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Office of Audits and Inspections

AUDIT REPORT

Issues Management at the Los Alamos
National Laboratory

DOE-OIG-16-07

February 2016



Department of Energy
Washington, DC 20585

February 25, 2016

MEMORANDUM FOR THE SECRETARY

A handwritten signature in blue ink, appearing to read "Rickey R. Hass", is positioned above the "FROM:" line.

FROM: Rickey R. Hass
Acting Inspector General

SUBJECT: INFORMATION: Audit Report on "Issues Management at the Los Alamos National Laboratory"

BACKGROUND

The Department of Energy's Los Alamos National Laboratory (LANL) is part of the National Nuclear Security Administration (NNSA) nuclear security enterprise. LANL's primary mission is to ensure the safety, security, and reliability of the Nation's nuclear stockpile. To meet its mission, LANL operates numerous nuclear facilities where activities include plutonium processing, packaging and transportation of nuclear materials, and management of radioactive and hazardous waste.

Department orders and guidance reflect its commitment to operating its nuclear facilities and conducting work activities in a manner that ensures environment, safety, and health (ES&H) concerns are considered and addressed in the performance of its mission. As such, the Department has policies requiring its management and operating contractors to establish issues management programs. These programs include a corrective action program to identify and correct deficiencies, an employee concerns program that allows employees to raise concerns and have those concerns independently investigated without fear of retaliation, and a process to resolve differing professional opinions.

As noted in Department Order 226.1B, *Implementation of Department of Energy Oversight Policy*, an effective issues management program is critical to continuous improvement in the safe and efficient operation of NNSA's programs and facilities for which the contractor is responsible. As such, we initiated an audit to determine whether LANL and the Los Alamos Field Office had effective issues management programs. This report covers the results of our review of the LANL program. In December 2015, we issued a separate report on *Issues Management at the Los Alamos Field Office* (OAI-M-16-02).

RESULTS OF AUDIT

Our review disclosed significant weaknesses in LANL's implementation of an effective issues management program. In our view, these problems adversely affected the usefulness of the

corrective action program and the differing professional opinions process. We noted that the employee concerns program was generally effective; however, due to the complexity of some concerns, LANL did not always meet its internal goal for resolving concerns within 90 days.

Issues Management

Overall, we found LANL's corrective action program did not always adequately address issues, did not effectively prevent their recurrence, and did not consistently identify systemic problems. Department Order 226.1B requires contractors to establish a formal issues management program that captures program and performance deficiencies, categorizes the significance of findings based on risk, and maintains documentation of corrective actions taken.

Despite these requirements, our review of 460 issues recorded in LANL's issues management tracking system during the period from January 2009 through February 2014, including all 196 issues identified in the system as high significance, revealed significant weaknesses in areas such as analysis and documentation of root causes for issues and evaluation of the effectiveness of corrective actions. We also noted weaknesses in identification of systemic deficiencies and risk categorization of issues. Specifically, we noted the following:

- LANL's corrective action management program had not always effectively resolved issues. We found that 73 percent of the 196 high-significance issues were unsatisfactorily addressed. Likewise, about 70 percent of the lower-significance issues we evaluated were closed even though actions taken did not address the specific problems identified, actions were closed before corrections were complete, or nothing was done to resolve known deficiencies.
- Approximately 46 percent of the 196 high-significance issues had been closed without addressing the underlying cause of the event, and 96 percent of those issues lacked effectiveness evaluations.
- LANL did not always identify or correct recurring or systemic issues, even when it recognized that a problem identified in one facility or area could exist in other areas.

We also found weaknesses in LANL's process for resolving Differing Professional Opinions (DPO). Department Order 442.2, *Differing Professional Opinions for Technical Issues Involving Environmental, Safety, and Health Technical Concerns*, requires that subcontractors be informed of the Department's process for raising technical concerns related to ES&H issues that cannot be resolved using routine processes. However, LANL did not include the requirements of the DPO process in its subcontracts, as required. We evaluated four subcontracts for ES&H-related work active between 2009 and September 2014 and found that none of them contained the DPO requirements.

The deficiencies in the corrective action program and the DPO process occurred because LANL had not fully implemented Department requirements. Specifically, with regard to corrective action management, LANL's guidance for its Performance Feedback and Improvement System

did not fully address requirements, such as effectiveness reviews for high-significance issues, to ensure that the actions implemented prevent recurrence. In addition, a lack of causal analysis may have contributed to the high rate of ineffective issue resolution that we identified.

Finally, we found that LANL's risk categorization process did not ensure that recurring and systemic issues receive the proper level of management attention. Miscategorization of issues may be indicative of a program that under-categorizes risk and, therefore, does not apply the appropriate level of management attention to safety and health issues, including nuclear safety issues. With regard to the DPO process, LANL incorrectly interpreted the type of subcontracts to which the requirements were applicable. Consequently, LANL's subcontractors may not be aware of the options available to them to raise ES&H issues.

Because of these problems, additional ES&H deficiencies may exist that have not been identified or effectively resolved. We noted that LANL initiated a process improvement effort for its corrective action process in May 2014, but it has encountered delays due to a reduction in staff assigned to the effort. As evidenced by our findings, additional effort is needed to ensure that issues are identified and effectively resolved in a timely manner to protect worker safety and health, protect the environment, and ensure the efficient use of resources. Therefore, this report includes several recommendations intended to promote a corrective action management program that better meets the standards and goals of the Department. In addition, we are making a recommendation to improve subcontractor access to the Department's DPO program for ES&H-related technical issues.

