U.S. Department of Energy
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Audit Report

Management Controls over Warranties Involving Newly Constructed and Renovated Facilities at National Defense Laboratories

OAS-M-10-02 June 2010

Department of Energy
Washington, DC 20585

June 15, 2010

MEMORANDUM FOR THE MANAGERS, LIVERMORE SITE OFFICE, LOS ALAMOS SITE OFFICE, AND SANDIA SITE OFFICE

FROM: George W. Collard
Assistant Inspector General
for National Security and Energy Audits
Office of Inspector General

SUBJECT: INFORMATION: Audit Report on "Management Controls over Warranties Involving Newly Constructed and Renovated Facilities at National Defense Laboratories"

BACKGROUND

The Department of Energy's (Department) National Nuclear Security Administration's (NNSA) research, surveillance, and manufacturing capabilities are carried out in facilities, many of which are 50 to 60 years old. Since these facilities are beyond their economic lifetime, NNSA requested and acquired funding not only to construct new facilities but also to restore and revitalize older ones. These construction projects enable NNSA to maintain the critical capabilities necessary to support its programmatic efforts such as nuclear nonproliferation, counterterrorism, and emergency response work.

Between Fiscal Years (FY) 2004 and 2008, Congress provided over $1 billion in line-item and General Plant and Project funds to construct and renovate facilities at Lawrence Livermore, Sandia, and Los Alamos National Laboratories (Laboratories). NNSA plans to spend an additional $18 billion over the next 10 years to complete construction of facilities in the process of being built as of April 2009. To ensure quality, NNSA required Laboratories to have construction contractors provide warranties for their equipment and work. Federal Acquisition Regulation 52.236-23 also requires design contractors to correct or revise, without compensation, any errors or deficiencies in design, drawings, and specifications. Laboratories also required that contractors reimburse the Laboratories for needed remediation if they did not satisfy the warranty terms after reasonable notice of defect.

Based on the significant amount of funds invested in construction projects at defense Laboratories, we conducted this audit to determine whether NNSA Laboratories exercised contract warranties to correct defects in equipment, material, workmanship, or design of newly constructed and renovated facilities.

RESULTS OF AUDIT

NNSA Laboratories had not always adequately managed contract warranties. Rather, the Laboratories performed work to correct defects in equipment, material, workmanship or design in the construction of facilities even though these items were covered by a warranty. In 40

(23 percent) of the 172 work orders performed between October 1, 2004, and September 30, 2008, that we reviewed, Laboratories performed needed repairs or replacements themselves for items covered by a warranty. Additionally, one of the Laboratories did not seek indemnification from contractors that did not satisfy warranty provisions. When the Laboratories pursue these remedies in-house rather than exercise the provisions of the warranties, the taxpayers bear the burden of the repairs. For example:

- Livermore spent approximately $40,000 to repair tiled floors in the TeraScale Simulation Facility, including 6 different repairs within the first 10 months after final acceptance of the facility. According to Livermore officials, both the design and construction subcontractors agreed that the floor tile defect resulted from a design error. Livermore, however, did not attempt to recover the costs from the design subcontractor even though its contract required the design firm to correct, without compensation, defects caused by design omissions and errors;

- Sandia repeatedly repaired a defective heating and ventilation unit at its Central Utility Building during the warranty period and replaced the unit two months after the expiration of a warranty; and,

- Los Alamos did not seek indemnification after unsuccessful attempts to have a warranty contractor make necessary repairs. In that case, Los Alamos replaced defective concrete at a cost of approximately $42,000 in its National Security and Science Building within nine months after accepting the facility.

The Laboratories had not implemented effective controls to ensure that the warranty provisions specified in contracts were enforced. For 37 of the 40 work orders where the Laboratories performed work to repair or replace "in-warranty" items, we found that Project Managers did not provide warranty documentation, including warranty start dates or points of contacts from which to seek remedy, to personnel responsible for requesting, planning and performing work orders. Of particular note, Los Alamos' Project Acceptance and Closeout Procedure did not require construction Project Managers to transfer warranty documentation to facility operations personnel upon construction completion. As such, personnel were sometimes unaware of warranty options available.

Although personnel at Los Alamos and Livermore were aware that warranties may have existed for the remaining three work orders we examined, they did not have accurate or complete information to request warranty repairs. Initially, Livermore officials told us that the warranty for defective tile work was not exercised because management thought the warranty had expired. We found, however, that it actually was enforceable for about another two months under the construction contract. Subsequently, Livermore officials stated that they contacted the subcontractor and designer who cited the adhesive failure as a design error; however Livermore could not provide any documentary evidence to that effect. Livermore could have pursued correcting the tile problem under the architect's responsibilities for errors and omissions but had stopped tracking such design issues two years prior to final acceptance of the building. For the other two work orders, Los Alamos decided to perform the work themselves after the contractors were unresponsive to their requests to perform under the terms of the warranty. In these cases,

Los Alamos managers were unaware that they could or were responsible for seeking indemnification from the contractors for the repair work.

