United States Government Accountability Office

GAO

Report to the Chairman, Committee on Energy and Commerce, House of Representatives

November 2005

STAND-DOWN OF LOS ALAMOS NATIONAL LABORATORY

Total Costs Uncertain; Almost All Mission-Critical Programs Were Affected but Have Recovered

GAO-06-83

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GAO Accountability · Integrity · Reliability

Highlights

Highlights of GAO-06-83, a report to the Chairman, Committee on Energy and Commerce, House of Representatives

Why GAO Did This Study

On July 16, 2004, the director of the Los Alamos National Laboratory (LANL) declared a suspension, or stand-down, of laboratory operations to address safety and security concerns. LANL is one of three laboratories that conduct nuclear weapons research for the National Nuclear Security Administration (NNSA) within the Department of Energy (DOE). In deciding to stand down operations, LANL's director consulted with senior officials from NNSA and the University of California, the management and operating contractor for the laboratory. GAO was asked to assess (1) the extent to which LANL's and NNSA's estimates capture the total cost of the stand-down, (2) the effect of the stand-down on LANL's major research programs, and (3) whether there was a reasonable basis for NNSA's decisions regarding the reimbursement of stand-down costs to the University of California.

What GAO Recommends

GAO is recommending that DOE take actions to improve its oversight of management and operating contractors by requiring that contractors (1) track the costs of future stand-downs on an actual cost basis and (2) achieve an overall rating of outstanding as a basis to be awarded extra years to their contract terms. In commenting on the draft report, DOE generally concurred with GAO's recommendations.

www.gao.gov/cgi-bin/getrpt?GAO-06-83.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Gene Aloise at (202) 512-3841 or aloisee@gao.gov.

What GAO Found

Neither LANL's $121 million estimate nor NNSA's $370 million estimate, which it considers an upper bound, accurately captures the total cost of the LANL stand-down. LANL did not establish separate stand-down activity codes to track the actual time spent on stand-down activities, such as safety reviews and training. As a result, neither NNSA nor GAO can calculate actual stand-down costs. LANL's estimate used a formula-based approach to estimate this time and did not include most administrative and other support costs associated with stand-down activities. While both LANL's and NNSA's estimates include labor and other direct costs, NNSA's estimate also includes the costs of administrative and other activities that supported stood-down activities. NNSA officials said that while their estimate fully covers stand-down activities, it overstates actual stand-down costs because it does not take into account the sequenced resumption of activities.

As a result of the stand-down, many mission-critical programs had to extend key milestones. In particular, the stand-down affected LANL's Nuclear Weapons Program, including the refurbishment of three nuclear weapons to ensure their reliability, because many of these activities were stood down longer. While LANL's Nuclear Weapons Program has changed only one major delivery date, it assumed additional risk of achieving its other major delivery dates by reducing the time available for scientists to analyze test data and to make design changes or run additional tests if initial tests yield unexpected results. However, LANL has not substantially reduced the scope of any of its efforts because of the stand-down and almost all programs had recovered from stand-down delays by the end of fiscal year 2005, according to LANL and NNSA program managers. LANL program managers said that the results of tests performed to date have confirmed predictive models, and thus far have not indicated that nuclear weapons programs' schedules will bear additional risk.

The basis for NNSA's determination that almost all of the stand-down costs were allowable appears to be reasonable because (1) NNSA's contract for LANL authorizes stand-downs to address serious safety and security concerns, (2) NNSA found that almost all stand-down costs were consistent with the allowability and safety provisions of the contract, (3) NNSA personnel were substantially involved in stand-down and restart activities, and (4) NNSA concluded that the duration of the stand-down was reasonable. However, NNSA has not fully ensured that LANL will be held accountable for safe and secure future operations. Specifically, recent DOE management and operating contracts have given contractors the opportunity to earn extra years to their contract terms, primarily by achieving an overall rating of outstanding performance. For the new LANL contract to be awarded in December 2005, however, the contractor could earn additional years to the contract term by achieving a lower performance score.

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Abbreviations

ALT	alternative
CD ROM	compact disk, read-only memory
CFO	chief financial officer
CREM	classified removable electronic media
DARHT	Dual-Axis Radiographic Hydrodynamic Test (Facility)
DBT	design basis threat
DOD	Department of Defense
DOE	Department of Energy
FPU	first production unit
GPS	global positioning system
IAEA	International Atomic Energy Agency
LANL	Los Alamos National Laboratory
LASO	Los Alamos Site Office
LEP	life extension program
NASA	National Aeronautics and Space Administration
NNSA	National Nuclear Security Administration
Pu	plutonium
QMU	quantification of margins and uncertainties
SS-21	Seamless Safety for the 21st Century
TA	Technical Area

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GAO
Accountability * Integrity * Reliability

United States Government Accountability Office
Washington, D.C. 20548

November 18, 2005

The Honorable Joe Barton
Chairman, Committee on Energy
and Commerce
House of Representatives

Dear Mr. Chairman:

On July 16, 2004, the director of the Los Alamos National Laboratory (LANL), one of the National Nuclear Security Administration's (NNSA) three nuclear weapons laboratories,[1] declared a suspension, or stand-down, of laboratory operations to address immediate safety and security concerns, as well as a negative trend in laboratory safety and security performance. In making this decision, LANL's director consulted with senior officials from NNSA and the University of California, the management and operating contractor for the laboratory. The LANL director suspended all activities except those specifically designated as critical, citing a pattern of safety and security incidents that occurred over the course of a year. Specifically, in the weeks prior to the stand-down, an undergraduate student was partially blinded in a laser accident, and two classified computer disks were reported missing.[2] In both cases, laboratory employees disregarded established procedures and then attempted to cover up the incident, according to LANL officials. (See app. II for a chronology of key events that occurred prior to and during the stand-down.)

LANL's primary mission is to maintain the nation's nuclear weapons stockpile without nuclear testing. To accomplish this mission, LANL

[1]These laboratories each have annual operating costs of more than $1.5 billion. Since the end of the cold war, their mission has changed from designing and testing nuclear weapons to ensuring the reliability and safety of the nation's nuclear weapons stockpile. The National Defense Authorization Act for Fiscal Year 2000 (Pub. L. No. 106-65, § 3211) created NNSA as a separately organized agency within the Department of Energy (DOE).

[2]On July 23, 2004, the Deputy Secretary of Energy ordered a DOE-wide stand-down of operations that used accountable classified removable electronic media. These media include computer disks; removable hard drives; and compact discs, read-only memory (CD ROM) that contain information classified as secret restricted data, top secret, or specially sensitive information. Almost all DOE facilities resumed operations within 6 weeks, once they had certified that these media were accounted for and posed no security risk. (See app. I for data on the estimated cost of the DOE-wide stand-down.)

scientists are involved in numerous research, evaluation, and computer simulation programs to assess the long-term reliability of several nuclear weapons systems. LANL also serves as a focal point for nonproliferation and threat reduction activities, as well as chemical, biological, and physics research. In addition, LANL performs specific research projects for other programs within the Department of Energy (DOE) and for such federal agencies as the Department of Defense (DOD), the Department of Homeland Security, the National Aeronautics and Space Administration, and the National Institutes of Health.

In the days following the stand-down order, laboratory management and members of NNSA's Los Alamos Site Office, which has oversight responsibility for LANL, assigned a risk level to each of 384 laboratory activities. LANL designated (1) as risk level 1, or low risk, 341 activities (89 percent), including administrative functions and unclassified computer work; (2) as risk level 2, 25 moderately hazardous activities, such as light laboratory work and routine industrial activities; and (3) as risk level 3, the most hazardous 18 activities, such as those involving the use of nuclear materials or classified removable electronic media (CREM)—e.g. computer disks and removable hard drives.[3] Irrespective of the risk level assigned to activities under this process, any activities that LANL and NNSA management identified as either mission-critical or necessary for the safe and secure operation of the laboratory received a risk level 0 exception that enabled them to continue with special NNSA oversight. All risk level 0 activities were required to go through resumption activities appropriate to their risk levels.

LANL and NNSA also developed processes for reviewing the status of activities at each risk level and criteria for resuming each activity once senior management agreed the activity had fulfilled safety and security requirements. Almost all risk level 1 activities had resumed by the middle of August 2004; almost all risk level 2 activities resumed between the end of August and November 2004; and almost all risk level 3 activities resumed between October 2004 and February 2005. Some high-hazard, risk level 0 activities that operated throughout the stand-down, such as explosive tests in support of mission-critical nuclear weapons programs, were not approved for full resumption without special oversight until May 2005. LANL teams identified over 3,400 individual safety and security concerns,

[3]The risk levels indicated the hazard of the activities to employees, the laboratory, or the community if an accident or security breach occurred.

including over 400 that needed to be addressed prior to activities' resumptions. In addition, LANL officials undertook a laboratory-wide inventory of all CREM holdings and told us that by March 2005 they had destroyed about 15,000 pieces and had consolidated the remaining 20,000 pieces in 20 centralized CREM storage vaults, staffed by a limited number of security specialists.

During the stand-down, LANL's contractor—the University of California—continued to receive funding from NNSA programs and other work sponsors. Under its current management and operating contract, NNSA reimburses University of California for all allowable, allocable, and reasonable costs that LANL incurs. Costs incurred during the stand-down would be allowable for reimbursement to the extent that they meet these criteria. On July 30, 2004, the manager of NNSA's Los Alamos Site Office, who is NNSA's senior contracting officer for LANL, directed LANL to track the costs of the stand-down. In response, LANL's chief financial officer (CFO) developed a methodology for capturing the costs, briefed Site Office officials on this approach in August 2004, and documented this methodology in a letter to NNSA in September 2004. LANL estimates stand-down costs at $121 million. NNSA's newly created Field CFO Office attempted to validate LANL's cost-capturing methodology and cost estimate, but it could not do so accurately because (1) LANL did not record stand-down costs on an actual incurred cost basis in its official accounting records and (2) NNSA Field CFO officials could not use LANL's methodology to objectively identify stand-down costs. As a result, NNSA Field CFO officials developed an upper bound cost estimate of $370 million using cost information from LANL's accounting records and documented stand-up dates. NNSA Field CFO officials said this upper bound is the maximum potential cost of the stand-down and is not intended to be interpreted as an accurate estimate of the stand-down's costs. In April 2005, the manager of NNSA's Los Alamos Site Office determined the duration of the stand-down was reasonable. But the allowability of $14.3 million in stand-down costs still has not been resolved.

You asked us to assess (1) the extent to which LANL's and NNSA's estimates capture the total cost of the LANL stand-down, (2) the effect of the stand-down on LANL's major research programs, and (3) whether there was a reasonable basis for NNSA's decisions regarding the reimbursement of stand-down costs to the University of California.

To assess the extent to which LANL's and NNSA's estimates capture the total cost of the LANL stand-down, we examined the methodologies each

used to determine stand-down costs and interviewed senior officials in the CFO offices of LANL and NNSA. To assess the effect of the stand-down on LANL's major research programs, we asked NNSA and LANL officials to identify programs they considered most vital for achieving LANL's mission. For these programs, we reviewed program milestone documentation provided by both LANL and NNSA and interviewed NNSA program officials and senior LANL scientists and managers to identify schedule modifications caused by the stand-down. In addition, we interviewed officials from the Defense Nuclear Facilities Safety Board—an independent federal oversight board—to obtain its perspective on the safety of the laboratory's nuclear facilities and officials from DOD, LANL's largest end user, to confirm information about programs' schedules and performance requirements. To assess whether NNSA's decisions regarding the reimbursement of stand-down costs are reasonable, we reviewed federal regulations and pertinent provisions of the LANL contract, as well as Los Alamos Site Office and University of California documents outlining decisions related to allowing reimbursement. We also interviewed cognizant LANL, Site Office, and other NNSA officials. We conducted our work from March 2005 through October 2005 in accordance with generally accepted government auditing standards.

Results in Brief

Neither LANL's $121 million estimate nor NNSA's $370-million estimate, which it considers an upper bound, accurately captures the total cost of the LANL stand-down. The LANL estimate is inaccurate primarily because LANL did not track the actual time employees spent on stand-down activities. More specifically, LANL's method for tracking costs did not establish separate stand-down activity codes within its accounting system to identify time actually spent on stand-down activities. Instead, LANL used a formula-based approach to estimate costs by applying its units' average daily labor rates to those units' activity risk levels. As a result, rather than tracking costs based on how scientists and other personnel actually spent their time during the stand-down, LANL's cost estimate is based on the proportion of activities each unit allocated to each risk level and how long each activity was stood down. Moreover, LANL's estimate includes only labor and other direct costs and did not include support costs associated with stand-down activities, further limiting the accuracy of its cost estimate. For these reasons, neither NNSA's Field CFO nor we believe that an accurate cost calculation can be computed using the information LANL collected. Accordingly, NNSA developed its own cost estimate that does not rely on LANL's estimated risk levels. To ensure that all stand-down costs were accounted for, NNSA treated an entire unit as stood down until

all of its activities had resumed, even though most LANL personnel had resumed risk level 1 and 2 activities while risk level 3 activities continued to be suspended. NNSA officials stated they did this because it was not possible to objectively validate which employees worked on a particular risk level activity within a unit. Consequently, NNSA believes its upper bound overstates actual stand-down costs. Like LANL's estimate, NNSA's estimate includes labor and other direct costs. Unlike LANL's estimate, NNSA's estimate also includes associated support costs, such as costs for laboratory management activities that had been resumed but were still supporting stand-down activities. Without the ability to track costs, it is difficult for DOE to hold management and operating contractors accountable and to make determinations regarding the allowability of stand-down costs. Consequently, we are recommending that the Secretary of Energy require DOE's management and operating contractors to set up activity codes within their accounting systems so that the costs of any future stand-downs can be tracked on an actual cost basis and require the inclusion of associated support costs when reporting on stand-down costs. DOE generally agreed with our recommendations.

