



U.S. Department of Energy  
Office of Inspector General  
Office of Audit Services

# Audit Report

## The Los Alamos National Laboratory Hydrodynamic Test Program

DOE/IG-0699

September 2005



## Department of Energy

Washington, DC 20585

September 16, 2005

MEMORANDUM FOR THE SECRETARY

FROM:

*Greg Friedman*  
Gregory H. Friedman  
Inspector General

SUBJECT:

INFORMATION: Audit Report on "The Los Alamos National Laboratory Hydrodynamic Test Program"

### BACKGROUND

A primary mission of the National Nuclear Security Administration (NNSA) is to ensure the safety, reliability, and performance of the Nation's nuclear weapons stockpile. NNSA relies on complex computer calculations and simulations to achieve this goal. As a compliment to these simulations, hydrodynamic tests (hydrotests) seek out phenomena that may not be accounted for in computer models.

Non-nuclear hydrotests help to determine if key weapons components are performing as designed. The data obtained from these tests is compared with data generated from computer models, and differences are examined so that models may be fine-tuned to make them more accurate. Hydrotests are critical to the Department's confidence in making the annual certification of the safety, reliability and performance of the nuclear weapons stockpile.

NNSA's Los Alamos National Laboratory (Los Alamos) is responsible for performing hydrotests for weapons in the stockpile, including the W76, B61, and W88. Tests are performed at Los Alamos' Dual Axis Radiographic Hydrodynamic Test facility, which became partially operational in July 1999. Los Alamos budgets over \$20 million each year for conducting hydrotests. Because of the importance of these tests, we initiated an audit to determine if NNSA was meeting its schedule for conducting hydrotests at Los Alamos.

### RESULTS OF AUDIT

Los Alamos did not complete hydrotests as scheduled in support of NNSA's Stockpile Stewardship Program. According to NNSA plans, Los Alamos was to conduct a total of 15 hydrotests in Fiscal Years 2002 through 2004. Of the scheduled tests, nine



experienced delays of up to two years, including three tests which had yet to be performed as of the time of our audit. Further, we found that Los Alamos may not have the capacity to meet future hydrotest needs. This occurred, in part, because the Laboratory did not:

- Adequately define the scope of work for conducting hydrotests;
- Assign responsibility and authority to specific managers for carrying out certain tasks associated with the tests;
- Develop and use the most efficient strategy to mitigate environmental contamination and reduce turnaround time at the test facility; and,
- Carry out the test necessary to determine if facilities at Lawrence Livermore National Laboratory can be used to meet some of its hydrotest needs.

Without critical hydrotest data, scientists lose one of their most important tools for evaluating, among other things, the performance of key weapons components and the reliability of the stockpile. Since the majority of hydrotests currently being conducted are in support of the W76 life extension program, continued slippages could also impact the schedule for the first production unit in Fiscal Year 2007.

The OIG previously reported on issues affecting the hydrotest program in May 2003. In the audit of the Dual Axis Radiographic Hydrodynamic Test Facility (DOE/IG-0599), we found that the completion of the facility was behind schedule and that project management needed improvement. The current audit underscores the continued need for improvements in NNSA's hydrotest program.

### MANAGEMENT COMMENTS

Management generally agreed with the findings and recommendations and stated that Los Alamos, as a result of the review, had already implemented project management changes as demonstrated by the successful execution of two hydrotests since the restart of Los Alamos operations. However, in its response, NNSA acknowledged that project management continues to mature. Management's comments are summarized in our report and are included in their entirety in Appendix 3.

### Attachments

cc: Deputy Secretary  
Under Secretary for Energy, Science and Environment  
Administrator, National Nuclear Security Administration  
Chief of Staff

# **REPORT ON THE LOS ALAMOS NATIONAL LABORATORY HYDRODYNAMIC TEST PROGRAM**

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# THE LOS ALAMOS HYDRODYNAMIC TEST PROGRAM

## **Testing Delays**

Los Alamos did not complete all hydrotests as scheduled. Fifteen hydrotests were scheduled in Fiscal Years (FY) 2002 through 2004. Of these, six were completed as scheduled, six were delayed up to two years, and three had not been completed as of April 2005. Future hydrotests may also be at risk.