Finally, nothing came to our attention to indicate that the Employee Concerns Program did not meet the requirements of Department Order 442.1, as amended, *Department of Energy Employee Concerns Program*. As previously noted, however, not all reported issues were resolved within internally established time goals.

MANAGEMENT RESPONSE

Management concurred with our findings and recommendations and indicated that corrective actions were planned, noting that the Office of Inspector General's assessment was consistent with NNSA's prior findings reflected in the contractor's performance evaluation reports. Management's response and planned actions are responsive to our recommendations. Management's formal comments are included in Appendix 4.

Attachment

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

ISSUES MANAGEMENT AT THE LOS ALAMOS NATIONAL LABORATORY

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ISSUES MANAGEMENT AT THE LOS ALAMOS NATIONAL LABORATORY

DETAILS OF FINDING

Los Alamos National Laboratory (LANL) had not successfully implemented a comprehensive program to manage issues and their associated corrective actions. LANL's program did not ensure that issues were adequately addressed to prevent recurrence or identify systemic problems. Department of Energy (Department) Order 226.1B, *Implementation of Department of Energy Oversight Policy*, requires the contractor to establish a structured corrective action management system that provides for timely reporting of issues, categorizes issues based on priority and risk, and documents action taken. For higher-significance issues, the contractor must also provide a thorough causal analysis, track implementation of corrective actions to completion, and conduct an effectiveness evaluation after corrective action is complete.

LANL used its Performance Feedback and Improvement System (PFITS) to manage issues and corrective actions. Based on our review of PFITS records, we found that a large percentage of issues were not effectively addressed. We also found that analyses of cause for incidents and effectiveness of corrective actions were lacking. Finally, we found weaknesses in the proper risk-based categorization of issues and identification of systemic problems. Our results are consistent with both the Office of Enterprise Assessments January 2013 report, *Independent Oversight Review of the Los Alamos National Laboratory Corrective Action Effectiveness Review*, and our own report *Followup on Nuclear Safety/Safety Basis and Quality Assurance at the Los Alamos National Laboratory* (DOE/IG-0941, July 2015).

In addition, LANL did not have an effective method of communicating the scope or purpose of the Differing Professional Opinions (DPO) process to its subcontractors, as required by Department Order 442.2, *Differing Professional Opinions for Technical Issues Involving Environmental, Safety, and Health Technical Concerns*. However, LANL's Employee Concerns Program (ECP), established under Department Order 442.1, *Department of Energy Employee Concerns Program*, was generally effective. These Department Orders are included in LANL's management and operating contract. Together, the DPO and ECP programs compliment the corrective action system and provide another avenue for identifying and reporting environment, safety, and health (ES&H) issues to LANL management and help to protect workers and ensure that mission work is safely and efficiently accomplished.

Corrective Action Program

Our review of the corrective action program identified several deficiencies, including failure to completely address the root causes of issues, closure of corrective actions before they were complete, miscategorization of issues, failure to identify systemic issues, and failure to close records that were open for as long as 2 years after the corrective actions were completed. We reviewed a total of 460 PFITS records during the period from January 2009 through February 2014, including all 196 records for issues that LANL identified as high significance. We considered records to be high significance if the issue had to be reported to the Department's Occurrence Reporting and Processing System (ORPS) at a significance level of two or higher or

were categorized at the institutional level in PFITS. Our review of the 196 high-significance records determined that 73 percent of the issues were not effectively closed for the reasons enumerated above.

The LANL corrective action management system was also ineffective for addressing issues categorized as medium and low significance and thus requiring less documentation under LANL procedures. We took 3 random samples totaling 264 of the 25,522 medium- and low-significance issues recorded in PFITS and extrapolated the results. We found that about 70 percent of the lower-significance issues were not adequately addressed.

Addressing Root Causes

We found that 46 percent of the high-significance issues were closed without addressing the root cause. For example, an operational emergency issue concerning a chemical spill and hazardous material cleanup at a waste management site occurred in August 2010. The planned corrective action called for specific changes to a procedure to prevent recurrence of the issue, but those changes were not made. While the procedure was revised, the revisions did not address the specific handling and packaging issues that LANL determined contributed to the spill.

LANL's corrective action management system lacked information on the cause of incidents that required corrective action. Specifically, we found that 35 percent of the high-significance issues that LANL identified did not contain causal information. The Department Order 226.1B requires causal analysis for high-significance issues to ensure that corrective actions are properly targeted, but LANL procedures did not implement this requirement. Trending based on the identified causes of incidents, especially high-significance incidents, could provide a mechanism for identifying systemic or institution-wide problems. Although the causal information for many of the high-significance issues was available in other systems, the data was not present in the portion of the record designed for that purpose and, therefore, not readily available for trending analysis. Similarly, we found that causal data was lacking for 72 percent of the first medium-significance sample and 66 percent of the low-significance sample. The lack of causal analysis may contribute to the high rate of ineffective corrective actions that we found throughout the system. Without consideration of the underlying reasons a deficiency occurred, LANL has no assurance that the corrective action taken will be sufficient to prevent recurrence of the same or similar issues.

