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NUCLEAR WEAPONS

Views on Proposals to Transform the Nuclear Weapons Complex

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Highlights of [GAO-06-606T](#), a testimony before the Subcommittee on Energy and Water Development, Committee on Appropriations, House of Representatives

Why GAO Did This Study

Over the past several years, a serious effort has begun to comprehensively reevaluate how the United States maintains its nuclear deterrent and what the nation's approach should be for transforming its aging nuclear weapons complex. The National Nuclear Security Administration (NNSA), a separately organized agency within the Department of Energy, is responsible for overseeing this weapons complex, which comprises three nuclear weapons design laboratories, four production plants, and the Nevada Test Site.

At the direction of the Subcommittee on Energy and Water Development, the Secretary of Energy Advisory Board's (SEAB) Nuclear Weapons Complex Infrastructure Task Force issued a report in October 2005 that provided a systematic review of the requirements for the weapons complex for the next 25 years and offered its vision for an agile and responsive weapons complex. GAO was asked to discuss (1) the current actions NNSA is taking to address the SEAB task force's recommendations and (2) the critical steps that will be needed to achieve and sustain a meaningful, cost-effective transformation of the weapons complex.

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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.

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Views on Proposals to Transform the Nuclear Weapons Complex

What GAO Found

The SEAB task force report contained the following five recommendations:

- Immediately begin to modernize the cold war nuclear stockpile by designing a Reliable Replacement Warhead (RRW).
- Create a Consolidated Nuclear Production Center (CNPC) that contains a modern set of production facilities in one location.
- Consolidate all weapons-grade material and weapons components at the CNPC.
- Aggressively dismantle the cold war stockpile.
- Create an Office of Transformation to oversee the transformation of the nuclear weapons complex.

NNSA has offered a proposal for transforming the nuclear weapons complex that it believes is responsive to the recommendations in the SEAB task force report. Specifically, NNSA officials noted, they (1) will decide on a design competition for the RRW in November 2006, (2) have requested an increase of over \$15 million in funding for dismantling legacy weapons in fiscal year 2007, and (3) have requested \$15 million in their fiscal year 2007 budget proposal to create an Office of Transformation, among other things. However, NNSA does not support the SEAB task force's recommendation for a CNPC and the accompanying recommendation of consolidating weapons-grade material at the CNPC, primarily because it views these recommendations as too costly. Instead, NNSA has proposed building a consolidated center for processing plutonium, removing weapons-grade material from the three weapons laboratories, and modernizing the remaining production capabilities at their existing locations.

Regardless of the approach chosen, any attempt to change an extremely complex enterprise must be based on solid analysis, careful planning, and effective leadership. GAO has identified the following four actions that, in its view, are critical to successfully transforming the weapons complex:

- The Department of Defense will need to establish clear, long-term requirements for the nuclear stockpile by determining the types and quantities of nuclear weapons needed to provide for our nation's nuclear deterrent.
- After the Department of Defense determines the size and composition of the future stockpile, NNSA will need to develop accurate cost estimates of the proposals for transforming the weapons complex. Current estimates of the costs of transforming the weapons complex contain considerable uncertainty.
- After NNSA selects a proposal based on accurate cost estimates, it will need to develop a clear transformation plan containing measurable milestones so that it can evaluate progress and the Congress can hold it accountable.
- The proposed Office of Transformation must have authority to make and enforce its decisions on transformation and must be held accountable by the Congress for achieving timely and cost-effective results.

Mr. Chairman and Members of the Subcommittee:

We are pleased to be here today to provide our observations on the October 2005 report, *Recommendations for the Nuclear Weapons Complex of the Future*, prepared by the Secretary of Energy Advisory Board's (SEAB) Nuclear Weapons Complex Infrastructure Task Force.¹ After the end of the cold war, the United States, in 1992, began a unilateral moratorium on underground nuclear testing. Subsequently, in 1993, the Department of Energy (DOE), at the direction of the President and the Congress, established the Stockpile Stewardship Program to ensure the United States' core intellectual and technical competencies in nuclear weapons without testing.² The National Nuclear Security Administration (NNSA), a separately organized agency within DOE, is now responsible for carrying out the Stockpile Stewardship Program through a nuclear weapons complex (weapons complex) that comprises three nuclear weapons design laboratories (weapons laboratories), four production plants, and the Nevada Test Site. With the creation of the Stockpile Stewardship Program, the mission of the weapons complex changed from "designing, building, and testing" successive generations of weapons to extending the life of the existing nuclear weapons stockpile through "scientific study, computer simulation, and refurbishment."

