



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

Special Report

Management Challenges at the Department of Energy

DOE/IG-0782

December 2007



Department of Energy

Washington, DC 20585

December 13, 2007

MEMORANDUM FOR THE SECRETARY

FROM:


Gregory H. Friedman
Inspector General

SUBJECT:

INFORMATION: Special Report on "Management Challenges at the Department of Energy"

BACKGROUND

Annually, the Office of Inspector General identifies what it considers to be the most significant management challenges facing the Department of Energy. Now required by the *Reports Consolidation Act of 2000*, this effort also takes into account emerging issues facing the Department. Our conclusions are based on an examination of the results of current Office of Inspector General audits, inspections, and investigations as well as an assessment of the Department's progress in addressing previously identified challenges.

Through this process, the Office of Inspector General highlights activities that demonstrate systematic or recurring performance problems and those which are inherently difficult to manage. Consistent with our mission, the overall goal is to focus attention on significant issues with the objective of enhancing the effectiveness of the Department's many programs and operations.

RESULTS

Based on work performed by the Office of Inspector General over the past year, the following represent the most serious challenges facing the Department of Energy:

- Contract Management
- Cyber Security
- Environmental Cleanup
- Human Capital Management
- Project Management
- Safeguards and Security
- Stockpile Stewardship

It is important to note that these challenges are not amenable to immediate resolution. They must, therefore, be addressed through a concentrated, persistent effort over time.

Each year, we also develop a "watch list," which consists of significant issues that do not meet the "management challenge" threshold, yet warrant continued attention by Department



management. This year, the watch list includes the following operational and programmatic functions: Infrastructure Modernization and Worker and Community Safety.

In addition to these management issues, the Department's energy security responsibilities represent a broad national challenge. Over the last several years, energy consumption in the United States and throughout the world has grown dramatically. As a result of this growth in demand and the absence of a corresponding increase in supply, U.S. domestic energy costs have increased significantly, clearly impacting the U.S. economy. The underlying geopolitical, science, and technical issues are extraordinarily complex and, therefore, resolution will require multi-faceted short-term and long-term efforts on a number of fronts. The Department's involvement in energy policy development and program implementation and execution is critically important to this process.

The Department has taken a number of positive actions to strengthen its management processes. For example, in order to better address the Nation's energy situation, the Department instituted a new strategic plan, which serves as a roadmap to address many of the challenges outlined in this review. Focusing on energy security, environmental responsibility, scientific discovery and innovation, nuclear security, and management excellence, the strategic plan is designed to achieve the Department's goals. Also, in recent years, the Department has emphasized programs and policies to strengthen and improve the health, safety, and security of Department workers, facilities, and the public.

While the Department continues its efforts to improve in many key areas, during the last year, the Office of Inspector General identified a number of operational deficiencies and opportunities for cost savings, many of which are outlined in the attached report. The Department, in its *Fiscal Year 2007 Agency Financial Report*, identified a similar set of issues that impact the Department's ability to fulfill its critical missions. In this regard, we look forward to working closely with Department officials to evaluate Agency performance in an effort to improve programs and operations, particularly as they relate to the management challenge areas identified in this report.

Attachment

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



Table of Contents

Introduction	1
Management Challenges	3
Contract Management	3
Cyber Security	4
Environmental Cleanup	5
Human Capital Management	8
Project Management	9
Safeguards and Security	11
Stockpile Stewardship	13
Watch List	15
Infrastructure Modernization	15
Worker and Community Safety	16
Appendices	18
Challenge Areas and Significant Issues Reported by Various Groups	18
Relevant Reports Issued in Fiscal Year 2006	19



Introduction

While its origins can be traced to the Manhattan Project and the race to develop the atomic bomb during World War II, the Department of Energy (Department) has evolved to become a multi-faceted agency that encompasses a broad range of national security, scientific, and environmental activities. Since the passage of the *Department of Energy Organization Act* in 1977, the Department has shifted its emphasis and priorities over time in order to advance the changing energy and security needs of the United States. Despite this trend, the fundamental mission of the Department has always centered on the advancement of the national, economic, and energy security of the Nation. In support of this mission, the Department strives to promote scientific and technological innovation as well as directs the maintenance and environmental cleanup of the national nuclear weapons complex. To accomplish these objectives, the Department receives an annual appropriation of approximately \$24 billion, employs nearly 115,000 Federal and contractor personnel, and manages assets valued at more than \$135 billion.

As a means of helping to promote the effective, efficient, and economical operation of the Department's programs and operations, on an annual basis the Office of Inspector General (OIG) identifies what it considers to be the most significant management challenges facing the Agency. Now codified as part of the *Reports Consolidation Act of 2000*, this effort assesses the Agency's progress in addressing previously identified challenges and considers emerging issues facing the Department. The management challenges outlined in this report constitute a major factor in setting internal OIG priorities as it evaluates Department of Energy programs and procedures.

Representing risks inherent to the Department's complex operations as well as those related to management processes, these challenges are, for the most part, not amenable to immediate resolution and must, therefore, be addressed through a concentrated, persistent effort over time. This year, the Office of Inspector General identified the following seven management challenges:

- Contract Management
- Cyber Security
- Environmental Cleanup
- Human Capital Management
- Project Management
- Safeguards and Security
- Stockpile Stewardship

In addition to identifying these challenges, the Office of Inspector General has also developed a "watch list," which consists of significant issues that do not meet the threshold of being classified as management challenges, yet warrant continued attention by Department

management. This year, the watch list consists of the following operational and programmatic functions: Infrastructure Modernization and Worker and Community Safety.

Although many of these challenges require long-term efforts, by aggressively addressing these issues the Department can enhance program efficiency and effectiveness; reduce or eliminate operational deficiencies; decrease fraud, waste, and abuse; and achieve substantial monetary savings.



Management Challenges

Contract Management

The Department places significant reliance on contractors, employing over 100,000 contractor employees to operate a vast network of laboratories, production facilities and environmental remediation projects across the country. On an annual basis, the Department awards thousands of contracts, grants, cooperative agreements and other instruments in pursuit of its energy and science missions. Consuming more than 90 percent of the Department's annual budget, contractual instruments are awarded to commercial companies, academic institutions, and non-profit organizations that are involved in a broad range of Department programs, including its most sensitive national security activities. As a result, effective contract oversight is an essential component of the Department's management of its many programs.