### Hydrotest Objectives

In FY 2002, Los Alamos scheduled five hydrotests but completed only two of those tests. These tests were in support of the W76, B61, and W88 Life Extension Programs (LEP). In addition, the W76 baseline test that was completed had to be redone due to test set errors that compromised the data. Two of the three remaining tests were rescheduled for FY 2003 and the third test was rescheduled for FY 2004. Similar delays occurred in the FY 2003 hydrotest schedule. For example, a W78 safety hydrotest scheduled in FY 2003 had not been conducted at the time of this audit.

To its credit, in FY 2004 Los Alamos completed 7 of the 10 hydrotests scheduled, including two carryover tests from FY 2003. Los Alamos officials pointed out that, until the Laboratory suspended operations in July 2004, all hydrotests were completed as scheduled in FY 2004. Furthermore, Los Alamos noted that preparations for the remaining hydrotests were proceeding on schedule when the suspension occurred.

Although Los Alamos made progress during FY 2004 towards recovering its hydrotest schedule, it did so in large part by keeping its Pulsed High Energy Machine Emitting X-rays (PHERMEX) facility open longer than planned. Specifically, four of the seven tests were performed at PHERMEX in FY 2004. PHERMEX executed its final hydrotest in February 2004 and was shut-down in April 2004.

### Future Objectives

In the absence of PHERMEX, Los Alamos may not have the necessary capacity to meet future hydrotesting needs. Los Alamos is able to conduct about six hydrotests a year at the DARHT facility. (See Appendix 2 for a photograph of the DARHT facility). Prior to the July 2004 suspension

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of operations, Los Alamos had forecasted demand to exceed capacity beginning in FY 2005. Specifically, Los Alamos projected the need to conduct seven hydrotests in FY 2005, not including carryover tests from FY 2004, and eight hydrotests in FY 2006. Because Los Alamos may not have the capacity to meet this demand, it will likely have to delay certain tests in these years. Projected demand in FYs 2007 through 2009 is even greater. For example, Los Alamos projected the need to perform 11 hydrotests in FY 2009.

Los Alamos officials advised us in July 2005 that they believe the DARHT facility can meet future requirements, in part, through engineering and logistical improvements that reduced turn-around time limitations. Although management currently believes that improvements will allow DARHT to carry out scheduled tests, as previously noted, Los Alamos had to rely on a second facility, PHERMEX, in order to execute scheduled tests in FY 2004.

## **Hydrotest Management**

Although some hydrotests had been delayed by external events outside the control of the management, such as fire hazards, Los Alamos had not fully implemented key project management tools or adopted programmatic changes that could increase its efficiency in conducting such tests. For example, Los Alamos' hydrotest program did not make full use of project management tools to control the scope of work and allocate sufficient resources to the tests, nor did it use the most efficient method to mitigate the dispersal of materials into the environment when tests were performed. In addition, NNSA had not implemented a key objective of its National Hydrodynamic Plan that is necessary to maximize the utilization of hydrotest facilities available at Lawrence Livermore National Laboratory (Livermore).

### Los Alamos Project Management

Although Los Alamos conducted hydrotests as separate projects, it had not fully prepared project execution documents, such as work packages, to plan the scope and schedule of work and allocate resources to the various tasks. Specifically, work packages to complete tests did not describe the scope of work at a manageable level, but rather described broad objectives such as to "identify and perform required design, procurement, fabrication, and

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assembly of the integrated test assembly of the experiment." The broad definition of work scope also often dispersed responsibility for completing the work among several organizations with separate chains of management, thereby, lessening control and accountability for completing specific tasks. We found that 22 of the 46 work packages in Fiscal Year 2004 did not have a specific manager assigned to completing the work.

To facilitate project completion, work packages should contain meaningful, manageable, measurable, and authorized units of work that represent project scope at the lowest level of detail. Furthermore, work packages should be assigned to an individual with specific responsibility and authority to complete the work.