In addition, we found numerous examples where causal information was missing when safety analyses were inadequate or inaccurate. This occurred in about 55 percent of the high-significance issues that involved safety analyses. For example, in December 2009, a Potential Inadequacy of the Safety Analysis was declared at the Chemistry and Metallurgy Research (CMR) facility concerning the use of a certain type of repository for the storage of nuclear material, with the results submitted to the Los Alamos Field Office for approval. However, there was no record of the causal analysis and, therefore, no documentation in PFITS, of why the existing safety analysis was inadequate. According to the Los Alamos Field Office facility representative, this analysis was required because the criteria for seismic analyses were updated as part of a laboratory-wide effort. If the causal data for the high-significance incidents

had been included in the system, an analysis could be performed to determine if the causes were similar, which might indicate whether a systemic problem exists in LANL's method of conducting these types of safety analyses.

Finally, 34 to 48 percent of lower-significance issues were also closed without adequate support to demonstrate that the underlying cause of the deficiency was addressed. For example, LANL assessed the implementation of its Management of Projects policy in March 2014. The assessment found that half of the capital project leaders were "somewhat lacking in understanding of the requirements," in areas such as risk and waste management, which could affect worker safety. Meetings with the project leaders were held to discuss the areas of misunderstanding. However, the record provided no documentation of the underlying cause of the misunderstanding or of action taken to ensure that project leaders would have the appropriate training for future assignments.

Completion of Corrective Actions

In addition, we found that 36 percent of the high-significance issues were closed before corrective actions were complete. For example, in September 2011, discrepancies with nuclear material control and accountability operations at the Sigma Complex resulted in 16 corrective actions. However, five of those actions were closed in PFITS before work on them was completed, according to the documentation provided in the record. This included training and qualifying staff, addressing errors in the nuclear material inventory, completing implementation of needed changes to the facility safety analysis, and verification that the implementation plan was successfully completed. We also found that 30 to 51 percent of lower-significance issues were closed before corrective actions were complete. When issues are closed before corrective actions are completed, there is no assurance that the changes required to prevent recurrence of the issues were actually instituted.

Furthermore, 30 of the 196 high-significance records (15 percent) were closed when documentation of the corrective action was submitted to the Field Office, but without evidence of approval. Without evidence that the Field Office approved the corrective actions proposed by LANL, we could not determine whether the corrective actions were considered sufficient to correct the issue. For example, when the original submissions were rejected by the Field Office, information on the reasons for rejection and whether additional work was required to resolve the issues was missing from the record and, therefore, not available for determining whether there were systemic problems with LANL's submissions. We also noted that only 4 percent of the high-significance issues reviewed had a post-implementation effectiveness evaluation, as required by Department Order 226.1B. Effectiveness evaluations help ensure that corrective actions had been properly implemented to prevent recurrence of known issues.

Miscategorization of Issues

We also noted 34 high-significance issues (17 percent) in which the significance categorization was increased after the deficiencies were initially categorized and entered into the system. In 2013, over half of the high-significance issues were recategorized after system entry. Some changes in risk categorization were to be expected if, for example, additional information about

an injury became available at a later date. The miscategorization of issues was previously reported as a deficiency by the Department's Office of Enterprise Assessment in January 2013. That review found that PFITS did not ensure complete and accurate issue screening and did not specify adequate grading to categorize the significance of findings based on risk as required by Department Order 226.1B. LANL opened 12 records in PFITS related to that assessment, but our review found that none of them adequately addressed the miscategorization of issues. Eight of the 12 records were closed without corrective action. The only action taken was an administrative action to institute quality reviews of issue closure packages and did not address the findings related to appropriate categorization based on risk. Our analysis of PFITS issues showed that, of 34 issues for which the risk level was changed, 14 issues were recategorized from low to high significance after entry, which may indicate that miscategorization of issues continues to be a problem.

As a result of their July 2014 review, LANL officials estimated that about one quarter of the issues categorized at the lowest level should have been treated as higher significance. For the period from January 2009 through February 2014, the number of low-significance issues increased from 28 percent to 90 percent of the universe of PFITS records. When issues are under-categorized, they do not receive the level of management scrutiny and documentation needed to meet Department requirements. For example, in August 2011, a problem was identified with LANL's procedures at some nuclear facilities. Specifically, an internal assessment outlined several inconsistencies in roles and responsibilities for final approval of the controls and documentation that ensured safe operations. According to the record, this problem was screened as "no further action" because it was "not an actionable issue" with no justification provided. Accordingly, no action was taken to review the cited LANL procedures to see if there were inconsistencies or whether there might have been deficiencies in training that caused the confusion. Because the management personnel who made the decision are no longer with LANL, we were unable to determine why no action was taken to address this problem.

Identification of Systemic Issues

In addition, we concluded that LANL did not always identify or correct recurring or systemic deficiencies. Of the high-significance issues, 84 percent had no extent of condition documented in PFITS and, of the 16 percent that did have a documented review, only three reviews considered additional facilities or areas of LANL. For example, in several cases LANL recognized that an issue identified in one facility or area could exist in other areas. However, there was no record that an extent of condition review, as required by the Department Order 226.1B, was performed that would have identified whether the issue existed in other locations and, if so, ensure that it was corrected throughout LANL. We also found 33 records in our 3 samples that were indicative of possible systemic deficiencies, such as records that stated an identified issue could exist in other facilities, but lacked any documentation that an analysis was performed or even that the information had been provided to other facilities' management for their consideration. The following examples illustrate the failure to identify and correct systemic problems:

- In 2009, an assessment of the Advanced Recovery and Integrated Extraction System activities at the plutonium facility identified many issues that were entered in PFITS,

including 15 issues included in our sample. In some cases, issues remained open for extended periods until the projects associated with the deficiencies identified had been completed and no documented corrective action was taken. In addition, these issues represented systemic issues that could affect other nondestructive evaluation work, such as training and qualification of personnel and retrofitting of instrumentation without the proper certification in place. However, we found no evidence that other LANL locations were evaluated for those issues.