During FY 2007, OIG reviews highlighted the need for improved management oversight in the administration of Department contracts. For example, the Department's contractor-operated facilities use Intergovernmental Personnel Act (IPA) and Change of Station (COS) assignments to permit contractor employees to work at other organizations. A March 2007 review to determine whether the Department was effectively managing contractor use of IPA and COS assignments found that the Department did not have controls in place to determine the number and propriety of these types of assignments (*The Department of Energy's Management of Contractor Intergovernmental Personnel Assignments*, IG-0761, March 2007). The Department was not actively reviewing the IPA and COS assignments to determine that they were cost effective and operated in accordance with existing procedures, or that taxpayer-provided funds supporting these assignments were put to the best possible use. While it is apparent that the IPA/COS concept may benefit the Department, it is incumbent upon Departmental officials to ensure that the program is managed in the best interests of the U.S. taxpayer.

In a separate review, an audit was conducted to determine whether the costs and benefits associated with the Idaho National Laboratory's voluntary separation program were consistent with recent similar efforts at other Department facilities (*Voluntary Separation Program at the Idaho Cleanup Project*, IG-0765, May 2007). As part of its contract proposal, the management and operating contractor at the Laboratory included a strategy for workforce restructuring to optimize employment levels and obtain the proper skills mix to safely address mission priorities. The Department approved a two-phased restructuring approach, permitting the contractor to initially separate up to 700 employees by offering a voluntary separation program.

As a result of this initiative, 291 contractor employees were separated at a cost to the Department of \$14 million. While the Idaho separation program reduced the size of the contractor workforce and will result in monetary savings to the Department over time, the initiative proved to be exceptionally costly and, in certain respects, inefficient. Specifically, the program provided significantly higher incentives than were offered in other recent comparable Department

separation programs and did not retain critical skills of certain employees needed to accomplish the work of the Laboratory. To ensure the reasonable and equitable treatment for separated employees and their affected communities, we found that the Department needs a consistent approach to workforce restructuring. Our report included specific recommendations to help achieve this goal.

To its credit, the Department has developed strategies and programs to address contract management concerns. However, given the number of contracts awarded and managed by the Department, combined with the issues raised in our reviews, the area of Contract Management remains a significant management challenge.

Cyber Security

As a result of the importance of Information Technology (IT) to its numerous projects, laboratories, and assets, along with the vast array of data that is produced, cyber security has become a crucial aspect of the Department's overall security posture. The Department expected to spend approximately \$300 million in FY 2007 to protect its investment in IT resources. These protective activities are critical to ensuring that systems and data remain secure and available, particularly in light of the increasingly sophisticated attacks on the Department's information technology resources. In 2005, the Department established a Cyber Security Improvement initiative, the goal of which was to identify improvements for cyber security controls within the Agency. Over the past few years, the area of "Information Technology," which encompassed a broad range of IT contracts, programs, and security, had been classified as a management challenge. Recently, however, threats to the Government's information systems have risen to become a national security risk. As a result of these risks and in light of recent efforts to intrude into the Department's systems, we have categorized Cyber Security as a significant management challenge.

During FY 2007, the OIG conducted various reviews in this area that highlighted the need for improvements in the Department's overall cyber security program. As required by the *Federal Information Security Management Act (FISMA)*, an OIG audit was conducted to determine whether the Department's unclassified cyber security program adequately protects data and information systems. In our annual evaluation of the Department's unclassified cyber security program, we found that while various steps had been taken to improve cyber security practices over the past year, certain problems persisted, which require additional action in order to reduce the risk of malicious intrusion and other external threats (*The Department's Unclassified Cyber Security Program – 2007*, IG-0776, September 2007). Specifically, we found that continuing problems with the certification and accreditation of Department systems existed at various sites across the complex. Additionally, while some progress had been made, the Department had yet to establish a complex-wide inventory of information systems. Further, the Department could not always ensure that personal information collected and maintained on agency systems was adequately protected. These continuing concerns led us to conclude that the risk of compromise to the Department's information and systems remains higher than acceptable.

It must be acknowledged that the Department has in place an aggressive effort to address existing weaknesses and has continued implementation of a plan to revitalize its cyber security

program. For example, an overarching policy was issued that directed senior management to develop and implement cyber security plans within their respective organizations. During the course of our evaluation, we also noted that a number of positive steps had been taken to help ensure that personal information maintained in agency systems was protected.

Another important aspect of the Department's cyber security curriculum, the Certification and Accreditation (C&A) process, required by Federal law and Departmental guidance, is designed to ensure that information systems are secure prior to beginning operation and that they remain so throughout their lifecycle. The process involves determining whether system controls are in place and operating as intended, identifying weaknesses, mitigating them to the maximum extent possible, and officially recognizing and accepting residual risks. Previous OIG reports have disclosed shortcomings with the Department's C&A process. These reports identified several sites that had incomplete C&A processes and incorrect grouping of systems.

As a result of these problems and the importance of the C&A process, we conducted a January 2007 review to determine whether the Department's information systems had been appropriately certified and accredited for operation. Despite recent efforts by the Department to improve its process by strengthening guidance, many of its systems were not properly certified and accredited for operation (*Certification and Accreditation of Unclassified Information Systems*, IG-0752, January 2007). Without proper C&A, the Department lacks assurance that its information systems and the data they contain are secure. In addition, accrediting officials may have unknowingly accepted a higher risk than necessary and systems may lack the controls needed to prevent data compromises.

During our review, we did note that the Department continues to revitalize its Cyber Security Program throughout the complex. The Office of the Chief Information Officer recently issued updated guidance that describes the minimum expectations for the C&A of information systems. The National Nuclear Security Administration is also in the process of implementing its Integrated Certification and Accreditation System (ICAS) – a program-wide application intended to standardize the certification process within the organization. In addition, the Office of Science's Office of Information Technology Management, in conjunction with the Office of Independent Oversight, Office of Health, Safety, and Security, had been conducting site visits to identify and resolve cyber security problems, provide site assistance, and follow-up on corrective actions. This process, if implemented across the complex, should help the Department improve its C&A process and strengthen information system security.

