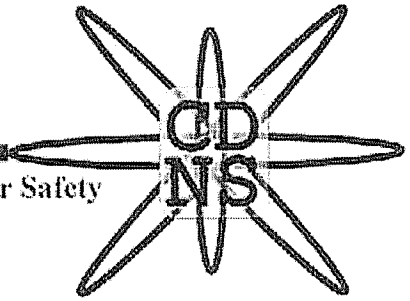
Headquarters Biennial Review of Site Nuclear Safety Performance Los Alamos Site Office

Richard Crowe

August 9, 2007

NNSA

Biennial Review Purpose



- Provide objective, value-added information for NNSA managers
  - Site office oversight capability
  - Contractor implementation of nuclear safety requirements
- Promote continuous improvement where deficiencies are identified
- Encourage consistent application of nuclear safety requirements across NNSA

Objectives

Chief, Defense Nuclear Safety

Determine the status of:

- Implementation and maintenance of nuclear safety requirements of the Nuclear Safety Rule
- The implementation and institutionalization of ISMS that affect the implementation and maintenance of nuclear safety requirements
- The Federal oversight processes

Biennial Review Definitions

Chief, Defense Nuclear Safety

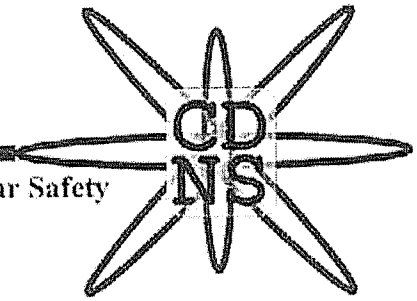
- **Finding**—a violation of an identified requirement.
- **Weakness**—a situation while not a direct violation of an identified requirement may, if not resolved, lead to degradation in nuclear safety performance. Management attention to evaluate the situation and take action as deemed appropriate is recommended.
- **Management Concern**: A significant issue or several similar issues that indicate a systemic problem.

Biennial Review Definitions

Chief, Defense Nuclear Safety

- **Opportunity For Improvement:** A condition, practice, or situation for which a best practice or process improvement that if applied to a particular site activity would result in improved efficiency or improved performance.
- **Noteworthy Practice:** A condition, practice, or situation identified at the site that is highlighted for the attention of management for possible expanded implementation at the site or communication to other NNSA sites.

Biennial Review Grades



- **Exceeds Expectations:** All criteria are met, the objective is met, and few or no issues are identified. Some noteworthy practices are identified.
- **Meets Expectations:** Most criteria are met and the objective is met. Some issues may be identified.
- **Needs Improvement:** Objective is not met, but the site has the capability to resolve the issues associated with the functional area.
- **Does Not Meet Expectations:** Objective not met. Management concerns identified associated with the functional area reflect failure to meet nuclear safety performance expectations. External support or oversight is appropriate to resolve the issues associated with the functional areas.

Results

Chief, Defense Nuclear Safety

- Four Functional Areas Met Expectations
  - Packaging and Transportation
  - Quality Assurance
  - Criticality Safety
  - Radiation Protection
- Two Functional Areas Are Still Under Review
  - Integrated Safety Management
  - Feedback and Improvement
- Other Areas Need Improvement

Management Concerns

Chief, Defense Nuclear Safety

- Significant Issues in Contractor Oversight
  - Safety System Oversight Program
  - Maintenance
  - Contractor Training and Qualification
- Federal Technical Qualification Weaknesses
- Staffing Skill Mix Concerns in Key Functional Areas
- Inconsistent Oversight of LANS Gap Analysis and Corrective Actions
- Federal Responsibility for Identified LANS Gaps

Conclusion

Chief, Defense Nuclear Safety

- LASO's management self-assessment identified a number of necessary improvements and established Site Office ownership of the corrective actions.
- The management self-assessment provides evidence that LASO has initiated improvement in key areas such as startup and restart of nuclear facilities and safety basis oversight.
- Continued improvement is needed in most areas.