Several events over the past few years have made it clear that it is time for the United States to comprehensively reevaluate how it maintains its nuclear deterrent and to develop and implement a strategy for transforming its weapons complex. For example, the 2001 Nuclear Posture Review found that the nuclear weapons infrastructure had atrophied and needed to be repaired; it also called for the development of a "responsive infrastructure" that would support a smaller nuclear deterrent. Subsequently, the 2002 Moscow Treaty between the United States and Russia set a goal of reducing the number of deployed U.S. nuclear warheads to between 1,700 and 2,200 by 2012. More recently, NNSA, as directed by the conference report accompanying DOE's fiscal year 2005 appropriations act, created the Reliable Replacement Warhead (RRW) program to study a new approach to maintaining nuclear warheads over

¹U.S. Department of Energy, Secretary of Energy Advisory Board, *Report of the Nuclear Weapons Complex Infrastructure Task Force: Recommendations for the Nuclear Weapons Complex of the Future* (Washington, D.C.: July 13, 2005).

²National Defense Authorization Act for Fiscal Year 1994, Pub. L. No. 103-160, § 3138 (1993).

the long term by making weapons easier to manufacture, maintain, dismantle, and certify without nuclear testing.³

In this context, this Subcommittee requested, and the SEAB task force has provided, a systematic review of the requirements for the weapons complex over the next 25 years. The SEAB task force report contains five major recommendations that, combined with numerous supporting recommendations, offer the task force's vision for an agile and responsive weapons complex. These recommendations are as follows:

- Immediately begin to modernize the nuclear weapons stockpile by designing a RRW.
- Create a Consolidated Nuclear Production Center (CNPC) that contains a modern set of production facilities in one location.
- Consolidate all Category I and Category II quantities of Special Nuclear Material and weapon primary and secondary components at the CNPC.
- Aggressively dismantle the cold war stockpile.
- Create an Office of Transformation to oversee the transformation of the weapons complex.

Our testimony discusses (1) the current actions NNSA is taking to address the SEAB task force's recommendations and (2) the critical actions needed to achieve and sustain a meaningful, cost-effective transformation of the weapons complex.

To carry out our objectives, we reviewed the final SEAB task force report and the comments provided by various parties on the initial draft. We interviewed the SEAB task force members individually to obtain their views on the final report and NNSA's response to it. We met with various NNSA officials, including the Deputy Administrator for Defense Programs and the head of NNSA's Responsive Infrastructure Steering Committee, and with the Deputy Assistant to the Secretary of Defense (Nuclear

³The conference report accompanying the fiscal year 2005 Consolidated Appropriations Act, Pub. L. No. 108-447, stated that the appropriations committee was providing \$9 million "for the Reliable Replacement Warhead program to improve the reliability, longevity, and certifiability of existing weapons and their components." H.R. Rep. No. 108-792, Div. C, at 951 (2004).

Matters). We also reviewed the methods the SEAB task force used to develop cost estimates for options presented in its report. Finally, we reviewed a variety of documents, including the Nuclear Posture Review, and the recent Defense Science Board report, entitled *Report of the Defense Science Board Task Force on Nuclear Capabilities*.⁴ We performed our work between February 2006 and April 2006 in accordance with generally accepted government auditing standards.

In summary:

NNSA has offered a proposal for transforming the weapons complex that it believes is responsive to the recommendations in the SEAB task force report. Specifically, NNSA officials noted, they (1) will decide on a design competition for the RRW in November 2006, (2) have requested an increase of over \$15 million in funding for dismantling legacy weapons in fiscal year 2007, and (3) have requested \$15 million in their fiscal year 2007 budget proposal to create an Office of Transformation and to begin studying ways to transform the business practices of the weapons complex. However, NNSA does not plan to adopt the SEAB task force's recommendation for a CNPC and the accompanying recommendation of consolidating all Category I and II quantities of Special Nuclear Material at the CNPC, primarily because it views these recommendations as too costly. Instead, NNSA has proposed building a consolidated center for processing plutonium, removing Category I and II Special Nuclear Material from the three weapons laboratories, and modernizing the remaining production capabilities at their existing locations.