Environmental Cleanup

The Department's environmental remediation activities are among its most important activities. With the end of the Cold War, this endeavor became of even greater importance, as the Department took on efforts to dispose of large volumes of solid and liquid radioactive waste from over a half a century of nuclear defense and energy research activities. Currently, the Department is responsible for cleaning more than 100 contaminated sites and disposing of radioactive, hazardous, and mixed waste resulting from nuclear weapons production, nuclear powered naval vessels, and commercial nuclear energy production. As a whole, these sites encompass an area of over two million acres, which is roughly equal to the size of Rhode Island

and Delaware combined. Due to the risks and hazards associated with this difficult and costly task, we conducted a number of reviews over the past year to assess the progress of the Department's environmental cleanup activities.

For example, with an annual budget of \$2 billion, the Department's Hanford Site, located in southeastern Washington State, is the country's largest environmental cleanup project. In the 1950's and 1960's, operations at the Hanford Site generated large amounts of radioactive waste. Subsequently, Hanford established waste burial grounds, which received nuclear waste from fuel fabrication research and development activities during this period. Based on historical information about the origin of this waste, the burial grounds may contain irradiated fuel fragments, transuranic waste, and low-level waste, including some hazardous mixed wastes. Radiation levels at the edge of the burial grounds, which are approximately four miles from the Columbia River, have been found to be 100 times the annual radiation dose limit per one hour of exposure. The Department, in 2005, awarded a "River Corridor" contract to, among other things, remediate the burial grounds at an estimated cost of \$136 million.

An October 2006 Office of Inspector General review disclosed that the Department's planned remediation actions for the burial grounds did not address all pertinent issues (*Remediation of the Waste Burial Grounds at the Hanford Site*, IG-0743, October 2006). Specifically, we found that the Department's remediation strategy may produce a waste form or waste package that, in some cases, will not meet current acceptance criteria for interim storage. Further, the Department's strategy did not reflect the cost to prepare the retrieved waste to meet waste acceptance criteria for final disposition. Moreover, although the retrieved waste is likely to require additional processing, the Department's River Corridor contractor and the Hanford Site do not have the capability to treat these wastes for interim storage and final disposal. Our review revealed that the Department had not fully addressed these issues in its planning process. As a result, the Department may incur up to \$188 million more than planned to store, monitor, and manage waste retrieved from the burial grounds.

The Department is also responsible for managing the agency's spent nuclear fuel inventory and preparing it for final disposition in a geologic repository. In 1998, legislation was enacted that required the Department to convert the 704,000 metric tons of depleted uranium hexafluoride stored at its gaseous diffusion plants to a more stable form. In August 2002, the Department awarded a contract for the design, construction, and operation of conversion facilities in Paducah, Kentucky, and Portsmouth, Ohio. The Paducah facility was designated with four conversion lines to process its larger inventory of depleted uranium hexafluoride, while the Portsmouth facility was designed with three conversion lines. The Department expected that it would take approximately 25 years to convert all of the depleted uranium hexafluoride to a more stable form.

In a March 2004 report, we noted that the Department's conversion program could have been improved by adding an additional conversion line to the Portsmouth facility. We found that with a capital investment of \$5.6 million, the Department could reduce lifecycle operating costs by about \$60.2 million and complete the project nearly five years sooner than anticipated. A December 2006 follow-up review was conducted to determine if the Department had performed a cost-benefit analysis and implemented the most cost-effective approach to converting depleted

uranium hexafluoride (*Follow-up of Depleted Uranium Hexafluoride Conversion*, IG-0751, December 2006). We found that the Department had, in fact, performed an analysis in May 2005 that showed that adding the fourth line to the Portsmouth facility could result in the estimated savings indicated in our previous report. However, the Department had not taken the next step to implement the most cost-effective approach to converting depleted uranium into a more stable form. Despite the passage of time, we found that the Department could still save \$35 million in lifecycle costs by reducing the operations schedule by approximately five years through the utilization of a fourth conversion line at the Portsmouth facility.



View of test tunnels at Yucca Mountain

In addition to its environmental cleanup efforts, the Department is responsible for constructing a geological repository at Yucca Mountain, Nevada. In July 2002, after more than two decades of scientific study, President George W. Bush signed the *Yucca Mountain Development Act*, designating Yucca Mountain as the site of the Nation's first geologic repository for radioactive waste and spent nuclear fuel. During FY 2007, the Department made progress toward developing a license application for submittal to the Nuclear Regulatory Commission (NRC), which is required before waste shipments to the repository can begin. Specifically, in

October 2007, the Department certified its collection of documents to the NRC, further advancing the Yucca Mountain repository licensing process. In addition, the Department issued two draft supplemental environmental impact statements for public comment related to Yucca Mountain. These steps were required prior to presenting a license application to NRC, which the Department plans to submit by June 2008. While progress has been made in the construction and licensing process at Yucca Mountain, the Department must work to ensure that quality control deficiencies outlined in past OIG reviews, which could affect the ongoing design, analysis, and eventual licensing of the repository, are not repeated.

Past OIG reviews have underscored the monumental task that the Department faces to ensure that contaminated materials and radioactive waste are disposed of in a safe, timely, and cost effective manner. Overseeing the largest cleanup effort in the world, the Department has made significant progress at several sites over the past several years, including the completion of cleanup efforts at Rocky Flats, the Lawrence Livermore National Laboratory, and the Kansas City Plant. However, the Department continues to experience delays in accelerated cleanup programs at other sites such as Savannah River and Hanford. As a result, Environmental Cleanup remains a management challenge that warrants significant attention on the part of Department management.

Human Capital Management

In previous years, the area of Human Capital Management was classified as a “watch list” item, not rising to the level of a significant management challenge. This year, for a variety of reasons, the OIG has elevated Human Capital Management to the management challenges list. First and foremost, the Department’s workforce is aging and getting smaller. Since 1995, the Department has experienced a 30 percent reduction in the size of its workforce, and the average age of Agency employees currently stands at more than 49 years. Adding to these existing concerns, 26 percent of the Department’s workforce will be eligible to retire in the next 3 years. The precipitous decline in agency staffing levels, combined with possible high future attrition rates present the Department with the difficult challenge of ensuring that its workforce has the knowledge and skills that are necessary to fulfill the Agency’s various missions.