While the stand-down delayed many mission-critical programs, including nuclear weapons and threat reduction programs, almost all programs had recovered by the end of fiscal year 2005, according to LANL and NNSA program managers. In particular, the stand-down affected LANL's Nuclear Weapons Programs—especially the life extension and refurbishment programs for the W76 and B61 nuclear weapons and manufacturing and certification activities for the W88 nuclear warhead—because many of these activities rely on high-risk experimental facilities that were stood down longer. In response to the stand-down, LANL's Nuclear Weapons Programs have changed only one major delivery date and have not substantially reduced the scope of any of their efforts, according to NNSA, LANL, and DOD officials. However, the W76 and the W88 programs extended certain key interim milestones and assumed schedule risk by reducing the time available for scientists to analyze test data and to make design changes or run additional tests if initial tests yield unexpected results. LANL program managers said that the results of tests performed to date have confirmed predictive models, and thus far have not indicated that nuclear weapons programs' schedules will bear additional risk. The stand-down also affected Threat Reduction Programs, which seek to reduce the threat of weapons of mass destruction, proliferation, and terrorism. For example, the stand-down delayed the processing of radiological sources recovered from medical and commercial facilities. The impact of the stand-down on some Threat Reduction Programs is less clear because of other

intervening factors, such as the nationwide recall of a critical sensor component.

The basis for NNSA's determination that almost all of the stand-down costs were allowable appears to be reasonable because (1) the LANL management and operating contract authorizes stand-downs to address serious safety and security concerns, such as those that existed at LANL; (2) NNSA's Field CFO found that almost all stand-down costs were consistent with the allowability and safety provisions of the contract; (3) NNSA personnel were substantially involved in LANL's stand-down and restart activities and participated in all key decisions; and (4) NNSA concluded that the duration of the stand-down was reasonable. NNSA has issued a notice of intent to disallow $14.3 million in stand-down costs to the University of California for personnel costs for the first 2 days of the stand-down and certain small subcontractor claims and other incremental costs, but the allowability of these costs has not yet been resolved. However, given the scope of safety and security issues identified during the stand-down, a growing trend in safety and security incidents at the laboratory, and a long-standing attitude that the safety precautions employees are expected to take in carrying out often hazardous experiments are too cumbersome and really not necessary, it is clear that safety and security approaches at the laboratory need improvement going forward. According to the manager of NNSA's Los Alamos Site Office, who arrived at Los Alamos in April 2004, the safety culture at the laboratory is not as rigorous as it is at other DOE facilities. Beginning in 2004, DOE's management and operating contracts have given contractors the opportunity to earn extra years to their contract terms. For example, to earn a 1-year contract extension, the contractor for Sandia National Laboratories needs to achieve an award-fee performance score of at least 90 percent, equivalent to overall rating of outstanding performance, and meet cost reduction goals. In comparison, NNSA officials stated that the new LANL contract, to be awarded in December 2005, will allow NNSA's Administrator to award an additional year to the contract if, for a given year, the contractor achieves (1) an award-fee performance score of at least 85 percent based on predetermined performance evaluation criteria and then (2) performance standards for additional award-term criteria. To improve management and operating contractors' accountability, we recommend that the Secretary of Energy require that contractors achieve an overall performance rating of outstanding as a basis for being awarded extra years to their contract terms. DOE generally agreed with our recommendation.

Background

While LANL's safety and security stand-down immediately followed incidents in which (1) an undergraduate student who was not wearing required eye protection was partially blinded in a laser accident and (2) two pieces of CREM—computer disks in this case—were reported missing, senior LANL managers said that the stand-down resulted from concern over a negative trend in laboratory safety and security performance beginning in fiscal year 2002. Laboratory data show that in the 1-year period from July 1, 2003, through June 30, 2004, LANL experienced 98 reportable safety, security, and environmental protection occurrences—including an airborne radiation release and a raw sewage discharge—up from 81 occurrences in fiscal year 2002. Moreover, LANL officials have stated that what distinguished this instance of missing CREM from others in the past was that LANL employees disregarded security procedures and attempted to cover up the loss.[4] As a result of negative trends and back-to-back safety and security incidents in which procedures were not properly followed, LANL's director stood down the laboratory to systematically address laboratory safety and security. According to the manager of NNSA's Los Alamos Site Office (LASO), the stand-down decision was appropriate.

The stand-down of operations at LANL was one of many stand-downs that have occurred there and at other DOE facilities in recent years. For example, in response to a plutonium exposure incident in August 2003, LANL stood down some operations at its Plutonium Facility (known as TA-55); corrective measures had not been completely implemented to address the causes of the incident at the time of the 2004 LANL-wide stand-down. In addition, 1 week prior to the LANL director's decision to stand down all operations at the laboratory, experiments requiring the use of nuclear materials were stood-down at LANL's Critical Experiments Facility (known as TA-18) because of safety concerns. Further, in October 2004 the Stanford Linear Accelerator Center was stood down following a serious electrical arc injury to a contract employee; operations did not resume until March 2005. In January 2005, management at Lawrence Livermore National Laboratory stood down programmatic work within its Plutonium Facility to

[4]In March 2004, a classified computer disk was determined to have been destroyed without proper documentation. The incident was properly reported to responsible officials. An investigation of the two classified computer disks reported missing in July 2004 determined that, even though the disks had never been created, inventory numbers had been established in LANL's CREM inventory records. The responsible LANL employees later falsified inventory records to cover up the error.

address safety deficiencies. In October 2005, NNSA's Livermore Site Office approved the resumption of reduced activities of the Plutonium Facility.

DOE and the University of California require the protection and control of classified information, including CREM; and LANL has reduced the number of pieces of CREM it secures to better ensure its control. DOE Order 471.2A establishes the department's Information Security Program for the protection and control of classified and sensitive information. Further, the University of California's Policy on Accountable Classified Removable Electronic Media establishes practices to comply with specific DOE/NNSA requirements for accountable CREM at the laboratories it contractually manages, including conducting at least annual inventories of holdings and reporting instances of missing CREM. LANL security officials told us that as a result of reports of missing CREM in late 2003, LANL undertook an inventory of its CREM holdings and reduced its holdings from over 80,000 pieces to about 35,000 pieces by moving the information stored on CREM to secure networks and then destroying the CREM. LANL further reduced its CREM holdings to 20,000 pieces during the stand-down, according to these officials. In response to LANL *Director's Instruction 04-009*, which guided resumption of LANL's CREM activities, LANL consolidated its CREM into 20 centralized libraries controlled by security specialists with daily CREM inventories.[5] LANL security officials have stated that planned expansion of the laboratory's classified network will allow the further reduction of CREM to under 5,000 pieces and further improve CREM accountability and control.

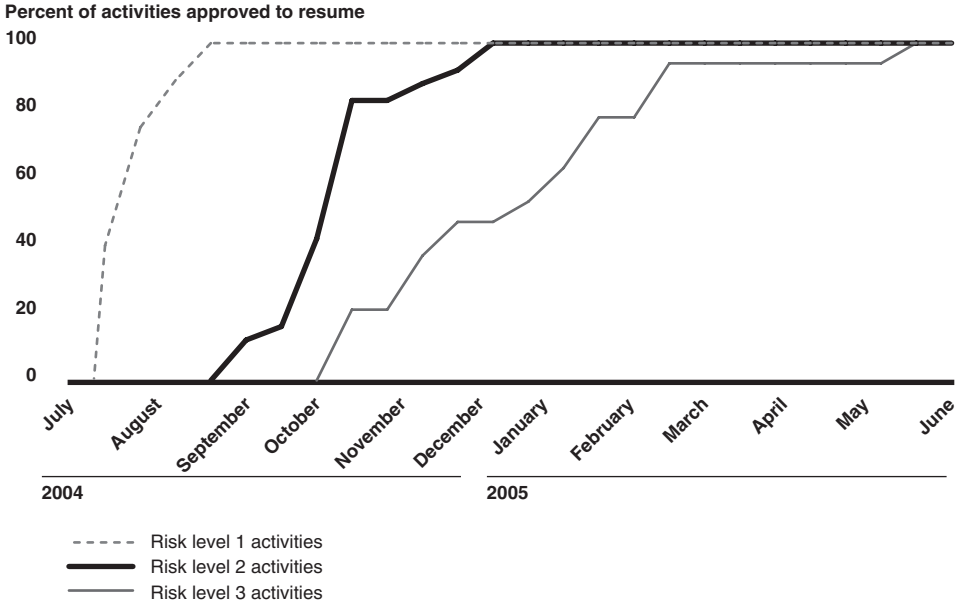
DOE Order 425.1C establishes departmental requirements for restarting nuclear facilities that were shut down, including an operational readiness review process that must demonstrate that it is safe to restart. Attachment 1 of the order, the Contractor Requirements Document, directs management and operating contractors of DOE-owned facilities, such as the University of California for LANL, to establish procedures for managing restart actions that meet the order's requirements, including the process for planning and conducting operational readiness reviews and review and reporting criteria. In particular, the University of California established procedures for restarting LANL operations after a stand-down in Laboratory Implementation Requirement 300-00-08.0 and through a series of *Director's Instructions* issued to guide different facets of LANL's July

[5]In February 2005, the NNSA Administrator approved a revision of LANL's CREM policy that allows weekly CREM inventories.

2004 stand-down and resumption—activities at different risk levels, construction projects, and CREM—through readiness reviews.

In the days following July 16, 2004, LANL management and LASO officials assigned a risk level to each of LANL's programmatic and administrative activities; established an operational resumption process; and created a Culture and Operations Model, Plan and Surety System to manage it. Resumption of risk level 1 activities required approval by the cognizant LANL associate director once, among other things, one-on-one supervisory meetings were held to ensure that each employee was committed to safety and security requirements and had completed certain reading and training requirements. LANL management established a more rigorous resumption process for risk level 2 and 3 activities that included LASO oversight. Each activity underwent a self-assessment through which 430 immediate safety and security concerns were identified as requiring corrective actions prior to resumption. An additional 3,047 safety and security concerns were identified for correction after activities resumed operations. An independent Resumption Review Board, composed of senior LANL managers and LASO officials, reviewed each self-assessment for operational readiness and to ensure that identified concerns had been addressed. These less-immediate concerns that could be addressed after resumption have been incorporated into LANL's Operational Efficiency plan, a laboratory-wide effort to address unacceptable risks while implementing programs that can improve laboratory efficiency. Risk level 3 activities also went through an additional independent facility review to ensure laboratory readiness. Each risk level 2 and 3 activity needed to obtain approval from both the LANL director and LASO manager before resumption. In addition, resumption of all CREM activities needed the approval of the Deputy Secretary of Energy. As shown in figure 1, risk level 1 activities were approved to resume more quickly than risk level 2 and 3 activities.

Figure 1: Percent of LANL Activities Approved to Resume Normal Operations by Risk Level, July 2004 through May 2005



Source: GAO analysis of LANL data.

Note: LANL assigned risk levels to 384 individual activities. Of these, 341 (or 89 percent) were assigned to risk level 1, 25 to risk level 2, and 18 to risk level 3.

Neither LANL's Estimate Nor NNSA's Upper Bound Accurately Captures the Total Cost of the LANL Stand-Down

LANL estimates that the total cost of the stand-down is about $121 million, while NNSA's $370 million estimate represents an upper bound of stand-down costs.[6] However, because LANL did not track the actual time employees spent on stand-down activities, neither amount accurately captures the stand-down's total cost. In addition, we found that LANL's cost estimate understates the total cost of the stand-down because it does not include certain stand-down related costs, and NNSA officials stated that their estimate overstates stand-down costs because it treats the costs of many risk level 1 and 2 activities as stood down months after they had resumed operations.

[6]LANL's May 2005 estimate of total stand-down costs is $1.9 million higher than its original January 2005 estimate of $119 million because it includes an additional 4 months of activities. Similarly, NNSA's May 2005 estimate is $3 million higher costs than its February 2005 estimate of $367 million because of subsequent costs.

LANL Did Not Track the Actual Time Spent on Stand-Down Activities

In response to NNSA's July 30, 2004, directive to track stand-down costs, LANL's CFO developed a formula-based methodology to capture labor costs for each of the laboratory's approximately 375 organizational units—or cost centers—which used the following factors:

- the average daily labor costs, based on the total salaries and benefits paid to employees for a given week during the stand-down;
- the risk levels of the various activities performed within each cost center;
- the amount of time managers estimated their employees spent on activities at each risk level; and
- the amount of time activities at each risk level were stood down.

Table 1 shows a hypothetical example for a cost center with $10,000 in average daily labor costs and whose management estimated that staff spent 40 percent of their time working on risk level 1 activities, 50 percent on level 2 activities, and 10 percent on level 3 activities. If risk level 2 and 3 activities on a given day were stood down, but risk level 1 activities had resumed, the cost center's estimated stand-down costs for that day would be $6,000.

Table 1: Example of Results of LANL's Cost-Estimating Methodology Using a Hypothetical Cost Center with Average Daily Labor Costs of $10,000

Activity risk level	Percentage of work	Stand-down costs before any activities resumed	Stand-down costs after risk level 1 activities resumed	Stand-down costs after risk level 1 and 2 activities resumed
Risk level 1	40	$4,000	$0	$0
Risk level 2	50	5,000	5,000	0
Risk level 3	10	1,000	1,000	1,000
Total	**100**	**$10,000**	**$6,000**	**$1,000**

Source: GAO example using LANL's methodology.

Note: LANL's methodology excluded the costs of ongoing risk level 0 activities.

