

Memorandum

DATE: July 8, 2011

Report Number: INS-L-11-02

REPLY TO

ATTN OF: IG-40 (S10IS001)

SUBJECT: Letter Report on "Implementation of Nuclear Weapons Quality Assurance Requirements at Los Alamos National Laboratory"

TO: Manager, Los Alamos Site Office

INTRODUCTION AND OBJECTIVE

The National Nuclear Security Administration's (NNSA) Los Alamos National Laboratory (Los Alamos) is a multidisciplinary research and production institution responsible for the design and production of nuclear weapons components. In its effort to attain the highest quality in weapons engineering design and manufacturing, the Department of Energy (Department) established the *DOE/NNSA Weapon Quality Policy (QC-1)*. This policy requires NNSA and its contractors to establish processes to detect and prevent quality problems. This policy also requires that items, services and processes that do not meet established requirements be identified, controlled and corrected. To that end, NNSA and Los Alamos conduct surveys to help ensure that problems are identified and corrected.

Previous Office of Inspector General reports have identified problems with quality assurance processes at the Department's National Laboratories. Specifically, our Audit Report on *Nuclear Safety: Safety Basis and Quality Assurance at the Los Alamos National Laboratory* (DOE/IG-0837, August 2010), found that management had not focused sufficient attention on implementing the nuclear safety Quality Assurance Program throughout the Laboratory. In addition, our Inspection Report on *Issues Relating to the Production of Components for the W76 Weapon System at Sandia National Laboratory-New Mexico*, (Inspection Summary Report, November 2008), found problems with the execution of established policies and procedures in the procurement, contract management and quality assurance processes associated with Sandia National Laboratory–New Mexico's nuclear weapons products.

Because of past issues and the importance of having effective quality management systems, we initiated this inspection to determine if QC-1 requirements were being appropriately applied within Los Alamos' nuclear weapons programs.

CONCLUSIONS AND OBSERVATIONS

Our inspection did not identify any material concerns with Los Alamos' quality management system. For the quality assurance component and process surveys we reviewed, we specifically noted that officials took action to develop and implement corrective actions designed to correct specific issues. We did, however, identify a potential opportunity to improve the effectiveness of the program. Specifically, we found that Los Alamos may not

have focused on identifying and evaluating the cause or causes of frequently cited weaknesses related to certain design and production activities. Therefore, additional effort may be needed to determine whether weaknesses reported in the surveys are systemic in nature.

During the course of our inspection, alleged problems with reviews of weapons design changes and a lack of quality assurance focus over non-pit production activities were brought to our attention. We were, however, unable to substantiate those allegations.

Potential Systemic Findings in Surveys

While individual survey findings were commonly brought to the attention of Los Alamos officials and corrective actions were developed, additional effort may be needed to determine whether weaknesses reported in quality assurance component and process surveys are systemic in nature. Our testing of NNSA and Los Alamos quality assurance component and process surveys revealed that 27 of 30 surveys, conducted between Fiscal Years 2007 through 2009, contained 136 findings. The surveys examined a number of design and production related activities, including the continuous evaluation of portions of pit, detonator and Joint Test Assembly processes and procedures. Of the 136 findings, 50 were similar to findings identified previously and could generally be grouped under four major quality management topical areas. The four areas, including survey results, were:

1. Instructions, Procedures and Drawings. The survey results cited 20 instances of inappropriately performing procedures, and missing and/or excluding required information;
2. Training. There were 11 instances of incomplete and/or missing operator and support staff instruction and records;
3. Document Control. The surveys identified 10 instances of missing signatures, applicable references and guidance; and,
4. Inspection, Test and Acceptance. There were 9 instances of missing waiver references, untimely calibration of measurement equipment and specifications not being checked.

As part of our inspection, we also reviewed a sample of quality assurance and work instruction documents, such as Pit Manufacturing Detail Operating Procedures and Pit Manufacturing Work Instructions. These documents described Los Alamos production and design agency activities. We determined that two of the seven documents we reviewed contained errors similar to the survey findings just noted. Examples of the errors we identified included references to the wrong paragraph numbers in a work instruction and references to an inappropriate Sigma designation. Sigmas are subsets of nuclear weapon information classified under the Atomic Energy Act and control access to certain categories of classified information.

Recurring deficiencies are potential indicators of systemic failure of the quality management system. QC-1 requires that procedures be established and implemented to: identify and categorize conditions adverse to quality; track, trend and report conditions adverse to quality; perform causal analysis of significant conditions adverse to quality; and, capture and communicate lessons learned internally to NNSA for use in preventing problems and making improvements.