The importance of adequate planning was illustrated in February 2004 when a crane was damaged while remediating the firing point at DARHT. The firing point was being cleaned in preparation for the next test. According to an investigative report conducted by Los Alamos, the root cause of the incident was identified as a failure by Hydrotest Program managers to adequately plan and resource load shot recovery activities. Los Alamos failed to identify all the resources necessary to perform firing pad remediation and, therefore, those resources were not available when needed. As a result, the following hydrotest was delayed almost two months.

Los Alamos officials stated that, in response to schedule slippages in FYs 2002 and 2003, they restructured the Hydrotest Program and made improvements in its project management practices in late FY 2003. Officials attributed the progress in completing scheduled hydrotests in FY 2004 to these improvements. However, as demonstrated above, project management weaknesses persist in defining the scope of work packages and ensuring that managers are assigned to them. In fact, Los Alamos management agreed that the implementation of work packages continue to mature.

#### Mitigation Strategy

The current strategy utilized at DARHT to mitigate the dispersal of materials to the environment during a test is not the most efficient. Before a hydrotest is performed at Los

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Alamos, a tent structure is constructed over the firing pad and filled with aqueous foam to mitigate releases of materials such as beryllium, depleted uranium, and lead into the environment. It takes approximately two months to clean up the DARHT firing pad following a hydrotest using foam to control releases. Although Los Alamos uses foam, it is neither the only form of mitigation nor is it the preferred method. (Appendix 2 contains photographs illustrating the foam method of mitigation.)

According to the DARHT Record of Decision (ROD), containment vessels are the preferred alternative for mitigating releases of materials during a hydrotest. In fact, Los Alamos planned to use vessels once the first axis of DARHT was operational in July 1999. Specifically, the ROD indicated that during Phase 1 (years 1-5), a vessel prototype program would be initiated utilizing an existing vessel design modified for use at DARHT, while designing a new vessel specifically suited for DARHT testing. Phase 2 (years 6-10) called for the utilization of the newly designed DARHT vessel and the implementation of an extensive vessel program. However, according to Los Alamos officials, they did not fully implement Phase 1 of the vessel program. Further, our audit determined that Los Alamos is about a year behind schedule in conducting the first Phase 2 hydrotest using a vessel at DARHT. According to Los Alamos officials, the recent stand-down and other programmatic missions have affected vessel implementation at Los Alamos. (Appendix 2, photograph 4, illustrates a vessel.)

Vessels would improve the turnaround time of each hydrotest since they could be moved off the firing pad and cleaned at a remote facility. This would allow another hydrotest to be moved to the firing pad, thereby expediting the hydrotest schedule. In addition, the amount of waste generated from these tests would be reduced.

Los Alamos officials stated that improvements have reduced cleanup time to only 2 to 3 weeks and is no longer the rate-controlling factor for DARHT hydrotest capacity. Los Alamos also noted that less mature vessel designs would have yielded significantly inferior data quality than provided through the use of foam.



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Despite efforts to reduce the time required to cleanup the site, Los Alamos officials, in subsequent discussions, agreed that the use of foam mitigation could impact the rate at which hydrotests can be conducted at DARHT. Regarding the ability of vessels to provide desired data quality, as previously noted, Los Alamos did not fully implement its program to develop vessel containment.

#### NNSA National Hydrodynamic Plan

NNSA had not implemented a key objective of its National Hydrotest Plan to make best use of facilities at Los Alamos and Livermore. In October 2003, NNSA directed Los Alamos and Livermore to develop a National Hydrotest Plan (NHP) that addressed mission need and made best use of national user facilities, such as DARHT and Site 300 at Livermore, which directly supports the hydrotest program. NHP also required that a proof of principle shot first be completed at Livermore to ensure that hydrotests Los Alamos transferred to Livermore would yield reliable data. Los Alamos scientists had expressed concern that the Livermore facility did not have the data collection capability of DARHT.