Beginning in August 2004, LANL's CFO provided LASO's manager with weekly stand-down cost estimates using this methodology. In November 2004, LASO's manager asked NNSA's Field CFO to validate LANL's costs.

NNSA Field CFO officials told us they could not validate LANL's stand-down costs because LANL management had estimated the amount of time employees spent on stand-down activities instead of tracking the actual time. NNSA officials also found a number of discrepancies in the data that LANL had used to develop its estimates and instructed LANL's CFO to re-estimate stand-down costs once adjustments were made. These include re-estimating the time spent on risk level 1, 2, and 3 activities within cost centers; ensuring the accuracy of resumption dates, excluding the costs of ongoing risk level 0 activities, and developing more accurate average daily labor rates. Although LANL made these adjustments and revised its cost estimate accordingly, NNSA Field CFO officials said they could not validate LANL's stand-down costs because LANL's formula-based methodology for estimating stand-down labor costs was unreliable. To more accurately account for stand-down costs, NNSA Field CFO officials requested in December 2004 that LANL employees revise their time charges to reflect time actually spent on stand-down activities, beginning October 1, 2004. LANL told NNSA that this task would require over 16,000 hours and cost approximately $1.6 million to complete, yet it most likely would not provide any more accurate costs than its cost estimation formula. NNSA did not pursue this further, but instructed LANL to set up activity codes in its accounting system to track stand-down charges, beginning in January 2005, which it did. The LANL CFO told us that setting up accounts was more feasible in January than it was at the beginning of the stand-down because most activities had resumed by then.

LANL's CFO said LANL decided to estimate time spent on stand-down activities prior to January 2005 because LANL's time and effort reporting system could not easily track the time that individual employees actually spent on stand-down activities, such as training or unit safety assessments. LANL's CFO stated that LANL's time and effort charge codes could not be easily modified to capture stand-down costs—for example, by adding a suffix to indicate that the work was stand-down related. According to LANL's CFO, over 4,000 new activity codes would have had to be created and employees would have had to be trained to report their stand-down time, activities that would have taken time away from LANL's primary focus of resuming safe and secure laboratory operations, as quickly as possible. Consequently, LANL decided that estimating costs would provide the best information to NNSA.

LANL's Estimate Is Inaccurate Because It Understates Total Stand-Down Costs

LANL's estimate of the total cost of the stand-down from July 2004 through May 2005 is $121 million. This total is composed of (1) $74 million in labor costs for LANL's research programs, including work directly related to ensuring the reliability of nuclear weapons and reducing the threat of nuclear proliferation, known as threat reduction; (2) $23 million in labor costs for support functions, including human resources and information management; and (3) $24 million for materials, subcontractor services, and other nonlabor costs.

However, LANL's estimate is inaccurate for the following reasons:

- Total stand-down costs should have included both the costs of LANL's research programs and the costs of activities that support these programs, such as laboratory direction and other administrative activities. LANL included the cost of support activities only for the time period that those activities were stood down. LANL did not include costs for resumed activities that provided support to other activities that had not yet resumed. As a result, LANL's cost estimate understates total stand-down costs.[7] If LANL had included support activities, its total cost estimate for the stand-down would have been about $155 million.

- In January 2005, LANL managers reevaluated their previous estimates of the percentage of time that their staff engaged in work at each risk level. Although LANL substituted these new percentages into its cost calculations in an effort to arrive at a more accurate stand-down cost estimate, it is not clear if these percentages are typical of the time employees would have spent on those activities had the laboratory not stood down. For example, LANL managers told us that while some scientists were unable to perform higher risk activities, they wrote papers, engaged in planning and unclassified activities, and worked on a backlog of lower risk projects that had previously been deferred because of higher priority higher risk work. While these lower risk activities are of value to the laboratory, staff may have devoted more time to them than usual, resulting in an overestimate of time spent on

[7]LANL managers said they would normally include all related support costs in calculating program costs for DOE or its other customers. However, in estimating stand-down costs, they considered only the cost of the time that activities were stood down because they believed that was what LASO had requested.

regular activities compared with stand-down activities. In this case LANL's estimate may understate stand-down costs.

- LANL's cost estimate did not take into account all of the time spent performing resumption activities. For example, the 15 members of the laboratory's resumption review board spent 4 or more months participating in the resumption process, but their time spent on this stand-down activity was not captured in LANL's estimate.

- LANL did not consider the different pay levels of employees. The result may have been higher or lower, depending on the salary level of the employees who either were most involved in resumption activities or could not resume normal activities.

NNSA's Field CFO Developed an Upper Bound for Stand-Down Costs Because It Could Not Validate LANL's Cost Estimate

NNSA Field CFO officials said that NNSA could not validate LANL's cost estimate because LANL did not establish unique cost accounts to separately identify time and effort associated with stand-down activities. According to NNSA Field CFO officials, the only cost figure that could be validated from the information LANL maintained was an upper bound, reflecting all recorded labor costs incurred by each of LANL's cost centers prior to each center's total resumption of activities. Using this approach to estimate labor costs, NNSA's Field CFO officials developed its $370-million upper bound cost estimate. NNSA Field CFO officials said that this methodology ensured that all stand-down labor costs were captured, even though they recognized that the costs of low-risk work performed by affected cost centers would be captured as well.

Table 2 shows how NNSA's methodology provides very different results from LANL's methodology shown in table 1. Using NNSA's methodology, the hypothetical cost center would incur a total cost of $10,000 each day until all three risk levels of activities were approved to resume.

Table 2: Example of Results of NNSA's Cost Estimating Methodology Using a Hypothetical Cost Center with Average Daily Labor Costs of $10,000

Activity risk level	Percentage of work	Stand-down costs before any activities resumed	Stand-down costs after risk level 1 activities resumed	Stand-down costs after risk level 1 and 2 activities resumed
Risk level 1	40	$4,000	$4,000	$4,000
Risk level 2	50	5,000	5,000	5,000
Risk level 3	10	1,000	1,000	1,000
Total	**100**	**$10,000**	**$10,000**	**$10,000**

Source: GAO example using NNSA's methodology.

Note: NNSA's methodology treated the costs of ongoing risk level 0 activities as stand-down costs and included them in its risk level 1, 2, and 3 estimates.

NNSA Field CFO officials stated their estimate overstates actual stand-down costs because they calculated stand-down costs on an "all up" or "all down" basis, even though many LANL employees resumed risk level 1 activities while risk level 2 and 3 activities continued to be suspended.[8] In addition, the NNSA Field CFO decided to include in its estimate the costs of ongoing risk level 0 activities—which were not stood down because they were determined to be either mission-critical or necessary to maintain the safety and security of the laboratory—even though they were undergoing required risk level 1, 2, or 3 safety and security reviews.

Table 3 shows the difference in LANL's cost estimate and NNSA's upper bound estimate. In particular, LANL included only the cost of support activities for the time period that those activities were stood down and not their costs after they resumed and were providing support to program activities that were stood down. In contrast, NNSA fully allocated support

[8]According to NNSA Field CFO personnel, in early February 2005, they proposed to interview LANL managers and obtain supporting information to document the amount of work ongoing at each risk level prior to full resumption. However, this effort was curtailed when LANL management delayed the interviews and indicated its preference that laboratory managers devote their time and efforts on resumption activities.

costs to program stand-down costs to ensure that the total costs of the stand-down to NNSA and LANL's other program sponsors were captured.[9]

Table 3: Comparison of the Impact of LANL's and NNSA's Treatment of Support Costs on Cost Estimates

Dollars in millions

Cost category	LANL's cost estimate	NNSA's upper bound cost estimate
Labor support costs	$23	$0[a]
Labor program costs	74	196
Nonlabor costs	24	20
Allocated support costs	0	154
Total	**$121**	**$370**

Source: GAO calculation based on NNSA's and LANL's data.

Note: LANL's estimate includes labor support costs only for the time period those activities were stood down. In contrast, NNSA's upper bound fully allocated support costs to program stand-down costs, using LANL's fiscal year 2004 and fiscal year 2005 support-cost multipliers.

[a]NNSA included labor support costs in its "allocated support costs" category.

Neither LANL's Nor NNSA's Estimates Include Other Stand-Down Related Costs

In addition to costs incurred at LANL during the stand-down that were captured in LANL's estimate and NNSA's upper bound estimate, there are subsequent costs incurred that were not captured. Specifically, neither the LANL estimate nor the NNSA estimate includes related costs for (1) additional actions that LANL is taking to address 3,047 safety and security problems identified as a result of the stand-down that units were allowed to address after resumption and (2) unknown future costs of program delays or additional work that may need to be performed to keep program milestones on track. In response, NNSA officials stated their upper bound sufficiently overstated actual stand-down costs that it could also include stand-down related future costs. Nevertheless, we cannot determine the

[9]To allocate support costs to the stand-down costs of LANL programs, NNSA used a support-cost multiplier of 1.83 for labor costs and 1.42 for other direct costs for fiscal year 2004 and a support-cost multiplier of 1.85 for labor costs and 1.37 for other direct costs for fiscal year 2005. For example for fiscal year 2004, $100 in program labor costs would be $183 when support costs are fully allocated and $100 in other direct program costs would be $142 when support costs are fully allocated. LANL's annual support-cost multipliers equal the total costs of its support activities divided by total program costs.

total stand-down cost because LANL did not separately track actual costs during the stand-down and did not include these additional related costs.

Although the Stand-Down Delayed Many Mission-Critical Programs, Almost All Have Recovered According to LANL and NNSA Program Managers

Of the mission-critical programs whose activities were delayed by the stand-down, LANL's family of nuclear weapons programs was most affected; however, LANL and NNSA officials said almost all of these programs had recovered by the end of fiscal year 2005, and they expect these programs to achieve their major delivery dates. In addition, LANL's stand-down affected nuclear weapons programs at other NNSA facilities. The stand-down also affected threat reduction programs and other LANL activities, but unrelated issues, such as the earlier stand-down of some operations at LANL's Critical Experiments Facility and that facility's failure to resume almost all criticality experiments, also contributed to schedule delays.

While the Stand-Down Primarily Affected Nuclear Weapons Activities, Almost All Major Delivery Dates Have Been Maintained

Nuclear weapons activities, central to LANL's mission, represent the majority of programmatic costs at the laboratory and were affected by the stand-down more than other families of laboratory programs because of the longer stand-down time associated with these high-risk activities and the more critical nature of project deadlines. LANL's primary mission is to help ensure the safety and reliability of nuclear weapons in the nation's stockpile. It is responsible for the design, evaluation, and annual assessment and certification of the W76, W78, and W88 nuclear warheads and the B61 nuclear bomb in the U.S. nuclear weapons stockpile and works in cooperation with NNSA's other nuclear weapons design laboratories and production plants.[10] Because the United States stopped conducting underground nuclear weapons tests in 1992, LANL weapons scientists are involved in hundreds of research projects in programs aimed at developing strong physics modeling and predictive capabilities that provide information about nuclear weapons' performance. In fiscal year 2004, LANL's total operating costs were about $2 billion. Of this total, about $1.3 billion, or 65 percent, was spent on nuclear weapons activities and

[10]NNSA's other facilities are Lawrence Livermore National Laboratory in Livermore, California; Sandia National Laboratories in Albuquerque, New Mexico, and Livermore, California; the Pantex Plant in Amarillo, Texas; the Y-12 Plant in Oak Ridge, Tennessee; the Kansas City Plant in Kansas City, Missouri; parts of the Savannah River site in Aiken, South Carolina; and the Nevada Test Site near Las Vegas, Nevada.

associated facilities operations, excluding work sponsored by other federal agencies.

Those nuclear weapons program activities LANL categorized as risk level 3 were stood down longer than risk level 1 and 2 activities at the laboratory. These high-risk activities include the use of special nuclear materials, high explosives, and hazardous chemicals in facilities that require rigorous safety and security measures to protect employees from potential safety hazards and materials and information from unauthorized access. Of the 26 LANL cost centers that did not resume full operations until after January 28, 2005, 18 were related to nuclear weapons program activities.

Unlike LANL's threat reduction programs and strategic research programs, which have fewer key delivery dates, most of LANL's nuclear weapons programs and activities are incorporated into formal project schedules with many milestones that are tracked and reported up to LANL and NNSA management. These milestones take into account laboratory resource availability, production plant availability, and the requirements of DOD and other LANL customers. When milestones are missed, realigning them is an intensive effort that requires NNSA and sometimes DOD consultation.

Although many mission-critical nuclear weapons activities at LANL were affected by the stand-down, LANL and NNSA officials report that the major delivery dates for almost all of these activities have been maintained. To maintain these delivery dates, LANL officials and managers engaged in recovery planning during the stand-down by (1) applying for risk level 0 exceptions to continue operation of key time-critical activities, (2) reordering schedules to prioritize key tests and experiments, (3) working around the stand-down by sending LANL staff to Sandia and other NNSA facilities, and (4) prioritizing the resumption of facilities central to LANL's most essential nuclear weapons programs. However, to mitigate stand-down effects and achieve major delivery dates, NNSA and LANL officials said programs eliminated some less vital tests, reduced the scope of some design options, reduced time available for scientists and engineers to analyze test data, and lost schedule contingency—assuming more risk to the achievement of major delivery dates if tests provided unexpected results. NNSA and LANL officials said that, under the revised program schedules, it will be difficult to facilitate design changes or perform any additional testing without affecting major nuclear weapons program delivery dates if test data reveal anomalies. LANL officials said that, to date, test results have confirmed predictive models and, thus far, have not

indicated that nuclear weapons programs' schedules will bear additional risk.