As identified in our Audit Report on *Nuclear Safety: Safety Basis and Quality Assurance at the Los Alamos National Laboratory* (DOE/IG-0837, August 2010), Los Alamos initiated actions to "drive" quality assurance implementation throughout the Laboratory. Specifically, in March 2010, Los Alamos established a Quality Assurance Implementation Council composed of senior Laboratory managers from each of its major operations organizations to focus on quality assurance issues. Our report noted that, although it had not completed its work, the Quality Assurance Implementation Council had identified a number of actions needed to fully implement quality assurance throughout the Laboratory, citing the need to increase quality assurance resources, training and use of trending resources to identify and correct quality assurance problems.

Consistent with the establishment of the Quality Assurance Implementation Council and its efforts to fully implement quality assurance throughout the Laboratory, further action may be needed to reduce the frequency of the survey findings noted previously and to identify opportunities for process improvement. We believe that this may be achieved by following established QC-1 requirements. Management agreed that the Site Office Manager and the Los Alamos Site Office Quality Assurance Manager should continue efforts to fully implement quality assurance throughout the Laboratory and ensure that Los Alamos performs causal analysis of the frequently cited weaknesses in survey findings.

Implementation of QC-1 Requirements

During the course of our inspection, concerns were raised about implementing certain QC-1 requirements; however, we found no evidence to substantiate these concerns. The three areas of concern and our findings in each included:

- Changes in weapon system design were being made without appropriate quality reviews. Our review found that the specific changes we tested were reviewed and approved by the cognizant National Laboratory. Specifically, representatives of the National Laboratories briefed and submitted documentation on changes to the appropriate Department of Defense Design Review and Acceptance Group (Group) as required. The Group then reviewed and approved the documentation, and the National Laboratories recorded the acceptance of the changes in a weapon systems design publication. While we did not evaluate the quality of the review and approval process, design changes appeared to have been routinely reviewed and approved before the changes were implemented.
- The Quality Assurance Surveillance process was divided between two organizations: the Quality Assurance Division and the Weapons Systems Engineering Division. A

certain official commented that the division in responsibilities could affect the interpretation and understanding of applicable directives. We found, however, that the current Los Alamos division of responsibilities did not violate the basic requirements of QC-1 which allow for more than one organization to be involved in QC-1 activities as long as the responsibilities are clearly documented.

- NNSA's and Los Alamos' quality assurance efforts were primarily focused on manufacturing of nuclear pits. Although the Site Office and Los Alamos focused substantial effort on the quality of the pit manufacturing process, we confirmed (through interviews and reviews of surveys) that the quality assurance efforts of both organizations have included other components, such as detonators and Joint Test Assemblies.

SUGGESTED ACTION

In addition to identifying corrective actions on individual findings in major quality management topical areas, further action may be needed to reduce the frequency of the survey findings and to identify opportunities for improving the quality management process. Therefore, we suggest that the Manager, Los Alamos Site Office, and the Quality Assurance Manager, Los Alamos Site Office, continue to fully implement quality assurance throughout the Laboratory and ensure that Los Alamos addresses recurring deficiencies consistent with the requirements of QC-1.

Since we are not making any recommendations in this report, a response is not required.

We appreciated the cooperation we received from your staff during our inspection. If you have any questions concerning this inspection, please contact Mr. Richard W. Curran, Director, Western Inspection Region, Office of Inspections, at (505) 845-5153.



Sandra D. Bruce
Assistant Inspector General
for Inspections
Office of Inspector General

Attachment

cc: Deputy Secretary
Associate Deputy Secretary
Administrator, National Nuclear Security Administration
Chief of Staff

OBJECTIVE, SCOPE AND METHODOLOGY

Because of past issues and the importance of having effective quality management systems, we initiated this inspection to determine if DOE/NNSA Weapon Quality Policy requirements were being appropriately applied within the Los Alamos National Laboratory (Los Alamos) nuclear weapons programs.

This inspection was performed between October 2009 and October 2010, at the National Nuclear Security Administration's (NNSA) Los Alamos. To accomplish the objective of the inspection, we:

- Reviewed applicable Department of Energy, NNSA, and site specific policies and procedures that provide requirements for quality assessment of Los Alamos' nuclear-related component production functions, to include the *Weapon Quality Assurance Program, Production Agency, Revision D*, and *Los Alamos Design Agency Weapon Quality Assurance Program*;
- Toured four production facilities at Los Alamos;
- Reviewed internal Los Alamos production-related documents;
- Reviewed external Los Alamos Site Office administrative documents;
- Reviewed external NNSA production documents;
- Interviewed key personnel located at the NNSA Service Center and Los Alamos Site Office, and contractor officials and employees at Los Alamos regarding quality assurance activities; and,
- Reviewed 30 NNSA and Los Alamos quality assurance component and process surveys conducted between Fiscal Years 2007 through 2009.

This inspection was conducted in accordance with the Council of the Inspectors General on Integrity and Efficiency, *Quality Standards for Inspections*, issued by the President's Council on Integrity and Efficiency, January 2005. Because our review was limited, it would not necessarily have disclosed all internal control deficiencies that may have existed at the time of our inspection.

Management waived the Exit Conference.

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