- Our review of PFITS identified more than 2,600 pressure safety issues among the low-significance records. However, we found no evidence that pressure safety was evaluated as a systemic or recurring problem. A Field Office official confirmed that pressure safety was a systemic problem and that the records in our sample were a small proportion of the total pressure safety issues that existed.
- In 2012, CMR reported two deficiencies in the fire protection system for the facility concerning missing or obstructed sprinkler heads that affected the facility safety basis and operations. The related ORPS reports indicate that the sprinkler heads were not functional for several months before the conditions were identified even though routine surveillances were conducted. The extent of condition review was confined to this facility and no institutional level lessons learned were issued to inform other facilities of the findings.

In addition to the above examples, previous reviews by the Department's Office of Enterprise Assessment and our 2015 nuclear safety audit (DOE/IG-0941) similarly found that systemic issues were not properly identified at its plutonium and tritium facilities. A Field Office official confirmed our assessment regarding the lack of recognition of systemic deficiencies. Based on our sampling, we found that as many as 5,203 medium- and low-risk issues were reportable to the Department through ORPS and/or the Department's Noncompliance Tracking System. These systems are designed to gather information on significant safety and health issues at Department sites to ensure that such problems are adequately addressed. The fact that thousands of such issues are categorized as lower priority by LANL may be indicative of a system that under-categorizes risks and, therefore, does not apply the appropriate management attention to safety and health issues, including nuclear safety issues. Field Office officials told us that they do not have the resources to review every corrective action in LANL's system, which makes it even more important that LANL improve the quality of its handling of issues to ensure that lower-risk issues are corrected before they become high-risk problems.

Closure of Records

Finally, we noted 36 (18 percent) of the high-significance issues were not closed for at least 1 year after the corrective actions were complete. Of those 36 issues, 15 were not closed for at least 2 years after all actions were complete. During that time, no further activity occurred to address those deficiencies, and there was no documentation that explained why the issues were left without management review or closure for such long periods. Therefore, without notification that an issue was ready for closure, management may not have known whether additional work was needed to adequately address the issues. LANL officials stated that they

estimate about 20 percent of all active records in the system should have been closed out, based on a special review they conducted in May 2014. The same was true for the lower-significance issues. For the three samples we reviewed, the percentage of issues not closed within 6 months of the final action being completed ranged from 19 percent to 36 percent. When we discussed the reasons for issues being left open for extended periods with LANL officials, they gave two primary reasons for the untimely closure. In some cases, as with the tritium production facilities, officials stated they had a large backlog of unclosed issues they were trying to work through. In other cases, officials stated that they were sometimes unaware that an issue was ready for closure because PFITS did not automatically notify the issue owners when all of the corrective actions were complete.

Differing Professional Opinions

With regard to the DPO process, we found that LANL did not have an effective method of communicating the scope or purpose of the process to its subcontractors. This effectively precluded subcontractors from using a Department-approved process to resolve technical ES&H issues when routine work processes have been exhausted. The Department Order requires contractors to include the DPO requirements in subcontracts of a management and operating contractor. These requirements are specifically applicable to subcontracts for the design, construction, operation, decontamination, decommissioning, or demolition of facilities.

We reviewed a judgmental sample of subcontracts active between 2009 and September 2014 to ascertain if the subcontracts were structured to inform subcontract employees of the DPO process available for resolving technical ES&H issues. As of September 2014, we found that none of the applicable subcontracts contained the DPO requirements. For example:

- The design subcontract for the Chemical and Metallurgy Research Replacement – Nuclear Facility (CMRR-NF) did not have the DPO requirements. This facility would house analytical chemistry and materials characterization capabilities and support several LANL programs such as nuclear materials handling, processing, and fabrication; stockpile stewardship; and waste management.
- None of the three transuranic waste packaging subcontracts we reviewed contained the DPO requirements. The scope of work for two of these subcontracts was for packaging transuranic waste to be stored at the Waste Isolation Pilot Plant.

Finally, after reviewing the LANL process, we concluded this was a systemic issue because the template used to incorporate ES&H requirements in subcontracts did not contain the DPO requirement. Instead, the process placed reliance on specific personnel, has proven to be prone to human error, and did not ensure that the requirements were consistently communicated to subcontractors working on ES&H-related issues. During the course of our audit, LANL made efforts to address the deficiency. However, the revised ES&H requirements document still did not contain the requirements of Department Order 442.2. Further, although LANL addressed the issue for subcontracts that it has categorized as high hazard, using its criteria, this change would not include DPO requirements in design subcontracts such as the one for CMRR-NF, which LANL categorized as low hazard.

Employee Concerns Program

Nothing came to our attention to indicate that LANL's ECP did not meet the Department's requirements, although it sometimes took longer than its 90-day goal to resolve cases. We reviewed a sample of 66 ECP cases and found that LANL's program generally met the Department Order requirements for documentation, investigation of concerns, timely resolution, and notification to employees of the results of their cases. However, we found that 16 of 66 cases (24 percent) in our sample were open longer than 90 days, the goal specified in LANL's program policy. These cases were open from 97 days to as long as 301 days with an average of 157 days for resolution. Approximately two-thirds of the 16 cases were investigated by Ethics and Audits and the rest were investigated by other organizations, such as Human Resources–Employee Relations or Security, which are not held to the 90-day goal that applies to the ECP organization.