Table 4 shows the effects of the stand-down on many of LANL's nuclear weapons activities reported to us by LANL, NNSA, and DOD officials. (See app. III for detailed discussions of these activities and actions taken during the stand-down to mitigate its effects.) Effects include shifting dates of critical tests to support LANL's W76 life extension program; eliminating the time available to scientists and engineers for test data analysis; increased risk that manufacturing schedules will not be met; $4 million in additional future poststand-down compliance costs for repairs to a key testing facility; and delayed implementation of a methodology that aids weapons designers in understanding the confidence they have in their models' abilities to predict weapons' capabilities.

Table 4: The Stand-Down's Effects on LANL's Nuclear Weapons Activities

Program	Program description	Stand-down effects
W76-1 Life Extension Program	This program is an effort to refurbish the Navy's W76 warhead through a significant design modification that will extend its service life. The first refurbished warhead is scheduled for production by September 2007.	Key tests were completed during the stand-down under risk level 0 exceptions and some test work-arounds were developed to support a successful final design review in May 2005, 3 months late. Officials have said the September 2007 production milestone will be met, though the stand-down increased the risk to schedule achievement.
W88 Pit Manufacturing and Certification Activities[a]	LANL is working to manufacture and certify pits for the Navy's W88 warhead. By the end of fiscal year 2007, LANL will (1) deliver the first certified W88 pit since 1989 and (2) establish a manufacturing capability to produce between 10 and 20 certified W88 pits per year.	To meet its 2007 deadlines, LANL has significantly reduced contingency time in its schedule and increased the risk that the schedule can be achieved because of one delayed experiment and the need to push fiscal year 2004 work into fiscal year 2005.
B61 ALT 357 Program	This program is an effort to refurbish two modifications of the Air Force's B61 gravity bomb. The program transitioned into production in 2003; and at the time of the stand-down, LANL was building test units. The first refurbished bomb for each modification is scheduled for production by June 2006 and January 2007.	LANL delayed several key tests and reduced the time available for test data analysis. Testing has resulted in design changes, which officials said could be more difficult to facilitate without delaying delivery dates because of the stand-down. However, officials said the delivery dates have been maintained.

(Continued From Previous Page)

Program	Program description	Stand-down effects
Repairs to the Second Axis of the Dual Axis Radiographic Hydrodynamic Test (DARHT) Facility and Facility Commissioning[b]	LANL is repairing the second axis of DARHT to fix a high voltage breakdown problem. Prior to the stand-down, LANL was scheduled to finish the repairs and commission the facility in September 2007. During the stand-down, LANL revised its schedule for commissioning to January 2008.	LANL was unable to resume work on DARHT repairs until almost 2 months later than planned, and now plans to commission the facility in March 2008, 6 months later than originally planned. LANL's test schedule will not be affected if the second axis is commissioned by that time.
Hydrotesting Program[c]	NNSA updates its 5-year National Hydrotest Plan annually, and LANL's capabilities are used to implement it. LANL performs hydrotests to support the W76-1 Life Extension Program, W88 activities, and emergency response.	LANL had six hydrotests scheduled during the stand-down, five of which were to support the W76-1 Life Extension Program. LANL shifted its schedule to prioritize tests that were key to maintaining the W76-1 schedule. Some tests were rescheduled from fiscal year 2005 to 2006.
Experimental Programs	LANL's Experimental Programs span its stockpile stewardship activities, and data from these programs serve as a check of the accuracy of the laboratory's weapons models and simulations.	A number of experimental milestones were delayed as a result of the stand-down. However, LANL prioritized the experiments most critical to meeting programs' major production and delivery dates. Some experimental activities have shifted from fiscal year 2005 to 2006.
Simulation and Implementation of the Quantification of Margins and Uncertainties (QMU) Methodology	LANL's Simulation activities focus on integrating experimental and computational data into models used to predict weapons' characteristics and to support stockpile stewardship. The QMU methodology is a means of quantifying the uncertainty in these models and simulations.	Simulation activities were stood down for 2 months, and some fiscal year 2004 work was completed in fiscal year 2005. To meet near-term delivery dates, longer-term work schedules, including QMU implementation, were put at greater risk.

Sources: NNSA and LANL.

[a]Modern nuclear weapons have a primary stage that is the initial source of energy and a secondary stage that is driven by the primary and provides additional explosive energy.

[b]The DARHT Facility provides LANL with the capability to capture X-ray images of nuclear weapons using mock materials during their implosion. The facility is comprised of two buildings, or axes, each of which houses an accelerator to produce X-rays. The first axis became operational in 1999, while the second axis is scheduled to be commissioned in March 2008.

[c]Nonnuclear hydrotests are high-explosives driven experiments used to study what happens to a weapon's pit when it implodes. The DARHT facility uses X-ray imaging and other techniques to provide test data for evaluating weapons models and simulations.

Nuclear Weapons Activities at Other Laboratories

Nuclear weapons activities at other laboratories were also affected by the LANL stand-down to different extents. Many of LANL's nuclear weapons programs either require cooperation and coordination with other NNSA laboratories and production plants or provide support to programs that are primarily the responsibility of other facilities. Table 5 summarizes information provided by agency officials and contractors on several of

these affected programs (see app. III for detailed discussions of these activities and actions taken during the stand-down to mitigate its effects).

Table 5: The LANL Stand-Down's Effects on Related Nuclear Weapons Activities at Other NNSA Facilities

Program	Program description	Stand-down effects
Neutron Generator Fabrication Activities at Sandia[a]	Sandia builds neutron generators, and LANL supplies Sandia with neutron tube targets, a key subcomponent.	Because LANL could neither produce nor ship targets during the stand-down, Sandia was unable to fabricate 300 generators at a cost of $75,000 each. Without any additional staff resources, this delay may affect Sandia's ability to meet a major 2009 delivery date.
W80 Detonator Surveillance Activities at Lawrence Livermore[b]	LANL was scheduled to transfer responsibility for W80 detonator surveillance to Lawrence Livermore by October 1, 2004. This required shipping detonators as well as historical surveillance data, stored on CREM.	LANL was unable to ship detonators or data during the stand-down, likely delaying Lawrence Livermore's schedule for completing W80 detonator surveillance by 1 year. LANL did make shipments in June and August 2005.
Seamless Safety for the 21st Century Program at Pantex[c]	Pantex is implementing programs for LANL's B61 and W88 pit activities. At the time of the stand-down, Pantex was working with LANL to complete final hazardous analyses for these programs.	Primarily because information stored on CREM could not be accessed during the stand-down, Pantex was delayed in developing final hazardous analyses by about 3 months for the W88 and about 6 months for the B61.

Sources: LANL and NNSA.

[a]Neutron generators are components in all nuclear weapons that must be exchanged on a regular basis because of their limited life.

[b]The W80 is a cruise missile warhead. Its detonator system sets off the explosives that act upon a nuclear weapon's primary stage. Surveillance is performed annually to determine whether any design anomalies have developed as the weapon ages.

[c]This nuclear-complex wide program enhances worker and environmental safety in the assembly, disassembly, and testing processes for nuclear weapons. The program requires an exchange of information between the design laboratories and production plants to determine potential hazards. Data are exchanged using CREM.

The Stand-Down Also Affected Threat Reduction and Other Programs at LANL, but the Extent of Its Impact Is Unclear Because of Unrelated Factors

LANL's family of threat reduction programs was also affected by the stand-down, in some cases, facing schedule delays and elevated risks similar to those faced by the laboratory's nuclear weapons programs; however, many threat reduction programs continued operations during the stand-down because they received risk level 0 exceptions.[11] Threat reduction programs that were stood-down had almost all resumed by the end of September 2004, except for risk level 3 activities involving LANL's Critical Experiments Facility (TA-18), which was stood down for security and safety concerns on July 9, 2004—1 week prior to the laboratory-wide stand-down—and which, to date, has not resumed operations. Many of LANL's threat reduction programs rely on TA-18, and LANL officials have said that its near-simultaneous stand-down makes it difficult to attribute schedule delays to the laboratory-wide stand-down, as opposed to the TA-18 stand-down (see app. IV for a discussion of the TA-18 stand-down).

Table 6 describes LANL's major threat reduction programs with schedules affected by the stand-down, as reported to us by LANL, NNSA, and DOD officials. (See app. V for detailed discussions of these activities and actions taken during the stand-down to mitigate its effects.) Effects include $14 million in costs incurred because of a delay to one program, delays in testing of radiation detection monitors for borders, and a missed nuclear materials training course for international inspectors.

[11]These programs include projects funded by NNSA, DOD, the Department of Homeland Security, the National Institutes of Health, and the Centers for Disease Control and Prevention to reduce the threat of weapons of mass destruction, proliferation, and terrorism. In addition, the National Aeronautics and Space Administration sponsors work through LANL's Center for Space Exploration.

Table 6: The LANL Stand-Down's Effects on Threat Reduction Activities

Program	Program description	Stand-down effects
Off-Site Source Recovery Program	This NNSA program recovers excess and unwanted radiological sources from medical and commercial facilities to reduce the risk that they might be used in a dirty bomb. LANL processes or secures these sources for storage.	LANL could not receive shipments or process sources during the stand-down, and LANL's off-site source recovery activities fully resumed in January 2005. However, officials report that fiscal year 2004 and 2005 program benchmarks were met.
Fabrication of Nuclear Explosion Monitoring Sensor Packages for Air Force Global Positioning System (GPS) Satellites	LANL fabricates suites of nuclear explosion monitoring sensors for a new constellation of GPS satellites. During the stand-down, the Air Force became aware of an industry-wide part recall affecting a part LANL uses in its sensors.	Officials said the sensor fabrication program was delayed 4 months because of the stand-down. The Air Force was precluded from communicating about the part recall with LANL during the stand-down, contributing to this delay.
Design Work and Process Testing for the Pit Disassembly and Conversion Facility	This facility is currently in design for construction at Savannah River. LANL's role in the project is primarily design work and a full-scale demonstration of many of the facility's processes.	NNSA estimates that delays from the stand-down cost the project $14 million and delayed the start of the demonstration by as much as 18 months.
Testing of Radiation Detection Portal Monitors for Borders	At the time of the stand-down, LANL was involved in testing of radiation detection portal monitors to be deployed at borders to enhance homeland security. Testing was to occur at TA-18.	Testing was delayed for over 5 months, but it did occur at TA-18. It is unclear whether testing activities would have resumed more quickly had TA-18 operations fully resumed with the laboratory.
Plutonium (Pu-238) Heat Sources Fabrication	LANL manufactures small heat sources using Pu-238, a nonfissile plutonium isotope. These heaters are used by NASA to keep spacecraft's electronics packages warm during deep space missions. At the program's inception, LANL planned to fabricate 72 Pu-238 heaters, but a 2003 safety incident reduced the scope of the program to the fabrication of 36 Pu-238 heaters.	The stand-down further reduced the scope of the program to the fabrication of 23 Pu-238 heaters, and NASA agreed to make up the difference with leftover heaters from a previous mission. Some additional risk has been accepted as these leftover heaters have decayed more than the newly fabricated heaters would have. LANL shipped 21 new heaters to NASA in January 2005.
Emergency Response Hydrotest	LANL had scheduled a hydrotest in July 2004 to support emergency response operations.	Because of the stand-down, the test was not performed until August 2005, with the agreement of the test sponsor.
Nondestructive Assay Training for the International Atomic Energy Agency (IAEA)	LANL hosts IAEA inspectors twice per year for training in the identification of radioactive materials using nondestructive means.	As a result of the stand-down, one training session was cancelled. Some IAEA inspectors were fielded without the training.

Sources: LANL and NNSA.

At the outset of the stand-down, LANL management recognized that many threat reduction activities were crucial laboratory functions—such as country-specific nonproliferation assistance and emergency response

training—and gave them risk level 0 exceptions to continue operations throughout the stand-down's duration. Examples follow:

- LANL was permitted to ship a mixed-oxide fuel test assembly to France in support of a nuclear materials disposition project that LANL officials reported would otherwise have faced several years delay and an additional $1 billion in costs.

- Emergency response training for the Federal Bureau of Investigation and the DOE/DOD Joint Tactical Operations Team, which responds to domestic nuclear incidents, was permitted to continue in TA-18 during the stand-down, as resources permitted.

- Activities to move special nuclear materials out of TA-18 continued during the stand-down.

- DOE's Proliferation Information Network System, housed at LANL, was made available during the stand-down to other DOE facilities to facilitate their reviews of export license applications.

- A LANL employee was permitted to stay in Greece to complete the process of calibrating radiation detection monitors in advance of the 2004 Summer Olympics in Athens.

- LANL experts were allowed to travel to countries such as Libya and Turkey for in-country support.

- Throughout nearly all of the stand-down, LANL continued to support specific counterintelligence activity.

- LANL employees were able to staff and provide equipment for designated national security special events.

Beyond the laboratory's nuclear weapons and threat reduction activities, many LANL scientists focus their efforts on Strategic Research Programs, including chemical, environmental, and energy research. These programs were minimally affected by the stand-down, because many are managed by individual scientists and often are not driven by schedules with critical deadlines. All of LANL's Strategic Research Programs were approved to resume risk level 2 operations after the stand-down by the end of September 2004 and risk level 3 operations by the end of October 2004.

The Strategic Research activity most affected by the stand-down was use of the laboratory's National High Magnetic Field Laboratory, a user facility jointly supported by NNSA and the National Science Foundation, to which researchers from around the world travel to use the laboratory's high-strength magnets. At the time of the stand-down several groups of researchers, some from foreign universities, were flown home by LANL. Ultimately, LANL officials calculate that the stand-down resulted in the loss to users of at least 135 magnet days—the number of magnets multiplied by the days they were unavailable. In addition, the stand-down delayed design work and procurement for a new magnet, the largest magnet in the world, which is now expected to be completed 2 months late in September 2006.