As directed, Los Alamos and Livermore established the criteria to be used when determining where a hydrotest is to be conducted. Further, Livermore has executed hydrotests at Los Alamos, however, Los Alamos had not yet conducted the proof of principle shot. The proof of principle shot was planned at Livermore in FY 2005, but was removed from the schedule following the Los Alamos security stand-down. Because of competing priorities, Los Alamos had not re-scheduled the proof of principle shot. Effective implementation of the NHP offers the opportunity to maximize the use of the laboratories to meet the demand for hydrotests.

#### **Consequences**

Hydrotest results are critical to the Department's confidence in making the annual certification of the safety, reliability and performance of the nuclear weapons stockpile. Without these tests data, scientists lose one of their most important tools for evaluating the performance of weapon components, computer models, and aging of remanufactured components. Moreover, since the majority

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of tests currently being conducted at Los Alamos are in support of the W76 LEP, any further slippages of the test schedule could also impact W76 LEP milestones and possibly the first production unit scheduled for FY 2007.

## **RECOMMENDATIONS**

We recommend that the Administrator, NNSA, ensure that the Los Alamos National Laboratory:

1. Develop and utilize project execution plans for hydrotest projects, including work packages, that contain meaningful, manageable, measurable and authorized units of work, and represent project scope at the lowest level of detail.
2. Assign these work packages to appropriate managers to control the execution of the work;
3. Reevaluate the current mitigation strategy utilized at the DARHT facility and expedite the current vessel schedule utilizing the decision reached in the DARHT ROD; and,
4. Fully implement the National Hydrotest Plan.

## **Management Reaction**

Management generally concurred with the findings and accepted the recommendations in the report. Management noted that, with respect to our recommendations pertaining to project management, Los Alamos has effectively implemented project management tools as demonstrated by the successful execution of two hydrodynamic tests since the restart of operations.

Management agreed that the current mitigation techniques deployed at DARHT may not be the most ideal and they continue to evaluate newer concepts. However, the current foam mitigation techniques far exceed the environmental limits contained within the DAHART ROD, while maintaining the world class hydrodynamic testing.

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Management noted that the DARHT ROD is an environmental impact document and should not be referenced as the technical basis for achieving goals. Management also contended that activities associated with foaming are not the rate-controlling step for DARHT's shot capacity. Further, there is an aggressive schedule for deploying vessels that will further improve hydrodynamic testing data.

Finally, management agreed that the implementation of the National Hydrotest Plan is important and the goal of executing a test at Livermore is still being pursued. Management stated that the ability to execute a Los Alamos designed hydroshot at Livermore would help to promote the effective utilization of resources between the two laboratories. Management, however, disagreed that failure to achieve this one goal is indicative of failure to implement the entire plan.

**AUDITOR  
COMMENTS**

Management's comments were responsive to the recommendations. As a result of our audit, Los Alamos implemented improved project management tools. We noted that the usage of these tools has led to the successful execution of hydrotests since the restart of operations. However, our work has shown that additional project management improvements are needed regarding adequately defining hydrotest work scope and assigning all work packages to specific managers. As noted previously, Los Alamos acknowledged that project management continues to mature.

We agree that the foam mitigation meets the environmental limitations defined in the ROD. However, as previously discussed, foam mitigation is not the most efficient means and management has acknowledged it is exploring more efficient options. In fact, the use of foam actually increases the amount of low-level waste that must be disposed of by Los Alamos. Although management indicates that the DARHT ROD should not be referenced as a technical basis for achieving goals, we noted that the vessel system requirement was part of the DARHT funding line item project, and that NNSA has invested in the infrastructure necessary to utilize vessels rather than foam as part of the project.

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We also recognize that other factors, such as assembly of test devices, can dictate the number of hydrotests in any given year. However, Los Alamos officials have acknowledged that the use of foam could impact the rate at which hydrotests can be conducted at DARHT. Additionally, Los Alamos attributed delays in one W76 related hydrotest to the cleanup of the DARHT firing pad following a foam-mitigated test. Also, a senior Los Alamos Hydrotest Program scientist told us that foam containment dramatically increased hazards to the workers involved at the firing point and increased the time and costs associated with executing hydrotests.