Regardless of the approach chosen to transform the weapons complex, any attempt to change such an extremely complex enterprise must be based on solid analysis, careful planning, and effective leadership. We have identified four actions that, in our view, are critical to successfully transforming the weapons complex. As the Congress oversees NNSA's future actions, it should expect to see each of these actions carefully and fully implemented:

- *The Department of Defense (DOD) will need to establish clear, long-term requirements for the stockpile.* Our current stockpile comprises nine weapon systems, all of which were designed during the cold war. Several

⁴Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics, *Report of the Defense Science Board Task Force on Nuclear Capabilities* (Washington, D.C.: January 2006).

of these systems—the B61, W76, and W80—are currently having their useful lives extended for up to 30 years through NNSA’s Stockpile Life Extension Program. However, these life extensions are very expensive, and some have already experienced cost and schedule slippages. NNSA is now evaluating a new warhead—the RRW—which may be able to take the place of some existing warheads. Before any plans for a new weapons complex can be made final, however, in our view, DOD will need to determine the systems, their capabilities, their quantities, and the schedule it needs to provide for our nation’s nuclear deterrent.

- *NNSA will need to provide accurate estimates of the costs of transformation.* Once a decision is made about the size and composition of the stockpile, NNSA can develop accurate estimates of the costs of proposals for transforming the weapons complex. As we have noted in numerous reports over the last several years on key projects such as the National Ignition Facility and the Stockpile Life Extension Program, NNSA has had difficulty estimating costs and schedules and adhering to them.⁵ Some cost estimates to transform the weapons complex were developed as part of the SEAB task force report and, according to NNSA officials, NNSA is currently using the same cost models for its effort. However, these estimates need considerable refinement. As a result, NNSA will need to develop credible, defensible cost estimates for transforming the weapons complex.
- *NNSA will need to develop a transformation plan with clear milestones for measuring progress.* Developing workable plans, with realistic, measurable milestones has been a continuing problem for NNSA. For example, as we noted in our February 2006 report on NNSA’s effort to develop and implement a new method for assessing and certifying the stockpile, NNSA does not have an integrated plan for carrying out this important activity or clear milestones for measuring progress.⁶ Without question, transforming the weapons complex will be a much more daunting enterprise. However, without a clear transformation plan that contains measurable milestones, NNSA will have no way to evaluate its progress, and the Congress will have no way to hold NNSA accountable.

⁵See GAO, *Nuclear Weapons: Opportunities Exist to Improve the Budgeting, Cost Accounting and Management Associated with the Stockpile Life Extension Program*, [GAO-03-583](#) (Washington, D.C.: July 28, 2003) and GAO, *National Ignition Facility: Management and Oversight Failures Caused Major Cost Overruns and Schedule Delays*, [GAO/RCED-00-271](#) (Washington, D.C.: Aug. 8, 2000).

⁶GAO, *Nuclear Weapons: NNSA Needs to Refine and More Effectively Manage Its New Approach for Assessing and Certifying Nuclear Weapons*, [GAO-06-261](#) (Washington, D.C.: Feb. 3, 2006).

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- *Change will require a strong Office of Transformation.* As we noted in a 2003 report, one of the key practices for successfully transforming an organization is to ensure that top leadership sets the direction, pace, and tone for the transformation.⁷ Through its recent reorganizations, NNSA has shown that it can move from what was often called a “dysfunctional bureaucracy” to an organization with clearer lines of authority and responsibility. NNSA officials have embraced the SEAB task force’s proposal for an Office of Transformation. However, in order for such an office to be effective, it must (1) report directly to the Administrator, NNSA; (2) have real authority to make and enforce its decisions; and (3) be held accountable by the Congress for achieving results in a cost-effective and timely manner.

Background

NNSA conducts nuclear weapon and nonproliferation-related national security activities in research and development laboratories, production plants, and other facilities.⁸ Specifically, NNSA operates three weapons laboratories—Lawrence Livermore National Laboratory (LLNL), California; Los Alamos National Laboratory (LANL), New Mexico; and the Sandia National Laboratories, New Mexico and California; and four nuclear weapons production sites—the Pantex Plant, Texas; the Y-12 Plant, Tennessee; the Kansas City Plant, Missouri; and the Savannah River Site, South Carolina. NNSA also operates the Nevada Test Site. To implement its nuclear weapons programs, NNSA received about \$6.4 billion for fiscal year 2006 and has requested more than \$6.4 billion for fiscal year 2007. Between fiscal years 2008 and 2011, NNSA is proposing to spend almost \$27 billion for these programs.

Over the past decade, NNSA has invested a substantial amount of money in sustaining the cold war stockpile and upgrading the three weapons laboratories with new, state-of-the-art experimental and computing facilities. However, as described in studies over the past decade, the production infrastructure of the weapons complex is aging and increasingly outdated. For example, a 2000 DOE Office of Inspector General report concluded that the postponement of repairs to aging and deteriorating facilities had resulted in delays in weapons modification,

⁷GAO, *Results-Oriented Cultures: Implementation Steps to Assist Mergers and Organizational Transformations*, GAO-03-669 (Washington, D.C.: July 2, 2003).