In the 2001 President’s Management Agenda, the Office of Management and Budget recognized strategic management of human capital as one of the Government’s “most glaring problems.” The Agenda specifically outlined concerns that the Department’s staff lacked adequate project and contract management skills required to oversee large projects. Subsequently, the Department undertook an effort to perform a critical skills gap analysis in order to review and evaluate specific critical skill needs. During FY 2007, the Department continued these efforts to strategically manage its workforce through newly implemented workforce planning techniques, increased emphasis on performance and accountability, and identifying critical hiring needs. In addition, efforts are underway to enhance overall recruitment and retention within the Department. While these are positive steps, the area of Human Capital Management is an ongoing challenge that will require the attention of Department management in the years to come.

During the course of our work over the past year, issues pertaining to Human Capital Management have arisen in various reviews primarily focused on issues of security, environmental remediation, contract administration, and project management. For example, during a review of the Department’s newly instituted loan guarantee program, it became apparent that a capable and proficient staff is essential toward establishing an effective loan guarantee program and minimizing costly mistakes. Our report on this issue concluded that as the Department moved forward in establishing its burgeoning loan guarantee program, staffing should be the first priority (*Loan Guarantees for Innovative Energy Technologies*, IG-0777, September 2007).

Additionally, acting on the concern that the number of Departmental acquisition officials has not kept pace with the demand for their services, we initiated a limited review of the Agency’s acquisition workforce. Along with sound contract management principles, a stable, skilled, and experienced workforce are key components to the effective performance of the Department’s programs. Our review found that while the dollar value and complexity of Department contracts has increased in recent years, the overall number of acquisition officials has essentially remained constant. Looking at this issue from another perspective, in 2006, contract specialists accounted for 2.9 percent of the Department’s total workforce, but were responsible for important aspects of 90 percent of the Agency’s budget. Adding to these concerns were statistics related to the retirement status of the Department’s acquisition workforce. Between 1998 and 2006, the

percentage of contract specialists eligible to retire nearly tripled. Given these statistics, overall staffing levels and the retirement status of the procurement workforce should be an issue of interest as the Department looks to the future.

The information obtained through this examination of the acquisition workforce also helps to provide a glimpse at the broader concerns facing the Department in the area of Human Capital Management. Given the importance of the Agency's mission and the fact that the Department will spend billions of dollars pursuing programs vital to the well-being of the American public, there are compelling reasons to ensure that the management and staffing of the workforce is a top priority.

Project Management

The Department supports numerous unique and complex multi-million dollar projects in order to accomplish its various missions. For several years, the OIG, the Government Accountability Office, and the Department itself have designated project management as a high-risk area vulnerable to waste, fraud, and abuse. In numerous cases, Department projects have routinely been completed behind schedule and exceeded established budgets. In recent years, the Department, in responding to identified weaknesses in the area of Project Management, has sought to improve the discipline and structure of project performance. However, due to a variety of reasons, our reviews continue to highlight concerns in the area of Project Management.

As part of its continuing efforts to identify, address, and resolve project management deficiencies, in October 2007, the Department held a workshop to discuss the major issues and associated root causes impacting project and contract management. As a result of this effort, the Department conducted an analysis to identify the underlying root causes contributing to these project management deficiencies. Key preliminary findings of the underlying root causes for project and contract management shortcomings, as outlined by the workshop, included:

- A lack of appropriate technical and management skills and experience in the Federal workforce;
- Ineffective integration of Federal contracting and project management functions;
- Poor understanding of, and adherence to, project management requirements;
- Competing program priorities and requirements that exceed the available personnel and budget resources; and
- An inadequate training and certification program.

The root cause analysis developed by the Department is a positive step in establishing a foundation upon which corrective measures can be implemented. In this mold, the Department developed several recommendations that will be used to initiate a corrective action plan to address and eliminate the identified root causes of project management concerns.



Cleanup of waste tanks at the Hanford Site

While these corrective actions are positive, recent OIG reviews have identified additional improvements that are necessary to ensure that the Department's efforts to implement project management principles are effective. For example, in one of the largest and most important of its environmental remediation projects, the Department is constructing a Waste Treatment Plant at the Hanford Site. The \$12.2 billion facility is designed to treat and prepare for disposal of 53 million gallons of radioactive and chemically hazardous waste. Given its classification as a Category II nuclear facility, the Waste Treatment Plant must meet quality assurance standards for nuclear facilities, which significantly exceed those required for commercial facilities. As a result, the design called for the installation of a computerized integrated control network to monitor the operation of a number of key processes of the Plant.

In a May 2007 review, we found that the Waste Treatment Plant control system acquired by the Department did not meet applicable quality assurance standards. Specifically, the system did not meet the stringent procedures, plans, specifications, or work practices associated with nuclear quality standards (*Quality Assurance Standards for the Integrated Control Network at the Hanford Site's Waste Treatment Plant*, IG-0764, May 2007). Under the circumstances, we concluded that the Department could not ensure that the Plant's current system is suitable for processing nuclear waste. To address the concerns raised during our review, we recommended that Department officials take the necessary steps to ensure that the control system for the integrated control network at the Waste Treatment Plant meets appropriate quality assurance standards.

Representing another activity vital to the well-being of the Nation, the Department's Strategic Petroleum Reserve consists of underground caverns located in the heart of the Gulf Coast region of the United States, which currently hold nearly 700 million barrels of crude oil. The Reserve's primary mission is to maintain drawdown readiness to mitigate the impact of a severe crude oil supply disruption. To facilitate this goal, the Energy Policy Act of 2005 required the Department to expand the Reserve's maximum storage capacity to one billion barrels of crude oil. After evaluating various alternatives, the Department decided to develop a new 160 million barrel storage facility at Richton, Mississippi, and to expand the storage capacity at two existing Reserve facilities. Subsequent to the announcement of the Richton site as the preferred expansion alternative, public and congressional entities raised concerns about the procedures used by the Department in eliminating a salt dome in Bruinsburg, Mississippi, from consideration as a potential expansion location. According to Department officials, the Bruinsburg site was not selected because the salt dome was too small to meet storage needs and the site presented significant technical risks associated with the use of deep injection wells to dispose of nearly 1.2 million barrels per day of brine used to excavate the caverns.