Issues Management Process

The problems we identified with LANL's issues management process occurred because LANL did not effectively implement the Department's requirements. The procedures for the PFITS corrective action system did not provide detailed guidance to fully meet the Department's requirements for identifying causal factors underlying issues, ensuring corrective actions were effectively implemented, determining risk categorization, and ensuring that issues are effectively closed. Under LANL's procedures, Management Review Boards (MRBs) determine what activities are undertaken in addressing each issue, such as whether a causal analysis or effectiveness evaluation of completed actions are performed. As a result, the procedures do not ensure that Department requirements for corrective action management are achieved. Finally, LANL did not correctly implement the DPO process to ensure that subcontractors involved in ES&H-related work were made aware of the process for resolving ES&H issues because it did not correctly interpret the Department's requirements.

Identification of Causal Factors

LANL's lack of documented causal analysis occurred because LANL's PFITS procedure requires causal analysis only for the highest risk level in the system, Level 1, which is defined to include issues that are systemic in nature, as well as multiple occurrences of similar issues. Department Orders require that corrective action systems, such as LANL's PFITS, address the underlying causes of issues, determine the extent of issues, and prevent recurrence. In addition, in order to achieve the Integrated Safety Management goal, organizations must learn from occurrences and near misses by going beyond surface level causal analysis to explain how the failures emerged. However, as noted earlier, LANL did not perform or document underlying causes for more than 60 percent of all the issues we sampled. Furthermore, only 2 of the 25,718 issues entered into PFITS from January 2009 through February 2014 were identified at the highest risk level. This is inconsistent with both the Department requirements and LANL's own causal analysis procedure, which requires that a graded approach to causal analysis be applied to every problem and that the conclusions be documented. The lack of causal analysis could have contributed to our finding that 34 to 48 percent of all issues had corrective actions that failed to

address the underlying causes. Additionally, extent of condition reviews were rarely performed because MRBs did not require them, thus missing an opportunity to identify similar issues in other facilities or areas of the Laboratory.

Corrective Action Management

LANL's procedures did not ensure that issues in the corrective action system were managed effectively to prevent the recurrence of known issues. For example, LANL's procedures require a review by either the cognizant MRB or the manager responsible for the issue before corrective actions and issues are closed in PFITS. In addition, Department Order 226.1B requires contractors to implement corrective actions that prevent recurrence. However, as previously stated, we found that 36 percent of the high-significance issues were closed before the corrective actions were complete, as were 30 to 51 percent of lower-significance issues.

Similarly, LANL procedures did not fully implement Department requirements for effectiveness evaluations of high-significance issues. Under the PFITS procedure, MRBs are not required to evaluate the effectiveness of corrective actions unless the issue is categorized at the highest risk (Level 1). For all other issues, effectiveness evaluations are at the discretion of the MRB. Our July 2015 report on LANL's nuclear safety program similarly found that corrective actions taken to address issues at the tritium and plutonium facilities were not effective in preventing recurrence of deficiencies and that long-standing nuclear criticality safety issues continued to persist, in part, because LANL lacked sufficient qualified staff to effectively implement corrective actions.

Risk Categorization

LANL's procedures did not effectively implement Department requirements for determining the appropriate risk level of issues. LANL's procedures give MRBs the authority to determine the risk categorization for most issues. This flexibility does not apply to issues that, for example, involve violations of 10 CFR 851 Worker Safety and Health Program and the *Price-Anderson Amendments Act*. In addition, LANL does not effectively identify systemic or recurring issues that, under its own procedure, should be categorized at the highest risk level if they represent a failure to systematically implement Department or regulatory requirements or multiple occurrences of similar risk Level 1 or 2 issues. However, issues that represent the greatest threats to worker safety and health, up to and including serious injury or fatalities, may not be categorized at the appropriate risk level. For example, LANL's procedures do not require a formally approved corrective action plan or an effectiveness evaluation for Level 2 issues, which may include ORPS operational emergencies and ORPS recurring issues. Further, our review found that LANL had not taken effective corrective action to address the findings of the January 2013 Office of Enterprise Assessments report. In addition, our July 2015 report on LANL nuclear safety found that the Field Office identified incomplete and inaccurate issue screening and categorization as an issue in its September 2012 assessment.

Issue Closure

With regard to untimely closure of records, we noted that PFITS does not provide automatic notifications to users when an action or record is ready for review. LANL is investigating the options for making it easier for managers to identify when records are ready for review, which could improve timeliness for organizations that manage many issues. To its credit, LANL initiated a process improvement effort for its corrective action process in May 2014 and has instituted reviews of record closure. However, as of May 2015, delays in implementation of recommended improvements had occurred due to a reduction in staff assigned to the effort. LANL told us that it is now reviewing closed issues with the managers responsible for those issues to better determine what improvements can be made quickly. Promptly closing records after corrective actions are complete provides assurance that LANL management has reviewed implementation of corrective actions and determined that they are sufficient to resolve the problem. While the failure to close records in a timely manner may be a processing problem, it also weakens assurance that issues have been resolved in a manner that protects employee safety and health and the environment.