⁸The Office of Naval Reactors is managed as a separate entity within NNSA.

remanufacture, and dismantlement, among other things.⁹ In addition, a 2001 report by the Foster Panel found the state of the production facilities to be troubling and recommended that NNSA restore missing production capabilities and refurbish the production infrastructure.¹⁰ In its fiscal year 2007 budget request, NNSA estimated that it will cost \$2.4 billion to reduce the backlog of deferred maintenance at these facilities to an appropriate level consistent with industry best practices.

Events over the past several years have served to intensify concern about how the United States maintains its nuclear deterrent and what the nation's strategy should be for transforming the weapons complex. Specifically:

- The 2001 Nuclear Posture Review stated, among other things, that cold war practices related to nuclear weapons planning were obsolete, and few changes had been made to the size or composition of the nation's nuclear forces. Furthermore, there had been underinvestment in the weapons complex, particularly the production sites. The Nuclear Posture Review called for, among other things, the development of a "responsive infrastructure" that would be sized to meet the needs of a smaller nuclear deterrent while having the capability to respond to future strategic challenges.
- The terrorist attacks of September 11, 2001, led DOE to increase the size of its Design Basis Threat, a classified document that identifies the size and capabilities of terrorist forces. This increase in the size of the Design Basis Threat has greatly increased NNSA's cost for protecting its weapons-grade nuclear material.
- The 2002 Moscow Treaty between the United States and Russia set a goal of reducing the number of deployed U.S. nuclear warheads to between 1,700 and 2,200 by 2012. However, a significant number of existing warheads would be kept in reserve to address potential technical contingencies with the existing stockpile.
- NNSA, at the Congress' direction, created the RRW program to study a new approach to maintaining nuclear warheads over the long term. The

⁹DOE Office of Inspector General, *Management of the Nuclear Weapons Production Infrastructure*, September 2000, DOE/IG-0484.

¹⁰John S. Foster, Fr., et. al, *FY 2000 Report to Congress of the Panel to Assess the Reliability, Safety, and Security of the United States Nuclear Stockpile*, Feb. 1, 2001.

RRW program would redesign weapon components to be easier to manufacture, maintain, dismantle, and certify without nuclear testing, potentially allowing NNSA to transition to a smaller, more efficient weapons complex. A design competition between LANL and LLNL is scheduled to end in November 2006.

- Finally, in recent congressional testimony, the Secretary of Energy and the Administrator of NNSA emphasized to the Congress that while they believe stockpile stewardship is working, the current cold war legacy stockpile is the wrong stockpile for the long term, and the current nuclear weapons infrastructure is not responsive to unanticipated events or emerging threats.

Current NNSA plans call for substantial funding to operate the existing weapons complex. For example, according to NNSA's fiscal year 2007 budget request, over the next 5 years, NNSA plans to spend about \$7.4 billion to operate and maintain the existing infrastructure of the weapons complex. In addition, NNSA plans to spend \$1.8 billion on new construction projects. These construction projects include

- the Highly Enriched Uranium Materials Facility at the Y-12 Plant, which is estimated to cost \$335 million and be completed in fiscal year 2007;¹¹
- the Chemistry and Metallurgy Research Replacement facility at LANL, which is estimated to cost \$838 million and be completed in fiscal year 2013; and
- the proposed Uranium Processing Facility at the Y-12 Plant, which is projected to cost between \$600 million to \$1 billion.

During testimony before this Subcommittee in March 2004, the Secretary of Energy agreed to conduct a comprehensive review of the weapons complex. Subsequently, in January 2005, the Secretary of Energy requested the SEAB to form the Nuclear Weapons Complex Infrastructure Task Force to assess the implications of presidential decisions on the size and composition of the stockpile; the cost and operational impacts of the

¹¹NNSA's fiscal year 2007 budget request states that detailed design, cost, and schedule assessments for incorporating facility improvements to meet the new Design Basis Threat and facility start-up activities are still in progress. It is anticipated that when these assessments are complete, the baseline "total estimated costs" of the Highly Enriched Uranium Materials Facility will increase substantially, and the completion date will slip.

new Design Basis Threat; and the personnel, facilities, and budgetary resources required to support a smaller stockpile. The review was also to evaluate opportunities for consolidating Special Nuclear Material, facilities, and operations across the weapons complex in order to minimize security requirements and the environmental impacts of continuing operations. The SEAB task force formally transmitted the final report to the Secretary of Energy in October 2005.