A barge docked at Phillips Terminal at the Strategic Petroleum Reserve

In order to evaluate these concerns, we conducted a review to determine whether the Department had analyzed all relevant data in selecting a site location for the expansion of the Reserve. Our review found that the Department and its contractor had in fact analyzed all available well and seismic data related to the Bruinsburg site and augmented this information with additional seismic tests. Additionally, we found that there are inherent uncertainties involved in the process of estimating the size of salt domes. As a consequence, the exact size and shape of the Bruinsburg salt dome is not fully known. Overall, we determined that the Department took the

necessary steps to determine an adequate location for the expansion of the Reserve.

Given the nature, quantity, as well as the overall economic and environmental impact of Department programs, the area of Project Management presents an evolving and expansive set of challenges. As the Department itself has acknowledged, stronger policies and controls to ensure that ongoing projects are frequently re-evaluated in light of changing missions and priorities is central to sound management principles. While the Department has made progress, our reviews over the past year have highlighted weaknesses in this area. Given the complexity and importance of the Department's numerous multi-million dollar projects and the results of recent OIG reports, Project Management remains a significant management challenge.

Safeguards and Security

While the Department has shifted its focus over time as the needs of the Nation have changed, special emphasis on Safeguards and Security has remained a vital aspect of the Agency's mission. The Department plays a fundamental role in the Nation's security by ensuring the safety of the country's nuclear weapons, advancing nuclear non-proliferation, and providing safe and efficient nuclear power plants for the United States Navy. In order to faithfully execute this sensitive mission, the Department maintains a substantial security regime, which includes over 4,000 protective force personnel and various physical safeguards for classified material and other sensitive property. In recent years, this management challenge was labeled "National Security." While the current management challenge, Safeguards and Security, encompasses Departmental programs and operations pertaining to national security, it also serves to include a broader range of issues such as internal security controls as well as protective force property and work environment concerns.

The Department, in fulfilling its various missions, maintains stewardship of vital national security capabilities, ranging from nuclear weapons to classified research and development projects. Agency activities are focused on protecting nuclear weapons secrets, but also

emphasize the protection of other sensitive scientific endeavors. Over the past year, the Department made strides toward improving critical safeguards. Specifically, during FY 2007, the Department continued its implementation of 2004 security initiatives to improve security throughout the Agency's complex of laboratories and defense facilities. These included efforts to implement necessary measures to improve material storage facilities, implement protective force measures, and deploy new security technologies.

An area of vital importance in terms of Safeguards and Security centers on the Department's efforts to meet the current Design Basis Threat (DBT) policy. The DBT policy reflects the most credible threats to Departmental assets and operations. In May 2003, the Department revised the DBT to reflect the threat environment existing after the attacks of September 11, 2001. Changes to site protection programs to implement the 2003 DBT were to be completed by the end of FY 2006. In October 2005, we reported that the National Nuclear Security Administration (NNSA) did not have sufficient time to fully integrate security planning and execute a coordinated effort to identify and evaluate cost-effective permanent upgrades to meet 2003 DBT requirements.

A June 2007 follow-up review found that NNSA sites certified that they met the 2003 DBT policy by the end of FY 2006 as required by the Department's policy. This most recent review on the Department's implementation of the DBT policy noted significant progress toward implementing necessary security measures (*Follow-Up Audit of the National Nuclear Security Administration's Implementation of the 2003 Design Basis Threat Policy*, OAS-M-07-04, June 2007). As the Department moves forward, it must continue these efforts, focusing on increased security requirements as outlined in the revised November 2005 DBT policy. National Nuclear Security Administration sites are currently in the process of making additional changes to their security programs in order to meet these requirements. While we view this progress associated with the Department's DBT policy as an important step, we conducted several reviews that highlighted the need for continued improvement in this area.

In light of the importance of safeguarding weapons parts, we initiated a review to determine whether selected NNSA sites had adequate accountability controls over non-nuclear classified weapons parts. While the weapons incorporate numerous nuclear and non-nuclear components or parts, even the non-nuclear parts are designated as classified since disclosure of related information could damage national security. We found that two of the three sites reviewed had not implemented adequate lifecycle controls and did not track many classified non-nuclear weapons parts in their custody. Although some site organizations maintained informal tracking systems, they lacked fundamental controls such as regularly scheduled inventories and segregation of duties to ensure full and accurate accountability. In addition, the tracking systems were not integrated and could not account for classified parts transferred between organizations. During our review, the two sites could not readily account for or locate some of the items included in our inventory sample. Accordingly, we made recommendations to improve lifecycle accountability for all classified non-nuclear weapons parts in the Department's possession (*The National Nuclear Security Administration's Management of Classified Weapons Parts*, IG-0772, July 2007).

Another important area of Safeguards and Security centers on the Department's extensive inventory of information technology systems. While many aspects of this inventory are

categorized under Cyber Security, specific areas such as the excessing of computers used for unclassified controlled information involve the safeguarding of sensitive technical as well as personal data. When unclassified computers and other electronic memory devices are determined to be excess, they may be transferred for reuse within Department facilities or other governmental agencies, donated for educational purposes, sold, or salvaged. However, to prevent the unauthorized dissemination of unclassified sensitive information, Department policy requires that, during the excessing process, data stored on computer hard drives and other memory devices be properly removed or physically destroyed.

In two separate reviews, we concluded that the Lawrence Livermore National Laboratory and the Idaho National Laboratory did not adhere to existing policies and internal controls for excessing computers and other electronic memory devices to prevent the unauthorized dissemination of unclassified controlled information. Despite the number of problems that we and others have identified over the years with the Department's efforts to appropriately excess computers and other electronic memory devices, major Department elements did not implement Agency policy specifically issued to address the appropriate excessing of computers. We concluded that added emphasis needed to be placed on the promulgation, implementation, and execution of effective policies and procedures over the excessing of computers and related devices (*Excessing of Computers Used for Unclassified Controlled Information at Lawrence Livermore National Laboratory*, IG-0759, March 2007; *Excessing of Computers Used for Unclassified Controlled Information at the Idaho National Laboratory*, IG-0757, February 2007).

Although the Department has taken various steps over the past year to improve its overall security posture and minimize threats, the issues disclosed in our work during FY 2007 suggest the need for continued focus and improvement by Department management in this challenge area. Given the fundamental mission of the Department, combined with its critical infrastructure and assets, the challenge area of Safeguards and Security will inevitably remain a challenge area in future years. In order to address this challenge, the Department must continue to develop immediate and long-term strategies to minimize risk in this critically important area of the Department's operations.