Managers also told us, as a general observation, that it may not always be cost effective to exercise a warranty. We found this argument unpersuasive since the Laboratories did not perform cost benefit analyses to determine if it was cost-effective prior to performing work on in-warranty items. Further, unless management requests that contractors repair and replace defective work, the Laboratories cannot be certain that any additional costs will be incurred in exercising the warranties.

Warranties that were not exercised during the warranty period resulted in unnecessary repair costs. Based on a projection of our statistical sample of work orders, the three Laboratories likely incurred at least $1.5 million by performing repairs that were covered by a warranty between FYs 2004 and 2008. Unnecessary repair costs, also, reduced funds available for direct mission and other mission support work. In addition, the Laboratories increased the risk of voiding warranties and decreased the opportunities to seek remediation when construction contractors or equipment manufacturers were not notified prior to making the repairs. This risk could impact corrective actions since warranties generally require that the contractor be provided the opportunity to remedy defects. To reduce unnecessary expenses, we made recommendations to improve the use of warranties to protect the Government's interest.

MANAGEMENT REACTION

NNSA management agreed with the report and the recommendations. Management's comments have been provided in their entirety in Appendix 3.

Attachments

cc: Administrator, National Nuclear Security Administration
Deputy Secretary
Chief of Staff
Acting Director, Office of Project Management and Systems Support, NA-54
Director, Office of Acquisition and Supply Management, NA-63
Director, Office of Engineering and Construction Management MA-50
Director, Office of Risk Management, CF-80
Director, Office of Internal Controls, NA-66
Team Leader, Office of Risk Management, CF- 80
Audit Resolution Specialist, Office of Risk Management, CF-80

REPORT ON MANAGEMENT CONTROLS OVER WARRANTIES INVOLVING NEWLY CONSTRUCTED AND RENOVATED FACILITIES

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Use of Warranties for Newly Constructed and Renovated Facilities

The National Nuclear Security Administration's (NNSA) Lawrence Livermore (Livermore), Sandia (Sandia), and Los Alamos (Los Alamos) National Laboratories (Laboratories) had not always exercised contract warranties to correct defects in equipment, material, workmanship or design in the construction of facilities. Rather, the Laboratories performed repair work themselves even though the defect was covered by a contract warranty. One of the Laboratories also did not seek indemnification from contractors that did not satisfy warranty provisions.

Laboratory Warranty Work

NNSA's Laboratories performed work that was covered by warranties. Through the inclusion of contract terms, NNSA Laboratories required construction contractors to warranty that their work conformed to contract requirements and was free of any defects in equipment, material, workmanship, or design for up to one year after final acceptance of the work. Furthermore, when a contractor fails to remedy a defect within a reasonable amount of time after receipt of notice, the standard Laboratory contract terms allow for the replacement or repair of the defect or damage at the contractor's expense. To evaluate compliance with these terms we statistically selected and reviewed 172 work orders performed between October 1, 2004, and September 30, 2008, at 30 facilities located at the three Laboratories. Our testing revealed that 40 work orders (23 percent) were for repairs that were covered by contract warranty provisions. For example:

- Livermore repaired tile floors that began to uplift at its TeraScale Simulation Facility (TSF). Within the first 10 months of final acceptance, Livermore made 6 different repairs to the tiles in the TSF. According to Livermore personnel, the adhesive did not adhere and caused the tile to bubble. Maintenance personnel stated that the adhesive was not applied correctly. Initially, Livermore officials told us that the warranty for tile work was not exercised because management thought that it had expired. Subsequently, Livermore officials told us they the Laboratory notified the tile subcontractor and designer, almost one year after final acceptance, and both agreed the tile problem was a design issue. Livermore, however, could not provide any documentary evidence of the designer's acceptance that there was a design issue. Under the terms of the design subcontract, the tile problem would have been covered under the designer's errors and omissions clause which, in effect, provides a warranty

against defects caused by errors and omissions in the design. We found, however, that Livermore ceased tracking design errors and omissions for this facility approximately two years prior to the final acceptance of the building. Livermore spent approximately $40,000 to repair the tile and did not seek remedy for the repairs.