Management of DPO and ECP

LANL did not properly implement the Department's DPO process because it incorrectly interpreted the requirements. LANL was required to include the DPO requirements in ES&H-related subcontracts. However, the subject matter experts that reviewed these subcontracts for inclusion of all requisite clauses were not aware of the need to include DPO requirements, which were not included in the template provided for their use. Regarding LANL's ECP process, some ECP cases exceeded the 90-day timeframe due to the complex nature of the allegations. Furthermore, in most of those instances, ECP cases were investigated by other LANL organizations that were not held to the ECP 90-day goal for resolution.

Potential Safety Impacts

Without a properly functioning corrective action management program, LANL cannot ensure that issues are identified and effectively resolved to protect worker safety and health and the environment. Because causal analysis for lower-risk issues is not performed, there is no assurance that the chosen corrective actions are properly targeted, resulting in LANL having to repeatedly correct the same problem, rather than addressing the underlying reason for systemic problems. This can result in the inefficient use of resources and increases the risk that accidents, injuries, and delays in mission-related work may occur. For example, implementation of effectiveness evaluations, as required by Department Order 226.1B, might have helped prevent the recurring issues that have plagued LANL's plutonium and tritium operations.

Furthermore, because LANL did not include the requirements of Department Order 442.2 in its subcontracts, it created a risk that differing professional opinions that could have resulted in safer operations were not provided to management for consideration. When subcontractor employees are not aware of the options available to them to raise ES&H issues, the Department's program cannot effectively meet the goal of ensuring worker safety and health and protecting the environment.

RECOMMENDATIONS

To improve the effectiveness of the implementation of LANL's issues management program, we recommend that the Manager, Los Alamos Field Office, direct the Los Alamos National Laboratory to ensure that:

1. All high-significance deficiencies are processed in accordance with the requirements of Department Order 226.1B, to include:
 - a. Identifying and addressing the underlying causes of the problem,
 - b. Determining the extent of the problem, and
 - c. Ensuring the effectiveness of corrective actions.
2. Corrective action management procedures include improved guidance on categorization of issues by risk, including metrics for identifying appropriate risk levels.
3. Corrective action management procedures include guidance on timeliness of issue entry and closure.
4. A formal, documented process is developed that consistently includes DPO requirements in subcontracts involving work that has potential for significant safety, health, and environmental risks.

MANAGEMENT RESPONSE

Management concurred with our findings and recommendations and indicated that corrective actions were planned to address the identified issues. Management noted that the Office of Inspector General's findings were consistent with their prior findings reflected in LANL performance evaluation reports, which identified issues management as an area for improvement and considered shortcomings in that area in performance fee payment decisions and contract term extension decisions.

AUDITOR COMMENTS

Management comments and planned corrective actions are responsive to our recommendations. Management's formal comments are included in Appendix 4.

OBJECTIVE, SCOPE, AND METHODOLOGY

Objective

The objective of this audit was to determine whether the Los Alamos National Laboratory (LANL) had an effective issues management system.

Scope

This audit was conducted between January 2014 and February 2016, at LANL and the Los Alamos Field Office, located in Los Alamos, New Mexico. Our scope encompassed LANL's issues management program, including the corrective action program, Employee Concerns Program (ECP), and the Differing Professional Opinions (DPO) process from 2009 through 2014. The audit was conducted under Office of Inspector General project number A14LA022.

Methodology

To accomplish the audit objective, we:

- Reviewed regulations, policies, and procedures pertaining to the Department of Energy oversight, including management of deficiencies and corrective actions, ECP, and DPO.
- Held discussions with National Nuclear Security Administration and LANL personnel.
- Reviewed 460 of 25,718 records in LANL's corrective action management system, the Performance Feedback and Improvement Tracking System (PFITS). Specifically, we reviewed all 196 high-significance records; randomly selected a total of 174 medium records and 90 low-significance records; and extrapolated the results of the random samples. Our methodology used attribute sampling and a 95 percent confidence level with a margin of error of 5 percent.
- Randomly selected 66 of 204 LANL ECP records for a detailed review of timely case triage and resolution, consistency in reporting case attributes and program results, and notification of investigative outcome.
- Selected eight LANL subcontracts, based on the contract value and scope of work. We reviewed four of those subcontracts that involved environmental-, safety-, and health-related work for the inclusion of DPO requirements.

We conducted this performance audit in accordance with generally accepted Government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective. Accordingly, the audit included tests of controls and compliance with laws and regulations necessary to satisfy the audit objective. In particular, we assessed compliance with the *GPRA Modernization Act of 2010* and

identified performance measures related to issues management. Because our review was limited, it would not necessarily have disclosed all internal control deficiencies that may have existed at the time of our audit. We utilized computer data to select our samples. Our audit work included a detailed examination of the data and supporting documents from LANL's PFITS, as well as examination of the DPO and ECP data. This work included tests of the accuracy, completeness, and reliability of the data we relied on to reach our conclusions. We determined the data to be sufficiently reliable for the purposes of this report.

Management waived an exit conference.