According to the report, the SEAB task force assessed the impact of its recommendations on near-term funding requirements, as well as total costs, for the weapons complex over the next 25 years. The report stated that implementing all of the recommendations will increase near-term costs substantially but would result in a substantial reduction in future operating costs after the CNPC is in full operation. The SEAB task force estimated that the long-term cost savings would be approximately twice the near-term cost increases.

NNSA Actions to Implement the SEAB Task Force Recommendations

Initially, NNSA officials did not provide us with any detailed information concerning their plans for transforming the infrastructure of the weapons complex and for addressing the recommendations in the SEAB task force report. Instead, NNSA officials described to us the following process they were using to establish a detailed vision for the future weapons complex and to identify a “path forward” for achieving that vision:

- In March 2005, NNSA established a Responsive Infrastructure Steering Committee and created a position within the Office of Defense Programs to lead this effort.
- In October 2005, NNSA received the final SEAB task force report. NNSA officials said that they have reviewed the recommendations from this report, along with recommendations from other advisory bodies, such as the Defense Science Board.
- In November 2005 and January 2006, NNSA held two meetings for senior-level officials within the weapons complex to establish a broad range of planning options, which NNSA refers to as its “preferred infrastructure planning scenario.”
- In January 2006, NNSA held a 3-week session for about 50 key midlevel managers within the weapons complex to evaluate the proposed planning options.

As a result of this process, NNSA recently offered a proposal for transforming the weapons complex that it believes is responsive to the recommendations in the SEAB task force report. Specifically, NNSA officials stated that

- NNSA will decide on the RRW design competition in November 2006 and, assuming that the RRW is technically feasible, will seek authorization to proceed to engineering development and production;
- NNSA is requesting an additional \$15.6 million in its fiscal year 2007 budget request to dismantle legacy weapons material at the Pantex Plant; and
- NNSA is requesting about \$15 million for fiscal year 2007, as well as over \$30 million annually from fiscal years 2008 through 2011, to support the implementation of its responsive infrastructure strategy, including the creation of an Office of Transformation within the Office of Defense Programs.

However, NNSA does not plan to adopt the SEAB task force's recommendation for a CNPC and the accompanying recommendation of consolidating all Category I and II quantities of Special Nuclear Material at the CNPC. NNSA believes that these recommendations are not affordable or feasible. For example, in recent congressional testimony, the Deputy Administrator for Defense Programs said that the SEAB task force report's recommendation on the timing for a CNPC—i.e., that a CNPC could be designed, built, and operational by 2015—is not plausible and underestimates the challenges of transitioning a unique and highly skilled workforce to a new location. He also stated that the recommendation does not recognize the challenge of meeting near-term requirements of the current stockpile and transforming the weapons complex infrastructure at the same time. In addition, he stated that it may be decades before all existing legacy weapons are fully removed from the stockpile and dismantled.

Instead, NNSA has proposed the following plan for the 2030 weapons complex, which it states will achieve many of the benefits of the SEAB task force's approach in a way that is technically feasible and affordable over both the near and longer term:

- *Consolidated plutonium center.* All research and development (except certain experiments at the Nevada Test Site), surveillance, and production activities involving Category I and II quantities of plutonium would be

transferred to a consolidated plutonium center. The center would have a baseline production capacity of 125 pits per year by 2022 and would be situated at an existing Category I and II Special Nuclear Material site. In the interim, NNSA would upgrade the plutonium facility at Tech Area 55 at LANL to produce 30-50 pits per year and operate the Chemistry and Metallurgy Research Replacement facility at LANL as a Category I and II Special Nuclear Material facility.

- *Consolidation of Category I and II Special Nuclear Material.* This material would be consolidated to fewer sites, and to fewer locations within sites. Specifically, NNSA would remove all Category I and II Special Nuclear Material from Sandia National Laboratory by 2008 and from LLNL by 2014, and would cease all activities involving this material at LANL by 2022. The remaining NNSA sites with Category I and II Special Nuclear Material would include the consolidated plutonium center, the Nevada Test Site, the Pantex Plant, the Y-12 Plant, and the Savannah River Site.
- *Modernizing the remaining production sites.* The planned Uranium Processing Facility at the Y-12 Plant would consolidate existing highly enriched uranium contained in legacy weapons, dismantle legacy warhead secondaries, support associated research and development, and provide a long-term capacity for new secondary production. Tritium production and stockpile support services would remain at the Savannah River Site. All weapons assembly and disassembly would be carried out at a Pantex Plant modernized for increased throughput for the long term. In addition, NNSA would build a new, nonnuclear component production facility by 2012 at an unspecified location. Finally, the Nevada Test Site would become the only site for large-scale hydrodynamic testing, which measure how stockpile materials behave when exposed to explosively driven shocks.