- Sandia replaced a heating and ventilation unit at its Central Utility Building that, according to technicians, was defective and repaired prior to being replaced. Even though management acknowledged that the warranty should have been extended due to prior repairs, Sandia spent approximately $20,000 to replace the unit. At its Microsystems and Engineering Sciences Application Facility, Sandia spent approximately $3,000 to replace defective and unreliable automatic flush units with manual units. Sandia performed these repairs less than one year after these facilities were completed.

- Los Alamos did not seek indemnification after they replaced defective concrete at its National Security and Science Building (NSSB) at cost of approximately $42,000. After efforts to have the contractor repair the defective concrete failed, Los Alamos replaced the concrete themselves but did not seek remedy for the cost of the repairs. In the same building, Los Alamos also replaced a pipe fitting that did not meet specifications and failed. The improper fitting resulted in flooding which damaged equipment, walls, and ceilings. Los Alamos spent over $20,000 to replace the fitting and repair the damage. In both cases, Los Alamos performed the work less than one year after the facility was completed.

Laboratory Controls

Laboratories did not ensure that warranty provisions included in construction contracts were enforced. In 37 of the 40 work orders reviewed, the Laboratories did not provide warranty documentation to personnel responsible for requesting, planning and performing work orders. Therefore, personnel responsible for authorizing repairs on newly constructed or renovated facilities and its equipment were unaware that a warranty existed. At Los Alamos, for example, the Project Acceptance and Closeout Procedure, in effect at the time of our audit, did not require construction project managers to transfer warranties to facility operations personnel. Even though Los Alamos updated the Project Acceptance and Closeout Procedure in September 2009, the procedure did not

address how construction project managers should transfer warranty information to building operations managers. Sandia had a process for transferring warranties, however, it did not track warranties for materials, workmanship and design. For example, Sandia's warranty database did not have a warranty recorded for the flush valves that were replaced during the warranty period.

In 3 of the 40 work orders, Los Alamos and Livermore management were aware that work on newly constructed facilities was warranted for defective equipment, materials or designs; however, incomplete and inaccurate information was available to the managers of the new facilities. For example, Livermore management told us they assumed the wrong warranty start date since not all warranty information, including the start date, had been accurately transferred. Livermore replaced the tiles in the TSF because, according to the Facility Manager, she thought the warranty had expired. Livermore also pointed out that it did not have recourse to obtain reimbursement since the amount of design errors and omissions for the facility was under a prescribed industry standard percentage. This industry standard, however, was not identified as a part of the contract provisions. In addition, as previously noted, Livermore stopped tracking design errors and omission approximately two years prior to final acceptance of the building.

Los Alamos was aware of the warranty provisions and tried to contact the warranty contractor to invoke the warranties associated with two of the work orders. Los Alamos managers, however, told us they did not know they could seek indemnification for replacing the concrete at the NSSB after the contractor was unresponsive to their request to remediate the defect under the warranty.

We also found that Laboratories had not established requirements regarding the exercise of warranties and that, in some cases, the exercise of warranties were not regarded as cost-effective. None of the Laboratories, for example, had established policies or procedures requiring managers to pursue indemnification from contractors who failed to fulfill their responsibilities under warranties. Management also told us, as a general observation, that it is often more cost-effective for them to repair defective work than to pursue a warranty.

In each case we reviewed, however, the Laboratories had not performed a cost benefit analysis to verify that it was cheaper to perform the warranty repairs rather than require the contractors to perform work. For example, Livermore management stated that if

they would have realized a warranty for repairing tile at the TSF was still in effect, they would not have pursued the warranty since the legal cost associated with pursuing the warranty may have exceeded the cost of the repair. Although the design contractor agreed to the design error, a cost resolution was not communicated with the design contractor prior to Livermore repairing the tile. Therefore, it was unclear if the contractor would have contested the applicability of the warranty and that any legal costs would be incurred. Additionally, we were unable to determine whether Livermore performed a cost benefit analysis regarding the floor tile repairs due to conflicting statements by Livermore officials about whether such an analysis had been performed and a lack of documentation.

Warranty Repair Costs

Warranty repairs made by the Laboratories to newly constructed and renovated facilities resulted in unnecessary costs. We estimated, based on our statistical sample of work orders, that the Laboratories may have incurred at least $1.5 million between Fiscal Years 2004 and 2008 on repairs that were covered by warranties. Unnecessary repair costs also could have reduced funds available for direct mission and other mission support work. The Laboratories also potentially voided warranties and reduced their opportunities for remediation when repairs or modifications were made prior to notifying the manufacturer since warranties generally require that the contractor be provided the opportunity to remedy defects.