The Basis for NNSA's Decision to Reimburse Almost All Stand-Down Costs Appears to Be Reasonable; Opportunities Exist to Strengthen NNSA's Oversight of LANL Management

The basis for the LASO manager's determination in April 2005 that almost all of the stand-down costs were allowable appears to be reasonable because (1) the LANL management and operating contract authorizes stand-downs to address serious safety and security concerns, such as those that existed at LANL; (2) NNSA's Field CFO found that almost all stand-down costs were consistent with the allowability and safety provisions of the contract; (3) LASO personnel were substantially involved in LANL's stand-down and restart activities and participated in all key decisions; and (4) LASO concluded that the duration of the stand-down was reasonable. LASO has questioned the allowability of $14.3 million in stand-down costs, but this issue has not yet been resolved, and negotiations between the University of California and NNSA are continuing. Given the scope of safety and security issues identified during the stand-down, the new management and operating contract to be awarded in December 2005 offers an opportunity to more comprehensively address safety and security at LANL over the long term.

The Basis for NNSA's Decision to Reimburse Almost All Stand-Down Costs Appears to Be Reasonable

LANL's contract authorizes stand-downs to address serious safety and security concerns, such as those that existed at LANL. As LANL's management and operating contractor, the University of California is subject to a number of DOE directives—listed in appendix G of the contract—that relate to the requirement to manage and operate the laboratory safely, securely, and in accordance with all applicable statutes and regulations. LANL reports that these directives encourage and require the University of California to take whatever steps it reasonably believes are necessary to ensure compliance, including standing down the laboratory. While NNSA initially questioned LANL's authority to order a stand-down, it subsequently determined that—given the nature of the safety and security incidents at the laboratory—prudent operation of the facility can include a decision by laboratory management to suspend operations until they are deemed safe and secure.[12]

LANL had experienced several serious safety incidents prior to the stand-down—and its data indicated declining safety performance since fiscal year 2002—contributing to the LANL director's decision to stand-down the laboratory. (See table 7.) LASO's manager, who arrived at Los Alamos in April 2004, said the safety culture at the laboratory was much less rigorous than at other DOE facilities. The manager said he had discussed approaches with LANL management for addressing issues associated, such as implementing a series of limited stand-downs at individual laboratory facilities focused on safety improvements, but no course of action was agreed upon prior to the July 2004 laboratory-wide stand-down.

[12]Clause G.001(e) of the LANL contract states that DOE and the University of California recognize that in performing the contract an appropriate balance must exist between the conduct of world-class scientific and technical research and the conduct of activities necessary for the prudent operation of the facility, the management of the workforce, and the safe conduct of research.

Table 7: Safety Incidents Preceding the LANL Director's Stand-Down Decision

Type of incident	Date	Description
Fire/explosion	April 2003	Chemist received first-degree burns when a chemical reaction caused the contents in a Petri dish to flash.
Slips and falls	April 2003	Pipe cutter fractured a leg when he fell from a ladder.
Hazardous-substance exposure	July 2003	Employee received eye injury resulting from an acid splash.
Radiation exposure	August 2003	Two employees were contaminated with plutonium while conducting a routine inventory.
Electrical	September 2003	Subcontractor employees were nearly killed or seriously injured accessing an electrical cabinet.
Hazardous substance exposure	September 2003	Five workers were exposed to toxic vapors.
Personnel contamination	March 2004	Employee detected contamination on face because the hood sash was open.
Radiation exposure	March 2004	Technicians received a low neutron dose during maintenance work.
Electrical	March 2004	Workers were nearly killed when a mobile crane struck an overhead electrical line.
Electrical	June 2004	Student received an electrical shock while testing cables.
Laser burn	July 2004	Student received a permanent eye injury while conducting laser experiment.

Source: LANL.

NNSA's Field CFO found that almost all stand-down costs were consistent with the allowability and safety provisions of the contract. Under the contract and applicable regulations, a cost is allowable if it is reasonable, allocable, and complies with the contract terms as well as applicable accounting standards and regulations.[13] In November 2004, LANL's legal counsel analyzed each of these factors, as well as safety requirements of the contract, and concluded that almost all stand-down costs were

[13]Clause H.026(c) of the LANL contract requires that cost allowability be determined based on (1) the Federal Acquisition Regulation Subpart 31.2, which specifies various contract cost principles, including the determination of allowability (48 C.F.R. § 31.201-2), and (2) DOE's Acquisition Regulation Subpart 970.31, which addresses other applicable procedures or principles.

reasonable.[14] NNSA's Field CFO's review of stand-down costs appears also to have considered the allowability and safety provisions of the contract. In addition, Field CFO officials examined LANL's cost estimating and reporting methodology—including reviewing and tracing actual labor costs recorded in LANL's accounting system—and interviewed key LANL personnel. On the basis of this review, NNSA's Field CFO determined that almost all stand-down costs appeared to be of the nature and type that would normally be considered allowable under the terms and conditions of the contract, including tasks where laboratory personnel were engaged in analyzing the safety, security, and environmental risks inherent in their jobs and in determining how to ensure that all LANL programs complied with the applicable regulatory criteria.

LASO personnel were substantially involved in LANL's stand-down and restart activities and participated in all key decisions. On July 15, 2004, LANL's director notified the NNSA Administrator and LASO's manager of his intent to institute a laboratory-wide stand-down. Both the Deputy Administrator of NNSA and the LASO manager have said they agreed with the LANL director's decision to stand down the entire laboratory to address safety and security concerns. On July 17, 2004, senior management from both LANL and LASO met to begin planning necessary resumption actions, and schedules for restart activities were later developed in conjunction with NNSA personnel. During the stand-down, LASO and LANL personnel worked closely together to identify key actions that had to be taken before an activity could resume operations and to verify their completion. LASO's manager approved all risk level 2 and 3 restart decisions. Because of LASO's involvement and its July 30, 2004, letter advising LANL that stand-down costs would be subject to the allowability provisions of the contract, LASO was in a position during the stand-down to know and instruct LANL as to what was and was not a proper cost.

According to NNSA's Field CFO, the stand-down's duration affects the reasonableness and allowability of stand-down costs. In an April 6, 2005, memorandum to NNSA's Administrator, the LASO manager concluded that

[14]In addition to clauses G.001(e) and H.026(c) of the LANL contract, LANL's counsel cited clause I.074(b), which directs that the contractor perform work safely and adequately ensure the protection of employees, the public, and the environment, and shall be accountable for the safe performance of work. LANL's counsel also cited appendix E, section 3.2 of the Statement of Work, which requires that the contractor conduct a laboratory integrated safety management program.

the duration of the stand-down and resumption efforts was reasonable and was likely noteworthy for its efficiency.

On April 8, 2005, LASO's manager issued a notice of intent to disallow $14.3 million in stand-down costs to the University of California. These costs included (1) $6.3 million in small subcontractor claims and other incremental costs and (2) $8 million in personnel costs for the first 2 days of the stand-down. These issues have not yet been resolved, and negotiations between the University of California and NNSA are continuing.

The New LANL Contract Provides Opportunities for Improving Safety and Security

LANL officials told us that LANL's safety and security problems are not the result of insufficient regulations or LANL employees' lack of familiarity with expected procedures, but instead reflect a long-standing attitude that the safety precautions employees are expected to take in carrying out often hazardous experiments are too cumbersome and really not necessary. For example, according to a 2001 report to LANL management, laboratory employees believed that excessive laboratory safety, security, and environmental protection requirements were an obstacle to their scientific accomplishment.[15] More recently, the LASO manager cited a culture of noncompliance at LANL and said the laboratory was 10 years behind other DOE facilities in implementing safety practices in performing work. Since the stand-down began, LANL has reported at least three serious safety incidents in which procedures were not followed. For example, in March 2005, several LANL employees were exposed to airborne radiological contaminants when they removed their safety equipment in a contaminated environment. Also, in June 2005, two employees accidentally inhaled fumes while mixing acids, but one failed to report the incident to management for 7 weeks, despite being hospitalized.

[15]The Final Report of the Task Force to Enhance Experimental Science at Los Alamos National Laboratory, (Feb. 14, 2001).

NNSA has proposed a 7-year contract for LANL's new management and operating contract for award in December 2005. NNSA's request for proposals allows those parties bidding on the contract to propose a maximum annual fee between $53.4 million and $79.7 million, which will be incorporated into the final contract. Thirty percent of this fee will be fixed, and 70 percent will be earned based on performance. The request for proposals also provides an opportunity for the new contractor to extend the length of the contract up to 13 years for a total of 20 years. According to NNSA officials, NNSA's Administrator may award an additional year to the contract if, for a given year, the contractor achieves (1) an award-fee performance score of at least 85 percent, based on predetermined performance evaluation criteria, and then (2) performance standards for additional award-term criteria.[16]

The proposed LANL contract does not require that the contractor achieve an overall rating of outstanding to be eligible to earn an extension to the contract's term. In contrast, the management and operating contract for Sandia National Laboratories, signed in fiscal year 2004, established a higher performance score for the contractor to earn up to 5 additional years on its 5-year contract. Specifically, to be eligible to earn a 1-year contract extension, Sandia's contractor needs to achieve an overall performance rating of at least 90 percent, considered "outstanding," during the fiscal year. Sandia's contractor also needs to achieve cost savings sufficient to fund completion of projects that had been approved but did not receive full funding.

Conclusions

The July 2004 LANL stand-down disrupted programmatic activity across the laboratory, in some areas for as long as 10 months. While this stand-down was particularly extensive, a number of other DOE laboratories and production plants have also stood down facilities in recent years. Because these stand-downs occur, DOE and the Congress need to be in a position to understand their impacts, including their costs. Without the ability to track costs, it is difficult for DOE to hold management and operating contractors accountable and to make determinations regarding the allowability of stand-down costs.

[16]The contractor becomes eligible for contract extension beginning in the second year of the contract.

NNSA officials have stated that a root cause of the July 2004 stand-down at LANL is a laboratory culture that does not prioritize safety and security in its daily operations. Despite LANL management's new emphasis on safety, LANL has reported at least three serious incidents where procedures were not followed. For example, in one incident an employee who had accidentally inhaled fumes while mixing acids waited 7 weeks before reporting the incident, despite being hospitalized. DOE has the opportunity to address problems with its laboratories' safety cultures when negotiating new management and operating contracts by holding contractors to the highest performance standards as the basis for awarding fees and additional contract years.

Recommendations for Executive Action

To improve DOE's oversight of its management and operating contractors, we recommend that the Secretary of Energy require that all contractors take the following two actions:

- establish activity codes within their accounting systems so that the costs of any future stand-downs can be tracked on an actual cost basis and
- include associated support costs when reporting on stand-down costs.

In addition, to improve management and operating contractors' accountability, we recommend that the Secretary of Energy require that contractors achieve an overall performance rating of outstanding to be eligible to earn extra years to their contract terms.

Agency Comments

We provided DOE with a draft of this report for its review and comment. In written comments, DOE generally agreed with our recommendations. (See app. VI.) DOE also clarified the new LANL contract's criteria for the contractor to earn extra years to the contract term, which we incorporated. In addition, DOE provided comments to improve the report's technical accuracy, which we have incorporated as appropriate.

Scope and Methodology

To assess the extent to which LANL's and NNSA's estimates capture the total cost of the LANL stand-down, we examined the methodologies each used to determine stand-down costs and interviewed senior officials in the financial management offices of LANL and NNSA. We were briefed by

LANL's CFO and NNSA's Field CFO officials on the methods each used to calculate stand-down costs. In addition, we discussed the parameters of LANL's accounting system and of the information LANL collected to develop its cost estimate. To better understand both LANL's and NNSA's methodologies for calculating labor costs, we reviewed data on activities' resumption dates by risk levels, daily cost calculations, and support cost rates. We also reviewed correspondence from LASO and NNSA Field CFO officials to LANL regarding cost tracking, correspondence describing LANL's and NNSA's methodologies, and NNSA's February 22, 2005, report to LASO on Los Alamos Stand-Down Costs. To understand what activities LANL staff engaged in during the stand-down, we interviewed LANL scientists, managers, and administrative staff.

To compile information about the costs of the DOE-wide CREM stand-down to DOE facilities, we obtained cost data and estimates from points of contact identified by DOE and NNSA at affected facilities and offices. Because DOE did not require facilities and offices to track their CREM stand-down costs, cost tracking methodologies differed. We are reporting this data as it was provided to us because the DOE facilities and program offices used different methods to develop reported costs.

To assess the status of LANL's major research programs affected by the stand-down, we reviewed LANL's fiscal year 2004 budget expenditures to determine its largest activities and asked NNSA and LANL officials to identify programs they considered most vital for achieving LANL's mission. For these programs, we reviewed program milestone documentation provided by both LANL and NNSA and interviewed NNSA program officials and senior LANL scientists and managers to identify schedule modifications caused by the stand-down. In addition, we interviewed officials from the Defense Nuclear Facilities Safety Board to obtain their perspective on the safety of the laboratory's nuclear facilities and officials from DOD, LANL's primary end user, to confirm information about nuclear weapons programs' schedules and performance requirements.

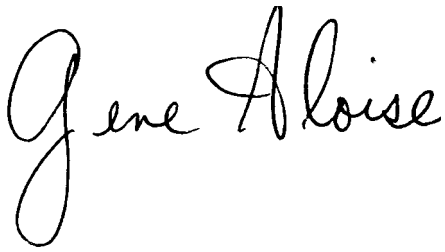
To assess whether NNSA's decisions regarding the reimbursement of stand-down costs were reasonable, we reviewed LASO and University of California documents outlining decisions related to allowing reimbursement and interviewed the LASO manager, contracting officers, general counsel, and other NNSA officials. To determine the LANL director's authority to direct the stand-down, we analyzed pertinent provisions of DOE's contract with the University of California, and relevant NNSA and LANL documentation. We discussed with the LANL director and

LASO manager events leading to the stand-down, NNSA's involvement in the stand-down decision, and LASO's involvement in the resumption process. We considered testimony and statements made by senior NNSA officials and the Defense Nuclear Facilities Safety Board. To determine what incentives DOE can provide to improve LANL's management and operating contractor's performance, with regard to safety and security, we reviewed DOE's request for proposals for the upcoming award of LANL's management and operating contract and the current management and operating contracts for Sandia National Laboratories and Lawrence Berkeley National Laboratory.