Stockpile Stewardship

A critical mission of the Department centers on the maintenance, certification, and reliability of the Nation's nuclear weapons stockpile. In order to ensure that our nuclear weapons continue to serve their essential deterrent role, the Department performs stockpile surveillance, refurbishes selected nuclear systems, and maintains manufacturing infrastructure for the production of replacement weapons. As has been the case in recent years, given the importance and complexity of the Department's role in ensuring the vitality of the U.S. nuclear stockpile, Stockpile Stewardship has been classified as a significant management challenge.

The conclusion of the Cold War was followed by a moratorium on nuclear testing as well as an end to the production of new nuclear warheads. Notwithstanding these factors, the Department is responsible for certifying the safety, security, and reliability of the existing U.S. nuclear stockpile. On an annual basis, the President of the United States issues the Nuclear Weapons Stockpile Plan. As part of the development of the Plan, the Secretary of Energy is required to

confirm that the U.S. nuclear weapons stockpile is safe, secure, and reliable. In support of this effort, NNSA uses statistical sampling techniques, various tests, and computer simulations to assess weapon reliability. Through the process of “Surveillance Testing,” the performance and reliability of randomly selected weapons and components are evaluated. In 2001, the OIG reported that the Department was behind schedule in conducting several of the stockpile surveillance tests. In response to our 2001 report, the Department committed to taking steps to return stockpile surveillance testing to its planned schedule.

In an October 2006 follow-up review, we found that although some progress had been made, the Department had not eliminated the weapons surveillance testing backlog (*Follow-up Audit on Stockpile Surveillance Testing*, IG-0744, October 2006). The review disclosed that significant backlogs existed in each of the three types of tests conducted in the surveillance program, which include laboratory tests, flight tests, and component tests. Consistent with prior commitments, the Department had taken steps to improve its surveillance test planning and to renew safety studies to eliminate the backlog. However, these efforts were not fully successful. The surveillance program’s role in assessing and ensuring confidence in the reliability of the weapons stockpile is increasingly important as the nuclear weapons stockpile continues to age. As a result of the continuing backlog of surveillance tests, the Department lacks vital information about the reliability of the stockpile. Further, as a result of testing delays, important operating anomalies or other defects could go undetected. From our perspective, elimination of the existing surveillance testing backlog depends in large part on the successful implementation and execution of existing Departmental initiatives as well as the realization of previous commitments.

Another aspect of the Department’s stockpile stewardship program centers on the mission of Technical Area 18 (TA-18) at the Los Alamos National Laboratory, which conducts nuclear criticality experiments and hands-on training in nuclear safeguards, safety, and emergency response. To consolidate special nuclear materials in a more secure facility, in December 2002, NNSA announced a decision to relocate the TA-18 mission to the Device Assembly Facility at the Nevada Test Site. Given the importance of security and safety, we conducted a review to determine whether NNSA minimized the impact of the TA-18 relocation on mission operations (*Management Controls over the National Nuclear Security Administration’s Ability to Maintain Capability of the TA-18 Mission*, OAS-M-07-02, February 2007). Although the goal was to establish interim operations as early as FY 2005, NNSA had not maintained the capability to conduct unique TA-18 criticality operations. While management had a reasonable basis to delay establishing interim operations, we concluded that full resumption of criticality operations by FY 2010 is at risk due to inadequate planning and staffing. During the course of our review, the Department recognized the importance of re-establishing the nuclear criticality and safety training missions and took action to establish some interim operations at the Device Assembly Facility. While this is a positive step, prompt action is needed to ensure that a fully trained and certified staff is available to carry out the unique functions of the TA-18 mission.

As demonstrated in recent reviews outlined above as well as those conducted in recent years, the Department needs to continue to improve in this vital challenge area by enhancing Life Extension Programs and improving management processes related to the cost and scheduling of various stockpile stewardship projects.



Watch List

The watch list consists of organizational and administrative issues that do not meet the threshold of major management challenges, yet warrant continued attention by senior Department managers. Watch list issues may include management challenges identified in previous years for which the Department has implemented corrective actions or has achieved significant positive outcomes. In addition, the watch list may include emerging issues that require Department action. Last year, our watch list addressed three areas: Financial Management and Reporting, Worker and Community Safety, and Human Capital Management. This year, Human Capital Management has risen to become a management challenge and Infrastructure Modernization has been added to the Watch List. However, Financial Management and Reporting has been removed from the watch list as a result of the Department's continued improvement associated with preparing accurate consolidated financial statements.

Infrastructure Modernization

With assets totaling more than \$135 billion, the Department manages an array of critical infrastructure, including national laboratories, power administrations, production and environmental cleanup facilities, and numerous operations and field offices. In many cases, the health and vitality of the Nation's science and technology depends on the availability and physical condition of the Department's advanced research facilities. Given that numerous facilities, particularly scientific laboratories, were built decades ago, the modernization of the Department's infrastructure should be a central feature of the Agency's long-term planning in order to advance the national, energy, and economic security of the United States.

Recognizing these concerns, in 2003, the Department's Office of Science issued a long-range facilities plan entitled, *Facilities for the Future of Science: A Twenty-Year Outlook*, which ranked various scientific facilities, including the complex of national laboratories, in terms of scientific priority and technological readiness. Since 2003, the plan has served as a roadmap for the future of the Department's scientific infrastructure, while providing an overarching strategic framework and long-term vision to guide yearly policy and funding decisions. In August 2007, the Office of Science issued an interim report, updating the status of facilities listed in the original 20-year outlook. According to the Office of Science, in many cases, substantial progress has been made toward deployment. Overall, construction of new facilities and upgrades to current facilities, integrated with the plans of the entire U.S. scientific community, will help sustain the flow of decisive scientific ideas, greater technological innovation, and other advances that are critical to the scientific and economic well-being of the Nation.