RECOMMENDATIONS

We recommend that the Managers, Livermore, Sandia, and Los Alamos Site Offices, direct their respective site contractors to develop and implement controls to:

1. Ensure that warranties are transferred between project management and facility operations personnel and that warranty information, including warranty start dates, and extensions are accessible to personnel responsible for requesting, planning and performing and authorizing work orders;

2. Seek remedy when manufacturers or construction contractors fail to remedy failures, defects or damage; and,

3. Analyze whether invoking a warranty or performing the work themselves is most cost effective prior to starting the work.

We also recommend that the Contracting Officers at each site determine whether the repair costs that were covered by a warranty were reasonable and allowable.

MANAGEMENT AND AUDITOR COMMENTS

NNSA management agreed with the report and stated that the recommendations to improve the management of warranties were reasonable. The Livermore Site Office provided technical comments on a draft of this report. We made changes to the report, where appropriate, to address management's comments. Management's comments are included in their entirety in Appendix 3.

OBJECTIVE

The objective of this audit was to determine if the National Nuclear Security Administration (NNSA) Laboratories exercised contract warranties to correct defects in equipment, material, workmanship, or design of newly constructed and renovated facilities.

SCOPE

The audit was performed between July 2008 and April 2010 at Lawrence Livermore, Sandia, and Los Alamos National Laboratories (Laboratories). Our review included a statistical, dollar unit sample of work orders for repairs to newly constructed and renovated facilities and associated equipment between Fiscal Years (FY) 2004 and 2008.

METHODOLOGY

To accomplish the objective, we:

- Reviewed Federal regulations and Department of Energy directives and guidance pertaining to invoking and transferring warranties;
- Reviewed reports issued by the Government Accountability Office and the Office of Inspector General;
- Reviewed work orders requesting repairs for newly constructed and renovated facilities and associated equipment between FYs 2004 and 2008;
- Held discussions with NNSA program officials and site offices as well as Laboratory project and facility management personnel;
- Performed physical observations at the Laboratories of repairs that were made to items under warranty; and,
- Projected the estimated cost of performing warranty work using the Defense Contract Audit Agency's E-Z Quant Sampling Program, using a Dollar Unit Variable Sampling technique.

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 the evidence obtained provides a reasonable basis for our findings and

conclusions based on our audit objectives. The audit included tests of internal controls and compliance with laws and regulations to the extent necessary to satisfy the audit objective. 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 also reviewed performance measures in accordance with the *Government Performance and Results Act of 1993* relevant to facilities management. We found that the Laboratories did not have performance measures related to the audit objective. We did not rely solely on computer-processed data to satisfy our objectives. However, in those instances where we did utilize computer-processed data, we confirmed the validity of the data, when appropriate, by reviewing supporting source documents.

NNSA management waived an exit conference.

PRIOR REPORTS

Office of Inspector General Reports

- *Work Order Estimate and Cost Issues for Site Support Services at Los Alamos National Laboratory* (DOE/IG-0780, October 2007). A review of work order task estimates revealed that a systemic problem existed in that actual costs frequently exceeded estimates, often by significant amounts. In one case, actual cost exceeded estimates by more than $100,000. In addition, there were significant issues relating to how the support service labor and material charges were calculated. For example, one employee charged 35 hours to a work order after the work was completed. This happened because the Los Alamos National Laboratory did not use established controls that limited the amount that support services could exceed estimated costs.

Department of Energy
National Nuclear Security Administration
Washington, DC 20585

May 11, 2010

MEMORANDUM FOR: GEORGE W. COLLARD
ASSISTANT INSPECTOR GENERAL
FOR PERFORMANCE AUDITS
OFFICE OF INSPECTOR GENERAL

FROM: Gerald L. Talbot, Jr. 5/11/10
Acting Associate Administrator
for Management and Administration

SUBJECT: Comments to the IG Draft Report on Warranties; A08LL019; IDRMS No. 2008-02241

The National Nuclear Security Administration (NNSA) appreciates the opportunity to review the Inspector General's (IG) draft report, *Management Controls over Warranties Involving Newly Constructed and Renovated Facilities*. I understand that the IG wanted to determine if NNSA is requiring our contractors to ensure that repairs are performed on newly constructed/remodeled facilities, and how NNSA's contractors ensure that contractual obligations related to facility construction have been completed prior to acceptance.

NNSA agrees with the report. The recommendations made by the IG auditors to improve the management of warranties appear to be reasonable, and NNSA will take the appropriate corrective action. Attached, for your consideration, are comments from the Livermore Site Office to correct some factual inaccuracies in the draft report.

If you have any questions concerning this response, please contact JoAnne Parker, Acting Director, Office of Internal Controls, 202-586-1913.

Attachment

cc: David Boyd, Senior Procurement Executive
Karen Boardman, Director, Service Center
David Sedillo, Director, IG's NNSA & Science Audits Division

IG Report No. OAS-M-10-02

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