Finally, we agree with management that demonstrating the ability to execute a Los Alamos designed hydrotest at Lawrence Livermore is important to the effective utilization of resources at the two laboratories. However, we did not intend to imply that the failure to achieve this one goal is indicative of failure to implement the entire plan.

## Appendix 1

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**OBJECTIVE** The objective of this audit was to determine if the Los Alamos Hydrodynamic Test Program is meeting its schedule for conducting hydrotests.

**SCOPE** The audit was performed between February 2004 and May 2005 at NNSA Headquarters, Los Alamos National Laboratory, and Lawrence Livermore National Laboratory. The audit examined FY's 2002 to 2004 hydrotest activity.

**METHODOLOGY** To accomplish the audit objective, we:

- Reviewed applicable public laws, Department orders, other Departmental guidance, related correspondence, and contracts;
- Reviewed prior Office of Inspector General and Government Accountability Office reports;
- Reviewed compliance with the Government Performance and Results Act of 1993;
- Examined Hydrodynamic Test Plans for FY's 2002 - 2004;
- Analyzed the DARHT Record of Decision;
- Interviewed key Headquarters, Los Alamos, and Livermore personnel;
- Analyzed project management documentation for FY 2004 Hydrotest projects;
- Examined briefings related to the Los Alamos Hydrodynamic Test Program; and,
- Reviewed hydrotest folders related to the various scheduled tests.

The audit was conducted in accordance with generally accepted Government auditing standards for performance audits and included tests of internal controls and compliance with laws and regulations to the extent necessary to satisfy

## Appendix 1 (continued)

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the objective of the audit. Accordingly, we assessed the significant internal controls and performance measures established under the Government Performance and Results Act of 1993. Specifically, we found that performance measures are in place relating to the hydrodynamic test program. 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. Computer processed data was not relied upon extensively in the conduct of this audit. NNSA waived the exit conference.

## Appendix 2

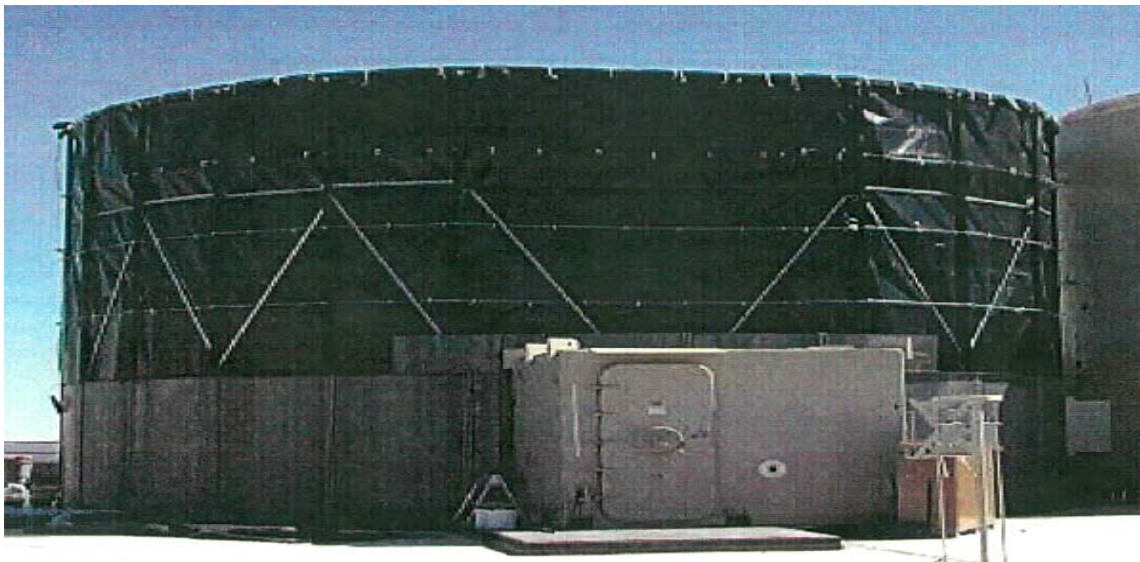
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### HYDRODYNAMIC TEST FACILITY, FOAMING, AND VESSELS

The photographs below are provided to aid readers in understanding hydrotest activities at Los Alamos.