Additionally, in FY 2006, the Department announced the details of a comprehensive plan to employ a smaller, safer, and more secure nuclear weapons stockpile in order to enhance the

Nation's capability to respond to changing security challenges. The Department's plans for the future will achieve the President's vision of the smallest stockpile consistent with our national security needs. The Complex 2030 framework includes consolidating nuclear materials and eliminating duplicative capabilities in and around the Nuclear Weapons Complex. The size of the weapons complex has decreased by more than 40 percent since the end of the Cold War and the future plans will allow NNSA to even further reduce the "footprint," or total square footage, set aside for weapons work at eight sites around the country. To oversee this plan, known as Nuclear Weapons Complex 2030, NNSA established the Office of Transformation under its Deputy Administrator for Defense Programs. Over the next several years, the transformation of the nuclear weapons security complex under this new initiative will shape the Department's stockpile stewardship program as well as the modernization of critical infrastructure.

The aforementioned examples of Agency efforts to modernize existing infrastructure represent a positive step toward revitalizing the Department's critical infrastructure. As many facilities continue to age, future efforts pertaining to the conception, design, maintenance, and operation of new and existing critical infrastructure are of vital importance to the Department as well as the Nation as a whole. Given the importance of the Department's mission in areas of energy innovation, environmental cleanup, and national security, the overall condition, functionality, and modernization of the Department's infrastructure is paramount to achieving current and future mission priorities.

Worker and Community Safety

Given the numerous large-scale facilities and dangerous materials that make up the Department, ensuring the safety of employees and the general public is of vital importance. Safety incidents may potentially destabilize, delay, and disrupt the Department's critical activities, and have intangible costs such as a negative public perception of the Department. Due to the inherently critical nature of these issues, the need for continued vigilance and improvement is essential. As a result, we have retained the area of Worker and Community Safety on our watch list.

Although steps that the Department took to address worker and community safety issues prompted us to remove it from the management challenges list in FY 2003, our work continues to identify safety issues that require the attention of senior management. For example, recent reports in this area have focused on hazardous materials and radioactive substances, which present a health and safety risk to Department employees as well as the public. The Department maintains a significant inventory of radioactive substances at facilities throughout the United States. To help ensure the safety of its workforce, the Department established a two-tiered approach to biological or "bioassay" testing of workers to determine whether, and to what extent, they may have absorbed radioactive material. Prior OIG reviews have identified problems regarding the cost-effectiveness and efficiency of the Department's bioassay monitoring program.

Given the current emphasis on worker safety and the obvious dangers posed by excessive radiation exposure, we conducted a review to determine whether contractor-developed bioassay programs were effectively administered. At selected sites, we found that the confirmatory bioassay component of contractor-developed programs to monitor the effectiveness of

radiological engineering and administrative controls was not functioning as intended. Further, we concluded that site-level safeguards for the bioassay component of the contractor-developed monitoring program were inadequate and that Federal reviews by the Department were not always sufficient. While recent actions by the Department to improve bioassay programs are noteworthy, without an improvement in the control process over personnel monitoring, Department and contractor employees may be at risk for occupational exposures to radioactive material that might not be detected (*Confirmatory Bioassay Testing at Selected Sites*, IG-0773, August 2007).

Throughout the Department complex, various safety and health regulations, including Occupational Safety and Health Administration (OSHA) regulations, National Fire Protection Association standards, and internal Department orders, must be followed in order to ensure the safety of the workforce as well as the general public. The Pantex Plant, for example, uses approximately 3,000 different kinds of chemicals, including acids, corrosives, flammable and combustible liquids, compressed gases, and explosives. The OIG conducted a February 2007 review in order to determine if the prime contractor at Pantex had in place an effective chemical safety program. Our review concluded that in most respects the contractor at Pantex implemented an effective chemical safety program. However, we identified several areas that needed improvement, including significant discrepancies involving the inventory in a hazardous chemicals storage building. Our review included several recommendations for corrective action to improve the Pantex chemical safety program (*Chemical Safety Protocols at the Pantex Plant*, IG-0756, February 2007).

To its credit, during 2007, the Department implemented a new Worker Health and Safety rule, establishing an integrated enforcement program for nuclear safety, worker safety and health, and integrating safety and security training throughout the Department. Additionally, the Office of Science and the Office of Nuclear Energy continued their efforts to improve worker and community safety through improved laboratory appraisal plans, new safety oversight models, and upgraded training requirements. Given the inherent risks associated with the Department's many nuclear, scientific, and cleanup projects, the area of Worker and Community Safety is a continual process that requires vigilant attention and improvement.

Challenge Areas and Significant Issues Reported by Various Groups

OIG Management Challenge	GAO Challenge Area ¹	Department Leadership Challenges ²
Environmental Cleanup	Cleanup of Radioactive & Hazardous Waste	Environmental Cleanup Nuclear Waste Disposal
Safeguards and Security	Security Threats and Problems	Security
Stockpile Stewardship	Nuclear Weapons Stockpile	Stockpile Stewardship
Contract Management	Contract Management	Oversight of Contractors Acquisition Process Management
Project Management		Project Management
Cyber Security		Cyber Security
Human Capital Management		Human Capital Management
	Leadership in Meeting Nation's Energy Needs	
OIG Watch List		
Worker and Community Safety		Safety and Health
Infrastructure Modernization	Revitalize Infrastructure	

¹According to *Major Management Challenges and Program Risks*, Department of Energy (GAO-03-100, January 2003).

²The Department's self-identified "Management Challenges and Significant Issues" according to *U.S. Department of Energy Performance and Accountability Report*, FY 2007 (November 2007).

Relevant Reports Issued in Fiscal Year 2007

Contract Management

- Audit Report on *Management Controls over Cash Advances for Proprietary Use of Office of Science User Facilities* (OAS-M-07-07, September 25, 2007)
- Audit Report on *Audit of Contract Transition Activities at Los Alamos National Laboratory* (OAS-L-07-16, August 7, 2007).
- Inspection Report on *Protective Force Overtime Pay at Lawrence Livermore National Laboratory* (INS-O-07-03, July 23, 2007).
- Audit Report on *Facility Contractor Acquisition and Management of Information Technology Hardware* (IG-0768, June 22, 2007).
- Audit Report on *Voluntary Separation Program at the Idaho Cleanup Project* (IG-0765, May 18, 2007).
- Audit Report on *Management Controls over Selected Facility Contractor Travel Expenses* (OAS-M-07-03, April 26, 2007).
- Audit Report on *The Department of Energy's Management of Contractor Intergovernmental Personnel and Change of Station Assignments* (IG-0761, March 26, 2007).
- Audit Report on *Recovery of Costs for Proprietary Use of the Advanced Photon Source* (IG-0753, January 11, 2007).
- Inspection Report on *Work Packages for Site Support Services at Los Alamos National Laboratory* (IG-0746, November 29, 2006).