As agreed with your office, unless you publicly announce the contents of this report, we plan no further distribution until 30 days from the date of this letter. At that time, we will send copies of this report to appropriate congressional committees; the Secretary of Energy; the Administrator, NNSA; the Secretary of Defense; the Director of the Office of Management and Budget; and other interested parties. We will also make copies available to others upon request. In addition, the report will be available at no charge on the GAO Web site at http://www.gao.gov.

If you or your staff have any questions about this report, please contact me at (202) 512-3841 or aloisee@gao.gov. Contact points for our offices of Congressional Relations and Public Affairs may be found on the last page of this report. Key contributors to this report were Richard Cheston, Carol Kolarik, Allison Bawden, Doreen Eng, Nancy Crothers, and Julian Klazkin.

Sincerely yours,



Gene Aloise
Director, Natural Resources
and Environment

The Estimated Cost of the DOE-Wide Stand-Down for Accountable Classified Removable Electronic Media

On July 23, 2004, the Deputy Secretary of Energy instructed Department of Energy (DOE) facilities and program offices to conduct a stand-down of all classified operations involving accountable classified removable electronic media (CREM) until they completed inventories of all accountable CREM material and ensured that it was properly safeguarded.[1] As shown in table 8, affected DOE and National Nuclear Security Administration (NNSA) offices and facilities reported that they incurred $13.2 million in response to the DOE-wide stand-down.[2] While a few sites said they had tracked stand-down costs, most provided us with estimated costs. As a result, we could not verify the completeness or accuracy of these reported costs. In addition, DOE and NNSA headquarters offices and some DOE field offices responded that time spent on stand-down activities was either minimal or part of their normal responsibilities, and therefore they had no incremental costs. Officials from these offices and facilities said they incurred stand-down costs primarily for completing inventories of accountable CREM items, entering accountable CREM into inventory tracking systems, destroying unused accountable CREM, developing procedures for handling accountable CREM, and training employees.

[1]Accountable CREM is any CREM that contains information classified as secret restricted data, top secret, or specially sensitive information.

[2]This total excludes the CREM stand-down costs of Los Alamos National Laboratory (LANL) because they could not be isolated from LANL's laboratory-wide safety and security stand-down cost estimate.

Table 8: Estimated Cost of the DOE-Wide Stand-Down for Accountable CREM

DOE office or facility	DOE program office	Reported stand-down costs
DOE headquarters offices	Not applicable	$0
NNSA headquarters offices	NNSA	0
NNSA's Albuquerque Service Center	NNSA	290,000
Kansas City Plant	NNSA	315,253
Lawrence Livermore Site Office	NNSA	13,058
Lawrence Livermore National Laboratory	NNSA	4,666,000
Nevada Site Office	NNSA	33,314
Nevada Test Site	NNSA	172,475
Pantex Plant	NNSA	1,317,068
Sandia National Laboratories	NNSA	2,649,400
Savannah River Plant	NNSA	10,000
Washington Group International	NNSA	0
Y-12 Site Office	NNSA	0
Y-12 Plant	NNSA	2,812,229
East Tennessee Technology Park	Environmental Management	96,165
Richland Operations Office	Environmental Management	42,000
Hanford contractors	Environmental Management	74,200
Ohio Field Office	Environmental Management	0
Paducah Gaseous Diffusion Plant	Environmental Management	5,220
Rocky Flats Field and Project Offices	Environmental Management	27,000
Savannah River site	Environmental Management	44,000
Strategic Petroleum Reserve	Fossil Energy	6,400
Idaho Operations Office	Nuclear Energy Science and Technology	4,182
Idaho National Laboratory	Nuclear Energy Science and Technology	165,276
Chicago Operations Office	Office of Science	4,680
Oak Ridge Office	Office of Science	43,074
Oak Ridge Office of the Inspector General	Office of Science	4,382
Argonne National Laboratory	Office of Science	36,425
Brookhaven National Laboratory	Office of Science	11,255
Oak Ridge National Laboratory	Office of Science	23,000
Office of Scientific and Technical Information	Office of Science	25,100
Pacific Northwest National Laboratory	Office of Science	333,000
Total		**$13,224,156**

Sources: Affected DOE facilities and program offices.

Note: Excludes LANL's CREM stand-down costs because they could not be isolated from LANL's laboratory-wide safety and security stand-down cost estimate. We are reporting these data as they were provided to us because the DOE facilities and program offices used different methods to develop reported costs.

Chronology of Key Stand-Down Events

Date	Event
July 7, 2004	Two pieces of CREM—in this case, classified computer disks—are reported missing.
July 9, 2004	Many operations involving nuclear materials at Technical Area 18 are stood down in response to the discovery of a Technical Safety Requirement violation.
July 14, 2004	An undergraduate student is partially blinded in a laser accident.
July 15, 2004	LANL's director stands down all CREM-related activities. The director consults with the Administrator of NNSA and the manager of NNSA's Los Alamos Site Office (LASO) about his intent to declare a laboratory-wide stand-down in response to the safety and security incidents.
July 16, 2004	LANL's director declares a laboratory-wide stand-down.
July 17, 2004	LANL and LASO managers meet to assess all operations and assign initial risk level rankings to laboratory activities.
July 23, 2004	The Deputy Secretary of Energy orders each DOE office or facility that uses accountable CREM to stand down operations until the office or facility completes an inventory of all accountable CREM materials and ensures these materials are properly safeguarded.
July 30, 2004	In a Letter of Direction, LASO's manager instructs LANL to track stand-down costs and advises LANL that stand-down costs are subject to the contract's allowability provisions.
July 31, 2004	75 percent of risk level 1 activities have been authorized to resume normal operations.
August 18, 2004	All risk level 1 activities have been authorized to resume normal operations.
September 8, 2004	In a letter to NNSA's contracting officer, LANL's chief financial officer (CFO) provides LANL's methodology for capturing stand-down costs.
October 25, 2004	83 percent of risk level 2 activities and 21 percent of risk level 3 activities have been authorized to resume normal operations.
November 24, 2004	At the request of LASO's manager, NNSA's Field CFO initiates a review of Los Alamos stand-down costs.
December 16, 2004	All risk level 2 activities and 47 percent of risk level 3 activities have been authorized to resume normal operations.
December 21, 2004	In a letter to LANL's director, NNSA's Field CFO requests that LANL (1) set up accounts to track actual stand-down costs, beginning in January 2005; (2) identify actual stand-down costs incurred back to the beginning of fiscal year 2005; (3) adjust its calculations using better estimates of the percentage of time associated with each risk level, more accurate resumption dates, and actual labor costs; and (4) provide NNSA a list of nonlabor stand-down costs, such as increased procurement costs and travel cancellation costs.
January 20, 2005	LANL informs NNSA's Field CFO that it has set up accounts to track stand-down costs incurred beginning in January 2005 and is making other adjustments as directed with the exception of recalculating staff time charges back to the beginning of fiscal year 2005, which it claims will take 16,104 staff hours and cost $1.6 million.
January 27, 2005	The final LANL CREM library is approved to stand up.
February 1, 2005	LANL provides an adjusted stand-down cost estimate of $119 million to NNSA's Field CFO.
February 2, 2005	LANL provides NNSA's Field CFO with a list of nonlabor stand-down costs, including $6.3 million in claims that NNSA later questioned.
February 3, 2005	78 percent of risk level 3 activities have been authorized to resume normal operations.

(Continued From Previous Page)

Date	Event
February 22, 2005	NNSA's Field CFO reports an upper bound of $367 million, stating that it was unable to separate stand-down costs from ongoing program costs because LANL did not adequately identify and track costs. The Field CFO recommends that the NNSA contracting officer (1) make final determinations on the allowability of $6.3 million in questioned costs and the reasonableness of the stand-down's duration and (2) consider the degree of LANL's compliance with the July 30, 2004, Letter of Direction.
March 3, 2005	In a letter to LANL's director, LASO's manager requests that LANL provide the rationale and justification for $6.3 million in costs questioned by NNSA's Field CFO and states that LASO will issue of Notice of Intent to Disallow Costs to the University of California if a response is not received by March 31, 2005.
March 31, 2005	LANL provides NNSA with its rationale and justification for questioned costs.
April 6, 2005	In a memorandum to the Administrator of NNSA, LASO's manager determines that (1) the University of California has substantially complied with his July 30, 2004, Letter of Direction; (2) he will send the University of California a Notice of Intent to Disallow Costs of $6.3 million in small subcontractor claims and other incremental costs and $8 million in costs incurred during the first 2 days of the stand-down; and (3) the duration of the stand-down was reasonable and all other stand-down costs are allowable.
April 8, 2005	LASO's manager sends the University of California a Notice of Intent to Disallow Costs of $6.3 million in small subcontractor claims and other incremental costs and $8 million in costs incurred during the stand-down's first 2 days.
May 27, 2005	The LANL stand-down officially ends as all activities have resumed. Because of additional costs incurred through the end of the stand-down, LANL reports a total cost estimate of $121 million, and NNSA reports an upper bound of $370 million. Corrective actions continue to address many of the 3,047 longer term safety and security concerns identified during the stand-down.
June 7, 2005	LANL submits written justification to LASO for the questioned costs, stating (1) activities were within LANL's scope of authority and discretion; (2) employees remained in work status and accomplished relevant tasks during the first 2 days; (3) costs were reasonable, necessary, and incidental to remedial safety and security review operations; and (4) the stand-down was conducted with NNSA officials' full knowledge and participation.

Sources: NNSA and LANL.

The Stand-Down's Effects on Nuclear Weapons Activities at LANL and Other NNSA Facilities

W76-1 Life Extension Program

The W76-1 Life Extension Program (LEP) is an effort by LANL, Sandia, Y-12, Pantex, Kansas City, and Savannah River to extend the service life of the W76 nuclear warhead for the Department of the Navy. The LEP is a significant design modification to the warhead and focuses on refurbishing the components that provide the primary and secondary stages of the weapon's two-stage nuclear explosion, providing a new gas transfer system, and installing refurbished warhead structural hardware. The W76 is a LANL-designed warhead that, at the time of the stand-down, was nearing its final design review and being prepared for a transition to the program's production phase. The major delivery date for the W76-1 LEP is September 2007, when the modified warhead's first production unit (FPU) will be produced. A senior LANL official told us that meeting this date is critical because of Navy submarine schedules and NNSA production plant availability.

The stand-down delayed the achievement of several important milestones that support the transition from the design to production phases and meeting the FPU date. LANL managers formed an Integrated Project Team to assess the potential effects of the stand-down on the W76-1 LEP and created a recovery plan that prioritized resumption of essential activities. In addition, LANL managers took steps to maintain the FPU date by (1) obtaining risk level 0 exceptions, enabling them to continue work on planned hydrotests and ship flight test units to the Navy; (2) reworking the LEP's testing schedule, including delaying the starts of some tests and eliminating some tests; (3) eliminating some design options; and (4) creating work-arounds to collect data for the LEP's final design review.

LANL officials report that the W76-1 LEP completely recovered from the stand-down by August 2005, and a senior Navy official said he is confident LANL will meet the FPU date. However, the delayed achievement of milestones has significantly reduced schedule contingency time and caused the program to assume schedule risk if test data analysis provides any unexpected results and requires either additional design changes or tests to resolve issues. The program completed a successful final design review in May 2005, which has increased LANL officials' confidence that the additional risks assumed by the program's recovery plan will not be realized in the long-term. The program transitioned from its design to its production phase in August 2005—3 months late—but still was able to support achievement of the September 2007 FPU, according to LANL, NNSA, and Navy officials.

W88 Pit Manufacturing and Certification Activities

Since 2001, LANL has been working to reconstitute the nation's capability to manufacture and certify pits—part of the nuclear weapon's primary stage.[1] More specifically, LANL is reconstituting this capability for the Navy's W88 warhead. LANL met its first major delivery milestone in 2003, when it manufactured the first two certifiable W88 pits since Rocky Flats Plant's closure in 1989. LANL is now working to meet two major delivery milestones before the end of fiscal year 2007: (1) delivering the first certified W88 pit since 1989 and (2) establishing a manufacturing capability to produce between 10 and 20 certified W88 pits per year.[2] LANL's pit manufacturing and certification activities are among the highest risk activities at the laboratory, requiring the handling of plutonium and other radiological materials in specialized facilities.

The stand-down affected a number of important milestones in support of the W88's two 2007 delivery dates, including two key subcritical tests—nuclear tests that do not achieve sustained chain reactions and are designed to examine nuclear materials' properties—performed at the Nevada Test Site, three interim pit manufacturing milestones, and the development of LANL's Pit Manufacturing and Certification Integrated Plan. LANL managers planned the program's recovery to maintain the dates for the delivery of the first certified pit and the establishment of the targeted manufacturing and certification capability by (1) reworking the test schedule to resolve resource constraints; (2) separating out risk level 1 work from other operations and accelerating this work forward in the program schedule to allow more time for risk levels 2 and 3 work after resumption; and (3) pushing work planned for fiscal year 2004 into fiscal year 2005, adding to the 2005 workload.

LANL and NNSA officials reported, and a senior Navy official agreed, that effective stand-down recovery planning supports achieving the delivery of

[1]NNSA's Pit Manufacturing and Certification Campaign focuses on providing an interim pit manufacturing and certification capability at LANL and establishing a longer term capability. DOE's Rocky Flats Plant near Denver, Colorado, manufactured pits for all of the nation's nuclear weapons until its closure in 1989.