SAMPLING METHODOLOGY FOR ISSUES AND CORRECTIVE ACTIONS

We reviewed records from the Los Alamos National Laboratory (LANL) Performance Feedback and Improvement Tracking System (PFITS). Each record addressed a single issue but could have multiple corrective actions. The high-significance records reviewed included all issues that had to be reported to the Department of Energy's Occurrence Reporting and Processing System at a significance level of two or higher or were categorized at the institutional level in PFITS. The high-significance category accounted for 196 of the total 25,718 records in PFITS from January 2009 through February 2014. (See Table 1.) We also took random samples of the remaining 25,522 issues, which were divided by the level of significance, using attribute sampling with a 95 percent confidence level and a margin of error of 5 percent. We selected two medium-significance samples that differed in both risk level identified and the amount of documentation required by LANL's procedures. (See Tables 2 and 3.) The low-significance sample was selected from the lowest risk category in PFITS, which also required the least documentation. (See Table 4.)

For analysis purposes, our review results were categorized as follows: the Ineffective category included records for which the corrective actions did not fully address the underlying cause of the issues or for which records were closed without Field Office approval of documentation when such approval was required. The Not Timely category included (a) records that were not entered in a timely manner or (b) records for which the corrective actions were complete but the PFITS record was not closed for several months and there was no other activity in the records. The Unsatisfactory category of records included those that were determined to be Ineffective or Not Timely. Records in the Not Complete category could not be assessed because the corrective actions were incomplete. Finally, the Satisfactory category included those records which, after review, appeared to fully address the issue identified.

Table 1: Combined Summary Data for Records Reviewed

Review Result	All Records		High Significance	
	Number	Percent*	Number	Percent*
Ineffective	202	43.9	91	46.4
Not Timely	124	27.0	52	26.5
Subtotal - Unsatisfactory	326	70.9	143	72.9
Not Complete	10	2.2	6	3.1
Satisfactory	124	27.0	47	24.0
Total Records Reviewed	460	100.0	196	100.0
*Figures may not add to total or subtotal due to rounding.				

Table 2: Medium-significance Sample 1 – Extrapolated Results

Review Result	Sample Results	Expected Results in Universe		Expected Range in Universe			
		Number*	Percent	Maximum		Minimum	
				Number	Percent	Number	Percent
Ineffective	39	2,085	43.8	2,570	54.0	1,599	33.6
Not Timely	24	1,284	27.0	1,717	36.1	848	17.8
Subtotal – Unsatisfactory	63	3,369	70.8	N/A	N/A	N/A	N/A
Not Complete	3	161	3.4	337	7.1	3	0.1
Satisfactory	23	1,230	25.8	1,658	34.9	800	16.8
Total Records	89	4,758	100.0	N/A	N/A	N/A	N/A

*Figures may not add to total or subtotal due to rounding.

Table 3: Medium-significance Sample 2 – Extrapolated Results

Review Result	Sample Results	Expected Results in Universe		Expected Range in Universe			
		Number	Percent*	Maximum		Minimum	
				Number	Percent	Number	Percent
Ineffective	41	615	48.2	745	58.5	484	38.0
Not Timely	16	240	18.8	342	26.9	137	10.8
Subtotal – Unsatisfactory	57	855	67.1	N/A	N/A	N/A	N/A
Not Complete	0	0	0	0	0.0	0	0.0
Satisfactory	28	420	32.9	543	42.6	296	23.3
Total Records	85	1,275	100.0	N/A	N/A	N/A	N/A

*Figures may not add to total or subtotal due to rounding.

Table 4: Low-significance Sample – Extrapolated Results

Review Result	Sample Results	Expected Results in Universe		Expected Range in Universe			
		Number*	Percent	Maximum		Minimum	
				Number	Percent	Number	Percent
Ineffective	31	6,713	34.4	8,621	44.2	4,803	24.7
Not Timely	32	6,930	35.6	8,852	45.4	5,006	25.7
Subtotal – Unsatisfactory	63	13,643	70.0	N/A	N/A	N/A	N/A
Not Complete	1	217	1.1	637	3.3	1	0.0
Satisfactory	26	5,631	28.9	7,450	38.2	3,809	19.6
Total Records	90	19,489	100.0	N/A	N/A	N/A	N/A

*Figures may not add to total or subtotal due to rounding.

PRIOR REPORTS

- Audit report on [*Issues Management at the Los Alamos Field Office*](#) (OAI-M-16-02, December 2015). This audit found that the Los Alamos Field Office had not implemented an effective issues management program. Specifically, the Field Office frequently did not enter issues identified in assessments into its corrective action tracking system. Of those issues that were entered, 81 percent were not entered within the first 90 days following receipt of the assessment report, and 59 percent of the records had incomplete, inaccurate, or invalid closure data. Additionally, we could not determine the effectiveness of the Field Office Employee Concerns Program because of inconsistencies in documenting cases. With regard to the Differing Professional Opinions (DPO) process, nothing came to our attention to indicate that the process was not generally effective in managing the three DPO submissions we identified.
- Audit report on [*Followup on Nuclear Safety: Safety Basis and Quality Assurance at the Los Alamos National Laboratory*](#) (DOE/IG-0941, July 2015). This audit found that the Los Alamos National Laboratory (LANL) continued to have problems in fully implementing a number of critical nuclear safety management requirements. This contributed to multiple safety basis iterations and lengthy update, review, and approval processes. The review identified a long history of operational issues that had not been resolved at two major processing facilities. The corrective actions taken by LANL to address these issues did not effectively address technical issues and were ineffective in preventing recurrence of deficiencies. Long-standing nuclear criticality safety issues also continued to persist at the plutonium and tritium facilities, in part, because LANL lacked sufficient qualified staff to effectively implement corrective actions.
- Audit report on [*Corrective Action Systems at the Pantex Plant*](#) (OAS-L-15-01, October 2014). This review found that Babcock & Wilcox Technical Services Pantex LLC, the site contractor through June 2014, had generally implemented corrective action systems that provided for the reporting, documenting, and tracking to resolution of findings, weaknesses, and significant quality issues. However, we identified certain aspects of the program that needed improvement, issues that should be considered by Consolidated Nuclear Security LLC (CNS), the contractor since July 2014, as corrective action systems to be implemented under the new contract. Because of the recent transition of the contract to CNS, we did not make formal recommendations. However, we made suggestions to the Manager, National Nuclear Security Administration Production Office to direct CNS to ensure employees fully understand requirements for corrective action systems and staffing is adequate for the Employee Concerns Program.
- Audit report on [*Fire Protection Deficiencies at Los Alamos National Laboratory*](#) (DOE/IG-0816, June 2009). This audit found that LANL had not resolved many of the fire protection deficiencies that had been identified in early 2006. In addition, LANL had not fully evaluated the most significant fire protection deficiencies, those requiring compensatory action or tracking until closure, to determine whether they had been