Cyber Security

- Evaluation Report on *The Department's Unclassified Cyber Security Program – 2007* (IG-0776, September 18, 2007).
- Audit Report on *Security over Personally Identifiable Information* (IG-0771, July 30, 2007).
- Audit Report on *The National Nuclear Security Administration's Implementation of the Federal Information Security Management Act* (IG-0758, February 22, 2007).
- Inspection Report on *Alleged Loss or Theft of Personally Identifiable Information at Pantex* (INS-L-07-05, February 2, 2007).
- Audit Report on *Certification and Accreditation of Unclassified Information Systems* (IG-0752, January 3, 2007).
- Special Report on *Selected Controls over Classified Information at the Los Alamos National Laboratory* (Special Inquiry Memorandum, November 11, 2006).

Environmental Cleanup

- Audit Report on *Follow-up of Depleted Uranium Hexafluoride Conversion* (IG-0751, December 26, 2006).

- Audit Report on *Remediation of the Waste Burial Grounds at the Hanford Site* (IG-0743, October 18, 2006).

Project Management

- Audit Report on *Management Controls over the Hanford Environmental Information System* (OAS-M-07-06, September 17, 2007).
- Special Report on *Expansion of the Strategic Petroleum Reserve* (IG-0767, June 19, 2007).
- Audit Report on *Quality Assurance Standards for the Integrated Control Network at the Hanford Site's Waste Treatment Plant* (IG-0764, May 4, 2007).
- Audit Report on *The Department's Efforts to Implement Common Information Technology Services at Headquarters* (IG-0763, March 30, 2007).
- Audit Report on *The Department's Wildland Fire Planning and Preparation Efforts* (IG-0760, March 6, 2007).
- Inspection Report on *Sandia National Laboratory-California Procurement Card Program* (IG-0754, January 18, 2007).
- Audit Report on *Management Controls over the Department of Energy's Superconductivity Partnerships* (OAS-M-07-01, January 18, 2007).
- Audit Report on *The Federal Energy Regulatory Commission's Program to Oversee Hydroelectric Dams* (IG-0750, December 18, 2006).
- Audit Report on *The Department of Energy's Use of the Strategic Petroleum Reserve in Response to Hurricanes Katrina and Rita* (IG-0747, December 5, 2006).

Safeguards and Security

- Audit Report on *National Nuclear Security Administration's Construction of a Radiological/Nuclear Complex for the Department of Homeland Security* (IG-0775, September 12, 2007).
- Inspection Report on *Material Control and Accountability at Los Alamos National Laboratory* (IG-0774, September 7, 2007).
- Audit Report on *The National Nuclear Security Administration's Management of Classified Weapons Parts* (IG-0772, July 31, 2007).
- Inspection Report on *Protective Force MK-19 Grenade Launcher Use at the National Nuclear Security Administration's Pantex Facility* (IG-0770, July 20, 2007).
- Inspection Report on *Controls over Ammunition within the Office of Secure Transportation* (INS-O-07-02, July 13, 2007).
- Inspection Report on *Alleged Unnecessary Protective Force Equipment Purchases at Pantex* (INS-L-07-07, July 11, 2007).
- Audit Report on *Follow-up Audit of the National Nuclear Security Administration's Implementation of the 2003 Design Basis Threat Policy* (OAS-M-07-04, June 4, 2007).
- Inspection Report on *Internal Controls over Computer Property at the Department of Energy's Counterintelligence Directorate* (IG-0762, March 28, 2007).
- Inspection Report on *Excessing of Computers Used for Unclassified Controlled Information at Lawrence Livermore National Laboratory* (IG-0759, March 5, 2007).

- Inspection Report on *Excessing of Computers Used for Unclassified Controlled Information at the Idaho National Laboratory* (IG-0757, February 16, 2007).
- Inspection Report on *Review of the Department of Energy's Canine Program at Selected Sites* (IG-0755, January 23, 2007).
- Audit Report on *The Department's Energy, Science, and Environment Sites' Implementation of the Design Basis Threat* (IG-0749, December 14, 2006).
- Inspection Report on *Material Control and Accountability at Lawrence Livermore National Laboratory* (IG-0745, November 15, 2006).
- Inspection Report on *Protective Force Property Management at Lawrence Livermore National Laboratory* (IG-0742, October 11, 2006).

Stockpile Stewardship

- Audit Report on *Management Controls over the National Nuclear Security Administration's Ability to Maintain Capability of the TA-18 Mission* (OAS-M-07-02, February 20, 2007).
- Audit Report on *Follow-up Audit on Stockpile Surveillance Testing* (IG-0744, October 30, 2007).

CUSTOMER RESPONSE FORM

The Office of Inspector General has a continuing interest in improving the usefulness of its products. We wish to make our reports as responsive as possible to our customers' requirements, and, therefore, ask that you consider sharing your thoughts with us. On the back of this form, you may suggest improvements to enhance the effectiveness of future reports. Please include answers to the following questions if they are applicable to you:

1. What additional background information about the selection, scheduling, scope, or procedures of the inspection would have been helpful to the reader in understanding this report?
2. What additional information related to findings and recommendations could have been included in the report to assist management in implementing corrective actions?
3. What format, stylistic, or organizational changes might have made this report's overall message more clear to the reader?
4. What additional actions could the Office of Inspector General have taken on the issues discussed in this report which would have been helpful?
5. Please include your name and telephone number so that we may contact you should we have any questions about your comments.

Name _____ Date _____

Telephone _____ Organization _____

When you have completed this form, you may telefax it to the Office of Inspector General at (202) 586-0948, or you may mail it to:

Office of Inspector General (IG-1)
Department of Energy
Washington, DC 20585

ATTN: Customer Relations

If you wish to discuss this report or your comments with a staff member of the Office of Inspector General, please contact Judy Garland-Smith at (202) 586-7828.

The Office of Inspector General wants to make the distribution of its reports as customer friendly and cost effective as possible. Therefore, this report will be available electronically through the Internet at the following address:

U.S. Department of Energy Office of Inspector General Home Page

<http://www.ig.doe.gov>

Your comments would be appreciated and can be provided on the Customer Response Form attached to the report.