[2]LANL's ability to manufacture and certify pits has implications for the success of the Reliable Replacement Warhead program, provided for by congressional conferees considering H.R. 4818, which became the Consolidated Appropriations Act of 2005 (Pub. L. No. 108-447). See H. Conf. Rep. No. 108-792 at 950-51. This program, an alternative to the nuclear weapons LEPs, would replace aging warheads with ones that can be more confidently manufactured and maintained.

the first pits and establishing the manufacturing and certification capability by the original 2007 date. However, schedule delays have significantly reduced contingency time and have caused the program to assume additional risk, particularly because one subcritical test has been delayed by at least 6 months. In addition, LANL's recovery plan requires that 12 months worth of pits be manufactured in 10 months of available manufacturing time. If the results of the delayed subcritical test or other tests reveal anomalies, NNSA and LANL officials acknowledge that it will be difficult to facilitate additional tests or design changes under the current schedule.

B61 ALT 357 Program

This program is an effort by LANL, Sandia, and the Y-12 production plant to refurbish modifications 7 and 11 of the Air Force's B61 gravity bomb using design alternative (ALT) 357, which is related to the nuclear weapon's secondary stage. The production phase of the B61 ALT 357 program began in October 2003; thus at the time of the stand-down, LANL was responsible for building units for tests executed by Sandia and the production plants. The FPU date for the B61-7 is June 2006 and for the B61-11 is January 2007.

The stand-down affected several important interim milestones in support of the FPU dates, including (1) a cable pull-down test performed at Sandia, a high impact test using a mock bomb to measure the weapon's performance on impact and gather penetration data; (2) two combined environment tests performed on a shaker table that provide data important to understanding the bomb's transportation; and (3) two accelerated aging tests that use ovens at Y-12 to speed the aging process of nuclear materials to help scientists understand anomalies associated with aging. LANL, Sandia, and Y-12 scientists and technicians worked to recover the program's schedule and to achieve the FPU dates by obtaining risk level 0 exceptions to allow LANL scientists to work at Sandia, Y-12, and the Kansas City Plant under those facilities' safety authorizations to complete the cable pull-down and combined environment tests and creating work-arounds to provide the Air Force with information normally stored on CREM. However, the stand-down reduced the time available to analyze the test data. In addition, the starts of the aging tests were delayed in response to technical issues at the production plants.

LANL, NNSA, and Air Force officials reported that effective recovery planning addressed the tests that were delayed by the stand-down, and the FPU dates have been maintained. NNSA officials said testing resulted in some additional design changes. Air Force officials said these design

changes could have been more easily facilitated by the program's schedule if the stand-down had not occurred and that the ability to meet the FPU dates will continue to be reassessed. Air Force officials said the FPU dates for the B61 ALT 357 were set by NNSA, and the Air Force can accommodate some schedule slip beyond June 2006 and January 2007.

Repairs to the Second Axis of the Dual-Axis Radiographic Hydrodynamic Test (DARHT) Facility and Facility Commissioning

The DARHT Facility provides LANL with the capability to capture images of nuclear weapons using mock materials during their implosion. These test implosions are created through LANL's hydrotesting program. Data from these tests are fed into three-dimensional and time-resolved physics models that are used to assess weapons performance, to understand what happens to nuclear weapons when they explode, and to certify the safety and reliability of weapons in the stockpile. As shown in figure 2, the DARHT facility consists of two separate buildings or axes, each containing an accelerator that ultimately provides X-rays to capture these images in a process called X-ray radiography. The first axis of DARHT became operational in 1999, and the construction of the buildings was completed in 2003 at a cost of $260 million. During testing of DARHT's second axis, high-voltage breakdown problems were noted; and in 2003 LANL began a project to understand the problems, fix them, and repair and upgrade the second axis before it becomes operational. In 2004, LANL scientists determined a solution to the high-voltage problem. However, the stand-down affected the implementation of this solution, the refurbishment of each of the 80 cells in the second-axis accelerator, which LANL estimates will cost $87.5 million. Prior to the stand-down, the completion of DARHT's second-axis repair, upgrade, and commissioning were scheduled for completion in September 2007.

Figure 2: The DARHT Facility at LANL

Source: LANL.

Note: Each building, or axis, houses one accelerator. During a hydrotest, the test unit is placed in the foreground between the two axes.

During the stand-down, LANL program managers adjusted the schedule for the completion of DARHT's refurbishment and commissioning to the first quarter of fiscal year 2008, based on an estimated resumption of DARHT activities at LANL at the beginning of January 2005. In the interim, LANL managers took steps to recover the project's schedule by (1) moving the majority of testing of the refurbished accelerator cells to Lawrence Berkeley National Laboratory and other testing to Lawrence Livermore National Laboratory and (2) obtaining risk level 0 exceptions to send LANL scientists to Lawrence Berkeley to work on cell refurbishment.

According to senior LANL program officials, the revised schedule will not be met because DARHT activities at LANL did not resume until the end of February 2005. DARHT's second axis is now scheduled to be commissioned in March 2008, a 6-month slip from the original schedule and a 2-month slip from the stand-down adjusted schedule. The head of LANL's Advanced Radiography program estimates that the program covered $7.4 million in costs related to the stand-down and will realize an additional $4 million in future poststand-down compliance costs that will be added to the total project costs. LANL's Hydrotest Program manager reported that the delayed refurbishment and commissioning of DARHT's second axis will not affect its use in 2008 for hydrotests scheduled in the National Hydrotest Plan if the DARHT commissioning is completed on time.

Hydrotesting Program

Nonnuclear hydrodynamic tests, or hydrotests, use high explosives-driven experiments to study what happens to a weapon's pit when it implodes. The term "hydrodynamic" refers to the behavior of metals and other materials in the pit—driven by the high pressures and temperatures generated by the detonation of high explosives, these metals and materials act like liquids. Test data are evaluated using radiographic images provided by the DARHT facility. Every year, NNSA updates its 5-year National Hydrotest Plan. Prior to the stand-down, LANL completed three successful hydrotests on time for a review of the W76 design. Six scheduled hydrotests were affected by the stand-down, five of which were to support the W76-1 LEP. Hydrotests are also used to support stockpile certification and assessment, emergency response, and other weapons activities such as W88 pit certification.

LANL and NNSA officials said because the laboratory's hydrotesting activities are central to its mission, particularly to achieving the FPU date for the W76-1 LEP, they worked together with Navy officials to revise the hydrotesting plan during the stand-down. This recovery planning included (1) obtaining risk level 0 exceptions to continue preparatory work for two W76-1 LEP hydrotests, the first of which was executed in April 2005 during the stand-down under NNSA oversight and the second of which was executed in June 2005 shortly after resumption; (2) canceling one planned W76-1 LEP hydrotest upon determination that it was no longer required, based on data from the first two hydrotests; and (3) shifting three additional fiscal year 2005 hydrotests to fiscal year 2006, however, these delays were not entirely due to the stand-down.

LANL and NNSA officials report that effective stand-down recovery planning allowed hydrotesting activities to go forward in support of the W76-1 FPU and the program to fully recover from the stand-down by August 2005. LANL officials said some of the six hydrotests scheduled during the stand-down period would have been delayed, regardless of the stand-down because of other, unrelated factors.

Experimental Programs

LANL's Experimental Programs provide a validation of the laboratory's predictive capability or a check of its physics models against data from tests that can still be performed without nuclear testing. Experimental Programs cut across many of the laboratory's science-based stockpile stewardship activities, or campaigns, that involve nonnuclear testing,

subcritical testing, and other types of experimentation.[3] In fiscal year 2004, LANL scheduled completion of 28 secondary level milestones across its Experimental Programs supporting the W76-1 LEP, W88 activities, stockpile surveillance and assessment, understanding materials properties, and inertial confinement fusion.

LANL officials reported delays to 10 of the 28 secondary level milestones scheduled for completion in fiscal year 2004; and, in one case, test dates were renegotiated and the work re-scoped. During the stand-down, experimental activities and resources were prioritized to support the Hydrotesting Program for the W76-1 LEP and subcritical experiments for W88 activities. Other experimental work was deliberately delayed to focus efforts on these two programs, which had hard deadlines for experimental work.

LANL officials reported that successful stand-down recovery planning facilitated Experimental Programs' ability to support the W76-1 LEP and W88 activities, and most experimental activities had recovered their schedules by the end of fiscal year 2005. Some fiscal year 2005 activities have shifted out to fiscal year 2006, including the capability to resume underground nuclear tests within 18 months of a presidential determination to do so. LANL officials said the impacts of the stand-down are unclear for some of these experimental delays, particularly in the area of inertial confinement fusion, because future funding levels are uncertain.

[3]These campaigns include Primary and Secondary Stage Assessment Technologies; Dynamic Materials Properties; Advanced Radiography (including DARHT activities); Enhanced Surveillance activities used to assess the lifetimes of weapons components and associated diagnostics; Sub-Critical Experiments; and high-energy density physics experiments in support of Inertial Confinement Fusion, designed to study nuclear phenomena by using lasers to create conditions approaching those in a nuclear weapon.

Simulation and Implementation of the Quantification of Margins and Uncertainties (QMU) Methodology

LANL's simulation activities focus almost exclusively on Advanced Simulation and Computing activities—the ability to integrate experimental and computational data into three-dimensional and time-resolved models used to predict different weapons' characteristics that support stockpile assessment and certification, LEPs, and analysis of accident scenarios and weapons aging issues. LANL's physics models and computer simulations compare data from hydrotests, experimental programs, and other tests against legacy data from past nuclear tests to ensure that scientists can understand weapons' performance, safety, and reliability issues. A major initiative at LANL is the implementation of the QMU methodology—a means of quantifying the uncertainty associated with the ability of LANL's models and simulations to predict weapons performance.[4] The QMU methodology is being implemented laboratory wide and project milestones for its implementation have been developed.

Simulation and QMU activities at LANL were delayed primarily because of the inability to do classified computing work at the laboratory until risk level 2 activities resumed. LANL's supercomputers were never shut down during the stand-down and were available for use by Lawrence Livermore and other laboratories; however, LANL scientists were stood-down from classified computing activities until mid-September 2004. During the stand-down, simulation activities recovered their schedules by (1) separating risk level 1 work from other operations and accelerating it forward in project schedules to allow more time for risk level 2 work after resumption, (2) eliminating contingency time in simulation schedules for the LEPs, and (3) employees consistently working overtime to make up for schedule loss.

The head of laboratory simulation activities said that 3 of 13 fiscal year 2004 project milestones were missed because simulation activities were stood down for 2 months. These milestones were completed in November 2004 and March 2005. However, he said that to meet these near-term delivery dates, schedules for longer term work are at risk, including delays in implementing QMU. One benefit of the stand-down was that the simulation program was able to complete a software quality assurance review, which had been identified by LANL officials as important.

[4]Successful implementation of the QMU methodology is particularly important for the Reliable Replacement Warhead program, which would redesign weapons components to be easier to manufacture, maintain, dismantle, and certify without nuclear testing.

Neutron Generator Fabrication Activities at Sandia

Sandia builds neutron generators, a component in all nuclear weapons that must be exchanged on a regular basis because of its limited life. LANL routinely supplies Sandia with tritium-loaded targets that Sandia uses to build the neutron generators.[5] During the stand-down, LANL could neither produce targets nor ship them to Sandia until April 2005. Sandia has a major delivery date for a large number of neutron generators in 2009.

During the stand-down, Sandia (1) used up a 60-day inventory of targets that it had in storage, (2) cross-trained technicians in other neutron generator manufacturing processes, and (3) built mock neutron generators that did not contain any targets as a part of operator training and to keep machines in good working order.

Sandia officials said that as a result of the LANL stand-down Sandia was unable to manufacture 300 planned neutron generators, at a cost of $75,000 per generator. While no immediate delivery dates were affected, Sandia officials have calculated that if current neutron generator demands are maintained, the project will need to add four employees to its manufacturing line by April 2006, to remain on pace to meet the 2009 delivery requirements. Sandia officials told us that since April 2005 LANL has been providing targets steadily.

W80 Detonator Surveillance Activities at Lawrence Livermore

LANL designed the W80 cruise missile warhead but transferred responsibility for its annual assessment and certification, as well as the W80 LEP to Lawrence Livermore in 2002. At the time of the stand-down, LANL was still completing some surveillance and testing on the W80's detonator system—which sets off the explosives that act upon a nuclear weapon's primary stage—to determine whether any anomalies had developed as the weapon aged. LANL had a deadline of October 1, 2004, to either complete this surveillance work or ship remaining work to Lawrence Livermore—along with historical surveillance information, stored on CREM—for use in W80 surveillance going forward. The stand-down prevented LANL from completing the surveillance work and from shipping uncompleted work and historical information to Lawrence Livermore.

[5]Independent of the stand-down, NNSA decided in October 2004 to permanently transfer LANL's neutron tube target loading activities to Sandia as a cost savings measure. Transfer of these activities is in process.

Lawrence Livermore received materials from LANL in June and August of 2005. The delay in the receipt of the detonators and historical data resulted in (1) some delays in developmental testing for the W80 LEP, which has a January 2009 FPU date and (2) a likely 1-year delay in the completion of the backlog of surveillance testing on the W80 in the stockpile, now slated for fiscal year 2006. Data from this detonator surveillance are fed into the annual assessment of the W80. If surveillance yields unusual results, this could impact the annual assessment. However, NNSA officials said weapons' detonators are generally acknowledged as being reliable.