Four Actions Will Be Critical to Successfully Transforming the Complex

Regardless of the approach chosen to transform the weapons complex, any attempt to change such an extremely complex enterprise must be based on solid analysis, careful planning, and effective leadership. We have identified four actions that, in our view, are critical to the successful transformation of the weapons complex. As the Congress oversees NNSA's future actions, it should expect to see each of these actions carefully and fully implemented.

DOD Will Need to Establish Clear, Long-Term Requirements for the Stockpile

The U.S. nuclear weapons stockpile consists of nine weapon types. (See table 1.) The lifetimes of the weapons currently in the stockpile have been extended well beyond the minimum life for which they were originally designed—generally about 20 years—increasing the average age of the stockpile and, for the first time, leaving NNSA with large numbers of weapons that are close to 30 years old.

Table 1: Nuclear Weapons in the Enduring Stockpile

Warhead or bomb type	Description	Date of entry into stockpile	Laboratory	Military service
B61 3/4/10	Tactical bomb	1979/1979/1990	LANL, SNL	Air Force
B61 7/11	Strategic bomb	1985/1996	LANL, SNL	Air Force
W62	ICBM warhead ^a	1970	LLNL, SNL	Air Force
W76	SLBM warhead ^b	1978	LANL, SNL	Navy
W78	ICBM warhead ^a	1979	LANL, SNL	Air Force
W80 0/1	Cruise missile warhead	1984/1982	LLNL, SNL	Air Force / Navy
B83 0/1	Strategic bomb	1983/1993	LLNL, SNL	Air Force
W87	ICBM warhead ^a	1986	LLNL, SNL	Air Force
W88	SLBM warhead ^b	1989	LANL, SNL	Navy

Source: NNSA.

Note: The dates of entry into the enduring nuclear stockpile are based on when the weapon reached phase 6 of the weapons development and production cycle. As of 2005, responsibility for the W80 0/1 was transferred from LANL to LLNL.

^aICBM = intercontinental ballistic missile.

^bSLBM = submarine launched ballistic missile.

NNSA is currently rebuilding several of these weapon types through the Stockpile Life Extension Program. Already, the W87 has been refurbished. In addition, the B61, W76, and W80 are well into their respective refurbishments. The first production unit for the B61 is scheduled for September 2006, while the first production unit for the W76 is scheduled for September 2007 and for the W80 for January 2009. These are costly and difficult undertakings. According to NNSA's fiscal year 2007 budget request, over the next 5 years, the agency will need \$118.4 million for the B61 life extension, \$669.9 million for the W76, and \$581.5 million for the W80. These efforts place considerable demands on the computational and experimental facilities of the weapons laboratories, as well as the production facilities. Finally, some of the life extensions have experienced

significant cost and schedule overruns.¹² For example, the total cost of the W80 life extension has increased by almost \$600 million, while the first production unit date has slipped from February 2006 to the current date of January 2009.

In its 2001 Nuclear Posture Review, DOD described the need to substantially reduce operationally deployed strategic warheads through 2012. These reductions were subsequently reflected in the Moscow Treaty between the United States and Russia, which was signed in May 2002. As part of this strategy, DOD has stated its support for the development of an RRW, which could enable reductions in the number of older, nondeployed warheads maintained as a hedge against reliability problems in deployed systems and assist in the evolution to a smaller and more responsive nuclear weapons infrastructure. Currently, LANL and LLNL are developing competing designs for an RRW deployed on a submarine-launched ballistic missile, with the first production unit planned for fiscal year 2012. However, since the RRW design competition will not be completed until November 2006, more information on the viability of the RRW program will be necessary before any firm plans can be drawn up, budgeted, and implemented. In particular, it is not clear at this point whether the RRW can achieve the military characteristics, such as yield, provided by the current stockpile. Some NNSA officials have indicated that the military characteristics may need to be relaxed in order to design a warhead that is safer, easier to build, and easier to maintain.