An aerial photograph of the Los Alamos DARHT facility.

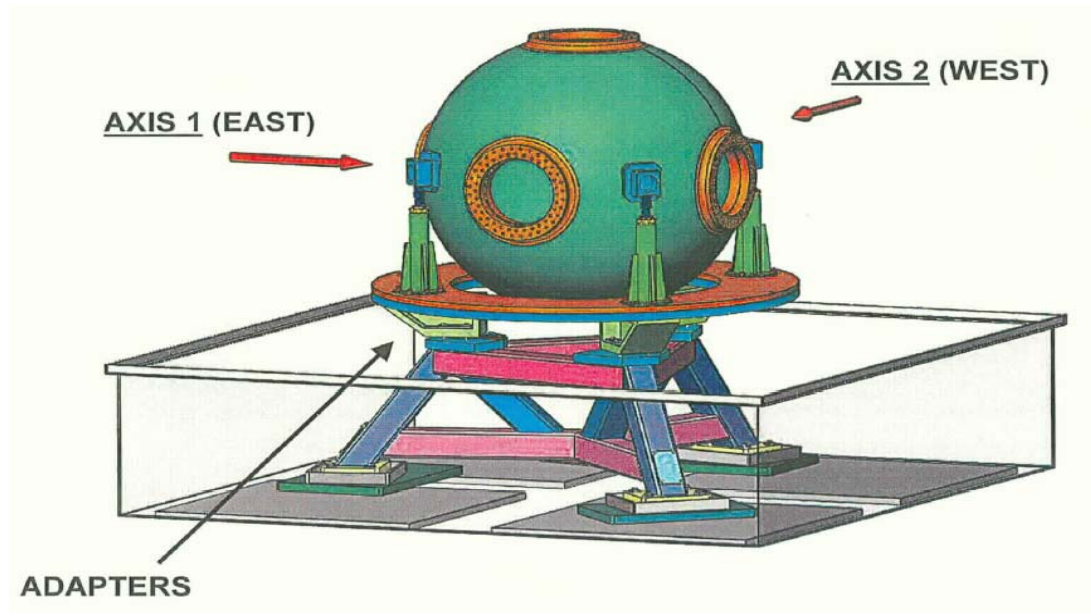


The foaming structure on the firing pad prior to a hydrotest.

Prior to a test, the tent structure is filled with aqueous foam to mitigate releases of materials to the environment.



The firing pad after a winter 2004 hydrotest shot.



A schematic representing a hydrotest vessel.

The use of a vessel similar to the schematic was identified as the preferred alternative in the DARHT Record of Decision. The vessel would be moved off of the firing pad for cleanup and preparation.