corrected or if additional actions were needed. In particular, LANL had not verified that corrective actions had actually been taken to remedy deficiencies. Finally, we reported that not all deficiencies identified had been tracked in either LANL's maintenance management system or the issues tracking system.

MANAGEMENT COMMENTS



Department of Energy
Under Secretary for Nuclear Security
Administrator, National Nuclear Security Administration
Washington, DC 20585



December 22, 2015

MEMORANDUM FOR RICKEY R. HASS
ACTING INSPECTOR GENERAL

FROM: FRANK G. KLOTZ *FK 12/22/2015*

SUBJECT: Comments on the Office of Inspector General Draft
Report Titled "Issues Management at the Los Alamos
National Laboratory" (A14LA022)

Thank you for the opportunity to review and comment on the subject draft report. The National Nuclear Security Administration (NNSA) appreciates the auditors' independent assessment, which is consistent with our prior findings reflected in Los Alamos National Security (LANS) Performance Evaluation Reports. We identified Issues Management as an area for improvement, and shortcomings were considered in performance fee payment decisions and contract term extension decisions in past years.

To keep attention on this important area, NNSA has again included successful institutional use of Contractor Assurance Systems, including Issues Management, as a performance objective in the LANS Fiscal Year 2016 Strategic Performance Evaluation and Measurement Plan. NNSA will use its structured performance monitoring and feedback program to focus Laboratory attention on this priority, using all the contractual tools available to incentivize progress.

We concur with the auditors recommendations. The attachment to this memorandum details the specific actions taken and planned to address each recommendation, as well as timelines for completion. If you have any questions regarding this response, please contact Mr. Dean Childs, Director, Audit Coordination and Internal Affairs, at (301) 903-1341.

Attachment



Attachment

NATIONAL NUCLEAR SECURITY ADMINISTRATION
Response to Report Recommendations

Issues Management at the Los Alamos National Laboratory (A14LA022)

The IG recommended the Manager, Los Alamos Field Office, ensure:

Recommendation 1: All high significance deficiencies are processed in accordance with the requirements of Department Order 226.1B, *Implementation of Department of Energy Oversight Policy*, to include: (a) identifying and addressing the underlying causes of the problem; (b) determining the extent of the problem; and (c) ensuring the effectiveness of corrective actions.

Management Response: Concur

The National Nuclear Security Administration (NNSA) will direct Los Alamos National Security (LANS) to demonstrate that high significance deficiencies are evaluated with respect to underlying causes, extent of condition, and effectiveness of corrective actions as required by DOE Order 226.1B, Attachment 1. The estimated closure date is September 30, 2016, to allow sufficient time to validate effective implementation as part of the Fiscal Year (FY) 2016 performance evaluation process.

Recommendation 2: Corrective action management procedures include improved guidance on categorization of issues by risk, including metrics for identifying appropriate risk levels.

Management Response: Concur

NNSA will direct LANS to develop and demonstrate effective implementation of improved guidance on categorization by risk of high significance issues management deficiencies as required by DOE Order 226.1B, Attachment 1. The estimated closure date is September 30, 2016, to allow sufficient time to validate effective implementation as part of the FY 2016 performance evaluation process.

Recommendation 3: Corrective action management procedures include guidance on timeliness of issue entry and closure.

Management Response: Concur

NNSA will direct LANS to demonstrate that internal policy promotes reliable compliance with DOE Order 226.1B requirements for timely corrective action for high significance findings. The estimated closure date is September 30, 2016, to allow sufficient time to validate effective implementation as part of the FY 2016 performance evaluation process.

Attachment

Recommendation 4: A formal, documented process is developed that consistently flows down DPO requirements to subcontractors involved in work that has potential for significant safety, health, and environmental risks.

Management Response: Concur

NNSA will direct LANS to demonstrate that procurement policy, systems and/or job aids promote compliance with flow down requirements for Differing Professional Opinion guidance to Laboratory subcontracts. The estimated closure date is September 30, 2016, to allow sufficient time to validate effective implementation as part of the FY 2016 performance evaluation process.

FEEDBACK

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Office of Inspector General (IG-12)
Department of Energy
Washington, DC 20585

If you want to discuss this report or your comments with a member of the Office of Inspector General staff, please contact our office at (202) 253-2162.