Seamless Safety for the 21st Century (SS-21) Program at Pantex

SS-21 is a nuclear complex-wide program that is intended to enhance worker and environmental safety in the assembly, disassembly, and experimentation processes for nuclear weapons. Pantex is implementing SS-21 programs for, among others, the B61 and the W88. To implement an SS-21 program, teams at Pantex identify potential hazard scenarios as they walk down Pantex processes; these scenarios are then sent to LANL for analyses of the consequences. Over time, final hazardous analyses are developed along with mitigation measures to protect against these hazards without adversely affecting the performance of the weapon. Pantex must implement SS-21 programs to be in compliance with Nuclear Safety Management regulations.[6] Because of the LANL stand-down, the iterative process of developing the final hazardous analysis could not go forward, primarily because hazard scenarios are transmitted on CREM, according to a Pantex official.

Pantex completed the final hazardous analysis for the B61 with just over a 6-month delay. It completed the final hazardous analysis for the W88 with just under a 3-month delay, though this program was minimally delayed prior to the LANL stand-down. To be in compliance with Nuclear Safety Management regulations, Pantex received an exception from NNSA for its SS-21 activities associated with LANL, which lasted until 4 weeks after LANL's resumption of CREM activities.

[6]10 C.F.R. pt. 830 (2005).

LANL's Technical Area-18

DOE has long recognized that a successful terrorist attack on a site containing the material used in nuclear weapons, such as plutonium or highly enriched uranium, could have devastating consequences for the site and its surrounding communities. The risks associated with these materials, which in specified forms and quantities are referred to as Category I or Category II special nuclear material, vary but include theft for use in an illegal nuclear weapon; the creation of improvised nuclear devices capable of producing a nuclear yield; and the creation of so-called "dirty bombs," in which conventional explosives are used to disperse radioactive material. Because terrorist attacks could have such devastating consequences, an effective safeguards and security program is essential. For many years, a key component for DOE security programs has been the development of the design basis threat (DBT), a classified document that identifies the potential size and capabilities of adversary forces.

According to NNSA officials, in 2003, DOE determined it would remove Category I and II special nuclear materials from LANL's Critical Experiments Facility at Technical Area-18 (TA-18) by the end of fiscal year 2008. Officials found security difficulties at TA-18 that could not be cost effectively remedied; specifically, the facility's siting makes it challenging to defend. While removal of this material would reduce the facility's security and safety risk, it would preclude further criticality experiments at LANL, a capability on which many programs depend and which does not exist elsewhere within DOE. NNSA is building a Critical Experiments Facility within the Nevada Test Site's Device Assembly Facility to relocate this capability. In September 2004, NNSA issued a revised DBT that required removal of TA-18's Category I and II special nuclear materials by September 30, 2005.[1]

On July 9, 2004, criticality experiments and other operations involving nuclear materials at TA-18, except the removal of special nuclear materials, were unexpectedly suspended when a technical safety requirement violation was discovered. One week later, the entire laboratory was stood-down. LANL managers received a risk level 0 exception to continue materials removal to meet the September 30, 2005, completion date.

NNSA and LANL program officials said that to meet this date, TA-18 personnel who supported criticality experiments and other programmatic

[1]According to LANL officials, these materials were removed by the September 30, 2005, milestone.

activities—such as emergency response training—were redirected toward special nuclear materials removal, limiting the availability of TA-18 for these other uses. While emergency response training also received a risk level 0 exception to continue throughout the stand-down, NNSA officials said it was difficult to do so because the people needed to facilitate the training were focused on materials removal. In April 2005, NNSA developed a TA-18 work prioritization to ensure the programmatic experiments and uses that were regarded as most vital could be achieved without compromising the schedule for removing special nuclear materials.

To date, TA-18's critical assembly machines have not resumed operations. In reassessing priorities for TA-18 in August 2005, LANL and NNSA officials decided to rededicate some resources to resuming the operation of one of the critical assemblies, specifically for a DOD-sponsored experiment.

LANL officials said it is difficult to determine the extent to which laboratory programs were affected by the TA-18 stand-down, the laboratory-wide stand-down, or both because (1) the TA-18 stand-down and the laboratory-wide stand-down occurred only 1 week apart; (2) the TA-18 stand-down for some activities lasted the duration of the laboratory-wide stand-down and beyond; and (3) resources dedicated to the laboratory's resumption and the removal of special nuclear materials from TA-18 may have delayed resumption of some TA-18 programmatic activities, such as criticality experiments. After the laboratory-wide stand-down, management responsibility for TA-18 was shifted to the division within LANL that also manages the Plutonium Facility at TA-55.

The Stand-Down's Effects on LANL's Threat Reduction Activities

Off-Site Source Recovery Program: This NNSA program recovers excess and unwanted radiological sources from medical and other commercial facilities to reduce the risk that they might be used in a dirty bomb. LANL processes or secures these sources for storage. Because recovered materials could not be shipped to LANL during the stand-down, NNSA negotiated with transportation subcontractors to temporarily store materials until LANL resumed operations and could accept them. LANL did not receive any materials in July or August 2004; and, according to NNSA officials, the program did not resume full operation until January 2005. However, NNSA and LANL officials reported that collection and processing benchmarks were met for fiscal years 2004 and 2005.

Fabrication of Nuclear Explosion Monitoring Sensor Packages for Air Force Global Positioning System Satellites: LANL fabricates suites of sensors for Global Positioning System satellites that are used to monitor nuclear detonations. According to NNSA officials, the Air Force is scheduled to launch the first of this constellation of satellites in December 2006. NNSA officials said the sensor fabrication program was delayed 4 months because of the LANL stand-down, a technical design issue, and a space industry-wide parts recall. Specifically, Air Force officials said the stand-down precluded discussions with LANL engineers about the parts recall, and they could not work with LANL engineers to (1) assess the impact of the recalled parts, (2) determine whether to try to expedite replacement parts, or (3) determine whether to replace recalled parts in LANL sensors already installed in one of the Air Force's satellites.

Design Work and Process Testing for the Pit Disassembly and Conversion Facility: The Pit Disassembly and Conversion Facility is currently in design for construction at Savannah River. It will provide the United States with the capability to dispose of surplus weapons-usable materials. LANL developed many of the systems to be implemented at the facility and is responsible for some design work and process testing. The facility is currently scheduled for completion in 2012. The scope of LANL's role in the project was reduced as a result of the stand-down and unrelated pre-existing issues. Some classified calculations LANL was to have completed were transferred to Washington Group International, a contractor that is part of the Pit Disassembly and Conversion Facility's design team, during the stand-down. NNSA officials said LANL was not able to do any work on the project from July 2004 through January 2005 and that work was not fully resumed until March 2005. NNSA estimates that the delay cost the project $14 million. LANL was scheduled to begin a year-long demonstration of its process and equipment in June 2004. LANL officials

said because of the stand-down it began in April 2005, but NNSA officials said it has been delayed until December 2005.

Testing of Radiation Detection Portal Monitors for Borders: At the time of the stand-down, LANL was involved in testing of radiation detection portal monitors to be deployed at borders to enhance homeland security. The testing was to occur at TA-18, which was stood down 1 week prior to the laboratory-wide stand-down. NNSA officials reported that portal monitoring testing was delayed for over 5 months. This testing did not require the use of the criticality machines, operation of which has not resumed to date. LANL officials said the testing did occur in TA-18. The LANL and TA-18 stand-downs both contributed to the extent of the delay, but it is unclear whether testing activities would have resumed earlier had TA-18 operations resumed fully with the laboratory.

Plutonium (Pu-238) Heat Sources Fabrication: LANL manufactures small heat sources using Pu-238, a nonfissile plutonium isotope. These heaters are used by the National Aeronautics and Space Administration (NASA) to enhance a spacecraft's electrical power and keep its electronics package warm during a deep space mission. At the time of the stand-down, LANL was manufacturing Pu-238 heat sources for a NASA probe scheduled to launch in January 2006 for a mission to Pluto. Originally, LANL planned to fabricate 72 Pu-238 heaters for NASA using capabilities in TA-55, however, a 2003 safety incident shut down those Pu-238 operations and caused LANL to revise the number of heaters it would fabricate down to 36. At the time of the July 2004 stand-down, LANL was still implementing corrective actions from the 2003 incident. As a result of the stand-down, LANL program managers further reduced the number of Pu-238 heaters it would produce to 23. Twenty-one of these heaters had already been successfully manufactured at the time of the stand-down and were shipped to NASA in January 2005.[1] NASA agreed to the reduced scope of the project and will make up the shortfall of heaters with excess inventory it has from a previous mission. Some additional risk has been accepted because the Pu-238 in these older heaters has decayed more than the Pu-238 in newly fabricated heaters would have.

[1]LANL subsequently produced an additional 13 Pu-238 heaters, which are available for use if NASA delays its launch for any reason.

Naval Reactors: Jupiter Icy Moon Orbiter/Prometheus: NASA contracted with Naval Reactors, a joint DOE/DOD office, to design and build a space-based nuclear reactor to power a mission to Jupiter. LANL is part of the Naval Reactors team, providing some design work on the reactor as well as the design and manufacturing of the reactor's fuel. Most of the design work for which LANL was responsible was considered risk level 1 work and was able to resume by the end of August 2004. LANL provided design options to Naval Reactors in April 2005. Testing of materials to inform the selection of a design requires the use of the criticality machines in TA-18 and was significantly delayed by the failure of these machines to resume operations. According to LANL officials, work commenced to make these machines operational so that 1 test for the Prometheus program—out of between 6 to 16 remaining tests—could occur before special nuclear materials are removed from TA-18 by September 30, 2005. However, in August 2005, NASA decided to terminate the Prometheus program for budgetary reasons, according to Naval Reactors officials. This decision has made moot any program delays related to the LANL stand-down.

Emergency Response Hydrotest: Among LANL's scheduled fiscal year 2004 hydrotests was one to support emergency response operations. The test was originally scheduled for July 2004. LANL managers determined that the test could be performed at Lawrence Livermore during spring 2005. However, it would have cost the test sponsor $1 million to have the testing unit transported. The sponsor agreed to complete the test at LANL after full resumption of hydrotesting activities. LANL managers reported that this hydrotest was executed in August 2005, a 1-year slip.

Nondestructive Assay Training for the International Atomic Energy Agency (IAEA): Twice per year, LANL hosts IAEA inspectors for training in the identification of radioactive materials using nondestructive means. As a result of the stand-down, one session was cancelled. Training has resumed at LANL, however, NNSA officials report that some IAEA inspectors were fielded without receiving the training. LANL and NNSA officials said LANL's reputation with the IAEA was damaged because of the

stand-down. NNSA officials said that LANL trainers' career-long relationships with the IAEA inspectors they train are a benefit, and the loss of this opportunity to form such relationships is an adverse effect of the stand-down.[2]

[2]Prior to the stand-down, discussions had occurred about moving the training from LANL to another facility, such as Idaho National Laboratory, because of concerns about foreign visitors accessing sensitive LANL facilities.

Comments from the Department of Energy

Department of Energy
National Nuclear Security Administration
Washington, DC 20585

NOV 0 2 2005

Mr. Gene Aloise
Director, Natural Resources
and Environment
Government Accountability Office
Washington, D.C. 20548

Dear Mr. Aloise:

The National Nuclear Security Administration (NNSA) appreciated the opportunity to have reviewed the Government Accountability Office (GAO) Draft Report, GAO-06-83, "STAND-DOWN OF LOS ALAMOS NATIONAL LABORATORY: Total Costs Uncertain; Almost All Mission-Critical Programs Were Affected but Have Recovered." We understand that the Chairman, House Committee on Energy and Commerce requested GAO to assess the total costs of the stand down, the status of research projects and programs, and whether the costs are reimbursable.

NNSA further understands that based on the audit work, GAO concluded that neither the methodology used by the Laboratory to track costs associated with the stand-down, nor the methodology used by the NNSA's Field Chief Financial Officer accurately captured costs associated with the stand-down. NNSA acknowledges that our methodology over estimates the cost of the stand down. The report also states that while there are programs that had to change milestone dates, the laboratory has recovered the lost time on most processes and will have to extend only one delivery date. The report also notes that the weapons programs will not bear any additional risk and that the basis for NNSA's determination that most of the stand-down costs were allowable seem to be reasonable.

As you know, there were many interactions with your staff prior to the draft report being issued. Therefore, we are providing only minor technical comments as they relate to the various sites mentioned in the report. NNSA accepts the report and generally agrees with the recommendations. .

Regarding the recommendation to establish activity codes in the budget and reporting systems so that the costs, including associated support costs, of **any** future stand-downs can be tracked on an annual cost basis, NNSA generally agrees. The NNSA's Field Chief Financial Officer (CFO) will work with the Department's CFO on establishing these activity codes.

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The report questions whether the new Los Alamos contract will have fewer performance requirements to achieve additional years being awarded to the contract or more stringent performance requirements. The characterization in GAO's Highlights page is incorrect. The new process as discussed by GAO is, in fact, more beneficial to the Government, strengthens accountability, and is exercised through a two-step process with the awarding of additional years to the contract approved solely by the NNSA Administrator not by the Contracting Officer.

Each year the contractor is/will be evaluated against a predetermined performance evaluation criteria for their Award Fee. During that process, should the contractor receive an Award Fee score that meets a predetermined Award Term evaluation threshold score, the contractor will then be evaluated against additional criteria that is only applied to the Award Term evaluation. The Administrator, after review of the Award Fee documentation and Performance Evaluation Report and after review of success of the contractor against the additional evaluation criteria, may award an additional year to the contract.

Should you have any questions related to this response, please contact Richard Speidel, Director, Policy and Internal Controls Management.

Sincerely,

Michael C. Kane
Associate Administrator
for Management and Administration

Attachment

cc: Senior Procurement Executive
Manager, Los Alamos Site Office
Director, Service Center

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