Producing an RRW warhead, while at the same time refurbishing a significant portion of the stockpile and continuing to dismantle retired weapons, will be a difficult and costly undertaking. Given NNSA's performance to date with the life extension programs and the current unresolved questions about the RRW, in our view, DOD will need to establish clear, long-term requirements for the nuclear stockpile before NNSA can make any final decisions about transforming the weapons complex. Specifically, DOD, working with NNSA through the Nuclear Weapons Council, needs to determine the types and quantities of nuclear weapons that will provide for our nation's nuclear deterrent over the long term. To facilitate this process, and to provide a foundation for transforming the weapons complex, the Congress may wish to consider

¹²For information on cost and schedule overruns associated with the W87 life extension program, see GAO, *Nuclear Weapons: Improved Management Needed to Implement Stockpile Stewardship Program Effectively*, GAO-01-48 (Washington, D.C.: Dec. 14, 2000).

setting firm deadlines for DOD, NNSA, and the Nuclear Weapons Council to determine the future composition of the nuclear stockpile.

NNSA Will Need to Provide Accurate Estimates of the Costs of Transformation

Once a decision about the size and composition of the stockpile is made, NNSA will need accurate estimates of the costs of proposals for transforming the weapons complex. However, historically, NNSA has had difficulty developing realistic, defensible cost estimates, especially for large complex projects. For example, in our August 2000 report on the National Ignition Facility,¹³ we found that NNSA and LLNL managers greatly underestimated the costs of creating such a technically complex facility and failed to include adequate contingency funding, which virtually assured that the National Ignition Facility would be over budget and behind schedule. Similarly, as noted in a March 2005 NNSA report, inadequate appreciation of the technical complexities and inadequate contingency funding directly contributed to the cost overruns and schedule slippage experienced by the Dual Axis Radiographic Hydrodynamic Test facility.¹⁴ As noted earlier, NNSA has experienced similar cost and schedule problems with some of its life extension efforts.

Some cost estimates to transform the weapons complex were included in the SEAB task force report. Specifically, using the results of computer models developed at LANL and LLNL, the SEAB task force estimated that NNSA would need about \$175 billion between now and 2030 to support its current baseline program and modernize the current weapons complex in place, while NNSA would need only \$155 billion to carry out the task force's recommendations. According to NNSA officials, NNSA is currently using the same cost models to evaluate its proposal.

However, according to SEAB task force and NNSA and laboratory officials, while the LANL and LLNL models are useful for analyzing overall cost trends and evaluating the cost implications of alternative strategies, they are not currently designed to provide overall life-cycle cost estimates. In addition, we found, among other things, that the cost data used in the models have a high degree of uncertainty associated with them and that the models do not currently have the ability to provide any confidence intervals around their estimates. Several of the SEAB task force members

¹³GAO, *National Ignition Facility: Management and Oversight Failures Caused Major Cost Overruns and Schedule Delays*, [GAO/RCED-00-141](#) (Washington, D.C.: Aug. 8, 2000).

¹⁴NNSA, *DARHT Construction Project Lessons Learned Report*, March 2005.

told us that they recognize the limitations associated with their cost estimates. Since they did not have the time to fully analyze the costs and implementation issues associated with their recommendations, they expected that the proposed Office of Transformation would perform the necessary, detailed cost-benefit analyses of their recommendations in order to make the most informed decisions.

As previously mentioned, NNSA officials have stated that they do not support building a CNPC because they believe that it is neither affordable nor feasible. However, until NNSA develops a credible, defensible method for estimating life-cycle costs and performs detailed cost analyses of the recommendations contained in the SEAB task force report, as well as its own proposal, it will not be possible to objectively evaluate the budgetary impact of any path forward.

NNSA Will Need to Develop a Transformation Plan with Clear Milestones for Measuring Progress

According to one count, NNSA has established over 70 plans with associated performance measures to manage the Stockpile Stewardship Program. Nevertheless, over the last 6 years, we have repeatedly documented problems with NNSA's process for planning and managing its activities. For example, in a December 2000 report prepared for this Subcommittee, we found NNSA needed to improve its planning process so that there were linkages between individual plans across the Stockpile Stewardship Program and that the milestones contained in NNSA's plans were reflected in contractors' performance criteria and evaluations.¹⁵ However, in February 2006, we reported similar problems with how NNSA is managing the implementation of its new approach for assessing and certifying the safety and reliability of the nuclear stockpile.¹⁶ Specifically, we found that NNSA planning documents did not contain clear, consistent milestones or a comprehensive, integrated list of the scientific research being conducted across the weapons complex in support of the Primary and Secondary Assessment Technologies programs. These programs are responsible for setting the requirements for the computer models and experimental data needed to assess and certify the safety and reliability of nuclear warheads. We also found that NNSA had not established adequate

¹⁵See [GAO-01-48](#).