### PRIOR REPORTS

#### OFFICE OF INSPECTOR GENERAL REPORTS

- Refurbishment of the W80--Weapon Type (DOE/IG-0590, March 2003). The audit disclosed that it is unlikely that National Nuclear Security Administration's (NNSA) W80 refurbishment project will meet cost, schedule, scope, and milestones established in the project plan. Specifically, the audit found that Lawrence Livermore National Laboratory and Sandia National Laboratory had cancelled and delayed testing, weapon component completion, and support facility renovation activities, without notifying NNSA or updating project plans. Further, key management controls were not in place or operating as intended.
- Dual Axis Radiographic Hydrodynamic Test Facility (DARHT) (DOE/IG-0599, May 2003). The audit disclosed that the DARHT would not be complete before June 2004, 15 months behind schedule. Additionally, scope changes had reduced or eliminated work elements; critical activities had been shifted to other programs; and, some activities were being completed using non-project funds. These activities gave the erroneous appearance that total project costs had remained within planned budget. The audit also found that project management control, as exercised by the NNSA and Los Alamos needed improvement. Consequently, delays in completion of DARHT may impede the performance of the Stockpile Stewardship Program.
- The Department of Energy's Tritium Extraction Facility (TEF) (DOE/IG-0560, June 2002). The audit disclosed that the TEF would cost more than planned. Based on current progress, it is unlikely that the facility will be completed by February 2006. Project management officials estimated that total project cost would increase \$500 million. Also, the facility may not be completed until December 2006, and it may not contain all elements of the original specifications. Completion of the TEF within its baseline cost, schedule, and scope was in jeopardy because the project team had not made full use of available project management controls. Consequently, NNSA cannot be assured that the facility will be available when needed or that project funds are being expended efficiently. The delays in completion of the TEF Project has the potential to impede performance of the Stockpile Stewardship Program.
- National Nuclear Security Administration's Planning, Programming, Budgeting, and Evaluation Process (PPBE) (DOE/IG-0614, August 2003). A PPBE process uses short-term and long-term planning to define program requirements and matches requirements with budgetary resources. NNSA's Administrator established an overall objective that the PPBE process becomes the core management protocol for NNSA. The audit disclosed that NNSA's PPBE process had not yet resulted in changes for existing financial and budgeting systems at the

## **Appendix 3 (continued)**

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NNSA management and operating contractors visited because the field role had not been fully developed for FY 2004. Without full implementation, NNSA could not fully benefit from the new PPBE system.

### **OTHER REPORTS**

- Nuclear Weapons Improved Management Needed to Implement Stockpile Stewardship Program Effectively (GAO-01-48, December 2000). Over the last few years, the Office of Defense Programs (DP) has taken steps to address the principal challenges facing the Stockpile Stewardship Program. However, the Government Accountability Office (GAO) found that additional improvements are needed to (1) remedy weaknesses in the program's planning processes; (2) ensure that required budget information for effective cost management is available; (3) correct organizational and leadership deficiencies; and, (4) develop an effective management process for overseeing the life extension process for nuclear weapons. Specifically, DP is still trying to determine some key requirements for the Stockpile Stewardship Program, such as validating the quantities of weapons to be refurbished. Also, a Congressionally mandated plan to manage the life extension of nuclear weapons does not contain complete schedules and budget information. Also, several studies have found that DP has a dysfunctional organization with unclear lines of authority that lead to a lack of accountability.
- Nuclear Weapons: Status of Planning for Stockpile Life Extension (GAO-02-146R, December 2001). GAO found that NNSA's Office of Defense Programs (DP) is not developing a comprehensive stockpile life extension program plan as called for in Section 3133 of the National Defense Authorization Act for FY 2000. Specifically, DP issued an "interim plan" in May 2000. However, this interim plan was essentially a description of the life extension process and did not meet all of the requirements stated in section 3133. Further, DP believes that their FY 2002 budget submittal fulfills the legislative requirement, and they have no current plans to complete a comprehensive plan for the stockpile life extension program.




Department of Energy  
National Nuclear Security Administration  
Washington, DC 20585



JUL 08 2005

MEMORANDUM FOR George W. Collard  
Assistant Inspector General  
for Audit Operations

FROM: Michael C. Kane   
Associate Administrator  
for Management and Administration

SUBJECT: Comments to Hydrodynamic Test Program Draft  
Report

The National Nuclear Security Administration (NNSA) appreciates the opportunity to have reviewed the Inspector General's (IG) draft report, "The Los Alamos National Laboratory Hydrodynamic Test Program." Since Los Alamos National Laboratory (LANL) is responsible for performing hydrodynamic tests for weapons in the stockpile, we understand that the IG initiated this audit to determine if the Test Program was meeting programmatic goals and objectives.

While we have technical comments—submitted separately—and some specific comments—contained herein, NNSA accepts the recommendations of the IG, while noting that they do not reflect new information as noted below. With regards to the recommendations related to project execution plans and the assignment of work packages, we want to note that the Laboratory, as a result of the IG's audit, has effectively implemented project management tools as demonstrated in the hydrodynamic test that occurred on April 1, and shown that the Core Team has the responsibility and authority for each of their respective work packages. NNSA believes that the report understates the extent to which progress had been made by the Laboratory in improving its management prior to the Laboratory stand-down.