¹⁶GAO, *Nuclear Weapons: NNSA Needs to Refine and More Effectively Manage Its New Approach for Assessing and Certifying Nuclear Weapons*, [GAO-06-261](#) (Washington, D.C.: Feb. 3, 2006).

performance measures to determine the progress of the weapons laboratories in developing and implementing this new methodology.

However, the need for effective planning applies to more than the Stockpile Stewardship Program. One of the major recommendations of the SEAB task force is to consolidate Category I and II Special Nuclear Material at the CNPC. In our July 2005 report, we noted that the successful consolidation of Special Nuclear Material into fewer locations is a crucial component of several DOE sites' Design Basis Threat implementation plans.¹⁷ Such consolidation requires the cooperation of a variety of entities, including NNSA's Office of Secure Transportation, which moves weapons-grade material from site to site. In our report, we recommended that DOE develop a departmentwide Design Basis Threat implementation plan that includes the consolidation of Special Nuclear Material. However, while DOE has established a Nuclear Material Disposition Consolidation and Coordination Committee, it has yet to develop such a comprehensive plan.

The process of transforming the weapons complex will take a long time to complete—as long as two decades, according to some estimates. As a result, NNSA will need to develop a transformation plan with clear milestones that all involved can work toward and that the Congress can use to hold NNSA accountable. For example, as we stated in a 2003 report, one key practice in successful transformations is to set implementation goals and a time line to build momentum and show progress from day 1.¹⁸ In addition, given the demand for transparency and accountability in the public sector, these goals and time lines should be made public. We would note that NNSA should be able to establish milestones for some activities quickly, while others will take more time. For example, NNSA's Deputy Administrator for Defense Programs has indicated a willingness to establish an Office of Transformation and to implement other SEAB task force recommendations, such as developing a consistent set of business practices across the weapons complex. In these situations, the Congress should expect NNSA to move quickly to establish specific milestones needed to create the Office of Transformation, select key staff to fill this office, and implement key initiatives.

¹⁷GAO, *Nuclear Security: DOE's Office of the Under Secretary for Energy, Science, and Environment Needs to Take Prompt, Coordinated Action to Meet the New Design Basis Threat*, [GAO-05-611](#) (Washington, D.C.: July 15, 2005).

¹⁸See [GAO-03-669](#).

We recognize that NNSA will not be able to establish specific milestones in some areas until after the Office of Transformation has performed a detailed, cost-benefit analysis of both the recommendations in the SEAB task force report and of NNSA's own preferred approach. However, once this analysis is complete, the Congress should expect to see specific, detailed plans and accompanying milestones for the RRW program, the establishment of a pit production capability, and the other adopted recommendations from the SEAB task force report.

Change Will Require a Strong Office of Transformation

Many of the recommendations in the SEAB report are not new. A number of studies over the past 15 years have stressed the need to transform the weapons complex. However, for a variety of reasons, DOE and NNSA have never fully implemented these ideas. One of the key problems that NNSA has experienced during this time has been its inability to build an organization with clear lines of authority and responsibility. As we noted in our June 2004 report, NNSA, through its December 2002 reorganization, made important strides in providing clearer lines of authority and responsibility.¹⁹ However, we also noted problems in certain oversight functions, such as safety. We are currently evaluating NNSA's management effectiveness for the Subcommittee on Strategic Forces of the House Committee on Armed Services.

The Congress, and Chairman Hobson in particular, have offered leadership in supporting the creation of the SEAB task force and in funding the RRW program. However, as we stated in a 2003 report, organizational transformation entails fundamental and often radical change.²⁰ As a result, top leadership must set the direction, pace, and tone for the transformation, while simultaneously helping the organization remain focused on the continued delivery of services. One key strategy is to dedicate a strong and stable implementation team that will be responsible for the transformation's day-to-day management. Accordingly, this team must be vested with the necessary authority and resources to set priorities, make timely decisions, and move quickly to implement decisions. Therefore, in our view, it is imperative that the proposed Office of Transformation (1) report directly to the Administrator of NNSA; (2) be

¹⁹GAO, *National Nuclear Security Administration: Key Management Structure and Workforce Planning Issues Remain as NNSA Conducts Downsizing*, [GAO-04-545](#) (Washington, D.C.: June 25, 2004).

²⁰See [GAO-03-669](#).

given sufficient authority to conduct its studies and implement its recommendations; and (3) be held accountable for creating real change within the weapons complex.

Mr. Chairman, this concludes my prepared statement. I would be happy to respond to any questions that you or Members of the Subcommittee may have.

GAO Contact and Staff Acknowledgments

For further information on this testimony, 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 statement. James Noel, Assistant Director; Jason Holliday; and Peter Ruedel made key contributions to this testimony.

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