Since the initiation of the Stockpile Stewardship Program, the Deputy Administrator for Defense Programs has placed a high priority on hydrotesting as a key experimental capability to assure that the implosion systems of aged or reconfigured nuclear weapons primaries continue to perform as required. Hydrotesting provides essential data to validate advanced computer simulations of device performance. As a direct result of its own assessment that resources allocations in this area were inadequate and were not managed in the most effective manner possible, NNSA created and managed the National Hydrotest Program. The findings of the IG Report "The Los Alamos National Laboratory

## Appendix 4 (continued)

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Hydrodynamic Test Program” are largely a reflection of facts already known, briefed to the audit team by NNSA, and in fact corrected by the Laboratory within the last 18 months.

As a result of the increased management focus, Los Alamos had substantially improved its performance of hydrotesting, executing all scheduled shots in the period from July 2003 to July 2004 when high-hazard operations were stood-down at LANL to begin a program of safety and security improvements. Since restart from the stand-down, LANL has successfully executed two principal hydrotests in support of the W76 Life Extension Program, returning outstanding radiographic data. Completing a major goal of the National Hydrotest Plan, LANL has successfully transitioned its hydrotesting operations to the DARHT 1<sup>st</sup> axis allowing efficiencies to be realized from closing the venerable PHERMEX facility.

While NNSA has requirements for each hydrotest on the schedule, the number of experiments executed is not the most important measure. Hydrotests range in cost, complexity and priority from essential tests for Life Extension Programs or investigations of possible system defects, to lower-priority shots for physics validation and designer training. NNSA has been executing its highest priority hydrotests to ensure that no essential weapons system data is missing and to ensure that there is no reason not to have full confidence in the performance of the stockpile. Mitigation of safety and environmental impacts is a very high priority for hydrotesting. In order to make best use of existing facilities, it is a goal of the hydrotest program to demonstrate that LANL experiments can be executed at the LLNL Contained Firing Facility, when the full DARHT capabilities are not required. That this demonstration has been delayed as a result of the stand-down and higher priority work is not, in itself, demonstrative of any failure of the hydrotest program to provide required data for certification

The third recommendation is related to the mitigation strategy and the IG mentions “the decision reached in the DARHT ROD.” NNSA agrees that the dispersal mitigation techniques in place may not be the most ideal and new concepts that promise easier clean-up and faster turn-around are being explored. However, the DARHT Record of Decision (ROD) is an environmental impact document. It should not be referenced as the technical basis for achieving goals. The current foam mitigation strategy far exceeds the DARHT ROD limits while maintaining the world-class hydrodynamic test radiographic fidelity required for the stockpile stewardship mission. Activities associated with foam mitigation are not the rate-controlling step for DARHT’s shot capacity. There is an aggressive schedule for deploying a state-of-the-art vessel system that would further improve hydrodynamic test data.

The fourth recommendation focuses on the full implementation of the National Hydrotest Plan. While all aspects of the plan are being implemented consistent

## Appendix 4 (continued)

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with scope, schedule, and cost parameters, it is important to note that the requirement that the Laboratory demonstrate the ability to execute a Los Alamos designed hydroshot at the Lawrence Livermore National Laboratory was an important objective of the National Hydrotest Plan. This remains an important goal in order to promote the effective utilization of resources between the two laboratories. It is, however, only one goal in a plan that includes requirements for multiple shots at each site. While this goal was affected by the stand-down, NNSA disagrees that failure to achieve this one goal is indicative of failure to implement the entire plan.

As stated previously, NNSA is providing technical comments separately for the IG's consideration prior to release of the Final Report. Should you have any questions related to this response, please contact Richard Speidel, Director, Policy and Internal Controls Management.

cc: Deputy Administrator for Defense Programs  
Senior Procurement Executive  
Manager, Los Alamos Site Office  
Director, Service Center

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